
conda

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CONTENTS

1	User guide	3
2	Conda configuration	117
3	Command reference	129
4	Glossary	163
5	Developer guide	169
6	Release notes	595
	Python Module Index	735
	Index	739

Package, dependency and environment management for any language---Python, R, Ruby, Lua, Scala, Java, JavaScript, C/ C++, FORTRAN

Conda is an open-source package management system and environment management system that runs on Windows, macOS, and Linux. Conda quickly installs, runs, and updates packages and their dependencies. Conda easily creates, saves, loads, and switches between environments on your local computer. It was created for Python programs but it can package and distribute software for any language.

Conda as a package manager helps you find and install packages. If you need a package that requires a different version of Python, you do not need to switch to a different environment manager because conda is also an environment manager. With just a few commands, you can set up a totally separate environment to run that different version of Python, while continuing to run your usual version of Python in your normal environment.

In its default configuration, conda can install and manage the over 7,500 packages at repo.anaconda.com that are built, reviewed, and maintained by Anaconda®.

Conda can be combined with continuous integration systems, such as GitHub Actions, to provide frequent, automated testing of your code.

The conda package and environment manager is included in all versions of [Anaconda®](#), [Miniconda](#), and [Anaconda Repository](#). Conda is also included in [Anaconda Enterprise](#), which provides on-site enterprise package and environment management for Python, R, Node.js, Java, and other application stacks. Conda is also available on [conda-forge](#), a community channel. You may also get conda on [PyPI](#), but that approach may not be as up to date.

1.1 Concepts

Explore the links to learn more about conda foundations.

1.1.1 Conda commands

The conda command is the primary interface for managing installations of various packages. It can:

- Query and search the Anaconda package index and current Anaconda installation.
- Create new conda environments.
- Install and update packages into existing conda environments.

Tip: You can abbreviate many frequently used command options that are preceded by 2 dashes (--) to just 1 dash and the first letter of the option. So --name and --envs can be written as -n and -e respectively.

For full usage of each command, including abbreviations, see `../commands`. You can see the same information at the command line by *viewing the command-line help*.

1.1.2 Conda packages

- *What is a conda package?*
- *.conda file format*
- *Using packages*
- *Package structure*
- *Metapackages*
 - *Anaconda metapackage*
 - *Mutex metapackages*
- *Noarch packages*
 - *Noarch Python*
- *Link and unlink scripts*

- [More information](#)

What is a conda package?

A conda package is a compressed tarball file (.tar.bz2) or .conda file that contains:

- system-level libraries.
- Python or other modules.
- executable programs and other components.
- metadata under the `info/` directory.
- a collection of files that are installed directly into an `install` prefix.

Conda keeps track of the dependencies between packages and platforms. The conda package format is identical across platforms and operating systems.

Only files, including symbolic links, are part of a conda package. Directories are not included. Directories are created and removed as needed, but you cannot create an empty directory from the tar archive directly.

.conda file format

The .conda file format was introduced in conda 4.7 as a more compact, and thus faster, alternative to a tarball.

The .conda file format consists of an outer, uncompressed ZIP-format container, with 2 inner compressed .tar files.

For the .conda format's initial internal compression format support, we chose Zstandard (zstd). The actual compression format used does not matter, as long as the format is supported by libarchive. The compression format may change in the future as more advanced compression algorithms are developed and no change to the .conda format is necessary. Only an updated libarchive would be required to add a new compression format to .conda files.

These compressed files can be significantly smaller than their bzip2 equivalents. In addition, they decompress much more quickly. .conda is the preferred file format to use where available, although we continue to provide .tar.bz2 files in tandem.

Read more about the [introduction of the .conda file format](#).

Note: In conda 4.7 and later, you cannot use package names that end in “.conda” as they conflict with the .conda file format for packages.

Using packages

- You may search for packages

```
conda search scipy
```

- You may install a package

```
conda install scipy
```

- You may build a package after [installing conda-build](#)


```
conda build my_fun_package
```

Package structure

```
.
├── bin
│   └── pyflakes
├── info
│   ├── LICENSE.txt
│   ├── files
│   ├── index.json
│   ├── paths.json
│   └── recipe
└── lib
    └── python3.5
```

- bin contains relevant binaries for the package.
- lib contains the relevant library files (eg. the .py files).
- info contains package metadata.

Metapackages

When a conda package is used for metadata alone and does not contain any files, it is referred to as a metapackage. The metapackage may contain dependencies to several core, low-level libraries and can contain links to software files that are automatically downloaded when executed. Metapackages are used to capture metadata and make complicated package specifications simpler.

An example of a metapackage is "anaconda," which collects together all the packages in the Anaconda installer. The command `conda create -n envname anaconda` creates an environment that exactly matches what would be created from the Anaconda installer. You can create metapackages with the `conda metapackage` command. Include the name and version in the command.

Anaconda metapackage

The Anaconda metapackage is used in the creation of the [Anaconda Distribution](#) installers so that they have a set of packages associated with them. Each installer release has a version number, which corresponds to a particular collection of packages at specific versions. That collection of packages at specific versions is encapsulated in the Anaconda metapackage.

The Anaconda metapackage contains several core, low-level libraries, including compression, encryption, linear algebra, and some GUI libraries.

[Read more about the Anaconda metapackage and Anaconda Distribution.](#)

Mutex metapackages

A mutex metapackage is a very simple package that has a name. It need not have any dependencies or build steps. Mutex metapackages are frequently an "output" in a recipe that builds some variant of another package. Mutex metapackages function as a tool to help achieve mutual exclusivity among packages with different names.

Let's look at some examples for how to use mutex metapackages to build NumPy against different BLAS implementations.

Building NumPy with BLAS variants

If you build NumPy with MKL, you also need to build SciPy, scikit-learn, and anything else using BLAS also with MKL. It is important to ensure that these "variants" (packages built with a particular set of options) are installed together and never with an alternate BLAS implementation. This is to avoid crashes, slowness, or numerical problems. Lining up these libraries is both a build-time and an install-time concern. We'll show how to use metapackages to achieve this need.

Let's start with the metapackage `blas=1.0=mkl`: https://github.com/AnacondaRecipes/intel_repack-feedstock/blob/e699b12/recipe/meta.yaml#L108-L112

Note that `mkl` is a string of `blas`.

That metapackage is automatically added as a dependency using `run_exports` when someone uses the `mkl-devel` package as a build-time dependency: https://github.com/AnacondaRecipes/intel_repack-feedstock/blob/e699b12/recipe/meta.yaml#L124

By the same token, here's the metapackage for OpenBLAS: <https://github.com/AnacondaRecipes/openblas-feedstock/blob/ae5af5e/recipe/meta.yaml#L127-L131>

And the `run_exports` for OpenBLAS, as part of `openblas-devel`: <https://github.com/AnacondaRecipes/openblas-feedstock/blob/ae5af5e/recipe/meta.yaml#L100>

Fundamentally, conda's model of mutual exclusivity relies on the package name. OpenBLAS and MKL are obviously not the same package name, and thus are not mutually exclusive. There's nothing stopping conda from installing both at once. There's nothing stopping conda from installing NumPy with MKL and SciPy with OpenBLAS. The metapackage is what allows us to achieve the mutual exclusivity. It unifies the options on a single package name, but with a different build string. Automating the addition of the metapackage with `run_exports` helps ensure the library consumers (package builders who depend on libraries) will have correct dependency information to achieve the unified runtime library collection.

Installing NumPy with BLAS variants

To specify which variant of NumPy that you want, you could potentially specify the BLAS library you want:

```
conda install numpy mkl
```

However, that doesn't actually preclude OpenBLAS from being chosen. Neither MKL nor its dependencies are mutually exclusive (meaning they do not have similar names and different version/build-string).

This pathway may lead to some ambiguity and solutions with mixed BLAS, so using the metapackage is recommended. To specify MKL-powered NumPy in a non-ambiguous way, you can specify the mutex package (either directly or indirectly):

```
conda install numpy "blas=*mkl"
```

There is a simpler way to address this, however. For example, you may want to try another package that has the desired mutex package as a dependency.

OpenBLAS has this with its “nomkl” package: <https://github.com/AnacondaRecipes/openblas-feedstock/blob/ae5af5e/recipe/meta.yaml#L133-L147>

Nothing should use “nomkl” as a dependency. It is strictly a utility for users to facilitate switching from MKL (which is the default) to OpenBLAS.

How did MKL become the default? The solver needs a way to prioritize some packages over others. We achieve that with an older conda feature called `track_features` that originally served a different purpose.

Track_features

One of conda’s optimization goals is to minimize the number of `track_features` needed to specify the desired specs. By adding `track_features` to one or more of the options, conda will de-prioritize it or “weigh it down.” The lowest priority package is the one that would cause the most `track_features` to be activated in the environment. The default package among many variants is the one that would cause the least `track_features` to be activated.

There is a catch, though: any `track_features` must be unique. No two packages can provide the same `track_feature`. For this reason, our standard practice is to attach `track_features` to the metapackage associated with what we want to be non-default.

Take another look at the OpenBLAS recipe: <https://github.com/AnacondaRecipes/openblas-feedstock/blob/ae5af5e/recipe/meta.yaml#L127-L137>

This attached `track_features` entry is why MKL is chosen over OpenBLAS. MKL does not have any `track_features` associated with it. If there are 3 options, you would attach 0 `track_features` to the default, then 1 `track_features` for the next preferred option, and finally 2 for the least preferred option. However, since you generally only care about the one default, it is usually sufficient to add 1 `track_feature` to all options other than the default option.

More info

For reference, the Visual Studio version alignment on Windows also uses mutex metapackages. <https://github.com/AnacondaRecipes/aggregate/blob/9635228/vs2017/meta.yaml#L24>

Noarch packages

Noarch packages are packages that are not architecture specific and therefore only have to be built once. Noarch packages are either generic or Python. Noarch generic packages allow users to distribute docs, datasets, and source code in conda packages. Noarch Python packages are described below.

Declaring these packages as `noarch` in the `build` section of the `meta.yaml` reduces shared CI resources. Therefore, all packages that qualify to be noarch packages should be declared as such.

Noarch Python

The `noarch: python` directive in the build section makes pure-Python packages that only need to be built once.

Noarch Python packages cut down on the overhead of building multiple different pure Python packages on different architectures and Python versions by sorting out platform and Python version-specific differences at install time.

In order to qualify as a noarch Python package, all of the following criteria must be fulfilled:

- No compiled extensions.
- No post-link, pre-link, or pre-unlink scripts.
- No OS-specific build scripts.
- No Python version-specific requirements.
- No skips except for Python version. If the recipe is py3 only, remove skip statement and add version constraint on Python in host and run section.
- 2to3 is not used.
- Scripts argument in setup.py is not used.
- If `console_script` entrypoints are in setup.py, they are listed in `meta.yaml`.
- No activate scripts.
- Not a dependency of conda.

Note: While `noarch: python` does not work with selectors, it does work with version constraints. `skip: True` # [py2k] can sometimes be replaced with a constrained Python version in the host and run subsections, for example: `python >=3` instead of just `python`.

Note: Only `console_script` entry points have to be listed in `meta.yaml`. Other entry points do not conflict with noarch and therefore do not require extra treatment.

Read more about [conda's noarch packages](#).

Link and unlink scripts

You may optionally execute scripts before and after the link and unlink steps. For more information, see [Adding pre-link, post-link, and pre-unlink scripts](#).

More information

Go deeper on how to *manage packages*. Learn more about package metadata, repository structure and index, and package match specifications at *Package specifications*.

1.1.3 Conda package specification

- *Package metadata*
- *Repository structure and index*
- *Package match specifications*
- *Version ordering*

Package metadata

The `info/` directory contains all metadata about a package. Files in this location are not installed under the install prefix. Although you are free to add any file to this directory, conda only inspects the content of the files discussed below.

Info

- `files`
 - a list of all the files in the package (not included in `info/`)
- `index.json`
 - metadata about the package including platform, version, dependencies, and build info

```
{
  "arch": "x86_64",
  "build": "py37hfa4b5c9_1",
  "build_number": 1,
  "depends": [
    "depend > 1.1.1"
  ],
  "license": "BSD 3-Clause",
  "name": "fun-package",
  "platform": "linux",
  "subdir": "linux-64",
  "timestamp": 1535416612069,
  "version": "0.0.0"
}
```

- `paths.json`
 - a list of files in the package, along with their associated SHA-256, size in bytes, and the type of path (eg. hardlink vs. softlink)

```
{
  "paths": [
    {
      "_path": "lib/python3.7/site-packages/fun-package/__init__.py",
      "path_type": "hardlink",
      "sha256": "76f3b6e34feeb651aff33ca59e0279c4eadce5a50c6ad93b961c846f7ba717e9",
      "size_in_bytes": 2067
    }
  ]
}
```

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```

    },
    {
      "_path": "lib/python3.7/site-packages/fun-packge/__config__.py",
      "path_type": "hardlink",
      "sha256": "348e3602616c1fe4c84502b1d8cf97c740d886002c78edab176759610d287f06",
      "size_in_bytes": 87519
    },
    ...
  }
}

```

info/index.json

This file contains basic information about the package, such as name, version, build string, and dependencies. The content of this file is stored in `repodata.json`, which is the repository index file, hence the name `index.json`. The JSON object is a dictionary containing the keys shown below. The filename of the conda package is composed of the first 3 values, as in: `<name>-<version>-<build>.tar.bz2`.

Key	Type	Description
name	string	The lowercase name of the package. May contain the "-" character.
version	string	The package version. May not contain "-". Conda acknowledges PEP 440 .
build	string	The build string. May not contain "-". Differentiates builds of packages with otherwise identical names and versions, such as: <ul style="list-style-type: none"> A build with other dependencies, such as Python 3.4 instead of Python 2.7. A bug fix in the build process. Some different optional dependencies, such as MKL versus ATLAS linkage. Nothing in conda actually inspects the build string. Strings such as <code>np18py34_1</code> are designed only for human readability and conda never parses them.
build_number	integer	A non-negative integer representing the build number of the package. Unlike the build string, the <code>build_number</code> is inspected by conda. Conda uses it to sort packages that have otherwise identical names and versions to determine the latest one. This is important because new builds that contain bug fixes for the way a package is built may be added to a repository.
depends	list of strings	A list of dependency specifications, where each element is a string, as outlined in Package match specifications .
arch	string	Optional. The architecture the package is built for. EXAMPLE: <code>x86_64</code> Conda currently does not use this key.
platform	string	Optional. The OS that the package is built for. EXAMPLE: <code>osx</code> Conda currently does not use this key. Packages for a specific architecture and platform are usually distinguished by the repository subdirectory that contains them---see Repository structure and index .

info/files

Lists all files that are part of the package itself, 1 per line. All of these files need to get linked into the environment. Any files in the package that are not listed in this file are not linked when the package is installed. The directory delimiter for the files in `info/files` should always be `/`, even on Windows. This matches the directory delimiter used in the tarball.

info/has_prefix

Optional file. Lists all files that contain a hard-coded build prefix or placeholder prefix, which needs to be replaced by the install prefix at installation time.

Note: Due to the way the binary replacement works, the placeholder prefix must be longer than the install prefix.

Each line of this file should be either a path, in which case it is considered a text file with the default placeholder `/opt/anaconda1anaconda2anaconda3`, or a space-separated list of placeholder, mode, and path, where:

- Placeholder is the build or placeholder prefix.
- Mode is either `text` or `binary`.
- Path is the relative path of the file to be updated.

EXAMPLE: On Windows:

```
"Scripts/script1.py"
"C:\Users\username\anaconda\envs\_build" text "Scripts/script2.bat"
"C:/Users/username/anaconda/envs/_build" binary "Scripts/binary"
```

EXAMPLE: On macOS or Linux:

```
bin/script.sh
/Users/username/anaconda/envs/_build binary bin/binary
/Users/username/anaconda/envs/_build text share/text
```

Note: The directory delimiter for the relative path must always be `/`, even on Windows. The placeholder may contain either `"\"` or `"/"` on Windows, but the replacement prefix will match the delimiter used in the placeholder. The default placeholder `/opt/anaconda1anaconda2anaconda3` is an exception, being replaced with the install prefix using the native path delimiter. On Windows, the placeholder and path always appear in quotes to support paths with spaces.

info/license.txt

Optional file. The software license for the package.

info/no_link

Optional file. Lists all files that cannot be linked - either soft-linked or hard-linked - into environments and are copied instead.

info/about.json

Optional file. Contains the entries in the [about section](#) of the `meta.yaml` file. The following keys are added to `info/about.json` if present in the build recipe:

- home
- dev_url
- doc_url
- license_url
- license
- summary
- description
- license_family

info/recipe

A directory containing the full contents of the build recipe.

meta.yaml.rendered

The fully rendered build recipe. See [conda render](#).

This directory is present only when the `include_recipe` flag is `True` in the [build section](#).

Repository structure and index

A conda repository - or channel - is a directory tree, usually served over HTTPS, which has platform subdirectories, each of which contain conda packages and a repository index. The index file `repodata.json` lists all conda packages in the platform subdirectory. Use `conda index` to create such an index from the conda packages within a directory. It is simple mapping of the full conda package filename to the dictionary object in `info/index.json` described in [link scripts](#).

In the following example, a repository provides the conda package `misc-1.0-np17py27_0.tar.bz2` on 64-bit Linux and 32-bit Windows:

```
<some path>/linux-64/repodata.json
    repodata.json.bz2
    misc-1.0-np17py27_0.tar.bz2
/win-32/repodata.json
    repodata.json.bz2
    misc-1.0-np17py27_0.tar.bz2
```

Note: Both conda packages have identical filenames and are distinguished only by the repository subdirectory that contains them.

Package match specifications

This match specification is not the same as the syntax used at the command line with `conda install`, such as `conda install python=3.9`. Internally, conda translates the command line syntax to the spec defined in this section.

EXAMPLE: `python=3.9` is translated to `python 3.9*`.

Package dependencies are specified using a match specification. A match specification is a space-separated string of 1, 2, or 3 parts:

- The first part is always the exact name of the package.
- The second part refers to the version and may contain special characters:
 - `|` means OR.
EXAMPLE: `1.0|1.2` matches version 1.0 or 1.2
 - `*` matches 0 or more characters in the version string. In terms of regular expressions, it is the same as `r.*`.
EXAMPLE: `1.0|1.4*` matches 1.0, 1.4 and 1.4.1b2, but not 1.2.
 - `<`, `>`, `<=`, `>=`, `==` and `!=` are relational operators on versions, which are compared using [PEP-440](#). For example, `<=1.0` matches `0.9`, `0.9.1`, and `1.0`, but not `1.0.1`. `==` and `!=` are exact equality.
Pre-release versioning is also supported such that `>1.0b4` will match `1.0b5` and `1.0rc1` but not `1.0b4` or `1.0a5`.
EXAMPLE: `<=1.0` matches `0.9`, `0.9.1`, and `1.0`, but not `1.0.1`.
 - `,` means AND.
EXAMPLE: `>=2,<3` matches all packages in the 2 series. `2.0`, `2.1` and `2.9` all match, but `3.0` and `1.0` do not.
 - `,` has higher precedence than `|`, so `>=1,<2|>3` means greater than or equal to 1 AND less than 2 or greater than 3, which matches `1`, `1.3` and `3.0`, but not `2.2`.

Conda parses the version by splitting it into parts separated by `|`. If the part begins with `<`, `>`, `=`, or `!`, it is parsed as a relational operator. Otherwise, it is parsed as a version, possibly containing the `"*"` operator.

- The third part is always the exact build string. When there are 3 parts, the second part must be the exact version.

Remember that the version specification cannot contain spaces, as spaces are used to delimit the package, version, and build string in the whole match specification. `python >= 2.7` is an invalid match specification. Furthermore, `python>=2.7` is matched as any version of a package named `python>=2.7`.

When using the command line, put double quotes around any package version specification that contains the space character or any of the following characters: `<`, `>`, `*`, or `|`.

EXAMPLE:

```
conda install numpy=1.11
conda install numpy==1.11
conda install "numpy>1.11"
conda install "numpy=1.11.1|1.11.3"
conda install "numpy>=1.8,<2"
```

Examples

The OR constraint "numpy=1.11.1|1.11.3" matches with 1.11.1 or 1.11.3.

The AND constraint "numpy>=1.8,<2" matches with 1.8 and 1.9 but not 2.0.

The fuzzy constraint numpy=1.11 matches 1.11, 1.11.0, 1.11.1, 1.11.2, 1.11.18, and so on.

The exact constraint numpy==1.11 matches 1.11, 1.11.0, 1.11.0.0, and so on.

The build string constraint "numpy=1.11.2=*nomkl*" matches the NumPy 1.11.2 packages without MKL but not the normal MKL NumPy 1.11.2 packages.

The build string constraint "numpy=1.11.1|1.11.3=py36_0" matches NumPy 1.11.1 or 1.11.3 built for Python 3.6 but not any versions of NumPy built for Python 3.5 or Python 2.7.

The following are all valid match specifications for numpy-1.8.1-py27_0:

- numpy
- numpy 1.8*
- numpy 1.8.1
- numpy >=1.8
- numpy ==1.8.1
- numpy 1.8|1.8*
- numpy >=1.8,<2
- numpy >=1.8,<2|1.9
- numpy 1.8.1 py27_0
- numpy=1.8.1=py27_0

Version ordering

The class `VersionOrder(object)` implements an order relation between version strings.

Version strings can contain the usual alphanumeric characters (A-Za-z0-9), separated into components by dots and underscores. Empty segments (i.e. two consecutive dots, a leading/trailing underscore) are not permitted. An optional epoch number - an integer followed by ! - can precede the actual version string (this is useful to indicate a change in the versioning scheme itself). Version comparison is case-insensitive.

Supported version strings

Conda supports six types of version strings:

- Release versions contain only integers, e.g. 1.0, 2.3.5.
- Pre-release versions use additional letters such as a or rc, for example 1.0a1, 1.2.beta3, 2.3.5rc3.
- Development versions are indicated by the string dev, for example 1.0dev42, 2.3.5.dev12.
- Post-release versions are indicated by the string post, for example 1.0post1, 2.3.5.post2.
- Tagged versions have a suffix that specifies a particular property of interest, e.g. 1.1.parallel. Tags can be added to any of the preceding 4 types. As far as sorting is concerned, tags are treated like strings in pre-release versions.

- An optional local version string separated by + can be appended to the main (upstream) version string. It is only considered in comparisons when the main versions are equal, but otherwise handled in exactly the same manner.

Predictable version ordering

To obtain a predictable version ordering, it is crucial to keep the version number scheme of a given package consistent over time. Conda considers prerelease versions as less than release versions.

- Version strings should always have the same number of components (except for an optional tag suffix or local version string).
- Letters/Strings indicating non-release versions should always occur at the same position.

Before comparison, version strings are parsed as follows:

- They are first split into epoch, version number, and local version number at ! and + respectively. If there is no !, the epoch is set to 0. If there is no +, the local version is empty.
- The version part is then split into components at . and _.
- Each component is split again into runs of numerals and non-numerals
- Subcomponents containing only numerals are converted to integers.
- Strings are converted to lowercase, with special treatment for dev and post.
- When a component starts with a letter, the fillvalue 0 is inserted to keep numbers and strings in phase, resulting in `1.1.a1' == 1.1.0a1'`.
- The same is repeated for the local version part.

Examples:

```
1.2g.beta15.rc => [[0], [1], [2, 'g'], [0, 'beta', 15], [0, 'rc']]
1!2.15.1_ALPHA => [[1], [2], [15], [1, '_alpha']]
```

The resulting lists are compared lexicographically, where the following rules are applied to each pair of corresponding subcomponents:

- Integers are compared numerically.
- Strings are compared lexicographically, case-insensitive.
- Strings are smaller than integers, except
 - dev versions are smaller than all corresponding versions of other types.
 - post versions are greater than all corresponding versions of other types.
- If a subcomponent has no correspondent, the missing correspondent is treated as integer 0 to ensure `'1.1' == 1.1.0'`.

The resulting order is:

```
0.4
< 0.4.0
< 0.4.1.rc
== 0.4.1.RC    # case-insensitive comparison
< 0.4.1
< 0.5a1
< 0.5b3
< 0.5C1       # case-insensitive comparison
```

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```

< 0.5
< 0.9.6
< 0.960923
< 1.0
< 1.1dev1 # special case ``dev``
< 1.1a1
< 1.1.0dev1 # special case ``dev``
== 1.1.dev1 # 0 is inserted before string
< 1.1.a1
< 1.1.0rc1
< 1.1.0
== 1.1
< 1.1.0post1 # special case ``post``
== 1.1.post1 # 0 is inserted before string
< 1.1post1 # special case ``post``
< 1996.07.12
< 1!0.4.1 # epoch increased
< 1!3.1.1.6
< 2!0.4.1 # epoch increased again

```

Some packages (most notably OpenSSL) have incompatible version conventions. In particular, OpenSSL interprets letters as version counters rather than pre-release identifiers. For OpenSSL, the relation `1.0.1 < 1.0.1a => True` # for OpenSSL holds, whereas conda packages use the opposite ordering. You can work around this problem by appending a dash to plain version numbers:

```
1.0.1a => 1.0.1post.a # ensure correct ordering for OpenSSL
```

1.1.4 Package search and install specifications

Conda supports the following specifications for `conda search` and `conda install`.

Package search

`conda search` for a specific package or set of packages can be accomplished in several ways. This section includes information on the standard specification and the use of key-value pairs.

Standard specification

conda-forge/	linux-64::	numpy	1.17.*	py38*
channel	subdir	name	version	build

channel (Optional) Can either be a channel name or URL. Channel names may include letters, numbers, dashes, and underscores.

subdir (Optional) A subdirectory of a channel. Many subdirs are used for architectures, but this is not required. Must have a channel and backslash preceding it. For example: `main/noarch`

name (Required) Package name. May include the `*` wildcard. For example, `*py*` returns all packages that have "py" in their names, such as "numpy", "pytorch", "python", etc.

version (Optional) Package version. May include the `*` wildcard or a version range(s) in single quotes. For example: `numpy=1.17.*` returns all numpy packages with a version containing "1.17." and `numpy>1.17,<1.19.2` returns all numpy packages with versions greater than 1.17 and less than 1.19.2.

build (Optional) Package build name. May include the `*` wildcard. For example, `numpy 1.17.3 py38*` returns all version 1.17.3 numpy packages with a build name that contains the text "py38".

Key-value pairs

Package searches can also be performed using what is called "key-value pair notation", which has different rules than the [Standard specification](#) example image. The search below will return the same list of packages as the standard specification.

```
$ conda search "numpy[channel=conda-forge, subdir=linux-64, version=1.17.*, build=py38*]"
```

This notation supports the following key-value pairs:

- build	# validated via GlobStrMatch
- build_number	# validated via BuildNumberMatch
- channel	# validated via ChannelMatch
- features	# validated via FeatureMatch
- fn	# validated via ExactStrMatch
- license	# validated via CaseInsensitiveStrMatch
- license_family	# validated via CaseInsensitiveStrMatch
- md5	# validated via ExactStrMatch
- name	# validated via GlobLowerStrMatch
- sha256	# validated via ExactStrMatch
- subdir	# validated via ExactStrMatch
- track_features	# validated via FeatureMatch
- url	# validated via ExactStrMatch
- version	# validated via VersionSpec

Key-value pair notation can be used at the same time as standard notation.

```
$ conda search "conda-forge::numpy=1.17.3[subdir=linux-64, build=py38*]"
```

Warning: Any search values using the key-value pair notation will override values in the rest of the search string. For example, `conda search numpy 1.17.3[version=1.19.2]` will return packages with the version 1.19.2.

Package installation

When you're installing packages, conda recommends being as concrete as possible. Using * wildcards and version ranges during an install will most likely cause a conflict.

However, * wildcards can still be helpful in an install command when used sparingly.

Installing with wildcards

Let's say you are working on a project that requires version 2.3 of a package. If you upgrade to 2.4 or 3.0, your project will break. You're also using an environment file to create your environment.

In the version 2.3.1, 2 is the major version, 3 is the minor version, and 1 is the patch. Patches typically contain bug fixes, so if you want to keep version 2.3 in your environment without updating to 2.4 or 3.0, but want to take advantage of any bug fixes, using 2.3.* in your environment file would be helpful to you.

Concrete install example

Let's take the search from the [Package search](#) section.

```
$ conda search "conda-forge/linux-64::numpy 1.17.* py38"
```

This returns the following:

```
Loading channels: done
# Name                Version      Build      Channel
numpy                 1.17.3      py38h95a1406_0  conda-forge
numpy                 1.17.5      py38h18fd61f_1  conda-forge
numpy                 1.17.5      py38h95a1406_0  conda-forge
```

You can then choose a specific version and build, if necessary, and edit your conda install command accordingly.

```
$ conda install "conda-forge/linux-64::numpy 1.17.5 py38h95a1406_0"
```

1.1.5 Conda channels

- *What is a "conda channel"?*
- *Specifying channels when installing packages*
- *Conda clone channel RSS feed*

What is a "conda channel"?

Conda channels are the locations where packages are stored. They serve as the base for hosting and managing packages. Conda *packages* are downloaded from remote channels, which are URLs to directories containing conda packages. The conda command searches a set of channels. By default, packages are automatically downloaded and updated from the *default channel*, which may require a paid license, as described in the *repository terms of service*. The conda-forge channel is free for all to use. You can modify which remote channels are automatically searched; this feature is beneficial when maintaining a private or internal channel. For details, see how to *modify your channel lists*.

We use conda-forge as an example channel. Conda-forge is a community channel made up of thousands of contributors. Conda-forge itself is analogous to PyPI but with a unified, automated build infrastructure and more peer review of recipes.

Specifying channels when installing packages

- From the command line use `--channel`

```
$ conda install scipy --channel conda-forge
```

You may specify multiple channels by passing the argument multiple times:

```
$ conda install scipy --channel conda-forge --channel bioconda
```

Priority decreases from left to right - the first argument is higher priority than the second.

- From the command line use `--override-channels` to only search the specified channel(s), rather than any channels configured in `.condarc`. This also ignores conda's default channels.

```
$ conda search scipy --channel file:/<path to>/local-channel --override-channels
```

- In `.condarc`, use the key `channels` to see a list of channels for conda to search for packages.

Learn more about *managing channels*.

Conda clone channel RSS feed

We offer a RSS feed that represents all the things that have been cloned by the channel clone and are now available behind the CDN (content delivery network). The RSS feed shows what has happened on a rolling, two-week time frame and is useful for seeing where packages are or if a sync has been run.

Let's look at the *conda-forge channel RSS feed* as an example.

In that feed, it will tell you every time that it runs a sync. The feed includes other entries for packages that were added or removed. Each entry is formatted to show the subdirectory the package is from, the action that was taken (addition or removal), and the name of the package. Everything has a publishing date, per standard RSS practice.

```
<rss version="0.91">
  <channel>
    <title>conda-forge updates</title>
    <link>https://anaconda.org</link>
    <description>Updates in the last two weeks</description>
    <language>en</language>
    <copyright>Copyright 2019, Anaconda, Inc.</copyright>
    <pubDate>30 Jul 2019 19:45:47 UTC</pubDate>
    <item>
```

(continues on next page)

(continued from previous page)

```

<title>running sync</title>
<pubDate>26 Jul 2019 19:26:36 UTC</pubDate>
</item>
<item>
  <title>linux-64:add:jupyterlab-1.0.4-py36_0.tar.bz2</title>
  <pubDate>26 Jul 2019 19:26:36 UTC</pubDate>
</item>
<item>
  <title>linux-64:add:jupyterlab-1.0.4-py37_0.tar.bz2</title>
  <pubDate>26 Jul 2019 19:26:36 UTC</pubDate>
</item>

```

1.1.6 Conda environments

A conda environment is a directory that contains a specific collection of conda packages that you have installed. For example, you may have one environment with NumPy 1.7 and its dependencies, and another environment with NumPy 1.6 for legacy testing. If you change one environment, your other environments are not affected. You can easily activate or deactivate environments, which is how you switch between them. You can also share your environment with someone by giving them a copy of your `environment.yaml` file. For more information, see [Managing environments](#).

Conda directory structure

ROOT_DIR

The directory that Anaconda or Miniconda was installed into.

EXAMPLES:

```

/opt/Anaconda  #Linux
C:\Anaconda    #Windows

```

/pkgs

Also referred to as PKGS_DIR. This directory contains decompressed packages, ready to be linked in conda environments. Each package resides in a subdirectory corresponding to its canonical name.

/envs

The system location for additional conda environments to be created.

The following subdirectories comprise the default Anaconda environment:

```

/bin
/include
/lib
/share

```


Other conda environments usually contain the same subdirectories as the default environment.

Virtual environments

A virtual environment is a tool that helps to keep dependencies required by different projects separate by creating isolated spaces for them that contain per-project dependencies for them.

Users can create virtual environments using one of several tools such as Pipenv or Poetry, or a conda virtual environment. Pipenv and Poetry are based around Python's built-in venv library, whereas conda has its own notion of virtual environments that is lower-level (Python itself is a dependency provided in conda environments).

Scroll to the right in the table below.

Some other traits are:

	Python virtual environment	Conda virtual environment
Libraries	Statically link, vendor libraries in wheels, or use apt/yum/brew/etc.	Install system-level libraries as conda dependencies.
System	Depend on base system install of Python.	Python is independent from system.
Extending environment	Extend environment with pip.	Extended environment with conda or pip.
Non-Python dependencies		Manages non-Python dependencies (R, Perl, arbitrary executables).
Tracking dependencies		Tracks binary dependencies explicitly.

Why use venv-based virtual environments

- You prefer their workflow or spec formats.
- You prefer to use the system Python and libraries.
- Your project maintainers only publish to PyPI, and you prefer packages that come more directly from the project maintainers, rather than someone else providing builds based on the same code.

Why use conda virtual environments?

- You want control over binary compatibility choices.
- You want to utilize newer language standards, such as C++ 17.
- You need libraries beyond what the system Python offers.
- You want to manage packages from languages other than Python in the same space.

Workflow differentiators

Some questions to consider as you determine your preferred workflow and virtual environment:

- Is your environment shared across multiple code projects?
- Does your environment live alongside your code or in a separate place?
- Do your install steps involve installing any external libraries?
- Do you want to ship your environment as an archive of some sort containing the actual files of the environment?

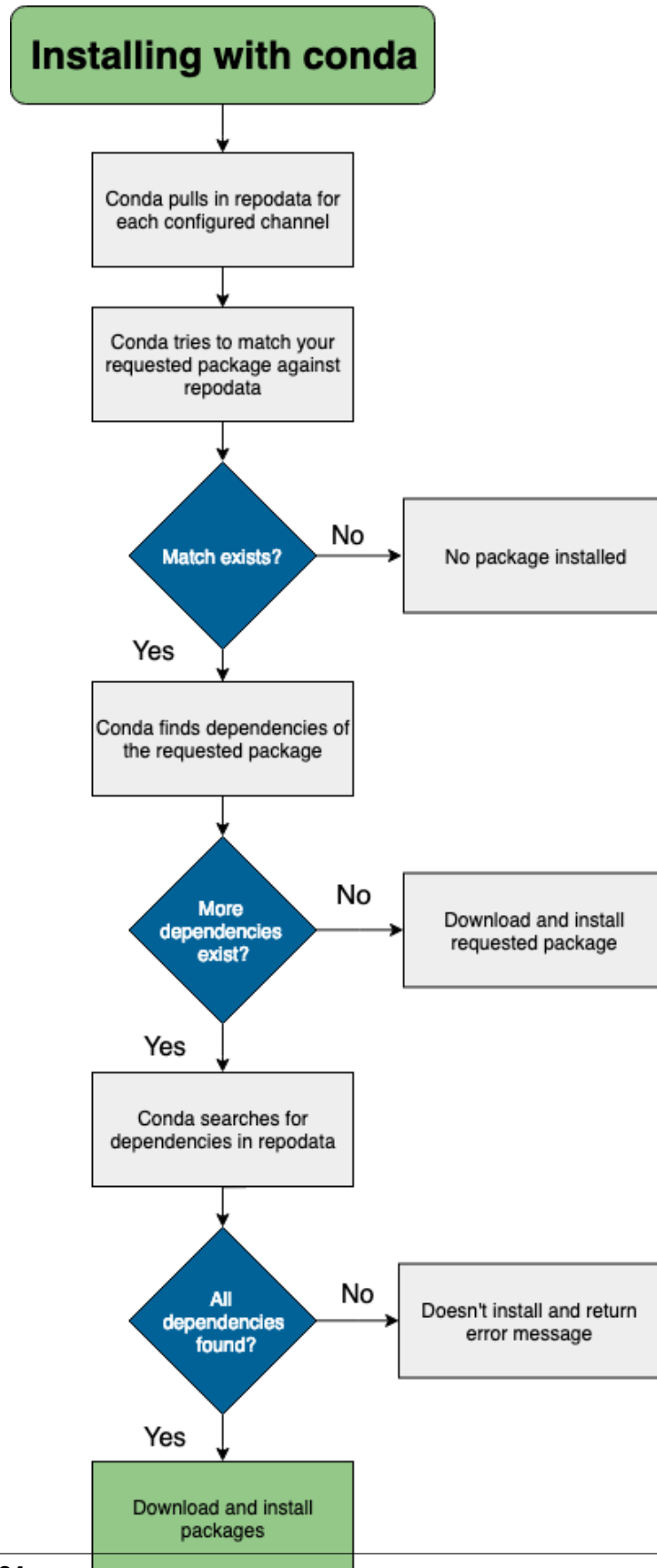
Package system differentiators

There are potential benefits for choosing PyPI or conda.

PyPI has one global namespace and distributed ownership of that namespace. Because of this, it is easier within PyPI to have single sources for a package directly from package maintainers.

Conda has unlimited namespaces (channels) and distributed ownership of a given channel. As such, it is easier to ensure binary compatibility within a channel using conda.

1.1.7 Installing with conda



```
conda install [packagename]
```

During the install process, files are extracted into the specified environment, defaulting to the current environment if none is specified. Installing the files of a conda package into an environment can be thought of as changing the directory to an environment, and then downloading and extracting the artifact and its dependencies---all with the single `conda install [packagename]` command.

Read more about [conda environments and directory structure](#).

- When you `conda install` a package that exists in a channel and has no dependencies, conda:
 - Looks at your configured channels (in priority).
 - Reaches out to the repodata associated with your channels/platform.
 - Parses repodata to search for the package.
 - Once the package is found, conda pulls it down and installs.

Conda update versus conda install

`conda update` is used to update to the latest compatible version. `conda install` can be used to install any version.

Example:

- If Python 2.7.0 is currently installed, and the latest version of Python 2 is 2.7.5, then `conda update python` installs Python 2.7.5. It does not install Python 3.
- If Python 3.7.0 is currently installed, and the latest version of Python is 3.9.0, then `conda install python=3` installs Python 3.9.0.

Conda uses the same rules for other packages. `conda update` always installs the highest version with the same major version number, whereas `conda install` always installs the highest version.

Installing conda packages offline

To install conda packages offline, run: `conda install /path-to-package/package-filename.tar.bz2/`

If you prefer, you can create a `/tar/` archive file containing many conda packages and install them all with one command: `conda install /packages-path/packages-filename.tar`

Note: If an installed package does not work, it may be missing dependencies that need to be resolved manually.

Installing packages directly from the file does not resolve dependencies.

Installing conda packages with a specific build number

If you want to install conda packages with the correct package specification, try `pkg_name=version=build_string`. Read more about [build strings and package naming conventions](#). Learn more about [package specifications and meta-data](#).

For example, if you want to install `llvmlite 0.31.0dev0` on Python 3.7.8, you would enter:

```
conda install -c numba/label/dev llvmlite=0.31.0dev0=py37_8
```

1.1.8 Conda performance

Conda's performance can be affected by a variety of things. Unlike many package managers, Anaconda's repositories generally don't filter or remove old packages from the index. This allows old environments to be easily recreated. However, it does mean that the index metadata is always growing, and thus conda becomes slower as the number of packages increases.

How a package is installed

While you are waiting, conda is doing a lot of work installing the packages. At any point along these steps, performance issues may arise.

Conda follows these steps when installing a package:

1. Downloading and processing index metadata.
2. Reducing the index.
3. Expressing the package data and constraints as a SAT problem.
4. Running the solver.
5. Downloading and extracting packages.
6. Verifying package contents.
7. Linking packages from package cache into environments.

Therefore, if you're experiencing a slowdown, evaluate the following questions to identify potential causes:

- Are you creating a new environment or installing into an existing one?
- Does your environment have pip-installed dependencies in it?
- What channels are you using?
- What packages are you installing?
- Is the channel metadata sane?
- Are channels interacting in bad ways?

Improving conda performance

To address these challenges, you can move packages to archive channels and follow the methods below to present conda with a smaller, simpler view than all available packages.

To speed up conda, we offer the following recommendations.

Are you:

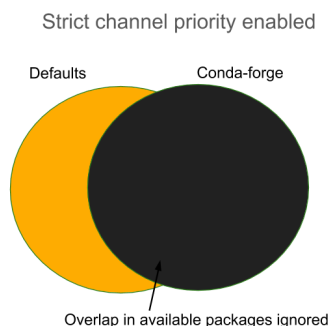
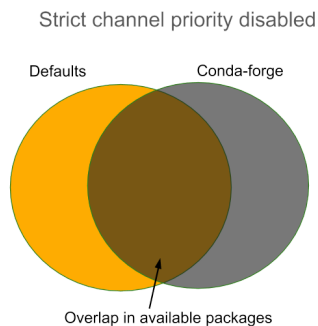
- **Using conda-forge?**
 - Use conda-metachannel to reduce conda's problem size.
- **Using bioconda?**
 - Use conda-metachannel to reduce conda's problem size.
 - [Read more about docker images.](#)
- **Specifying very broad package specs?**

- Be more specific. Letting conda filter more candidates makes it faster. For example, instead of `numpy`, we recommend `numpy=1.15` or, even better, `numpy=1.15.4`.
- If you are using R, instead of specifying only `r-essentials`, specify `r-base=3.5` `r-essentials`.
- **Feeling frustrated with “verifying transaction” and also feeling lucky?**
 - Run `conda config --set safety_checks disabled`.
- **Getting strange mixtures of defaults and conda-forge?**
 - Run `conda config --set channel_priority strict`.
 - This also makes things go faster by eliminating possible mixed solutions.
- **Observing that an Anaconda or Miniconda installation is getting slower over time?**
 - Create a fresh environment. As environments grow, they become harder and harder to solve. Working with small, dedicated environments can be much faster.

Read more about [how we made conda faster](#).

Set strict channel priority

Setting strict channel priority makes it so that if a package exists on a channel, conda will ignore all packages with the same name on lower priority channels.



This can dramatically reduce package search space and reduces the use of improperly constrained packages.

One thing to consider is that setting strict channel priority may make environments unsatisfiable. Learn more about [Strict channel priority](#).

Reduce the index

One option for speeding up conda is to reduce the index. The index is reduced by conda based upon the user's input specs. It's likely that your repodata contains package data that is not used in the solving stage. Filtering out these unnecessary packages before solving can save time.

Making your input specifications more specific improves the effectiveness of the index reduction and, thus, speeds up the process. Listing a version and build string for each of your specs can dramatically reduce the number of packages that are considered when solving so that the SAT doesn't have as much work to do.

Reducing the index:

- Reduces unnecessary input into generating solver clauses.
- Reduces solve complexity.
- Prefers newer packages that apply constraints.

Read more on [Understanding and Improving Conda's Performance](#).

1.1.9 Conda for data scientists

Conda is useful for any packaging process but it stands out from other package and environment management systems through its utility for data science.

Conda's benefits include:

- Providing prebuilt packages which avoid the need to deal with compilers or figuring out how to set up a specific tool.
- Managing one-step installation of tools that are more challenging to install (such as TensorFlow or IRAF).
- Allowing you to provide your environment to other people across different platforms, which supports the reproducibility of research workflows.
- Allowing the use of other package management tools, such as pip, inside conda environments where a library or tools are not already packaged for conda.
- Providing commonly used data science libraries and tools, such as R, NumPy, SciPy, and TensorFlow. These are built using optimized, hardware-specific libraries (such as Intel's MKL or NVIDIA's CUDA) which speed up performance without code changes.

Read more about how conda supports data scientists.

1.1.10 Conda plugins

- *Implementation*
 - *Hook*
 - *Packaging using a pyproject.toml file*
- *Conda plugins use cases*
- *Benefits of conda plugins*

In order to enable customization and extra features that are compatible with and discoverable by conda (but do not necessarily ship as a default part of the conda codebase), an official conda plugin mechanism has been implemented as of version 22.11.0.

Implementation

Plugins in conda integrate the "hook + entry point" structure by utilizing the [Pluggy](#) Python framework. This implementation can be broken down via the following two steps:

- Define the hook(s) to be registered
- Register the plugin under the conda entrypoint namespace

Hook

Below is an example of a very basic plugin "hook":

Listing 1: my_plugin.py

```
import conda.plugins

@conda.plugins.hookimpl
def conda_subcommands():
    ...
```

Packaging using a pyproject.toml file

Below is an example that configures `setuptools` using a `pyproject.toml` file (note that the `setup.py` file is optional if a `pyproject.toml` file is defined, and thus will not be discussed here):

Listing 2: pyproject.toml

```
[build-system]
requires = ["setuptools", "setuptools-scm"]
build-backend = "setuptools.build_meta"

[project]
name = "my-conda-plugin"
version = "1.0.0"
description = "My conda plugin"
requires-python = ">=3.7"
dependencies = ["conda"]

[project.entry-points."conda"]
my-conda-plugin = "my_plugin"
```

Conda plugins use cases

The new conda plugin API ecosystem brings about many possibilities, including but not limited to:

- *Custom subcommands*
- Support for packaging-related topics (*e.g.*, *virtual packages*)
- Development environment integrations (*e.g.*, shells)
- Alternative dependency solver backends
- Network adapters
- Build system integrations
- Non-Python language support (*e.g.*, C, Rust)
- Experimental features that are not currently covered by conda

Benefits of conda plugins

A conda plugin ecosystem enables contributors across the conda community to develop and share new features, thus bringing about more functionality and focus on the user experience. Though the list below is by no means exhaustive, some of the benefits of conda plugins include:

- Support for a better distribution of maintenance in the conda community
- Enabling third party contributors to use official APIs instead of having to divert to workarounds and wrappers
- The ability to extend conda internals via official APIs
- Lowering the barrier for contributions from other stakeholders in the conda ecosystem
- ... and much more!

When you're comfortable with the conda concepts, learn how to *get started using conda*.

1.2 Getting started with conda

Conda is a powerful package manager and environment manager that you use with command line commands at the Anaconda Prompt for Windows, or in a terminal window for macOS or Linux.

This 20-minute guide to getting started with conda lets you try out the major features of conda. You should understand how conda works when you finish this guide.

SEE ALSO: [Getting started with Anaconda Navigator](#), a graphical user interface that lets you use conda in a web-like interface without having to enter manual commands. Compare the Getting started guides for each to see which program you prefer.

1.2.1 Before you start

You should have already [installed Anaconda](#).

1.2.2 Contents

- *Starting conda* on Windows, macOS, or Linux. 2 MINUTES
- *Managing conda*. Verify that Anaconda is installed and check that conda is updated to the current version. 3 MINUTES
- *Managing environments*. Create *environments* and move easily between them. 5 MINUTES
- *Managing Python*. Create an environment that has a different version of Python. 5 MINUTES
- *Managing packages*. Find packages available for you to install. Install packages. 5 MINUTES

TOTAL TIME: 20 MINUTES

1.2.3 Starting conda

Windows

- From the Start menu, search for and open "Anaconda Prompt."

On Windows, all commands below are typed into the Anaconda Prompt window.

MacOS

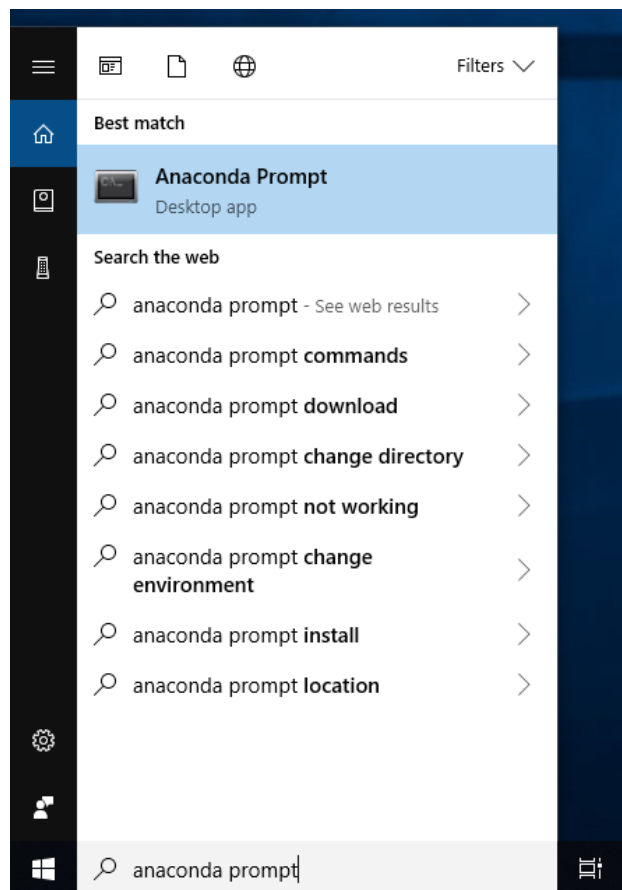
- Open Launchpad, then click the terminal icon.

On macOS, all commands below are typed into the terminal window.

Linux

- Open a terminal window.

On Linux, all commands below are typed into the terminal window.



1.2.4 Managing conda

Verify that conda is installed and running on your system by typing:

```
conda --version
```

Conda displays the number of the version that you have installed. You do not need to navigate to the Anaconda directory.

EXAMPLE: conda 4.7.12

Note: If you get an error message, make sure you closed and re-opened the terminal window after installing, or do it now. Then verify that you are logged into the same user account that you used to install Anaconda or Miniconda.

Update conda to the current version. Type the following:

```
conda update conda
```

Conda compares versions and then displays what is available to install.

If a newer version of conda is available, type **y** to update:

```
Proceed ([y]/n)? y
```

Tip: We recommend that you always keep conda updated to the latest version.

1.2.5 Managing environments

Conda allows you to create separate environments containing files, packages, and their dependencies that will not interact with other environments.

When you begin using conda, you already have a default environment named **base**. You don't want to put programs into your base environment, though. Create separate environments to keep your programs isolated from each other.

1. Create a new environment and install a package in it.

We will name the environment **snowflakes** and install the package **BioPython**. At the Anaconda Prompt or in your terminal window, type the following:

```
conda create --name snowflakes biopython
```

Conda checks to see what additional packages ("dependencies") BioPython will need, and asks if you want to proceed:

```
Proceed ([y]/n)? y
```

Type **"y"** and press Enter to proceed.

2. To use, or "activate" the new environment, type the following:

- Windows: `conda activate snowflakes`
- macOS and Linux: `conda activate snowflakes`

Note: `conda activate` only works on conda 4.6 and later versions.

For conda versions prior to 4.6, type:

- Windows: `activate snowflakes`
- macOS and Linux: `source activate snowflakes`

Now that you are in your `snowflakes` environment, any conda commands you type will go to that environment until you deactivate it.

3. To see a list of all your environments, type:

```
conda info --envs
```

A list of environments appears, similar to the following:

```
conda environments:

base          /home/username/Anaconda3
snowflakes    * /home/username/Anaconda3/envs/snowflakes
```

Tip: The active environment is the one with an asterisk (*).

4. Change your current environment back to the default (base): `conda activate`

Note: For versions prior to conda 4.6, use:

- Windows: `activate`
 - macOS, Linux: `source activate`
-

Tip: When the environment is deactivated, its name is no longer shown in your prompt, and the asterisk (*) returns to base. To verify, you can repeat the `conda info --envs` command.

1.2.6 Managing Python

When you create a new environment, conda installs the same Python version you used when you downloaded and installed Anaconda. If you want to use a different version of Python, for example Python 3.5, simply create a new environment and specify the version of Python that you want.

1. Create a new environment named "snakes" that contains Python 3.9:

```
conda create --name snakes python=3.9
```

When conda asks if you want to proceed, type "y" and press Enter.

2. Activate the new environment:

- Windows: `conda activate snakes`
- macOS and Linux: `conda activate snakes`

Note: `conda activate` only works on conda 4.6 and later versions.

For conda versions prior to 4.6, type:

- Windows: `activate snakes`
- macOS and Linux: `source activate snakes`

3. Verify that the snakes environment has been added and is active:

```
conda info --envs
```

Conda displays the list of all environments with an asterisk (*) after the name of the active environment:

```
# conda environments:
#
base                /home/username/anaconda3
snakes              *  /home/username/anaconda3/envs/snakes
snowflakes          /home/username/anaconda3/envs/snowflakes
```

The active environment is also displayed in front of your prompt in (parentheses) or [brackets] like this:

```
(snakes) $
```

4. Verify which version of Python is in your current environment:

```
python --version
```

5. Deactivate the snakes environment and return to base environment: `conda activate`

Note: For versions prior to conda 4.6, use:

- Windows: `activate`
 - macOS, Linux: `source activate`
-

1.2.7 Managing packages

In this section, you check which packages you have installed, check which are available and look for a specific package and install it.

1. To find a package you have already installed, first activate the environment you want to search. Look above for the commands to *activate your snakes environment*.
2. Check to see if a package you have not installed named "beautifulsoup4" is available from the Anaconda repository (must be connected to the Internet):

```
conda search beautifulsoup4
```

Conda displays a list of all packages with that name on the Anaconda repository, so we know it is available.

3. Install this package into the current environment:

```
conda install beautifulsoup4
```

4. Check to see if the newly installed program is in this environment:

```
conda list
```

1.2.8 More information

- *Conda cheat sheet*
- Full documentation--- <https://conda.io/docs/>
- Free community support--- <https://groups.google.com/a/anaconda.com/forum/#!forum/anaconda>
- Paid support options--- <https://www.anaconda.com/support/>

1.3 Installation

- *System requirements*
- *Regular installation*
- *Installing in silent mode*
- *Installing conda on a system that has other Python installations or packages*

The fastest way to *obtain* conda is to install *Miniconda*, a mini version of *Anaconda* that includes only conda and its dependencies. If you prefer to have conda plus over 7,500 open-source packages, install Anaconda.

We recommend you install Anaconda for the local user, which does not require administrator permissions and is the most robust type of installation. You can also install Anaconda system wide, which does require administrator permissions.

For information on using our graphical installers for Windows or macOS, see the instructions for [installing Anaconda](#).

1.3.1 System requirements

- 32- or 64-bit computer
- For Miniconda: 400 MB disk space
- For Anaconda: Minimum 3 GB disk space to download and install
- Windows, macOS, or Linux
- For Windows: Windows 8.1 or newer for Python 3.9, or Windows Vista or newer for Python 3.8

Note: You do not need administrative or root permissions to install Anaconda if you select a user-writable install location.

1.3.2 Regular installation

Follow the instructions for your operating system:

- *Windows*
- *macOS*
- *Linux*

1.3.3 Installing in silent mode

You can use *silent installation* of Miniconda or Anaconda for deployment or testing or building services, such as GitHub Actions.

Follow the silent-mode instructions for your operating system:

- *Windows*
- *macOS*
- *Linux*

1.3.4 Installing conda on a system that has other Python installations or packages

You do not need to uninstall other Python installations or packages in order to use conda. Even if you already have a system Python, another Python installation from a source such as the macOS Homebrew package manager and globally installed packages from pip such as pandas and NumPy, you do not need to uninstall, remove, or change any of them before using conda.

Install Anaconda or Miniconda normally, and let the installer add the conda installation of Python to your PATH environment variable. There is no need to set the PYTHONPATH environment variable.

To see if the conda installation of Python is in your PATH variable:

- On Windows, open an Anaconda Prompt and run `echo %PATH%`
- On macOS and Linux, open the terminal and run `echo $PATH`

To see which Python installation is currently set as the default:

- On Windows, open an Anaconda Prompt and run `where python`
- On macOS and Linux, open the terminal and run `which python`

To see which packages are installed in your current conda environment and their version numbers, in your terminal window or an Anaconda Prompt, run `conda list`.

Downloading conda

- *Anaconda or Miniconda?*
- *Choosing a version of Anaconda or Miniconda*
- *GUI versus command line installer*
- *Choosing a version of Python*
- *Cryptographic hash verification*

You have 3 conda download options:

- Download [Anaconda](#)---free.
- Download [Miniconda](#)---free.
- Purchase [Anaconda Enterprise](#).

You can download any of these 3 options with legacy Python 2.7 or current Python 3.

You can also choose a version with a GUI or a command line installer.

Tip: If you are unsure which option to download, choose the most recent version of Anaconda3. If you are on Windows or macOS, choose the version with the GUI installer.

Anaconda or Miniconda?

Choose Anaconda if you:

- Are new to conda or Python.
- Like the convenience of having Python and over 1,500 scientific packages automatically installed at once.
- Have the time and disk space---a few minutes and 3 GB.
- Do not want to individually install each of the packages you want to use.
- Wish to use a set of packages curated and vetted for interoperability and usability.

Choose Miniconda if you:

- Do not mind installing each of the packages you want to use individually.
- Do not have time or disk space to install over 1,500 packages at once.
- Want fast access to Python and the conda commands and you wish to sort out the other programs later.

Choosing a version of Anaconda or Miniconda

- Whether you use Anaconda or Miniconda, select the most recent version.
- Select an older version from the [archive](#) only if you are testing or need an older version for a specific purpose.
- To use conda on Windows XP, select Anaconda 2.3.0 and see [../configuration/use-winxp-with-proxy](#).

GUI versus command line installer

Both GUI and command line installers are available for Windows, macOS, and Linux:

- If you do not wish to enter commands in a terminal window, choose the GUI installer.
- If GUIs slow you down, choose the command line version.

Choosing a version of Python

- The last version of Python 2 is 2.7, which is included with Anaconda and Miniconda.
- The newest stable version of Python is quickly included with Anaconda3 and Miniconda3.
- You can easily set up additional versions of Python such as 3.9 by downloading any version and creating a new environment with just a few clicks. See [Getting started with conda](#).

Cryptographic hash verification

SHA-256 checksums are available for [Miniconda](#) and [Anaconda](#). We do not recommend using MD5 verification as SHA-256 is more secure.

Download the installer file and before installing verify it as follows:

- Windows:

- If you have PowerShell V4 or later:

Open a PowerShell console and verify the file as follows:

```
Get-FileHash filename -Algorithm SHA256
```

- If you don't have PowerShell V4 or later:

Use the free [online verifier tool](#) on the Microsoft website.

1. Download the file and extract it.
2. Open a Command Prompt window.
3. Navigate to the file.
4. Run the following command:

```
Start-PsFCIV -Path C:\path\to\file.ext -HashAlgorithm SHA256 -Online
```

- macOS: In iTerm or a terminal window enter `shasum -a 256 filename`.
- Linux: In a terminal window enter `sha256sum filename`.

Installing on Windows

1. Download the installer:

- [Miniconda installer for Windows](#).
- [Anaconda installer for Windows](#).

2. *Verify your installer hashes.*

3. Double-click the `.exe` file.

4. Follow the instructions on the screen.

If you are unsure about any setting, accept the defaults. You can change them later.

When installation is finished, from the **Start** menu, open the Anaconda Prompt.

5. Test your installation. In your terminal window or Anaconda Prompt, run the command `conda list`. A list of installed packages appears if it has been installed correctly.

Installing in silent mode

Note: The following instructions are for Miniconda. For Anaconda, substitute Anaconda for Miniconda in all of the commands.

Note: As of Anaconda Distribution 2022.05 and Miniconda 4.12.0, the option to add Anaconda to the PATH environment variable during an **All Users** installation has been disabled. This was done to address a [security exploit](#). You can still add Anaconda to the PATH environment variable during a **Just Me** installation.

To run the the Windows installer for Miniconda in *silent mode*, use the /S argument. The following optional arguments are supported:

- /InstallationType=[JustMe|AllUsers]---Default is JustMe.
- /AddToPath=[0|1]---Default is 0
- /RegisterPython=[0|1]---Make this the system's default Python. 0 indicates Python won't be registered as the system's default. 1 indicates Python will be registered as the system's default.
- /S---Install in silent mode.
- /D=<installation path>---Destination installation path. Must be the last argument. Do not wrap in quotation marks. Required if you use /S.

All arguments are case-sensitive.

EXAMPLE: The following command installs Miniconda for the current user without registering Python as the system's default:

```
start /wait "" Miniconda3-latest-Windows-x86_64.exe /InstallationType=JustMe /  
RegisterPython=0 /S /D=%UserProfile%\Miniconda3
```

Updating conda

1. Open your Anaconda Prompt from the start menu.
2. Navigate to the anaconda directory.
3. Run `conda update conda`.

Uninstalling conda

1. In the Windows Control Panel, click Add or Remove Program.
2. Select Python X.X (Miniconda), where X.X is your version of Python.
3. Click Remove Program.

Note: Removing a program is different in Windows 10.

Installing on macOS

Caution: If you use the .pkg installer for Miniconda, be aware that those installers may skip the Destination Select page which will cause the installation to fail. If the installer skips this page, click "Change Install Location..." on the Installation Type page and choose a location for your install, then click Continue.

1. Download the installer:

- [Miniconda installer for macOS](#).
- [Anaconda installer for macOS](#).

2. *Verify your installer hashes.*

3. Install:

- Miniconda---In your terminal window, run:

```
bash Miniconda3-latest-MacOSX-x86_64.sh
```

- Anaconda---Double-click the .pkg file.

4. Follow the prompts on the installer screens.

If you are unsure about any setting, accept the defaults. You can change them later.

5. To make the changes take effect, close and then re-open your terminal window.

6. Test your installation. In your terminal window or Anaconda Prompt, run the command `conda list`. A list of installed packages appears if it has been installed correctly.

Installing in silent mode

Note: The following instructions are for Miniconda. For Anaconda, substitute Anaconda for Miniconda in all of the commands.

To run the *silent installation* of Miniconda for macOS or Linux, specify the `-b` and `-p` arguments of the bash installer. The following arguments are supported:

- `-b`: Batch mode with no PATH modifications to shell scripts. Assumes that you agree to the license agreement. Does not edit shell scripts such as `.bashrc`, `.bash_profile`, `.zshrc`, etc.
- `-p`: Installation prefix/path.
- `-f`: Force installation even if prefix `-p` already exists.

EXAMPLE:

```
wget https://repo.anaconda.com/miniconda/Miniconda3-latest-MacOSX-x86_64.sh -O ~/
miniconda.sh
bash ~/miniconda.sh -b -p $HOME/miniconda
```

The installer prompts “Do you wish the installer to initialize Miniconda3 by running `conda init`?” We recommend “yes”.

Note: If you enter “no”, then conda will not modify your shell scripts at all. In order to initialize after the installation process is done, first run `source <path to conda>/bin/activate` and then run `conda init`.

macOS Catalina (and later)

If you are on macOS Catalina (or later versions), the default shell is `zsh`. You will instead need to run `source <path to conda>/bin/activate` followed by `conda init zsh` (to explicitly select the type of shell to initialize).

Updating Anaconda or Miniconda

1. Open a terminal window.
2. Navigate to the `anaconda` directory.
3. Run `conda update conda`.

Uninstalling Anaconda or Miniconda

1. Open a terminal window.
2. Remove the entire Miniconda install directory with:

```
rm -rf ~/miniconda
```
3. OPTIONAL: Edit `~/.bash_profile` to remove the Miniconda directory from your `PATH` environment variable.
4. Remove the following hidden file and folders that may have been created in the home directory:
 - `.condarc` file
 - `.conda` directory
 - `.continuum` directory

By running:

```
rm -rf ~/.condarc ~/.conda ~/.continuum
```

Installing on Linux

1. Download the installer:
 - [Miniconda installer for Linux](#).
 - [Anaconda installer for Linux](#).
2. *Verify your installer hashes.*
3. In your terminal window, run:

- Miniconda:

```
bash Miniconda3-latest-Linux-x86_64.sh
```

- Anaconda:

```
bash Anaconda-latest-Linux-x86_64.sh
```

4. Follow the prompts on the installer screens.

If you are unsure about any setting, accept the defaults. You can change them later.

5. To make the changes take effect, close and then re-open your terminal window.
6. Test your installation. In your terminal window or Anaconda Prompt, run the command `conda list`. A list of installed packages appears if it has been installed correctly.

Using with fish shell

To use conda with fish shell, run the following in your terminal:

1. Add conda binary to \$PATH, if not yet added:

```
fish_add_path <conda-install-location>/condabin
```

2. Configure fish-shell:

```
conda init fish
```

Installing in silent mode

See the instructions for *installing in silent mode on macOS*.

Updating Anaconda or Miniconda

1. Open a terminal window.
2. Run `conda update conda`.

Uninstalling Anaconda or Miniconda

1. Open a terminal window.
2. Remove the entire Miniconda install directory with:

```
rm -rf ~/miniconda
```

3. OPTIONAL: Edit `~/.bash_profile` to remove the Miniconda directory from your PATH environment variable.
4. OPTIONAL: Remove the following hidden file and folders that may have been created in the home directory:
 - `.condarc` file
 - `.conda` directory
 - `.continuum` directory

By running:

```
rm -rf ~/.condarc ~/.conda ~/.continuum
```

RPM and Debian Repositories for Miniconda

Conda, the package manager from Anaconda, is available as either a RedHat RPM or as a Debian package. The packages are the equivalent to the Miniconda installer which only contains conda and its dependencies. You can use yum or apt to install, uninstall and manage conda on your system. To install conda, follow the instructions for your Linux distribution.

To install the RPM on RedHat, CentOS, Fedora distributions, and other RPM-based distributions such as openSUSE, download the GPG key and add a repository configuration file for conda.

```
# Import our GPG public key
rpm --import https://repo.anaconda.com/pkgs/misc/gpgkeys/anaconda.asc

# Add the Anaconda repository
cat <<EOF > /etc/yum.repos.d/conda.repo
[conda]
name=Conda
baseurl=https://repo.anaconda.com/pkgs/misc/rpmrepo/conda
enabled=1
gpgcheck=1
gpgkey=https://repo.anaconda.com/pkgs/misc/gpgkeys/anaconda.asc
EOF
```

Conda is ready to install on your RPM-based distribution.

```
# Install it!
yum install conda
Loaded plugins: fastestmirror, ovl
Setting up Install Process
Loading mirror speeds from cached hostfile
 * base: repo1.dal.innoscale.net
 * extras: mirrordenvr.fdcservers.net
 * updates: mirror.tzulo.com
Resolving Dependencies
--> Running transaction check
---> Package conda.x86_64 0:4.5.11-0 will be installed
--> Finished Dependency Resolution
```

Dependencies Resolved

Package	Arch	Version	Repository	Size
Installing:				
conda	x86_64	4.5.11-0	conda	73 M
Transaction Summary				
Install 1 Package(s)				
Total download size: 73 M				

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```

Installed size: 210 M
Is this ok [y/N]:

```

To install on Debian-based Linux distributions such as Ubuntu, download the public GPG key and add the conda repository to the sources list.

```

# Install our public GPG key to trusted store
curl https://repo.anaconda.com/pkgsg/misc/gpgkeys/anaconda.asc | gpg --dearmor > conda.gpg
install -o root -g root -m 644 conda.gpg /usr/share/keyrings/conda-archive-keyring.gpg

# Check whether fingerprint is correct (will output an error message otherwise)
gpg --keyring /usr/share/keyrings/conda-archive-keyring.gpg --no-default-keyring --
↳fingerprint 34161F5BF5EB1D4BFBBB8F0A8AEB4F8B29D82806

# Add our Debian repo
echo "deb [arch=amd64 signed-by=/usr/share/keyrings/conda-archive-keyring.gpg] https://
↳repo.anaconda.com/pkgsg/misc/debrepo/conda stable main" > /etc/apt/sources.list.d/conda.
↳list

**NB:** If you receive a Permission denied error when trying to run the above command,
↳(because `/etc/apt/sources.list.d/conda.list` is write protected), try using the
↳following command instead:
echo "deb [arch=amd64 signed-by=/usr/share/keyrings/conda-archive-keyring.gpg] https://
↳repo.anaconda.com/pkgsg/misc/debrepo/conda stable main" | sudo tee -a /etc/apt/sources.
↳list.d/conda.list

```

Conda is ready to install on your Debian-based distribution.

```

# Install it!
apt update
apt install conda
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
conda
0 upgraded, 1 newly installed, 0 to remove and 3 not upgraded.
Need to get 76.3 MB of archives.
After this operation, 221 MB of additional disk space will be used.
Get:1 https://repo.anaconda.com/pkgsg/misc/debrepo/conda stable/main amd64
conda amd64 4.5.11-0 [76.3 MB]
Fetched 76.3 MB in 10s (7733 kB/s)
debconf: delaying package configuration, since apt-utils is not installed
Selecting previously unselected package conda.
(Reading database ... 4799 files and directories currently installed.)
Preparing to unpack .../conda_4.5.11-0_amd64.deb ...
Unpacking conda (4.5.11-0) ...
Setting up conda (4.5.11-0) ...

```

Check to see if the installation is successful by typing:

```

source /opt/conda/etc/profile.d/conda.sh
conda -V

```

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conda 4.5.11

Installing conda packages with the system package manager makes it very easy to distribute conda across a cluster of machines running Linux without having to worry about any non-privileged user modifying the installation. Any non-privileged user simply needs to run `source /opt/conda/etc/profile.d/conda.sh` to use conda.

Administrators can also distribute a `.condarc` file at `/opt/conda/.condarc` so that a predefined configuration for channels, package cache directory, and environment locations is pre-seeded to all users in a large organization. A sample configuration could look like:

```
channels:
defaults
pkg_dirs:
/shared/conda/pkgs
$HOME/.conda/pkgs
envs_dirs:
/shared/conda/envs
$HOME/.conda/envs
```

These RPM and Debian packages provide another way to set up conda inside a Docker container.

It is recommended to use this installation in a read-only manner and upgrade conda using the respective package manager only.

If you're new to conda, check out the documentation at <https://conda.io/docs/>

1.4 Configuration

1.4.1 Using the `.condarc` conda configuration file

- *Overview*
- *Creating and editing*
- *Searching for `.condarc`*
- *General configuration*
- *Advanced configuration*
- *Conda-build configuration*
- *Expansion of environment variables*
- *Obtaining information from the `.condarc` file*
- *Configuring number of threads*

Overview

The conda configuration file, `.condarc`, is an optional runtime configuration file that allows advanced users to configure various aspects of conda, such as which channels it searches for packages, proxy settings, and environment directories. For all of the conda configuration options, see the [configuration page](#).

Note: A `.condarc` file can also be used in an administrator-controlled installation to override the users' configuration. See [Administering a multi-user conda installation](#).

The `.condarc` file can change many parameters, including:

- Where conda looks for packages.
- If and how conda uses a proxy server.
- Where conda lists known environments.
- Whether to update the Bash prompt with the currently activated environment name.
- Whether user-built packages should be uploaded to [Anaconda.org](#).
- What default packages or features to include in new environments.

Creating and editing

The `.condarc` file is not included by default, but it is automatically created in your home directory the first time you run the `conda config` command. To create or modify a `.condarc` file, open Anaconda Prompt or a terminal and enter the `conda config` command.

The `.condarc` configuration file follows simple [YAML syntax](#).

EXAMPLE:

```
conda config --add channels conda-forge
```

Alternatively, you can open a text editor such as Notepad on Windows, TextEdit on macOS, or VS Code. Name the new file `.condarc` and save it to your user home directory or root directory. To edit the `.condarc` file, open it from your home or root directory and make edits in the same way you would with any other text file. If the `.condarc` file is in the root environment, it will override any in the home directory.

You can find information about your `.condarc` file by typing `conda info` in your terminal or Anaconda Prompt. This will give you information about your `.condarc` file, including where it is located.

You can also download a [sample .condarc file](#) to edit in your editor and save to your user home directory or root directory.

To set configuration options, edit the `.condarc` file directly or use the `conda config --set` command.

EXAMPLE: To set the `auto_update_conda` option to `False`, run:

```
conda config --set auto_update_conda False
```

For a complete list of conda config commands, see the [command reference](#). The same list is available at the terminal or Anaconda Prompt by running `conda config --help`. You can also see the [conda channel configuration](#) for more information.

Tip: Conda supports [tab completion](#) with external packages instead of internal configuration.

Conda supports a wide range of configuration options. This page gives a non-exhaustive list of the most frequently used options and their usage. For a complete list of all available options for your version of conda, use the `conda config --describe` command.

Searching for .condarc

Conda looks in the following locations for a `.condarc` file:

```
if on_win:
    SEARCH_PATH = (
        "C:/ProgramData/conda/.condarc",
        "C:/ProgramData/conda/condarc",
        "C:/ProgramData/conda/condarc.d",
    )
else:
    SEARCH_PATH = (
        "/etc/conda/.condarc",
        "/etc/conda/condarc",
        "/etc/conda/condarc.d/",
        "/var/lib/conda/.condarc",
        "/var/lib/conda/condarc",
        "/var/lib/conda/condarc.d/",
    )

SEARCH_PATH += (
    "$CONDA_ROOT/.condarc",
    "$CONDA_ROOT/condarc",
    "$CONDA_ROOT/condarc.d/",
    "$XDG_CONFIG_HOME/conda/.condarc",
    "$XDG_CONFIG_HOME/conda/condarc",
    "$XDG_CONFIG_HOME/conda/condarc.d/",
    "~/.config/conda/.condarc",
    "~/.config/conda/condarc",
    "~/.config/conda/condarc.d/",
    "~/.conda/.condarc",
    "~/.conda/condarc",
    "~/.conda/condarc.d/",
    "~/.condarc",
    "$CONDA_PREFIX/.condarc",
    "$CONDA_PREFIX/condarc",
    "$CONDA_PREFIX/condarc.d/",
    "$CONDARC",
)
```

`XDG_CONFIG_HOME` is the path to where user-specific configuration files should be stored defined following The XDG Base Directory Specification (XDG BDS). Default to `$HOME/.config` should be used. `CONDA_ROOT` is the path for your base conda install. `CONDA_PREFIX` is the path to the current active environment.

Conflict merging strategy

When conflicts between configurations arise, the following strategies are employed:

- Lists - merge
- Dictionaries - merge
- Primitive - clobber

Precedence

The precedence by which the conda configuration is built out is shown below. Each new arrow takes precedence over the ones before it. For example, config files (by parse order) will be superseded by any of the other configuration options. Configuration environment variables (formatted like `CONDA_<CONFIG NAME>`) will always take precedence over the other 3.



General configuration

- *Channel locations (channels)*
- *Default channels (default_channels)*
- *Update conda automatically (auto_update_conda)*
- *Always yes (always_yes)*
- *Show channel URLs (show_channel_urls)*
- *Change command prompt (changeprompt)*
- *Add pip as Python dependency (add_pip_as_python_dependency)*
- *Use pip (use_pip)*
- *Configure conda for use behind a proxy server (proxy_servers)*
- *SSL verification (ssl_verify)*
- *Offline mode only (offline)*

Channel locations (channels)

Listing channel locations in the `.condarc` file overrides conda defaults, causing conda to search only the channels listed here, in the order given.

Use `defaults` to automatically include all default channels. Non-URL channels are interpreted as Anaconda.org user or organization names. You can change this by modifying the `channel_alias` as described in [Set a channel alias \(channel_alias\)](#). The default is just `defaults`.

EXAMPLE:

channels:

- <anaconda_dot_org_username>
- <http://some.custom/channel>
- <file:///some/local/directory>
- defaults

To select channels for a single environment, put a `.condarc` file in the root directory of that environment (or use the `--env` option when using `conda config`).

EXAMPLE: If you have installed Miniconda with Python 3 in your home directory and the environment is named "flowers", the path may be:

```
~/miniconda3/envs/flowers/.condarc
```

Default channels (default_channels)

Normally the defaults channel points to several channels at the repo.anaconda.com repository, but if `default_channels` is defined, it sets the new list of default channels. This is especially useful for airgapped and enterprise installations:

To ensure that all users only pull packages from an on-premises repository, an administrator can set both *channel alias* and `default_channels`.

default_channels:

- <http://some.custom/channel>
- <file:///some/local/directory>

Update conda automatically (auto_update_conda)

When `True`, conda updates itself any time a user updates or installs a package in the root environment. When `False`, conda updates itself only if the user manually issues a `conda update` command. The default is `True`.

EXAMPLE:

```
auto_update_conda: False
```

Always yes (always_yes)

Choose the `yes` option whenever asked to proceed, such as when installing. Same as using the `--yes` flag at the command line. The default is `False`.

EXAMPLE:

```
always_yes: True
```

Show channel URLs (show_channel_urls)

Show channel URLs when displaying what is going to be downloaded and in `conda list`. The default is `False`.

EXAMPLE:

```
show_channel_urls: True
```

Change command prompt (change_ps1)

When using `conda activate`, change the command prompt from `$PS1` to include the activated environment. The default is `True`.

EXAMPLE:

```
change_ps1: False
```

Add pip as Python dependency (add_pip_as_python_dependency)

Add `pip`, `wheel`, and `setuptools` as dependencies of Python. This ensures that `pip`, `wheel`, and `setuptools` are always installed any time Python is installed. The default is `True`.

EXAMPLE:

```
add_pip_as_python_dependency: False
```

Use pip (use_pip)

Use `pip` when listing packages with `conda list`. This does not affect any `conda` command or functionality other than the output of the command `conda list`. The default is `True`.

EXAMPLE:

```
use_pip: False
```

Configure conda for use behind a proxy server (proxy_servers)

By default, proxy settings are pulled from the `HTTP_PROXY` and `HTTPS_PROXY` environment variables or the system. Setting them here overrides that default:

```
proxy_servers:
  http: http://user:pass@corp.com:8080
  https: https://user:pass@corp.com:8080
```

To give a proxy for a specific scheme and host, use the `scheme://hostname` form for the key. This matches for any request to the given scheme and exact host name:

```
proxy_servers:
  'http://10.20.1.128': 'http://10.10.1.10:5323'
```

If you do not include the username and password or if authentication fails, conda prompts for a username and password.

If your password contains special characters, you need escape them as described in [Percent-encoding reserved characters](#) on Wikipedia.

Be careful not to use `http` when you mean `https` or `https` when you mean `http`.

SSL verification (`ssl_verify`)

If you are behind a proxy that does SSL inspection such as a Cisco IronPort Web Security Appliance (WSA), you may need to use `ssl_verify` to override the SSL verification settings.

By default this variable is `True`, which means that SSL verification is used and conda verifies certificates for SSL connections. Setting this variable to `False` disables the connection's normal security and is not recommended:

```
ssl_verify: False
```

You can also set `ssl_verify` to a string path to a certificate, which can be used to verify SSL connections:

```
ssl_verify: corp.crt
```

Offline mode only (`offline`)

Filters out all channel URLs that do not use the `file://` protocol. The default is `False`.

EXAMPLE:

```
offline: True
```

Advanced configuration

- *Disallow soft-linking (`allow_softlinks`)*
- *Set a channel alias (`channel_alias`)*
- *Always add packages by default (`create_default_packages`)*
- *Track features (`track_features`)*
- *Disable updating of dependencies (`update_dependencies`)*
- *Disallow installation of specific packages (`disallow`)*
- *Add Anaconda.org token to automatically see private packages (`add_anaconda_token`)*
- *Specify environment directories (`envs_dirs`)*
- *Specify package directories (`pkgs_dirs`)*
- *Force conda to download only .tar.bz2 packages (`use_only_tar_bz2`)*

Disallow soft-linking (`allow_softlinks`)

When `allow_softlinks` is `True`, conda uses hard-links when possible and soft-links---symlinks---when hard-links are not possible, such as when installing on a different file system than the one that the package cache is on.

When `allow_softlinks` is `False`, conda still uses hard-links when possible, but when it is not possible, conda copies files. Individual packages can override this option, specifying that certain files should never be soft-linked.

The default is `True`.

EXAMPLE:

```
allow_softlinks: False
```

Set a channel alias (`channel_alias`)

Whenever you use the `-c` or `--channel` flag to give conda a channel name that is not a URL, conda prepends the `channel_alias` to the name that it was given. The default `channel_alias` is <https://conda.anaconda.org>.

If `channel_alias` is set to <https://my.anaconda.repo:8080/conda/>, then a user who runs the command `conda install -c conda-forge some-package` will install the package `some-package` from <https://my.anaconda.repo:8080/conda/conda-forge>.

For example, the command:

```
conda install --channel asmeurer <package>
```

is the same as:

```
conda install --channel https://conda.anaconda.org/asmeurer <package>
```

You can set `channel_alias` to your own repository.

EXAMPLE: To set `channel_alias` to your repository at <https://your.repo.com>:

```
channel_alias: https://your.repo/
```

On Windows, you must include a slash ("/") at the end of the URL:

EXAMPLE: <https://your.repo/conda/>

When `channel_alias` set to your repository at <https://your.repo.com>:

```
conda install --channel jsmith <package>
```

is the same as:

```
conda install --channel https://your.repo.com/jsmith <package>
```

Always add packages by default (create_default_packages)

When creating new environments, add the specified packages by default. The default packages are installed in every environment you create. You can override this option at the command prompt with the `--no-default-packages` flag. The default is to not include any packages.

EXAMPLE:

```
create_default_packages:  
- pip  
- ipython  
- scipy=0.15.0
```

Track features (track_features)

Enable certain features to be tracked by default. The default is to not track any features. This is similar to adding MKL to the `create_default_packages` list.

EXAMPLE:

```
track_features:  
- mkl
```

Disable updating of dependencies (update_dependencies)

By default, `conda install` updates the given package to the latest version and installs any dependencies necessary for that package. However, if dependencies that satisfy the package's requirements are already installed, conda will not update those packages to the latest version.

In this case, if you would prefer that conda update all dependencies to the latest version that is compatible with the environment, set `update_dependencies` to `True`.

The default is `False`.

EXAMPLE:

```
update_dependencies: True
```

Note: Conda still ensures that dependency specifications are satisfied. Thus, some dependencies may still be updated or, conversely, this may prevent packages given at the command line from being updated to their latest versions. You can always specify versions at the command line to force conda to install a given version, such as `conda install numpy=1.9.3`.

To avoid updating only specific packages in an environment, a better option may be to pin them. For more information, see [Preventing packages from updating \(pinning\)](#).

Disallow installation of specific packages (disallow)

Disallow the installation of certain packages. The default is to allow installation of all packages.

EXAMPLE:

```
disallow:
- anaconda
```

Add Anaconda.org token to automatically see private packages (add_anaconda_token)

When the channel alias is Anaconda.org or an Anaconda Server GUI, you can set the system configuration so that users automatically see private packages. Anaconda.org was formerly known as binstar.org. This uses the Anaconda command-line client, which you can install with `conda install anaconda-client`, to automatically add the token to the channel URLs.

The default is True.

EXAMPLE:

```
add_anaconda_token: False
```

Note: Even when set to True, this setting is enabled only if the Anaconda command-line client is installed and you are logged in with the `anaconda login` command.

Specify environment directories (envs_dirs)

Specify directories in which environments are located. If this key is set, the root prefix `envs_dir` is not used unless explicitly included. This key also determines where the package caches are located.

For each `envs` here, `envs/pkgs` is used as the `pkgs` cache, except for the standard `envs` directory in the root directory, for which the normal `root_dir/pkgs` is used.

EXAMPLE:

```
envs_dirs:
- ~/my-envs
- /opt/anaconda/envs
```

The `CONDA_ENVS_PATH` environment variable overwrites the `envs_dirs` setting:

- For macOS and Linux: `CONDA_ENVS_PATH=~/my-envs:/opt/anaconda/envs`
- For Windows: set `CONDA_ENVS_PATH=C:\Users\joe\envs;C:\Anaconda\envs`

Specify package directories (pkgs_dirs)

Specify directories in which packages are located. If this key is set, the root prefix `pkgs_dirs` is not used unless explicitly included.

If the `pkgs_dirs` key is not set, then `envs/pkgs` is used as the `pkgs` cache, except for the standard `envs` directory in the root directory, for which the normal `root_dir/pkgs` is used.

EXAMPLE:

```
pkgs_dirs:
- /opt/anaconda/pkgs
```

The `CONDA_PKGS_DIRS` environment variable overwrites the `pkgs_dirs` setting:

- For macOS and Linux: `CONDA_PKGS_DIRS=/opt/anaconda/pkgs`
- For Windows: set `CONDA_PKGS_DIRS=C:\Anaconda\pkgs`

Force conda to download only .tar.bz2 packages (use_only_tar_bz2)

Conda 4.7 introduced a new `.conda` package file format. `.conda` is a more compact and faster alternative to `.tar.bz2` packages. It's thus the preferred file format to use where available.

Nevertheless, it's possible to force conda to only download `.tar.bz2` packages by setting the `use_only_tar_bz2` boolean to `True`.

The default is `False`.

EXAMPLE:

```
use_only_tar_bz2: True
```

Note: This is forced to `True` if `conda-build` is installed and older than 3.18.3, because older versions of conda break when conda feeds it the new file format.

Conda-build configuration

- *Specify conda-build output root directory (root-dir)*
- *Specify conda-build build folder (conda-build 3.16.3+) (output_folder)*
- `pkg_format`
- *Automatically upload conda-build packages to Anaconda.org (anaconda_upload)*
- *Token to be used for Anaconda.org uploads (conda-build 3.0+) (anaconda_token)*
- *Limit build output verbosity (conda-build 3.0+) (quiet)*
- *Disable filename hashing (conda-build 3.0+) (filename_hashing)*
- *Disable recipe and package verification (conda-build 3.0+) (no_verify)*
- *Disable per-build folder creation (conda-build 3.0+) (set_build_id)*
- *Skip building packages that already exist (conda-build 3.0+) (skip_existing)*
- *Omit recipe from package (conda-build 3.0+) (include_recipe)*

- *Disable activation of environments during build/test (conda-build 3.0+) (activate)*
- *Disable long prefix during test (conda-build 3.16.3+) (long_test_prefix)*
- *PyPI upload settings (conda-build 3.0+) (pypirc)*
- *PyPI repository to upload to (conda-build 3.0+) (pypi_repository)*
- *Configuring number of threads*

Specify conda-build output root directory (root-dir)

Build output root directory. You can also set this with the CONDA_BLD_PATH environment variable. The default is <CONDA_PREFIX>/conda-bld/. If you do not have write permissions to <CONDA_PREFIX>/conda-bld/, the default is ~/conda-bld/.

EXAMPLE:

```
conda-build:
  root-dir: ~/conda-builds
```

Specify conda-build build folder (conda-build 3.16.3+) (output_folder)

Folder to dump output package to. Packages are moved here if build or test succeeds. If unset, the output folder corresponds to the same directory as the root build directory (root-dir).

```
conda-build:
  output_folder: conda-bld
```

Specify conda-build package version (pkg_version)

Conda package version to create. Use 2 for .conda packages. If not set, conda-build defaults to .tar.bz2.

```
conda-build:
  pkg_format: 2
```

Automatically upload conda-build packages to Anaconda.org (anaconda_upload)

Automatically upload packages built with conda-build to [Anaconda.org](https://anaconda.org). The default is False.

EXAMPLE:

```
anaconda_upload: True
```

Token to be used for Anaconda.org uploads (conda-build 3.0+) (anaconda_token)

Tokens are a means of authenticating with Anaconda.org without logging in. You can pass your token to conda-build with this conda setting, or with a CLI argument. This is unset by default. Setting it implicitly enables `anaconda_upload`.

```
conda-build:
  anaconda_token: gobbledygook
```

Limit build output verbosity (conda-build 3.0+) (quiet)

Conda-build's output verbosity can be reduced with the `quiet` setting. For more verbosity use the CLI flag `--debug`.

```
conda-build:
  quiet: true
```

Disable filename hashing (conda-build 3.0+) (filename_hashing)

Conda-build 3 adds hashes to filenames to allow greater customization of dependency versions. If you find this disruptive, you can disable the hashing with the following config entry:

```
conda-build:
  filename_hashing: false
```

Warning: Conda-build does not check when clobbering packages. If you utilize conda-build 3's build matrices with a build configuration that is not reflected in the build string, packages will be missing due to clobbering.

Disable recipe and package verification (conda-build 3.0+) (no_verify)

By default, conda-build uses conda-verify to ensure that your recipe and package meet some minimum sanity checks. You can disable these:

```
conda-build:
  no_verify: true
```

Disable per-build folder creation (conda-build 3.0+) (set_build_id)

By default, conda-build creates a new folder for each build, named for the package name plus a timestamp. This allows you to do multiple builds at once. If you have issues with long paths, you may need to disable this behavior. You should first try to change the build output root directory with the `root-dir` setting described above, but fall back to this as necessary:

```
conda-build:
  set_build_id: false
```

Skip building packages that already exist (conda-build 3.0+) (skip_existing)

By default, conda-build builds all recipes that you specify. You can instead skip recipes that are already built. A recipe is skipped if and only if *all* of its outputs are available on your currently configured channels.

```
conda-build:
  skip_existing: true
```

Omit recipe from package (conda-build 3.0+) (include_recipe)

By default, conda-build includes the recipe that was used to build the package. If this contains sensitive or proprietary information, you can omit the recipe.

```
conda-build:
  include_recipe: false
```

Note: If you do not include the recipe, you cannot use conda-build to test the package after the build completes. This means that you cannot split your build and test steps across two distinct CLI commands (`conda build --notest recipe` and `conda build -t recipe`). If you need to omit the recipe and split your steps, your only option is to remove the recipe files from the tarball artifacts after your test step. Conda-build does not provide tools for doing that.

Disable activation of environments during build/test (conda-build 3.0+) (activate)

By default, conda-build activates the build and test environments prior to executing the build or test scripts. This adds necessary PATH entries, and also runs any activate.d scripts you may have. If you disable activation, the PATH will still be modified, but the activate.d scripts will not run. This is not recommended, but some people prefer this.

```
conda-build:
  activate: false
```

Disable long prefix during test (conda-build 3.16.3+) (long_test_prefix)

By default, conda-build uses a long prefix for the test prefix. If you have recipes that fail in long prefixes but would still like to test them in short prefixes, you can disable the long test prefix. This is not recommended.

```
conda-build:
  long_test_prefix: false
```

The default is true.

PyPI upload settings (conda-build 3.0+) (pypirc)

Unset by default. If you have wheel outputs in your recipe, conda-build will try to upload them to the PyPI repository specified by the `pypi_repository` setting using credentials from this file path.

```
conda-build:
  pypirc: ~/.pypirc
```

PyPI repository to upload to (conda-build 3.0+) (pypi_repository)

Unset by default. If you have wheel outputs in your recipe, conda-build will try to upload them to this PyPI repository using credentials from the file specified by the `pypirc` setting.

```
conda-build:
  pypi_repository: pypi
```

Expansion of environment variables

Conda expands environment variables in a subset of configuration settings. These are:

- `channel`
- `channel_alias`
- `channels`
- `client_cert_key`
- `client_cert`
- `custom_channels`
- `custom_multichannels`
- `default_channels`
- `envs_dirs`
- `envs_path`
- `migrated_custom_channels`
- `pkgs_dirs`
- `proxy_servers`
- `verify_ssl`
- `allowlist_channels`

This allows you to store the credentials of a private repository in an environment variable, like so:

```
channels:
- https://${USERNAME}:${PASSWORD}@my.private.conda.channel
```


Obtaining information from the .condarc file

Note: It may be necessary to add the "force" option `-f` to the following commands.

To get all keys and their values:

```
conda config --get
```

To get the value of a specific key, such as channels:

```
conda config --get channels
```

To add a new value, such as <http://conda.anaconda.org/mutirri>, to a specific key, such as channels:

```
conda config --add channels http://conda.anaconda.org/mutirri
```

To remove an existing value, such as <http://conda.anaconda.org/mutirri> from a specific key, such as channels:

```
conda config --remove channels http://conda.anaconda.org/mutirri
```

To remove a key, such as channels, and all of its values:

```
conda config --remove-key channels
```

To configure channels and their priority for a single environment, make a `.condarc` file in the *root directory of that environment*.

Configuring number of threads

You can use your `.condarc` file or environment variables to add configuration to control the number of threads. You may want to do this to tweak conda to better utilize your system. If you have a very fast SSD, you might increase the number of threads to shorten the time it takes for conda to create environments and install/remove packages.

repodata_threads

- Default number of threads: None
- Threads used when downloading, parsing, and creating repodata structures from repodata.json files. Multiple downloads from different channels may occur simultaneously. This speeds up the time it takes to start solving.

verify_threads

- Default number of threads: 1
- Threads used when verifying the integrity of packages and files to be installed in your environment. Defaults to 1, as using multiple threads here can run into problems with slower hard drives.

execute_threads

- Default number of threads: 1
- Threads used to unlink, remove, link, or copy files into your environment. Defaults to 1, as using multiple threads here can run into problems with slower hard drives.

default_threads

- Default number of threads: None

- When set, this value is used for all of the above thread settings. With its default setting (None), it does not affect the other settings.

Setting any of the above can be done in `.condarc` or with `conda config`:

At your terminal:

```
conda config --set repodata_threads 2
```

In `.condarc`:

```
verify_threads: 4
```

1.4.2 Sample `.condarc` file

```
# This is a sample .condarc file.
# It adds the r Anaconda.org channel and enables
# the show_channel_urls option.

# channel locations. These override conda defaults, i.e., conda will
# search *only* the channels listed here, in the order given.
# Use "defaults" to automatically include all default channels.
# Non-url channels will be interpreted as Anaconda.org usernames
# (this can be changed by modifying the channel_alias key; see below).
# The default is just 'defaults'.
channels:
- r
- defaults

# Show channel URLs when displaying what is going to be downloaded
# and in 'conda list'. The default is False.
show_channel_urls: True

# For more information about this file see:
# https://conda.io/docs/user-guide/configuration/use-condarc.html
```

1.4.3 Using the free channel

- *Adding the free channel to defaults*
- *Changing `.condarc`*
- *Package name changes*
- *Troubleshooting*

The free channel contains packages created prior to September 26, 2017. Prior to conda 4.7, the free channel was part of the `defaults` channel. Read more about the *defaults channel*.

Removing the `free` channel reduced conda's search space and hid old software. That old software could have incompatible constraint information. Read more about *why we made this change*.

If you still need the content from the `free` channel to reproduce old environments, you can re-add the channel following the directions below.

Adding the free channel to defaults

If you want to add the `free` channel back into your default list, use the command:

```
conda config --set restore_free_channel true
```

The order of the channels is important. Using the above command will restore the `free` channel in the correct order.

Changing `.condarc`

You can also add the `free` channel back into your defaults by changing the `.condarc` file itself.

Add the following to the conda section of your `.condarc` file:

```
restore_free_channel: true
```

Read more about *Using the `.condarc` conda configuration file*.

Package name changes

Some packages that are available in the `free` channel have different names in the `main` channel.

Package name in free	Package name in main
dateutil	python-dateutil
gcc	gcc_linux-64 and similar
pil	pillow
ipython-notebook	now installable via notebook, a metapackage could be created
Ipython-qtconsole	now installable via qtconsole, a metapackage could be created
beautiful-soup	beautifulsoup4
pydot-ng	pydot

Troubleshooting

You may encounter some errors, such as `UnsatisfiableError` or a `PackagesNotFoundError`.

An example of this error is:

```
$ conda create -n test -c file:///Users/jsmith/anaconda/conda-bld bad_pkg
Collecting package metadata: done
Solving environment: failed

UnsatisfiableError: The following specifications were found to be in conflict:
- cryptography=2.6.1 -> openssl[version='>=1.1.1b,<1.1.2a']
- python=3.7.0 -> openssl[version='>=1.0.2o,<1.0.3a']
Use "conda search <package> --info" to see the dependencies for each package.
```

This can occur if:

- you're trying to install a package that is only available in `free` and not in `main`.
- you have older environments in files you want to recreate. If those spec files reference packages that are in `free`, they will not show up.

- a package is dependent upon files found only in the free channel. Conda will not let you install the package if it cannot install the dependency, which the package requires to work.

If you encounter these errors, consider using a newer package than the one in `free`. If you want those older versions, you can [add the free channel back into your defaults](#).

1.4.4 Administering a multi-user conda installation

By default, conda and all packages it installs, including Anaconda, are installed locally with a user-specific configuration. Administrative privileges are not required, and no upstream files or other users are affected by the installation.

You can make conda and any number of packages available to a group of one or more users, while preventing these users from installing unwanted packages with conda:

1. Install conda and the allowed packages, if any, in a location that is under administrator control and accessible to users.
2. Create a `.condarc system configuration file` in the root directory of the installation. This system-level configuration file will override any user-level configuration files installed by the user.

Each user accesses the central conda installation, which reads settings from the user `.condarc` configuration file located in their home directory. The path to the user file is the same as the root environment prefix displayed by `conda info`, as shown in [User configuration file](#) below. The user `.condarc` file is limited by the system `.condarc` file.

System configuration settings are commonly used in a system `.condarc` file but may also be used in a user `.condarc` file. All user configuration settings may also be used in a system `.condarc` file.

For information about settings in the `.condarc` file, see [Using the .condarc conda configuration file](#).

Example administrator-controlled installation

The following example describes how to view the system configuration file, review the settings, compare it to a user's configuration file, and determine what happens when the user attempts to access a file from a blocked channel. It then describes how the user must modify their configuration file to access the channels allowed by the administrator.

System configuration file

1. The system configuration file must be in the top-level conda installation directory. Check the path where conda is located:

```
$ which conda
/tmp/miniconda/bin/conda
```

2. View the contents of the `.condarc` file in the administrator's directory:

```
cat /tmp/miniconda/.condarc
```

The following administrative `.condarc` file uses the `#!final` flag to specify the channels, default channels, and `channel_alias` available to the user.

```
$ cat /tmp/miniconda/.condarc

channels:                                     #!final
- admin
```

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```
channel_alias: https://conda.anaconda.org/ #!final
```

The `#!final` flag is very similar to the `!important` rule in CSS; any parameter within the `.condarc` that is trailed by the `#!final` cannot be overwritten by any other `.condarc` source. For more information on this flag, see the [Anaconda Blog](#) on the subject.

Because the `#!final` flag has been used and the channel defaults are not explicitly specified, users are disallowed from downloading packages from the default channels. You can check this in the next procedure.

User configuration file

1. Check the location of the user's conda installation:

```
$ conda info
Current conda install:
. . .
    channel URLs : https://repo.anaconda.com/pkgs/free/osx-64/
                  https://repo.anaconda.com/pkgs/pro/osx-64/
    config file : /Users/username/.condarc
```

The `conda info` command shows that conda is using the user's `.condarc` file, located at `/Users/username/.condarc` and that the default channels such as `repo.anaconda.com` are listed as channel URLs.

2. View the contents of the administrative `.condarc` file in the directory that was located in step 1:

```
$ cat ~/.condarc
channels:
- defaults
```

This user's `.condarc` file specifies only the default channels, but the administrator config file has blocked default channels by specifying that only `admin` is allowed. If this user attempts to search for a package in the default channels, they get a message telling them what channels are allowed:

```
$ conda search flask
Fetching package metadata:
Error: URL 'http://repo.anaconda.com/pkgs/pro/osx-64/' not
in allowed channels.
Allowed channels are:
- https://conda.anaconda.org/admin/osx-64/
```

This error message tells the user to add the `admin` channel to their configuration file.

3. The user must edit their local `.condarc` configuration file to access the package through the admin channel:

```
channels:
- admin
```

The user can now search for packages in the allowed `admin` channel.

1.4.5 Enabling tab completion

Conda versions up to 4.3 supports tab completion in Bash shells via the `argcomplete` package. Bash tab completion has been removed starting with version 4.4.0.

To enable tab completion in your Bash shell:

1. Make sure that `argcomplete` is installed:

```
conda install argcomplete
```

2. Add the following code to your bash profile:

```
eval "$(register-python-argcomplete conda)"
```

3. Test it:

1. Open a new terminal window or an Anaconda Prompt.
2. Type: `conda ins`, and then press the Tab key.

The command completes to:

```
conda install
```

To get tab completion in Zsh, see [conda-zsh-completion](#).

1.4.6 Improving interoperability with pip

The conda 4.6.0 release added improved support for interoperability between conda and pip. This feature is still experimental and is therefore off by default.

With this interoperability, conda can use pip-installed packages to satisfy dependencies, cleanly remove pip-installed software, and replace them with conda packages when appropriate.

If you'd like to try the feature, you can set this `.condarc` setting:

```
conda config --set pip_interop_enabled True
```

Note: Setting `pip_interop_enabled` to `True` may slow down conda.

Even without activating this feature, conda now understands pip metadata more intelligently. For example, if we create an environment with conda:

```
conda create -y -n some_pip_test python=3.7 image_size=1.0
```

Then we update `image_size` in that environment using pip:

```
conda activate some_pip_test
pip install -U image_size
```

Prior to conda 4.6.0, the `conda list` command returned ambiguous results:

```
image_size          1.1.0
image_size          1.0.0 py37_0
```

Conda 4.6.0 now shows only one entry for imagesize (the newer pip entry):

imagesize	1.1.0	pypi_0	pypi
-----------	-------	--------	------

1.4.7 Disabling SSL verification

Using conda with SSL is strongly recommended, but it is possible to disable SSL and it may be necessary to disable SSL in certain cases.

Some corporate environments use proxy services that use Man-In-The-Middle (MITM) attacks to sniff encrypted traffic. These services can interfere with SSL connections such as those used by conda and pip to download packages from repositories such as PyPI.

If you encounter this interference, you should set up the proxy service's certificates so that the `requests` package used by conda can recognize and use the certificates.

For cases where this is not possible, conda-build versions 3.0.31 and higher have an option that disables SSL certificate verification and allows this traffic to continue.

`conda skeleton pypi` can disable SSL verification when pulling packages from a PyPI server over HTTPS.

Warning: This option causes your computer to download and execute arbitrary code over a connection that it cannot verify as secure. This is not recommended and should only be used if necessary. Use this option at your own risk.

To disable SSL verification when using `conda skeleton pypi`, set the `SSL_NO_VERIFY` environment variable to either 1 or True (case insensitive).

On *nix systems:

```
SSL_NO_VERIFY=1 conda skeleton pypi a_package
```

And on Windows systems:

```
set SSL_NO_VERIFY=1
conda skeleton pypi a_package
set SSL_NO_VERIFY=
```

We recommend that you unset this environment variable immediately after use. If it is not unset, some other tools may recognize it and incorrectly use unverified SSL connections.

Using this option will cause `requests` to emit warnings to `STDERR` about insecure settings. If you know that what you're doing is safe, or have been advised by your IT department that what you're doing is safe, you may ignore these warnings.

1.4.8 Using non-standard certificates

Using conda behind a firewall may require using a non-standard set of certificates, which requires custom settings.

If you are using a non-standard set of certificates, then the requests package requires the setting of `REQUESTS_CA_BUNDLE`. If you receive an error with self-signed certifications, you may consider unsetting `REQUESTS_CA_BUNDLE` as well as `CURL_CA_BUNDLE` and [disabling SSL verification](#) to create a conda environment over HTTP.

You may need to set the conda environment to use the root certificate provided by your company rather than conda's generic ones.

One workflow to resolve this on macOS is:

- Open Chrome, got to any website, click on the lock icon on the left of the URL. Click on «Certificate» on the dropdown. In the next window you see a stack of certificates. The uppermost (aka top line in window) is the root certificate (e.g. Zscaler Root CA).
- Open macOS keychain, click on «Certificates» and choose among the many certificates the root certificate that you just identified. Export this to any folder of your choosing.
- Convert this certificate with OpenSSL: `openssl x509 -inform der -in /path/to/your/certificate.cer -out /path/to/converted/certificate.pem`
- For a quick check, set your shell to acknowledge the certificate: `export REQUESTS_CA_BUNDLE=/path/to/converted/certificate.pem`
- To set this permanently, open your shell profile (e.g. `.bashrc` or `.zshrc`) and add this line: `export REQUESTS_CA_BUNDLE=/path/to/converted/certificate.pem`. Now exit your terminal/shell and reopen. Check again.

1.4.9 Mirroring channels

The conda configuration system has several keys that can be used to set up a mirrored context.

The default setup

By default, conda can serve packages from two main locations:

- `repo.anaconda.com`: this is where defaults points to by default. This base location is hardcoded in the default value of `default_channels`:
 - `https://repo.anaconda.com/pkgs/main`
 - `https://repo.anaconda.com/pkgs/r`
 - `https://repo.anaconda.com/pkgs/msys2`
- `conda.anaconda.org`: this is where conda clients look up community channels like `conda-forge` or `bioconda`. This base location can be configured via `channel_alias`.

So, when it comes to mirroring these channels, you have to account for those two locations.

Mirror defaults

Use `default_channels` to overwrite the *default configuration*. For example:

```
default_channels:  
- https://my-mirror.com/pkgs/main  
- https://my-mirror.com/pkgs/r  
- https://my-mirror.com/pkgs/msys2
```

Mirror all community channels

Redefine `channel_alias` to point to your mirror. For example:

```
channel_alias: https://my-mirror.com
```

This will make conda look for all community channels at `https://my-mirror.com/conda-forge`, `https://my-mirror.com/bioconda`, etc.

Mirror only some community channels

If you want to mirror only some community channels, you must use `custom_channels`. This takes precedence over `channel_alias`. For example:

```
custom_channels:  
  conda-forge: https://my-mirror.com/conda-forge
```

With this configuration, conda-forge will be looked up at `https://my-mirror.com/conda-forge`. All other community channels will be looked up at `https://conda.anaconda.org`.

Note: Feel free to explore all the available options in *Conda configuration*.

1.5 Tasks

1.5.1 Managing conda

- *Verifying that conda is installed*
- *Determining your conda version*
- *Updating conda to the current version*
- *Suppressing warning message about updating conda*

Verifying that conda is installed

To verify that conda is installed, in your terminal window or an Anaconda Prompt, run:

```
conda --version
```

Conda responds with the version number that you have installed, such as `conda 4.12.0`.

If you get an error message, make sure of the following:

- You are logged into the same user account that you used to install Anaconda or Miniconda.
- You are in a directory that Anaconda or Miniconda can find.
- You have closed and re-opened the terminal window after installing conda.

Determining your conda version

In addition to the `conda --version` command explained above, you can determine what conda version is installed by running one of the following commands in your terminal window or an Anaconda Prompt:

```
conda info
```

OR

```
conda -V
```

Updating conda to the current version

To update conda, in your terminal window or an Anaconda Prompt, run:

```
conda update conda
```

Conda compares versions and reports what is available to install. It also tells you about other packages that will be automatically updated or changed with the update. If conda reports that a newer version is available, type `y` to update:

```
Proceed ([y]/n)? y
```

Suppressing warning message about updating conda

To suppress the following warning message when you do not want to update conda to the latest version:

```
==> WARNING: A newer version of conda exists. <==  
current version: 4.6.13  
latest version: 4.8.0
```

Update conda by running: `conda update -n base conda`

Run the following command from your terminal or Anaconda Prompt: `conda config --set notify_outdated_conda false`

Or add the following line in your `.condarc` file: `notify_outdated_conda: false`

1.5.2 Managing environments

- *Creating an environment with commands*
- *Creating an environment from an environment.yml file*
- *Specifying a location for an environment*
- *Updating an environment*
- *Cloning an environment*
- *Building identical conda environments*
- *Activating an environment*
- *Deactivating an environment*
- *Determining your current environment*
- *Viewing a list of your environments*
- *Viewing a list of the packages in an environment*
- *Using pip in an environment*
- *Setting environment variables*
- *Saving environment variables*
- *Sharing an environment*
- *Restoring an environment*
- *Removing an environment*

With conda, you can create, export, list, remove, and update environments that have different versions of Python and/or packages installed in them. Switching or moving between environments is called activating the environment. You can also share an environment file.

Note: There are many options available for the commands described on this page. For details, see `../commands`.

Note: `conda activate` and `conda deactivate` only work on conda 4.6 and later versions. For conda versions prior to 4.6, run:

- Windows: `activate` or `deactivate`
 - Linux and macOS: `source activate` or `source deactivate`
-

Creating an environment with commands

Tip: By default, environments are installed into the `envs` directory in your conda directory. See [Specifying a location for an environment](#) or run `conda create --help` for information on specifying a different path.

Use the terminal or an Anaconda Prompt for the following steps:

1. To create an environment:

```
conda create --name myenv
```

Note: Replace `myenv` with the environment name.

2. When conda asks you to proceed, type `y`:

```
proceed ([y]/n)?
```

This creates the `myenv` environment in `/envs/`. No packages will be installed in this environment.

3. To create an environment with a specific version of Python:

```
conda create -n myenv python=3.9
```

4. To create an environment with a specific package:

```
conda create -n myenv scipy
```

OR:

```
conda create -n myenv python
conda install -n myenv scipy
```

5. To create an environment with a specific version of a package:

```
conda create -n myenv scipy=0.17.3
```

OR:

```
conda create -n myenv python
conda install -n myenv scipy=0.17.3
```

6. To create an environment with a specific version of Python and multiple packages:

```
conda create -n myenv python=3.9 scipy=0.17.3 astroid babel
```

Tip: Install all the programs that you want in this environment at the same time. Installing 1 program at a time can lead to dependency conflicts.

To automatically install `pip` or another program every time a new environment is created, add the default programs to the `create_default_packages` section of your `.condarc` configuration file. The default packages are installed every time you create a new environment. If you do not want the default packages installed in a particular environment, use the `--no-default-packages` flag:

```
conda create --no-default-packages -n myenv python
```

Tip: You can add much more to the `conda create` command. For details, run `conda create --help`.

Creating an environment from an `environment.yml` file

Use the terminal or an Anaconda Prompt for the following steps:

1. Create the environment from the `environment.yml` file:

```
conda env create -f environment.yml
```

The first line of the `yml` file sets the new environment's name. For details see [Creating an environment file manually](#).

2. Activate the new environment: `conda activate myenv`
3. Verify that the new environment was installed correctly:

```
conda env list
```

You can also use `conda info --envs`.

Specifying a location for an environment

You can control where a conda environment lives by providing a path to a target directory when creating the environment. For example, the following command will create a new environment in a subdirectory of the current working directory called `envs`:

```
conda create --prefix ./envs jupyterlab=3.2 matplotlib=3.5 numpy=1.21
```

You then activate an environment created with a prefix using the same command used to activate environments created by name:

```
conda activate ./envs
```

Specifying a path to a subdirectory of your project directory when creating an environment has the following benefits:

- It makes it easy to tell if your project uses an isolated environment by including the environment as a subdirectory.
- It makes your project more self-contained as everything, including the required software, is contained in a single project directory.

An additional benefit of creating your project's environment inside a subdirectory is that you can then use the same name for all your environments. If you keep all of your environments in your `envs` folder, you'll have to give each environment a different name.

There are a few things to be aware of when placing conda environments outside of the default `envs` folder.

1. Conda can no longer find your environment with the `--name` flag. You'll generally need to pass the `--prefix` flag along with the environment's full path to find the environment.
2. Specifying an install path when creating your conda environments makes it so that your command prompt is now prefixed with the active environment's absolute path rather than the environment's name.

After activating an environment using its prefix, your prompt will look similar to the following:

```
(/absolute/path/to/envs) $
```

This can result in long prefixes:

```
(/Users/USER_NAME/research/data-science/PROJECT_NAME/envs) $
```

To remove this long prefix in your shell prompt, modify the `env_prompt` setting in your `.condarc` file:

```
$ conda config --set env_prompt '({name}) '
```

This will edit your `.condarc` file if you already have one or create a `.condarc` file if you do not.

Now your command prompt will display the active environment's generic name, which is the name of the environment's root folder:

```
$ cd project-directory
$ conda activate ./env
(env) project-directory $
```

Updating an environment

You may need to update your environment for a variety of reasons. For example, it may be the case that:

- one of your core dependencies just released a new version (dependency version number update).
- you need an additional package for data analysis (add a new dependency).
- you have found a better package and no longer need the older package (add new dependency and remove old dependency).

If any of these occur, all you need to do is update the contents of your `environment.yml` file accordingly and then run the following command:

```
$ conda env update --prefix ./env --file environment.yml --prune
```

Note: The `--prune` option causes conda to remove any dependencies that are no longer required from the environment.

Cloning an environment

Use the terminal or an Anaconda Prompt for the following steps:

You can make an exact copy of an environment by creating a clone of it:

```
conda create --name myclone --clone myenv
```

Note: Replace `myclone` with the name of the new environment. Replace `myenv` with the name of the existing environment that you want to copy.

To verify that the copy was made:

```
conda info --envs
```

In the environments list that displays, you should see both the source environment and the new copy.

Building identical conda environments

You can use explicit specification files to build an identical conda environment on the same operating system platform, either on the same machine or on a different machine.

Use the terminal or an Anaconda Prompt for the following steps:

1. Run `conda list --explicit` to produce a spec list such as:

```
# This file may be used to create an environment using:
# $ conda create --name <env> --file <this file>
# platform: osx-64
@EXPLICIT
https://repo.anaconda.com/pkg/free/osx-64/mkl-11.3.3-0.tar.bz2
https://repo.anaconda.com/pkg/free/osx-64/numpy-1.11.1-py35_0.tar.bz2
https://repo.anaconda.com/pkg/free/osx-64/openssl-1.0.2h-1.tar.bz2
https://repo.anaconda.com/pkg/free/osx-64/pip-8.1.2-py35_0.tar.bz2
https://repo.anaconda.com/pkg/free/osx-64/python-3.5.2-0.tar.bz2
https://repo.anaconda.com/pkg/free/osx-64/readline-6.2-2.tar.bz2
https://repo.anaconda.com/pkg/free/osx-64/setuptools-25.1.6-py35_0.tar.bz2
https://repo.anaconda.com/pkg/free/osx-64/sqlite-3.13.0-0.tar.bz2
https://repo.anaconda.com/pkg/free/osx-64/tk-8.5.18-0.tar.bz2
https://repo.anaconda.com/pkg/free/osx-64/wheel-0.29.0-py35_0.tar.bz2
https://repo.anaconda.com/pkg/free/osx-64/xz-5.2.2-0.tar.bz2
https://repo.anaconda.com/pkg/free/osx-64/zlib-1.2.8-3.tar.bz2
```

2. To create this spec list as a file in the current working directory, run:

```
conda list --explicit > spec-file.txt
```

Note: You can use `spec-file.txt` as the filename or replace it with a filename of your choice.

An explicit spec file is not usually cross platform, and therefore has a comment at the top such as `# platform: osx-64` showing the platform where it was created. This platform is the one where this spec file is known to work. On other platforms, the packages specified might not be available or dependencies might be missing for some of the key packages already in the spec.

To use the spec file to create an identical environment on the same machine or another machine:

```
conda create --name myenv --file spec-file.txt
```

To use the spec file to install its listed packages into an existing environment:

```
conda install --name myenv --file spec-file.txt
```

Conda does not check architecture or dependencies when installing from a spec file. To ensure that the packages work correctly, make sure that the file was created from a working environment, and use it on the same architecture, operating system, and platform, such as `linux-64` or `osx-64`.

Activating an environment

Activating environments is essential to making the software in the environments work well. Activation entails two primary functions: adding entries to PATH for the environment and running any activation scripts that the environment may contain. These activation scripts are how packages can set arbitrary environment variables that may be necessary for their operation. You can also *use the config API to set environment variables*.

When *installing Anaconda*, you have the option to “Add Anaconda to my PATH environment variable.” This is not recommended because the add to PATH option appends Anaconda to PATH. When the installer appends to PATH, it does not call the activation scripts.

On Windows, PATH is composed of two parts, the system PATH and the user PATH. The system PATH always comes first. When you install Anaconda for Just Me, we add it to the user PATH. When you install for All Users, we add it to the system PATH. In the former case, you can end up with system PATH values taking precedence over our entries. In the latter case, you do not. We do not recommend *multi-user installs*.

Activation prepends to PATH. This only takes effect when you have the environment active so it is local to a terminal session, not global.

To activate an environment: `conda activate myenv`

Note: Replace myenv with the environment name or directory path.

Conda prepends the path name myenv onto your system command.

You may receive a warning message if you have not activated your environment:

Warning:
This Python interpreter **is in** a conda environment, but the environment has **not** been activated. Libraries may fail to load. To activate this environment please see <https://conda.io/activation>.

If you receive this warning, you need to activate your environment. To do so on Windows, run: `c:\Anaconda3\Scripts\activate base` in Anaconda Prompt.

Windows is extremely sensitive to proper activation. This is because the Windows library loader does not support the concept of libraries and executables that know where to search for their dependencies (RPATH). Instead, Windows relies on a *dynamic-link library search order*.

If environments are not active, libraries won't be found and there will be lots of errors. HTTP or SSL errors are common errors when the Python in a child environment can't find the necessary OpenSSL library.

Conda itself includes some special workarounds to add its necessary PATH entries. This makes it so that it can be called without activation or with any child environment active. In general, calling any executable in an environment without first activating that environment will likely not work. For the ability to run executables in activated environments, you may be interested in the `conda run` command.

If you experience errors with PATH, review our *troubleshooting*.

Conda init

Earlier versions of conda introduced scripts to make activation behavior uniform across operating systems. Conda 4.4 allowed `conda activate myenv`. Conda 4.6 added extensive initialization support so that conda works faster and less disruptively on a wide variety of shells (bash, zsh, csh, fish, xonsh, and more). Now these shells can use the `conda activate` command. Removing the need to modify `PATH` makes conda less disruptive to other software on your system. For more information, read the output from `conda init --help`.

One setting may be useful to you when using `conda init` is:

```
auto_activate_base: bool
```

This setting controls whether or not conda activates your base environment when it first starts up. You'll have the `conda` command available either way, but without activating the environment, none of the other programs in the environment will be available until the environment is activated with `conda activate base`. People sometimes choose this setting to speed up the time their shell takes to start up or to keep conda-installed software from automatically hiding their other software.

Nested activation

By default, `conda activate` will deactivate the current environment before activating the new environment and re-activate it when deactivating the new environment. Sometimes you may want to leave the current environment `PATH` entries in place so that you can continue to easily access command-line programs from the first environment. This is most commonly encountered when common command-line utilities are installed in the base environment. To retain the current environment in the `PATH`, you can activate the new environment using:

```
conda activate --stack myenv
```

If you wish to always stack when going from the outermost environment, which is typically the base environment, you can set the `auto_stack` configuration option:

```
conda config --set auto_stack 1
```

You may specify a larger number for a deeper level of automatic stacking, but this is not recommended since deeper levels of stacking are more likely to lead to confusion.

Environment variable for DLL loading verification

If you don't want to activate your environment and you want Python to work for DLL loading verification, then follow the [troubleshooting directions](#).

Warning: If you choose not to activate your environment, then loading and setting environment variables to activate scripts will not happen. We only support activation.

Deactivating an environment

To deactivate an environment, type: `conda deactivate`

Conda removes the path name for the currently active environment from your system command.

Note: To simply return to the base environment, it's better to call `conda activate` with no environment specified, rather than to try to deactivate. If you run `conda deactivate` from your base environment, you may lose the ability to run conda at all. Don't worry, that's local to this shell - you can start a new one. However, if the environment was activated using `--stack` (or was automatically stacked) then it is better to use `conda deactivate`.

Determining your current environment

Use the terminal or an Anaconda Prompt for the following steps.

By default, the active environment---the one you are currently using---is shown in parentheses () or brackets [] at the beginning of your command prompt:

```
(myenv) $
```

If you do not see this, run:

```
conda info --envs
```

In the environments list that displays, your current environment is highlighted with an asterisk (*).

By default, the command prompt is set to show the name of the active environment. To disable this option:

```
conda config --set change_ps1 false
```

To re-enable this option:

```
conda config --set change_ps1 true
```

Viewing a list of your environments

To see a list of all of your environments, in your terminal window or an Anaconda Prompt, run:

```
conda info --envs
```

OR

```
conda env list
```

A list similar to the following is displayed:

```
conda environments:
myenv                /home/username/miniconda/envs/myenv
snowflakes           /home/username/miniconda/envs/snowflakes
bunnies               /home/username/miniconda/envs/bunnies
```

If this command is run by an administrator, a list of all environments belonging to all users will be displayed.

Viewing a list of the packages in an environment

To see a list of all packages installed in a specific environment:

- If the environment is not activated, in your terminal window or an Anaconda Prompt, run:

```
conda list -n myenv
```

- If the environment is activated, in your terminal window or an Anaconda Prompt, run:

```
conda list
```

- To see if a specific package is installed in an environment, in your terminal window or an Anaconda Prompt, run:

```
conda list -n myenv scipy
```

Using pip in an environment

To use pip in your environment, in your terminal window or an Anaconda Prompt, run:

```
conda install -n myenv pip
conda activate myenv
pip <pip_subcommand>
```

Issues may arise when using pip and conda together. When combining conda and pip, it is best to use an isolated conda environment. Only after conda has been used to install as many packages as possible should pip be used to install any remaining software. If modifications are needed to the environment, it is best to create a new environment rather than running conda after pip. When appropriate, conda and pip requirements should be stored in text files.

We recommend that you:

Use pip only after conda

- Install as many requirements as possible with conda then use pip.
- Pip should be run with `--upgrade-strategy only-if-needed` (the default).
- Do not use pip with the `--user` argument, avoid all users installs.

Use conda environments for isolation

- Create a conda environment to isolate any changes pip makes.
- Environments take up little space thanks to hard links.
- Care should be taken to avoid running pip in the root environment.

Recreate the environment if changes are needed

- Once pip has been used, conda will be unaware of the changes.
- To install additional conda packages, it is best to recreate the environment.

Store conda and pip requirements in text files

- Package requirements can be passed to conda via the `--file` argument.
- Pip accepts a list of Python packages with `-r` or `--requirements`.
- Conda env will export or create environments based on a file with conda and pip requirements.

Setting environment variables

If you want to associate environment variables with an environment, you can use the config API. This is recommended as an alternative to using activate and deactivate scripts since those are an execution of arbitrary code that may not be safe.

First, create your environment and activate it:

```
conda create -n test-env
conda activate test-env
```

To list any variables you may have, run `conda env config vars list`.

To set environment variables, run `conda env config vars set my_var=value`.

Once you have set an environment variable, you have to reactivate your environment: `conda activate test-env`.

To check if the environment variable has been set, run `echo $my_var` (`echo %my_var%` on Windows) or `conda env config vars list`.

When you deactivate your environment, you can use those same commands to see that the environment variable goes away.

You can specify the environment you want to affect using the `-n` and `-p` flags. The `-n` flag allows you to name the environment and `-p` allows you to specify the path to the environment.

To unset the environment variable, run `conda env config vars unset my_var -n test-env`.

When you deactivate your environment, you can see that environment variable goes away by rerunning `echo my_var` or `conda env config vars list` to show that the variable name is no longer present.

Environment variables set using `conda env config vars` will be retained in the output of `conda env export`. Further, you can declare environment variables in the `environment.yml` file as shown here:

```
name: env-name
channels:
  - conda-forge
  - defaults
dependencies:
  - python=3.7
  - codecov
variables:
  VAR1: valueA
  VAR2: valueB
```

Saving environment variables

Conda environments can include saved environment variables.

Suppose you want an environment "analytics" to store both a secret key needed to log in to a server and a path to a configuration file. The sections below explain how to write a script named `env_vars` to do this on [Windows](#) and [macOS or Linux](#).

This type of script file can be part of a conda package, in which case these environment variables become active when an environment containing that package is activated.

You can name these scripts anything you like. However, multiple packages may create script files, so be sure to use descriptive names that are not used by other packages. One popular option is to give the script a name in the form `packagename-scriptname.sh`, or on Windows, `packagename-scriptname.bat`.

Windows

1. Locate the directory for the conda environment in your Anaconda Prompt by running in the command shell `%CONDA_PREFIX%`.
2. Enter that directory and create these subdirectories and files:

```
cd %CONDA_PREFIX%
mkdir .\etc\conda\activate.d
mkdir .\etc\conda\deactivate.d
type NUL > .\etc\conda\activate.d\env_vars.bat
type NUL > .\etc\conda\deactivate.d\env_vars.bat
```

3. Edit `.\etc\conda\activate.d\env_vars.bat` as follows:

```
set MY_KEY='secret-key-value'
set MY_FILE=C:\path\to\my\file
```

4. Edit `.\etc\conda\deactivate.d\env_vars.bat` as follows:

```
set MY_KEY=
set MY_FILE=
```

When you run `conda activate analytics`, the environment variables `MY_KEY` and `MY_FILE` are set to the values you wrote into the file. When you run `conda deactivate`, those variables are erased.

macOS and Linux

1. Locate the directory for the conda environment in your terminal window by running in the terminal `echo $CONDA_PREFIX`.
2. Enter that directory and create these subdirectories and files:

```
cd $CONDA_PREFIX
mkdir -p ./etc/conda/activate.d
mkdir -p ./etc/conda/deactivate.d
touch ./etc/conda/activate.d/env_vars.sh
touch ./etc/conda/deactivate.d/env_vars.sh
```

3. Edit `./etc/conda/activate.d/env_vars.sh` as follows:

```
#!/bin/sh

export MY_KEY='secret-key-value'
export MY_FILE=/path/to/my/file/
```

4. Edit `./etc/conda/deactivate.d/env_vars.sh` as follows:

```
#!/bin/sh

unset MY_KEY
unset MY_FILE
```

When you run `conda activate analytics`, the environment variables `MY_KEY` and `MY_FILE` are set to the values you wrote into the file. When you run `conda deactivate`, those variables are erased.

Sharing an environment

You may want to share your environment with someone else---for example, so they can re-create a test that you have done. To allow them to quickly reproduce your environment, with all of its packages and versions, give them a copy of your `environment.yml` file.

Exporting the `environment.yml` file

Note: If you already have an `environment.yml` file in your current directory, it will be overwritten during this task.

1. Activate the environment to export: `conda activate myenv`

Note: Replace `myenv` with the name of the environment.

2. Export your active environment to a new file:

```
conda env export > environment.yml
```

Note: This file handles both the environment's pip packages and conda packages.

3. Email or copy the exported `environment.yml` file to the other person.

Exporting an environment file across platforms

If you want to make your environment file work across platforms, you can use the `conda env export --from-history` flag. This will only include packages that you've explicitly asked for, as opposed to including every package in your environment.

For example, if you create an environment and install Python and a package:

```
conda install python=3.7 codecov
```

This will download and install numerous additional packages to solve for dependencies. This will introduce packages that may not be compatible across platforms.

If you use `conda env export`, it will export all of those packages. However, if you use `conda env export --from-history`, it will only export those you specifically chose:

```
(env-name) ~ conda env export --from-history
name: env-name
channels:
  - conda-forge
  - defaults
dependencies:
  - python=3.7
  - codecov
prefix: /Users/username/anaconda3/envs/env-name
```

Note: If you installed Anaconda 2019.10 on macOS, your prefix may be `/Users/username/opt/envs/env-name`.

Creating an environment file manually

You can create an environment file (`environment.yml`) manually to share with others.

EXAMPLE: A simple environment file:

```
name: stats
dependencies:
  - numpy
  - pandas
```

EXAMPLE: A more complex environment file:

```
name: stats2
channels:
  - javascript
dependencies:
  - python=3.9
  - bokeh=2.4.2
  - conda-forge::numpy=1.21.*
  - nodejs=16.13.*
  - flask
  - pip
  - pip:
    - Flask-Testing
```

Note: Using wildcards

Note the use of the wildcard `*` when defining a few of the versions in the complex environment file. Keeping the major and minor versions fixed while allowing the patch to be any number allows you to use your environment file to get any bug fixes while still maintaining consistency in your environment. For more information on package installation values, see [Package search and install specifications](#).

Specifying channels outside of "channels"

You may occasionally want to specify which channel conda will use to install a specific package. To accomplish this, use the `channel::package` syntax in `dependencies:`, as demonstrated above with `conda-forge::numpy` (version numbers optional). The specified channel does not need to be present in the `channels:` list, which is useful if you want some—but not *all*—packages installed from a community channel such as `conda-forge`.

You can exclude the default channels by adding `nodefaults` to the channels list.

```
channels:
  - javascript
  - nodefaults
```

This is equivalent to passing the `--override-channels` option to most conda commands.

Adding `nodefaults` to the channels list in `environment.yml` is similar to removing `defaults` from the [channels list](#) in the `.condarc` file. However, changing `environment.yml` affects only one of your conda environments while changing `.condarc` affects them all.

For details on creating an environment from this `environment.yml` file, see [Creating an environment from an environment.yml file](#).

Restoring an environment

Conda keeps a history of all the changes made to your environment, so you can easily "roll back" to a previous version. To list the history of each change to the current environment: `conda list --revisions`

To restore environment to a previous revision: `conda install --revision=REVNUM` or `conda install --rev REVNUM`.

Note: Replace REVNUM with the revision number.

Example: If you want to restore your environment to revision 8, run `conda install --rev 8`.

Removing an environment

To remove an environment, in your terminal window or an Anaconda Prompt, run:

```
conda remove --name myenv --all
```

You may instead use `conda env remove --name myenv`.

To verify that the environment was removed, in your terminal window or an Anaconda Prompt, run:

```
conda info --envs
```

The environments list that displays should not show the removed environment.

1.5.3 Managing channels

Conda channels are the locations where packages are stored. They serve as the base for hosting and managing packages. Conda packages are downloaded from remote channels, which are URLs to directories containing conda packages. The conda command searches a default set of channels and packages are automatically downloaded and updated from the [default channel](#). Read more about [conda channels](#) and the various terms of service for their use.

Different channels can have the same package, so conda must handle these channel collisions.

There will be no channel collisions if you use only the defaults channel. There will also be no channel collisions if all of the channels you use only contain packages that do not exist in any of the other channels in your list. The way conda resolves these collisions matters only when you have multiple channels in your channel list that host the same package.

By default, conda prefers packages from a higher priority channel over any version from a lower priority channel. Therefore, you can now safely put channels at the bottom of your channel list to provide additional packages that are not in the default channels and still be confident that these channels will not override the core package set.

Conda collects all of the packages with the same name across all listed channels and processes them as follows:

1. Sorts packages from highest to lowest channel priority.
2. Sorts tied packages---packages with the same channel priority---from highest to lowest version number. For example, if channelA contains NumPy 1.12.0 and 1.13.1, NumPy 1.13.1 will be sorted higher.
3. Sorts still-tied packages---packages with the same channel priority and same version---from highest to lowest build number. For example, if channelA contains both NumPy 1.12.0 build 1 and build 2, build 2 is sorted first. Any packages in channelB would be sorted below those in channelA.

4. Installs the first package on the sorted list that satisfies the installation specifications.

Essentially, the order goes: channelA::numpy-1.13_1 > channelA::numpy-1.12.1_1 > channelA::numpy-1.12.1_0 > channelB::numpy-1.13_1

Note: If strict channel priority is turned on then channelB::numpy-1.13_1 isn't included in the list at all.

To make conda install the newest version of a package in any listed channel:

- Add `channel_priority: disabled` to your `.condarc` file.

OR

- Run the equivalent command:

```
conda config --set channel_priority disabled
```

Conda then sorts as follows:

1. Sorts the package list from highest to lowest version number.
2. Sorts tied packages from highest to lowest channel priority.
3. Sorts tied packages from highest to lowest build number.

Because build numbers from different channels are not comparable, build number still comes after channel priority.

The following command adds the channel "new_channel" to the top of the channel list, making it the highest priority:

```
conda config --add channels new_channel
```

Conda has an equivalent command:

```
conda config --prepend channels new_channel
```

Conda also has a command that adds the new channel to the bottom of the channel list, making it the lowest priority:

```
conda config --append channels new_channel
```

Strict channel priority

As of version 4.6.0, Conda has a strict channel priority feature. Strict channel priority can dramatically speed up conda operations and also reduce package incompatibility problems. We recommend setting channel priority to "strict" when possible.

Details about it can be seen by typing `conda config --describe channel_priority`.

```
channel_priority (ChannelPriority)
Accepts values of 'strict', 'flexible', and 'disabled'. The default
value is 'flexible'. With strict channel priority, packages in lower
priority channels are not considered if a package with the same name
appears in a higher priority channel. With flexible channel priority,
the solver may reach into lower priority channels to fulfill
dependencies, rather than raising an unsatisfiable error. With channel
priority disabled, package version takes precedence, and the
configured priority of channels is used only to break ties. In
previous versions of conda, this parameter was configured as either
```

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```
True or False. True is now an alias to 'flexible'.
```

```
channel_priority: flexible
```

1.5.4 Creating custom channels

Channels are the path that conda takes to look for packages. The easiest way to use and manage custom channels is to use a private or public repository on [Anaconda.org](https://anaconda.org). If you designate your Anaconda.org repository as private, then only you and those you grant access to can access your private repository.

If you do not wish to upload your packages to the Internet, you can build a custom repository served either through a web server or locally using a `file://` URL.

To create a custom channel:

1. If you have not yet used conda-build, install conda-build:

```
conda install conda-build
```

2. Organize all the packages in subdirectories for the platforms you wish to serve:

```
channel/  
linux-64/  
  package-1.0-0.tar.bz2  
linux-32/  
  package-1.0-0.tar.bz2  
osx-64/  
  package-1.0-0.tar.bz2  
win-64/  
  package-1.0-0.tar.bz2  
win-32/  
  package-1.0-0.tar.bz2
```

3. Run `conda index` on the channel root directory:

```
conda index channel/
```

The conda index command generates a file `repodata.json`, saved to each repository directory, which conda uses to get the metadata for the packages in the channel.

Note: Each time you add or modify a package in the channel, you must rerun `conda index` for conda to see the update.

4. To test custom channels, serve the custom channel using a web server or using a `file://` URL to the channel directory. Test by sending a search command to the custom channel.

EXAMPLE: If you want a file in the custom channel location `/opt/channel/linux-64/`, search for files in that location:

```
conda search -c file:///opt/channel/ --override-channels
```

Note: The channel URL does not include the platform, as conda automatically detects and adds the platform.

Note: The option `--override-channels` ensures that conda searches only your specified channel and no other channels, such as default channels or any other channels you may have listed in your `.condarc` file.

If you have set up your private repository correctly, you get the following output:

```
Fetching package metadata: . . . .
```

This is followed by a list of the conda packages found. This verifies that you have set up and indexed your private repository successfully.

1.5.5 Managing packages

- *Searching for packages*
- *Installing packages*
- *Installing similar packages*
- *Installing packages from Anaconda.org*
- *Installing non-conda packages*
- *Installing commercial packages*
- *Viewing a list of installed packages*
- *Listing package dependencies*
- *Updating packages*
- *Preventing packages from updating (pinning)*
- *Adding default packages to new environments automatically*
- *Removing packages*

Note: There are many options available for the commands described on this page. For details, see `../commands`.

Searching for packages

Use the terminal or an Anaconda Prompt for the following steps.

To see if a specific package, such as SciPy, is available for installation:

```
conda search scipy
```

To see if a specific package, such as SciPy, is available for installation from Anaconda.org:

```
conda search --override-channels --channel defaults scipy
```

To see if a specific package, such as `iminuit`, exists in a specific channel, such as <http://conda.anaconda.org/mutirri>, and is available for installation:

```
conda search --override-channels --channel http://conda.anaconda.org/mutirri iminuit
```

Installing packages

Use the terminal or an Anaconda Prompt for the following steps.

To install a specific package such as SciPy into an existing environment "myenv":

```
conda install --name myenv scipy
```

If you do not specify the environment name, which in this example is done by `--name myenv`, the package installs into the current environment:

```
conda install scipy
```

To install a specific version of a package such as SciPy:

```
conda install scipy=0.15.0
```

To install multiple packages at once, such as SciPy and cURL:

```
conda install scipy curl
```

Note: It is best to install all packages at once, so that all of the dependencies are installed at the same time.

To install multiple packages at once and specify the version of the package:

```
conda install scipy=0.15.0 curl=7.26.0
```

To install a package for a specific Python version:

```
conda install scipy=0.15.0 curl=7.26.0 -n py34_env
```

If you want to use a specific Python version, it is best to use an environment with that version. For more information, see [Troubleshooting](#).

Installing similar packages

Installing packages that have similar filenames and serve similar purposes may return unexpected results. The package last installed will likely determine the outcome, which may be undesirable. If the two packages have different names, or if you're building variants of packages and need to line up other software in the stack, we recommend using [Mutex metapackages](#).

Installing packages from Anaconda.org

Packages that are not available using `conda install` can be obtained from Anaconda.org, a package management service for both public and private package repositories. Anaconda.org is an Anaconda product, just like Anaconda and Miniconda.

To install a package from Anaconda.org:

1. In a browser, go to <http://anaconda.org>.
2. To find the package named `bottleneck`, type `bottleneck` in the top-left box named Search Packages.
3. Find the package that you want and click it to go to the detail page.

The detail page displays the name of the channel. In this example it is the "pandas" channel.

4. Now that you know the channel name, use the `conda install` command to install the package. In your terminal window or an Anaconda Prompt, run:

```
conda install -c pandas bottleneck
```

This command tells conda to install the `bottleneck` package from the `pandas` channel on Anaconda.org.

5. To check that the package is installed, in your terminal window or an Anaconda Prompt, run:

```
conda list
```

A list of packages appears, including `bottleneck`.

Note: For information on installing packages from multiple channels, see [Managing channels](#).

Installing non-conda packages

If a package is not available from conda or Anaconda.org, you may be able to find and install the package via conda-forge or with another package manager like pip.

Pip packages do not have all the features of conda packages and we recommend first trying to install any package with conda. If the package is unavailable through conda, try finding and installing it with [conda-forge](#).

If you still cannot install the package, you can try installing it with pip. The differences between pip and conda packages cause certain unavoidable limits in compatibility but conda works hard to be as compatible with pip as possible.

Note: Both pip and conda are included in Anaconda and Miniconda, so you do not need to install them separately.

Conda environments replace virtualenv, so there is no need to activate a virtualenv before using pip.

It is possible to have pip installed outside a conda environment or inside a conda environment.

To gain the benefits of conda integration, be sure to install pip inside the currently active conda environment and then install packages with that instance of pip. The command `conda list` shows packages installed this way, with a label showing that they were installed with pip.

You can install pip in the current conda environment with the command `conda install pip`, as discussed in [Using pip in an environment](#).

If there are instances of pip installed both inside and outside the current conda environment, the instance of pip installed inside the current conda environment is used.

To install a non-conda package:

1. Activate the environment where you want to put the program:
 - On Windows, in your Anaconda Prompt, run `activate myenv`.
 - On macOS and Linux, in your terminal window, run `conda activate myenv`.
2. To use pip to install a program such as See, in your terminal window or an Anaconda Prompt, run:

```
pip install see
```

3. To verify the package was installed, in your terminal window or an Anaconda Prompt, run:

```
conda list
```

If the package is not shown, install pip as described in [Using pip in an environment](#) and try these commands again.

Installing commercial packages

Installing a commercial package such as IOPro is the same as installing any other package. In your terminal window or an Anaconda Prompt, run:

```
conda install --name myenv iopro
```

This command installs a free trial of one of Anaconda's commercial packages called **IOPro**, which can speed up your Python processing. Except for academic use, this free trial expires after 30 days.

Viewing a list of installed packages

Use the terminal or an Anaconda Prompt for the following steps.

To list all of the packages in the active environment:

```
conda list
```

To list all of the packages in a deactivated environment:

```
conda list -n myenv
```

Listing package dependencies

To find what packages are depending on a specific package in your environment, there is not one specific conda command. It requires a series of steps:

1. List the dependencies that a specific package requires to run: `conda search package_name --info`
2. Find your installation's package cache directory: `conda info`
3. Find package dependencies. By default, Anaconda/Miniconda stores packages in `~/anaconda/pkgs/` (or `~/opt/pkgs/` on macOS Catalina). Each package has an `index.json` file which lists the package's dependencies. This file resides in `~/anaconda/pkgs/package_name/info/index.json`.
4. Now you can find what packages depend on a specific package. Use `grep` to search all `index.json` files as follows:
`grep package_name ~/anaconda/pkgs/*/info/index.json`

The result will be the full package path and version of anything containing the <package_name>.

Example: `grep numpy ~/anaconda3/pkgs/*/info/index.json`

Output from the above command:

```
/Users/testuser/anaconda3/pkgs/anaconda-4.3.0-np111py36_0/info/index.json: numpy 1.11.3_
↪py36_0
/Users/testuser/anaconda3/pkgs/anaconda-4.3.0-np111py36_0/info/index.json: numpydoc 0.6.
↪0 py36_0
/Users/testuser/anaconda3/pkgs/anaconda-4.3.0-np111py36_0/info/index.json: numpy 1.11.3_
↪py36_0
```

Note this also returned “numpydoc” as it contains the string “numpy”. To get a more specific result set you can add < and >.

Updating packages

Use `conda update` command to check to see if a new update is available. If conda tells you an update is available, you can then choose whether or not to install it.

Use the terminal or an Anaconda Prompt for the following steps.

- To update a specific package:

```
conda update biopython
```

- To update Python:

```
conda update python
```

- To update conda itself:

```
conda update conda
```

Note: Conda updates to the highest version in its series, so Python 3.8 updates to the highest available in the 3.x series.

To update the Anaconda metapackage:

```
conda update conda
conda update anaconda
```

Regardless of what package you are updating, conda compares versions and then reports what is available to install. If no updates are available, conda reports "All requested packages are already installed."

If a newer version of your package is available and you wish to update it, type y to update:

```
Proceed ([y]/n)? y
```

Preventing packages from updating (pinning)

Pinning a package specification in an environment prevents packages listed in the `pinned` file from being updated.

In the environment's `conda-meta` directory, add a file named `pinned` that includes a list of the packages that you do not want updated.

EXAMPLE: The file below forces NumPy to stay on the 1.7 series, which is any version that starts with 1.7. This also forces SciPy to stay at exactly version 0.14.2:

```
numpy 1.7.*
scipy ==0.14.2
```

With this `pinned` file, `conda update numpy` keeps NumPy at 1.7.1, and `conda install scipy=0.15.0` causes an error.

Use the `--no-pin` flag to override the update restriction on a package. In the terminal or an Anaconda Prompt, run:

```
conda update numpy --no-pin
```

Because the `pinned` specs are included with each `conda install`, subsequent `conda update` commands without `--no-pin` will revert NumPy back to the 1.7 series.

Adding default packages to new environments automatically

To automatically add default packages to each new environment that you create:

1. Open Anaconda Prompt or terminal and run: `conda config --add create_default_packages PACKAGENAME1 PACKAGENAME2`
2. Now, you can create new environments and the default packages will be installed in all of them.

You can also *edit the `.condarc` file* with a list of packages to create by default.

You can override this option at the command prompt with the `--no-default-packages` flag.

Removing packages

Use the terminal or an Anaconda Prompt for the following steps.

- To remove a package such as SciPy in an environment such as `myenv`:

```
conda remove -n myenv scipy
```

- To remove a package such as SciPy in the current environment:

```
conda remove scipy
```

- To remove multiple packages at once, such as SciPy and `cURL`:

```
conda remove scipy curl
```

- To confirm that a package has been removed:

```
conda list
```


1.5.6 Managing Python

- *Viewing a list of available Python versions*
- *Installing a different version of Python*
- *Installing PyPy*
- *Using a different version of Python*
- *Updating or upgrading Python*

Conda treats Python the same as any other package, so it is easy to manage and update multiple installations.

Conda supports Python 3.8, 3.9, 3.10, and 3.11.

Viewing a list of available Python versions

To list the versions of Python that are available to install, in your terminal window or an Anaconda Prompt, run:

```
conda search python
```

This lists all packages whose names contain the text `python`.

To list only the packages whose full name is exactly `python`, add the `--full-name` option. In your terminal window or an Anaconda Prompt, run:

```
conda search --full-name python
```

Installing a different version of Python

To install a different version of Python without overwriting the current version, create a new environment and install the second Python version into it:

1. Create the new environment:

- To create the new environment for Python 3.9, in your terminal window or an Anaconda Prompt, run:

```
conda create -n py39 python=3.9 anaconda
```

Note: Replace `py39` with the name of the environment you want to create. `anaconda` is the metapackage that includes all of the Python packages comprising the Anaconda distribution. `python=3.9` is the package and version you want to install in this new environment. This could be any package, such as `numpy=1.19`, or *multiple packages*.

2. *Activate the new environment.*
3. Verify that the new environment is your *current environment*.
4. To verify that the current environment uses the new Python version, in your terminal window or an Anaconda Prompt, run:

```
python --version
```

Installing PyPy

To use the PyPy builds you can do the following:

```
conda config --add channels conda-forge
conda config --set channel_priority strict
conda create -n pypy pypy
conda activate pypy
```

Using a different version of Python

To switch to an environment that has different version of Python, *activate the environment*.

Updating or upgrading Python

Use the terminal or an Anaconda Prompt for the following steps.

If you are in an environment with Python version 3.4.2, the following command updates Python to the latest version in the 3.4 branch:

```
conda update python
```

The following command upgrades Python to another branch---3.8---by installing that version of Python. It is not recommended, rather it is preferable to create a new environment. The resolver has to work very hard to determine exactly which packages to upgrade. But it is possible, and the command is:

```
conda install python=3.8
```

1.5.7 Managing virtual packages

- *Listing detected virtual packages*
- *Overriding detected packages*

"Virtual" packages are injected into the conda solver to allow real packages to depend on features present on the system that cannot be managed directly by conda, like system driver versions or CPU features. Virtual packages are not real packages and not displayed by `conda list`. Instead conda runs a small bit of code to detect the presence or absence of the system feature that corresponds to the package. The currently supported list of virtual packages includes:

- `__cuda`: Maximum version of CUDA supported by the display driver.
- `__osx`: OSX version if applicable.
- `__glibc`: Version of glibc supported by the OS.
- `__linux`: Available when running on Linux.
- `__unix`: Available when running on OSX or Linux.
- `__win`: Available when running on Win.

Other virtual packages will be added in future conda releases. These are denoted by a leading double-underscore in the package name.

Note: Note that as of version 22.11.0, *virtual packages* are implemented as *conda plugins*.

Listing detected virtual packages

Use the terminal or an Anaconda Prompt for the following steps.

To see the list of detected virtual packages, run:

```
conda info
```

If a package is detected, you will see it listed in the `virtual packages` section, as shown in this example:

```
active environment : base
active env location : /Users/demo/dev/conda/devenv
shell level : 1
user config file : /Users/demo/.condarc
populated config files : /Users/demo/.condarc
conda version : 4.6.3.post8+8f640d35a
conda-build version : 3.17.8
python version : 3.7.2.final.0
virtual packages : __cuda=10.0
base environment : /Users/demo/dev/conda/devenv (writable)
channel URLs : https://repo.anaconda.com/pkgs/main/osx-64
               https://repo.anaconda.com/pkgs/main/noarch
               https://repo.anaconda.com/pkgs/free/osx-64
               https://repo.anaconda.com/pkgs/free/noarch
               https://repo.anaconda.com/pkgs/r/osx-64
               https://repo.anaconda.com/pkgs/r/noarch
package cache : /Users/demo/dev/conda/devenv/pkgs
               /Users/demo/.conda/pkgs
envs directories : /Users/demo/dev/conda/devenv/envs
               /Users/demo/.conda/envs
platform : osx-64
user-agent : conda/4.6.3.post8+8f640d35a requests/2.21.0 CPython/3.7.2
↳ Darwin/17.7.0 OSX/10.13.6
UID:GID : 502:20
netrc file : None
offline mode : False
```

Overriding detected packages

For troubleshooting, it is possible to override virtual package detection using an environment variable. Supported variables include:

- `CONDA_OVERRIDE_CUDA` - CUDA version number or set to `""` for no CUDA detected.
- `CONDA_OVERRIDE_OSX` - OSX version number or set to `""` for no OSX detected.
- `CONDA_OVERRIDE_GLIBC` - GLIBC version number or set to `""` for no GLIBC. This only applies on Linux.

1.5.8 Viewing command-line help

To see a list of supported conda commands, in your terminal window or an Anaconda Prompt, run:

```
conda --help
```

OR

```
conda -h
```

To get help for a specific command, type the command name followed by `--help`.

EXAMPLE: To see help for the `create` command, in your terminal window or an Anaconda Prompt, run:

```
conda create -h
```

Note: You can see the same command help in `../commands`.

1.6 Cheat sheet

See the [conda cheatsheet PDF](#) (1 MB) for a single-page summary of the most important information about using conda (link always points to the latest version).

1.6.1 Versions

- `conda 4.14.x` (latest)
- `conda 4.12.x`
- `conda 4.6.x`

1.7 Troubleshooting

- *Using conda in Windows Batch script exits early*
- *NumPy MKL library load failed*
- *SSL connection errors*
- *Permission denied errors during installation*
- *Permission denied errors after using `sudo conda` command*
- *Already installed error message*
- *Conda reports that a package is installed, but it appears not to be*
- *`pkg_resources.DistributionNotFound: conda==3.6.1-6-gb31b0d4-dirty`*
- *macOS error "ValueError unknown locale: UTF-8"*
- *AttributeError or missing `getproxies`*

- *Shell commands open from the wrong location*
- *Programs fail due to invoking conda Python instead of system Python*
- *UnsatisfiableSpecifications error*
- *Package installation fails from a specific channel*
- *Conda automatically upgrades to unwanted version*
- *Conda upgrade error*
- *ValidationError: Invalid value for timestamp*
- *Unicode error after installing Python 2*
- *Windows environment has not been activated*
- *The system cannot find the path specified on Windows*

1.7.1 Using conda in Windows Batch script exits early

In conda 4.6+, the way that you interact with conda goes through a batch script (%PREFIX%\condabin\conda.bat). Unfortunately, this means it's a little complicated to use conda from other batch scripts. When using batch scripts from within batch scripts, you must prefix your command with CALL. If you do not do this, your batch script that calls conda will exit immediately after the conda usage. In other words, if you write this in a .bat file:

```
conda create myenv python
conda activate myenv
echo test
```

Neither the activation, nor the echo will happen. You must write this in your batch script:

```
CALL conda create myenv python
CALL conda activate myenv
echo test
```

This is known behavior with cmd.exe, and we have not found any way to change it. <https://stackoverflow.com/questions/4798879/how-do-i-run-a-batch-script-from-within-a-batch-script/4798965>

1.7.2 NumPy MKL library load failed

Error messages like

```
Intel MKL FATAL ERROR: Cannot load mkl_intel_thread.dll
```

or

```
The ordinal 241 could not be located in the the dynamic link library
```

Cause

NumPy is unable to load the correct MKL or Intel OpenMP runtime libraries. This is almost always caused by one of two things:

1. The environment with NumPy has not been activated.
2. Another software vendor has installed MKL or Intel OpenMP (libiomp5md.dll) files into the C:\Windows\System32 folder. These files are being loaded before Anaconda's and they're not compatible.

Solution

If you are not activating your environments, start with doing that. There's more info at [Activating environments](#). If you are still stuck, you may need to consider more drastic measures.

1. Remove any MKL-related files from C:\Windows\System32. We recommend renaming them to add .bak to the filename to effectively hide them. Observe if any other software breaks. Try moving the DLL files alongside the .exe of the software that broke. If it works again, you can keep things in the moved state - Anaconda doesn't need MKL in System32, and no other software should need it either. If you identify software that is installing software here, please contact the creators of that software. Inform them that their practice of installing MKL to a global location is fragile and is breaking other people's software and wasting a lot of time. See the list of guilty parties below.
2. You may try a special DLL loading mode that Anaconda builds into Python. This changes the DLL search path from System32 first to System32 as another entry on PATH, allowing libraries in your conda environment to be found before the libraries in System32. Control of this feature is done with environment variables. Only Python builds beyond these builds will react to these environment variables:
 - Python 2.7.15 build 14
 - Python 3.6.8 build 7
 - Python 3.7.2 build 8

To update Python from the defaults channel:

```
conda update -c defaults python
```

Note: Anaconda has built special patches into its builds of Python to enable this functionality. If you get your Python package from somewhere else (e.g. conda-forge), these flags may not do anything.

Control environment variables:

- CONDA_DLL_SEARCH_MODIFICATION_ENABLE
- CONDA_DLL_SEARCH_MODIFICATION_DEBUG
- CONDA_DLL_SEARCH_MODIFICATION_NEVER_ADD_WINDOWS_DIRECTORY
- CONDA_DLL_SEARCH_MODIFICATION_NEVER_ADD_CWD

To set variables on Windows, you may use either the CLI (Anaconda Prompt, for example) or a Windows GUI.

- CLI: <https://superuser.com/questions/79612/setting-and-getting-windows-environment-variables-from-the-command-prompt>

- GUI: <http://www.dowdandassociates.com/blog/content/howto-set-an-environment-variable-in-windows-gui/>

These should be set to a value of 1 to enable them. For example, in an Anaconda Prompt terminal:

```
set CONDA_DLL_SEARCH_MODIFICATION_ENABLE=1
```

Note: Only CONDA_DLL_SEARCH_MODIFICATION_ENABLE should be set finally.

List of known software that installs Intel libraries to C:\Windows\System32:

- Amplitube, by IK Multimedia
- ASIO4ALL, by Michael Tippach

If you find others, please let us know. If you're on this list and you want to fix things, let us know. In either case, the conda issue tracker at <https://github.com/conda/conda/issues> is the best way to reach us.

1.7.3 SSL connection errors

This is a broad umbrella of errors with many causes. Here are some we've seen.

CondaHTTPError: HTTP 000 CONNECTION FAILED

If you're on Windows and you see this error, look a little further down in the error text. Do you see something like this?:

```
SSLError(MaxRetryError('HTTPSConnectionPool(host=\'repo.anaconda.com\', port=443): Max
↳ retries exceeded with url: /pkgs/r/win-32/repodata.json.bz2 (Caused by SSLError("Can\
↳ 't connect to HTTPS URL because the SSL module is not available.")))
```

The key part there is the last bit:

```
Caused by SSLError("Can\'t connect to HTTPS URL because the SSL module is not available.
↳ ")
```

Conda is having problems because it can't find the OpenSSL libraries that it needs.

Cause

You may observe this error cropping up after a conda update. More recent versions of conda and more recent builds of Python are more strict about requiring activation of environments. We're working on better error messages for them, but here's the story for now. Windows relies on the PATH environment variable as the way to locate libraries that are not in the immediate folder, and also not in the C:\Windows\System32 folder. Searching for libraries in the PATH folders goes from left to right. If you choose to put Anaconda's folders on PATH, there are several of them:

- (install root)
- (install root)/Library/mingw-w64/bin
- (install root)/Library/usr/bin
- (install root)/Library/bin
- (install root)/Scripts

- (install root)/bin
- (install root)/condabin

Early installers for Anaconda put these on PATH. That was ultimately fragile because Anaconda isn't the only software on the system. If other software had similarly named executables or libraries, and came earlier on PATH, Anaconda could break. On the flip side, Anaconda could break other software if Anaconda were earlier in the PATH order and shadowed any other executables or libraries. To make this easier, we began recommending "activation" instead of modifying PATH. Activation is a tool where conda sets your PATH, and also runs any custom package scripts which are often used to set additional environment variables that are necessary for software to run (e.g. JAVA_HOME). Because activation runs only in a local terminal session (as opposed to the permanent PATH entry), it is safe to put Anaconda's PATH entries first. That means that Anaconda's libraries get higher priority when you're running Anaconda but Anaconda doesn't interfere with other software when you're not running Anaconda.

Anaconda's Python interpreter included a patch for a long time that added the (install root)/Library/bin folder to that Python's PATH. Unfortunately, this interfered with reasoning about PATH at all when using that Python interpreter. We removed that patch in Python 3.7.0, and we regret that this has caused problems for people who are not activating their environments and who otherwise do not have the proper entries on PATH. We're experimenting with approaches that will allow our executables to be less dependent on PATH and more self-aware of their needed library load paths. For now, though, the only solutions to this problem are to manage PATH properly.

Our humble opinion is that activation is the easiest way to ensure that things work. See more information on activation in [Activating environments](#).

Solution

Use "Anaconda Prompt" or shells opened from Anaconda Navigator. If you use a GUI IDE and you see this error, ask the developers of your IDE to add activation for conda environments.

SSL certificate errors

Cause

Installing packages may produce a "connection failed" error if you do not have the certificates for a secure connection to the package repository.

Solution

Pip can use the `--trusted-host` option to indicate that the URL of the repository is trusted:

```
pip install --trusted-host pypi.org
```

Conda has three similar options.

1. The option `--insecure` or `-k` ignores certificate validation errors for all hosts.

Running `conda create --help` shows:

```
Networking Options:
-k, --insecure      Allow conda to perform "insecure" SSL connections and
                    transfers. Equivalent to setting 'ssl_verify' to
                    'False'.
```


2. The configuration option `ssl_verify` can be set to `False`.

Running `conda config --describe ssl_verify` shows:

```
# # ssl_verify (bool, str)
# #   aliases: verify_ssl
# #   conda verifies SSL certificates for HTTPS requests, just like a web
# #   browser. By default, SSL verification is enabled and conda operations
# #   will fail if a required URL's certificate cannot be verified. Setting
# #   ssl_verify to False disables certification verification. The value for
# #   ssl_verify can also be (1) a path to a CA bundle file, or (2) a path
# #   to a directory containing certificates of trusted CA.
# #
# #
# ssl_verify: true
```

Running `conda config --set ssl_verify false` modifies `~/.condarc` and sets the `-k` flag for all future conda operations performed by that user. Running `conda config --help` shows other configuration scope options.

When using `conda config`, the user's conda configuration file at `~/.condarc` is used by default. The flag `--system` will instead write to the system configuration file for all users at `<CONDA_BASE_ENV>/condarc`. The flag `--env` will instead write to the active conda environment's configuration file at `<PATH_TO_ACTIVE_CONDA_ENV>/condarc`. If `--env` is used and no environment is active, the user configuration file is used.

3. The configuration option `ssl_verify` can be used to install new certificates.

Running `conda config --describe ssl_verify` shows:

```
# # ssl_verify (bool, str)
# #   aliases: verify_ssl
# #   conda verifies SSL certificates for HTTPS requests, just like a web
# #   browser. By default, SSL verification is enabled, and conda operations
# #   will fail if a required URL's certificate cannot be verified. Setting
# #   ssl_verify to False disables certification verification. The value for
# #   ssl_verify can also be (1) a path to a CA bundle file, or (2) a path
# #   to a directory containing certificates of trusted CA.
# #
# #
# ssl_verify: true
```

Your network administrator can give you a certificate bundle for your network's firewall. Then `ssl_verify` can be set to the path of that certificate authority (CA) bundle and package installation operations will complete without connection errors.

When using `conda config`, the user's conda configuration file at `~/.condarc` is used by default. The flag `--system` will instead write to the system configuration file for all users at `<CONDA_BASE_ENV>/condarc`. The flag `--env` will instead write to the active conda environment's configuration file at `<PATH_TO_ACTIVE_CONDA_ENV>/condarc`. If `--env` is used and no environment is active, the user configuration file is used.

SSL verification errors

Cause

This error may be caused by lack of activation on Windows or expired certifications:

```
SSL verification error: [SSL: CERTIFICATE_VERIFY_FAILED] certificate verify failed (_ssl.  
↪c:590)
```

Solution

Make sure your conda is up-to-date: `conda --version`

If not, run: `conda update conda`

Temporarily set your `ssl_verify` variable to false, upgrade the requests package, and then set `ssl_verify` back to true using the following commands:

```
conda config --set ssl_verify false  
conda update requests  
conda config --set ssl_verify true
```

You can also set `ssl_verify` to a string path to a certificate, which can be used to verify SSL connections. Modify your `.condarc` and include the following:

```
ssl_verify: path-to-cert/chain/filename.ext
```

If the repository uses a self-signed certificate, use the actual path to the certificate. If the repository is signed by a private certificate authority (CA), the file needs to include the root certificate and any intermediate certificates.

1.7.4 Permission denied errors during installation

Cause

The `umask` command determines the mask settings that control how file permissions are set for newly created files. If you have a very restrictive `umask`, such as `077`, you get "permission denied" errors.

Solution

Set a less restrictive `umask` before calling conda commands. Conda was intended as a user space tool, but often users need to use it in a global environment. One place this can go awry is with restrictive file permissions. Conda creates links when you install files that have to be read by others on the system.

To give yourself full permissions for files and directories but prevent the group and other users from having access:

1. Before installing, set the `umask` to `007`.
2. Install conda.
3. Return the `umask` to the original setting:

```
umask 007  
conda install  
umask 077
```

For more information on `umask`, see <http://en.wikipedia.org/wiki/Umask>.

1.7.5 Permission denied errors after using `sudo conda` command

Solution

Once you run conda with `sudo`, you must use `sudo` forever. We recommend that you NEVER run conda with `sudo`.

1.7.6 Already installed error message

Cause

If you are trying to fix conda problems without removing the current installation and you try to reinstall Miniconda or Anaconda to fix it, you get an error message that Miniconda or Anaconda is already installed and you cannot continue.

Solution

Install using the `--force` option.

Download and install the appropriate Miniconda for your operating system from the [Miniconda download page](#) using the force option `--force` or `-f`:

```
bash Miniconda3-latest-MacOSX-x86_64.sh -f
```

Note: Substitute the appropriate filename and version for your operating system.

Note: Be sure that you install to the same location as your existing install so it overwrites the core conda files and does not install a duplicate in a new folder.

1.7.7 Conda reports that a package is installed, but it appears not to be

Sometimes conda claims that a package is already installed but it does not appear to be, for example, a Python package that gives `ImportError`.

There are several possible causes for this problem, each with its own solution.

Cause

You are not in the same conda environment as your package.

Solution

1. Make sure that you are in the same conda environment as your package. The `conda info` command tells you what environment is currently active under `default environment`.
2. Verify that you are using the Python from the correct environment by running:

```
import sys

print(sys.prefix)
```

Cause

For Python packages, you have set the `PYTHONPATH` or `PYTHONHOME` variable. These environment variables cause Python to load files from locations other than the standard ones. Conda works best when these environment variables are not set, as their typical use cases are obviated by conda environments and a common issue is that they cause Python to pick up the wrong or broken versions of a library.

Solution

For Python packages, make sure you have not set the `PYTHONPATH` or `PYTHONHOME` variables. The command `conda info -a` displays the values of these environment variables.

- To unset these environment variables temporarily for the current terminal session, run `unset PYTHONPATH`.
- To unset them permanently, check for lines in the files:
 - If you use bash---`~/.bashrc`, `~/.bash_profile`, `~/.profile`.
 - If you use zsh---`~/.zshrc`.
 - If you use PowerShell on Windows, the file output by `$PROFILE`.

Cause

You have site-specific directories or, for Python, you have so-called site-specific files. These are typically located in `~/local` on macOS and Linux. For a full description of the locations of site-specific packages, see [PEP 370](#). As with `PYTHONPATH`, Python may try importing packages from this directory, which can cause issues.

Solution

For Python packages, remove site-specific directories and site-specific files.

Cause

For C libraries, the following environment variables have been set:

- macOS---`DYLD_LIBRARY_PATH`.
- Linux---`LD_LIBRARY_PATH`.

These act similarly to `PYTHONPATH` for Python. If they are set, they can cause libraries to be loaded from locations other than the conda environment. Conda environments obviate most use cases for these variables. The command `conda info -a` shows what these are set to.

Solution

Unset DYLD_LIBRARY_PATH or LD_LIBRARY_PATH.

Cause

Occasionally, an installed package becomes corrupted. Conda works by unpacking the packages in the pkgs directory and then hard-linking them to the environment. Sometimes these get corrupted, breaking all environments that use them. They also break any additional environments since the same files are hard-linked each time.

Solution

Run the command `conda install -f` to unarchive the package again and relink it. It also does an MD5 verification on the package. Usually if this is different it is because your channels have changed and there is a different package with the same name, version, and build number.

Note: This breaks the links to any other environments that already had this package installed, so you have to reinstall it there, too. It also means that running `conda install -f` a lot can use up significant disk space if you have many environments.

Note: The `-f` flag to `conda install` (`--force`) implies `--no-deps`, so `conda install -f package` does not reinstall any of the dependencies of package.

1.7.8 pkg_resources.DistributionNotFound: conda==3.6.1-6-gb31b0d4-dirty

Cause

The local version of conda needs updating.

Solution

Force reinstall conda. A useful way to work off the development version of conda is to run `python setup.py develop` on a checkout of the [conda GitHub repository](#). However, if you are not regularly running `git pull`, it is a good idea to un-develop, as you will otherwise not get any regular updates to conda. The normal way to do this is to run `python setup.py develop -u`.

However, this command does not replace the conda script itself. With other packages, this is not an issue, as you can just reinstall them with conda, but conda cannot be used if conda is installed.

The fix is to use the `./bin/conda` executable in the conda git repository to force reinstall conda. That is, run `./bin/conda install -f conda`. You can then verify with `conda info` that you have the latest version of conda, and not a git checkout. The version should not include any hashes.

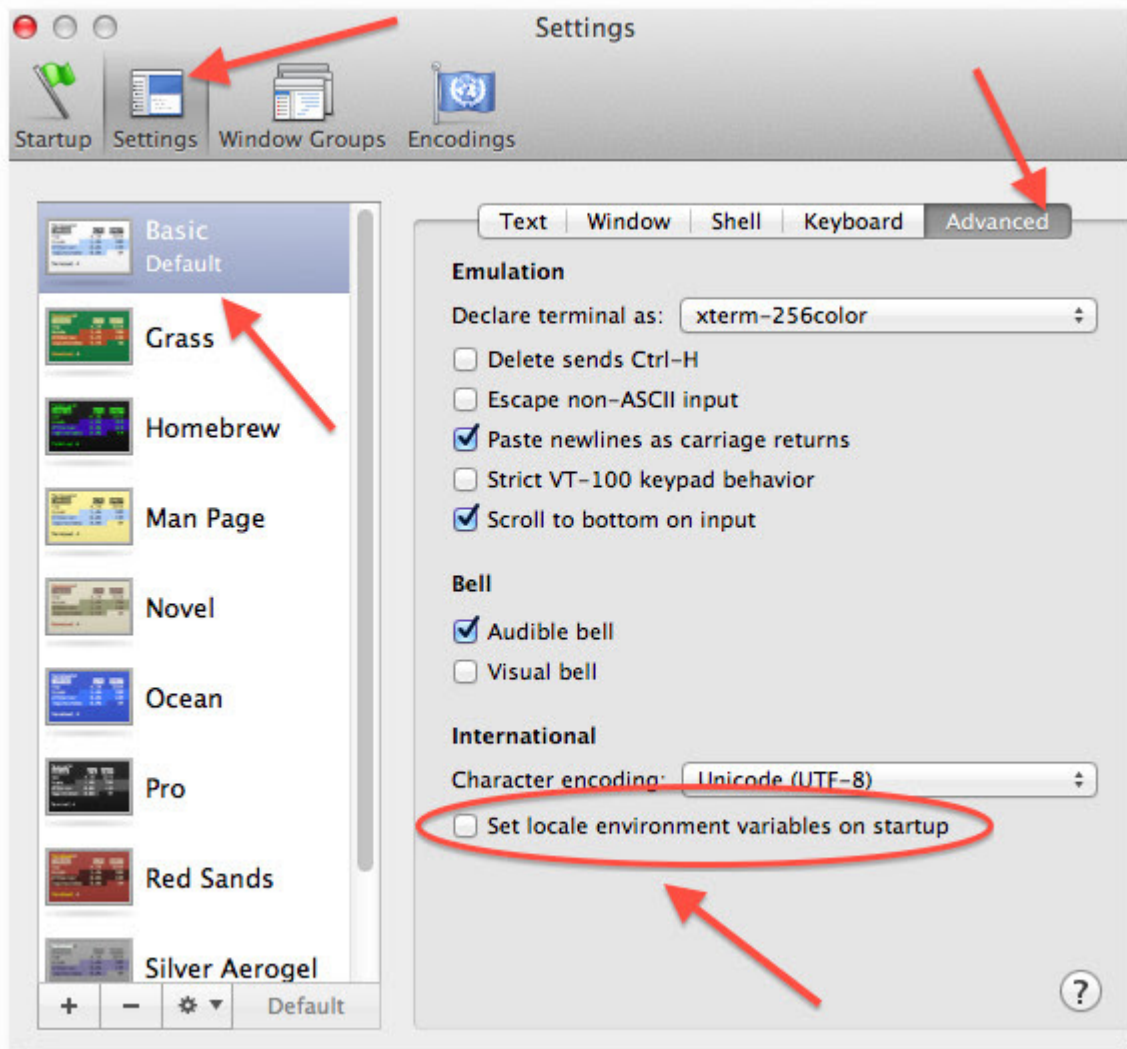
1.7.9 macOS error "ValueError unknown locale: UTF-8"

Cause

This is a bug in the macOS Terminal app that shows up only in certain locales. Locales are country-language combinations.

Solution

1. Open Terminal in /Applications/Utilities
2. Clear the Set locale environment variables on startup checkbox.



This sets your LANG environment variable to be empty. This may cause Terminal to use incorrect settings for your

locale. The `locale` command in Terminal tells you what settings are used.

To use the correct language, add a line to your bash profile, which is typically `~/.profile`:

```
export LANG=your-lang
```

Note: Replace `your-lang` with the correct locale specifier for your language.

The command `locale -a` displays all the specifiers. For example, the language code for US English is `en_US.UTF-8`. The locale affects what translations are used when they are available and also how dates, currencies, and decimals are formatted.

1.7.10 AttributeError or missing getproxies

When running a command such as `conda update ipython`, you may get an `AttributeError: 'module' object has no attribute 'getproxies'`.

Cause

This can be caused by an old version of `requests` or by having the `PYTHONPATH` environment variable set.

Solution

Update `requests` and be sure `PYTHONPATH` is not set:

1. Run `conda info -a` to show the `requests` version and various environment variables such as `PYTHONPATH`.
2. Update the `requests` version with `pip install -U requests`.
3. Clear `PYTHONPATH`:
 - On Windows, clear it the environment variable settings.
 - On macOS and Linux, clear it by removing it from the bash profile and restarting the shell.

1.7.11 Shell commands open from the wrong location

When you run a command within a conda environment, conda does not access the correct package executable.

Cause

In both `bash` and `zsh`, when you enter a command, the shell searches the paths in `PATH` one by one until it finds the command. The shell then caches the location, which is called hashing in shell terminology. When you run command again, the shell does not have to search the `PATH` again.

The problem is that before you installed the program, you ran a command which loaded and hashed another version of that program in some other location on the `PATH`, such as `/usr/bin`. Then you installed the program using `conda install`, but the shell still had the old instance hashed.

Solution

Reactivate the environment or run `hash -r` (in bash) or `rehash` (in zsh).

When you run `conda activate`, conda automatically runs `hash -r` in bash and `rehash` in zsh to clear the hashed commands, so conda finds things in the new path on the PATH. But there is no way to do this when `conda install` is run because the command must be run inside the shell itself, meaning either you have to run the command yourself or used a source file that contains the command.

This is a relatively rare problem, since this happens only in the following circumstances:

1. You activate an environment or use the root environment, and then run a command from somewhere else.
2. Then you `conda install` a program, and then try to run the program again without running `activate` or `deactivate`.

The command `type command_name` always tells you exactly what is being run. This is better than `which command_name`, which ignores hashed commands and searches the PATH directly. The hash is reset by `conda activate` or by `hash -r` in bash or `rehash` in zsh.

1.7.12 Programs fail due to invoking conda Python instead of system Python

Cause

After installing Anaconda or Miniconda, programs that run `python` switch from invoking the system Python to invoking the Python in the root conda environment. If these programs rely on the system Python to have certain configurations or dependencies that are not in the root conda environment Python, the programs may crash. For example, some users of the Cinnamon desktop environment on Linux Mint have reported these crashes.

Solution

Edit your `.bash_profile` and `.bashrc` files so that the conda binary directory, such as `~/miniconda3/bin`, is no longer added to the PATH environment variable. You can still run `conda activate` and `conda deactivate` by using their full path names, such as `~/miniconda3/bin/conda`.

You may also create a folder with symbolic links to `conda activate` and `conda deactivate` and then edit your `.bash_profile` or `.bashrc` file to add this folder to your PATH. If you do this, running `python` will invoke the system Python, but running conda commands, `conda activate MyEnv`, `conda activate root`, or `conda deactivate` will work normally.

After running `conda activate` to activate any environment, including after running `conda activate root`, running `python` will invoke the Python in the active conda environment.

1.7.13 UnsatisfiableSpecifications error

Cause

Some conda package installation specifications are impossible to satisfy. For example, `conda create -n tmp python=3 wxpython=3` produces an "Unsatisfiable Specifications" error because `wxPython 3` depends on Python 2.7, so the specification to install Python 3 conflicts with the specification to install `wxPython 3`.

When an unsatisfiable request is made to conda, conda shows a message such as this one:

The following specifications were found to be in conflict:

- python 3*
- wxpython 3* -> python 2.7*

Use ``conda search <package> --info`` to see the dependencies for each package.

This indicates that the specification to install wxpython 3 depends on installing Python 2.7, which conflicts with the specification to install Python 3.

Solution

Use `conda search wxpython --info` or `conda search 'wxpython=3' --info` to show information about this package and its dependencies:

```
wxpython 3.0 py27_0
-----
file name      : wxpython-3.0-py27_0.tar.bz2
name           : wxpython
version        : 3.0
build number    : 0
build string    : py27_0
channel         : defaults
size            : 34.1 MB
date            : 2014-01-10
fn              : wxpython-3.0-py27_0.tar.bz2
license_family : Other
md5             : adc6285edfd29a28224c410a39d4bdad
priority        : 2
schannel        : defaults
url             : https://repo.continuum.io/pkgs/free/osx-64/wxpython-3.0-py27_0.tar.bz2
dependencies:
  python 2.7*
  python.app
```

By examining the dependencies of each package, you should be able to determine why the installation request produced a conflict and modify the request so it can be satisfied without conflicts. In this example, you could install wxPython with Python 2.7:

```
conda create -n tmp python=2.7 wxpython=3
```

1.7.14 Package installation fails from a specific channel

Cause

Sometimes it is necessary to install a specific version from a specific channel because that version is not available from the default channel.

Solution

The following example describes the problem in detail and its solution.

Suppose you have a specific need to install the Python `cx_freeze` module with Python 3.4. A first step is to create a Python 3.4 environment:

```
conda create -n py34 python=3.4
```

Using this environment you should first attempt:

```
conda install -n py34 cx_freeze
```

However, when you do this you get the following error:

```
Using Anaconda Cloud api site https://api.anaconda.org
Fetching package metadata .....
Solving package specifications: .
Error: Package missing in current osx-64 channels:
- cx_freeze
```

You can search for packages on anaconda.org with

```
anaconda search -t conda cx_freeze
```

The message indicates that `cx_freeze` cannot be found in the default package channels. However, there may be a community-created version available and you can search for it by running the following command:

```
$ anaconda search -t conda cx_freeze
Using Anaconda Cloud api site https://api.anaconda.org
Run 'anaconda show <USER/PACKAGE>' to get more details:
Packages:
```

Name	Version	Package Types	Platforms
inso/cx_freeze	4.3.3	conda	linux-64
pyzo/cx_freeze	4.3.3	conda	linux-64, win-32, win-64, linux-32, osx-64
silg2/cx_freeze	4.3.4	conda	linux-64
scripts			create standalone executables from Python
takluyver/cx_freeze	4.3.3	conda	linux-64

Found 4 packages

In this example, there are 4 different places that you could try to get the package. None of them are officially supported or endorsed by Anaconda, but members of the conda community have provided many valuable packages. If you want to go with public opinion, then [the web interface](https://anaconda.org) provides more information:

Notice that the pyzo organization has by far the most downloads, so you might choose to use their package. If so, you can add their organization's channel by specifying it on the command line:

Browser address bar: https://beta.anaconda.org/search?q=cx_freeze

ANACONDA CLOUD

Search bar: cx_freeze

Filters: Type: All Access: All Platform: All

Favorites	Downloads	Package (owner / package)	Platforms
0	1976	pyzo / cx_freeze 4.3.3 http://cx-freeze.sourceforge.net/	linux-32 linux-64 osx-64 win-32 win-64
0	96	pypi / cx_Freeze 4.3.3 create standalone executables from Python scripts	source
0	14	inso / cx_freeze 4.3.3	linux-64
0	1	silg2 / cx_freeze 4.3.4 create standalone executables from Python scripts	linux-64
0	0	takluyver / cx_freeze 4.3.3	linux-64

« Previous showing 1 - 5 of 5 Next »

```
$ conda create -c pyzo -n cxfreeze_py34 cx_freeze python=3.4
Using Anaconda Cloud api site https://api.anaconda.org
Fetching package metadata: .....
Solving package specifications: .....

Package plan for installation in environment /Users/username/anaconda/envs/cxfreeze_py34:

The following packages will be downloaded:
```

package	build	
-----	-----	
cx_freeze-4.3.3	py34_4	1.8 MB
setuptools-20.7.0	py34_0	459 KB
-----	-----	
	Total:	2.3 MB

```

The following NEW packages will be INSTALLED:

cx_freeze: 4.3.3-py34_4
openssl: 1.0.2h-0
pip: 8.1.1-py34_1
python: 3.4.4-0
readline: 6.2-2
setuptools: 20.7.0-py34_0
sqlite: 3.9.2-0
tk: 8.5.18-0
wheel: 0.29.0-py34_0
xz: 5.0.5-1
zlib: 1.2.8-0

```

Now you have a software environment sandbox created with Python 3.4 and `cx_freeze`.

1.7.15 Conda automatically upgrades to unwanted version

When making a Python package for an app, you create an environment for the app from a file `req.txt` that sets a certain version, such as `python=2.7.9`. However, when you `conda install` your package, it automatically upgrades to a later version, such as `2.7.10`.

Cause

If you make a conda package for the app using conda-build, you can set dependencies with specific version numbers. The requirements lines that say `- python` could be `- python ==2.7.9` instead. It is important to have 1 space before the `==` operator and no space after.

Solution

Exercise caution when coding version requirements.

1.7.16 Conda upgrade error

Cause

Downgrading conda from 4.6.1 to 4.5.x and then trying to `conda install conda` or `conda upgrade conda` will produce a solving and upgrade error similar to the following:

```
Solving environment: failed
CondaUpgradeError: This environment has previously been operated on by a conda version_
↳ that's newer than the conda currently being used. A newer version of conda is required.
target environment location: /opt/conda
current conda version: 4.5.9
minimum conda version: 4.6
```

Solution

Change the `.condarc` file. Set the parameter by editing the `.condarc` file directly: `allow_conda_downgrades: true` in conda version 4.5.12. This will then let you upgrade. If you have something older than 4.5.12, install conda 4.6.1 again from the package cache.

EXAMPLE: If my conda info says package cache : `/opt/conda/pkgs` and my Python version is 3.7, then on the command line, type `conda install /opt/conda/pkgs/conda-4.6.1-py37_0.tar.bz2` to resolve the issue.

1.7.17 ValidationError: Invalid value for timestamp

Cause

This happens when certain packages are installed with conda 4.3.28, and then conda is downgraded to 4.3.27 or earlier.

Solution

See <https://github.com/conda/conda/issues/6096>.

1.7.18 Unicode error after installing Python 2

Example: `UnicodeDecodeError: 'ascii' codec can't decode byte 0xd3 in position 1: ordinal not in range(128)`

Cause

Python 2 is incapable of handling unicode properly, especially on Windows. In this case, if any character in your `PATH` env. var contains anything that is not ASCII then you see this exception.

Solution

Remove all non-ASCII from `PATH` or switch to Python 3.

1.7.19 Windows environment has not been activated

Cause

You may receive a warning message if you have not activated your environment:

Warning:
This Python interpreter **is in** a conda environment, but the environment has **not** been activated. Libraries may fail to load. To activate this environment please see <https://conda.io/activation>

Solution

If you receive this warning, you need to activate your environment. To do so on Windows, use the Anaconda Prompt shortcut in your Windows start menu. If you have an existing `cmd.exe` session that you'd like to activate conda in, run: `call <your anaconda/miniconda install location>\Scripts\activate base`.

1.7.20 The system cannot find the path specified on Windows

Cause

`PATH` does not contain entries for all of the necessary conda directories. `PATH` may have too many entries from 3rd party software adding itself to `PATH` at install time, despite the user not needing to run the software via `PATH` lookup.

Solution

Strip `PATH` to have fewer entries and activate your environment.

If there's some software that needs to be found on `PATH` (you run it via the CLI), we recommend that you create your own batch files to set `PATH` dynamically within a console session, rather than permanently modifying `PATH` in the system settings.

For example, a new conda prompt batch file that first strips `PATH`, then calls the correct activation procedure could look like:

```
set
PATH="%SystemRoot%\system32;%SystemRoot%;%SystemRoot%\System32\Wbem;%SYSTEMROOT%\
↳System32\WindowsPowerShell\v1.0\;<3rd-party-entries>"
call "<miniconda/anaconda root>\Scripts\activate"
```

If you need to run 3rd party software (software other than Windows built-ins and Anaconda) from this custom conda prompt, then you should add those entries (and only those strictly necessary) to the set PATH entry above. Note that only the quotes wrapping the entire expression should be there. That is how variables are properly set in batch scripts, and these account for any spaces in any entries in PATH. No additional quotes should be within the value assigned to PATH.

To make 3rd party software take precedence over the same-named programs as supplied by conda, add it to PATH after activating conda:

```
set
"PATH=%SystemRoot%\system32;%SystemRoot%;%SystemRoot%\System32\Wbem;%SYSTEMROOT%\
↳System32\WindowsPowerShell\v1.0\"
call "<miniconda/anaconda root>\Scripts\activate"
set "PATH=<3rd-party-entries>;%PATH%"
```

To make conda software take precedence, call the activation script last. Because activation prepends the conda environment PATH entries, they have priority.

```
set
PATH="%SystemRoot%\system32;%SystemRoot%;%SystemRoot%\System32\Wbem;%SYSTEMROOT%\
↳System32\WindowsPowerShell\v1.0\;<3rd-party-entries>"
call "<miniconda/anaconda root>\Scripts\activate"
```

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Get started

- [See what conda is and what it does.](#)
- [Learn conda concepts and fundamentals.](#)
- [Create your first conda project in 20 minutes.](#)
- [View system requirements and installation directions.](#)

Looking for more information on conda? Anaconda has a free Conda Basics course in [Anaconda Learning](#).

Dive deeper

- [Configure your conda files.](#)
- Follow the [tasks](#) to *manage conda environments*, *channels*, *packages*, and more.

Additional resources

- [Cheat sheet.](#)
- [Troubleshooting.](#)

CONDA CONFIGURATION

```
# #####
# ##          Channel Configuration          ##
# #####

# # channels (sequence: primitive)
# #   aliases: channel
# #   env var string delimiter: ','
# #   The list of conda channels to include for relevant operations.
# #
# channels:
#   - defaults

# # channel_alias (str)
# #   The prepended url location to associate with channel names.
# #
# channel_alias: https://conda.anaconda.org

# # default_channels (sequence: primitive)
# #   env var string delimiter: ','
# #   The list of channel names and/or urls used for the 'defaults'
# #   multichannel.
# #
# default_channels:
#   - https://repo.anaconda.com/pkgs/main
#   - https://repo.anaconda.com/pkgs/r

# # override_channels_enabled (bool)
# #   Permit use of the --override-channels command-line flag.
# #
# override_channels_enabled: true

# # allowlist_channels (sequence: primitive)
# #   aliases: whitelist_channels
# #   env var string delimiter: ','
# #   The exclusive list of channels allowed to be used on the system. Use
# #   of any other channels will result in an error. If conda-build channels
# #   are to be allowed, along with the --use-local command line flag, be
# #   sure to include the 'local' channel in the list. If the list is empty
# #   or left undefined, no channel exclusions will be enforced.
# #
```

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```

# allowlist_channels: []

# # custom_channels (map: primitive)
# #   A map of key-value pairs where the key is a channel name and the value
# #   is a channel location. Channels defined here override the default
# #   'channel_alias' value. The channel name (key) is not included in the
# #   channel location (value). For example, to override the location of
# #   the 'conda-forge' channel where the url to repodata is
# #   https://anaconda-repo.dev/packages/conda-forge/linux-64/repodata.json,
# #   add an entry 'conda-forge: https://anaconda-repo.dev/packages'.
# #
# custom_channels:
#   pkgs/pro: https://repo.anaconda.com

# # custom_multichannels (map: sequence)
# #   A multichannel is a metachannel composed of multiple channels. The two
# #   reserved multichannels are 'defaults' and 'local'. The 'defaults'
# #   multichannel is customized using the 'default_channels' parameter. The
# #   'local' multichannel is a list of file:// channel locations where
# #   conda-build stashes successfully-built packages. Other multichannels
# #   can be defined with custom_multichannels, where the key is the
# #   multichannel name and the value is a list of channel names and/or
# #   channel urls.
# #
# custom_multichannels: {}

# # migrated_channel_aliases (sequence: primitive)
# #   env var string delimiter: ','
# #   A list of previously-used channel_alias values. Useful when switching
# #   between different Anaconda Repository instances.
# #
# migrated_channel_aliases: []

# # migrated_custom_channels (map: primitive)
# #   A map of key-value pairs where the key is a channel name and the value
# #   is the previous location of the channel.
# #
# migrated_custom_channels: {}

# # add_anaconda_token (bool)
# #   aliases: add_binstar_token
# #   In conjunction with the anaconda command-line client (installed with
# #   `conda install anaconda-client`), and following logging into an
# #   Anaconda Server API site using `anaconda login`, automatically apply a
# #   matching private token to enable access to private packages and
# #   channels.
# #
# add_anaconda_token: true

# # allow_non_channel_urls (bool)
# #   Warn, but do not fail, when conda detects a channel url is not a valid
# #   channel.

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```

# #
# allow_non_channel_urls: false

# # restore_free_channel (bool)
# # "          Add the "free" channel back into defaults, behind
# # "main" in priority. The "free"          channel was removed
# # from the collection of default channels in conda 4.7.0.
# #
# restore_free_channel: false

# # repodata_fns (sequence: primitive)
# # env var string delimiter: ','
# # Specify filenames for repodata fetching. The default is
# # ('current_repodata.json', 'repodata.json'), which tries a subset of
# # the full index containing only the latest version for each package,
# # then falls back to repodata.json. You may want to specify something
# # else to use an alternate index that has been reduced somehow.
# #
# repodata_fns:
# - current_repodata.json
# - repodata.json

# # use_only_tar_bz2 (NoneType, bool)
# # A boolean indicating that only .tar.bz2 conda packages should be
# # downloaded. This is forced to True if conda-build is installed and
# # older than 3.18.3, because older versions of conda break when conda
# # feeds it the new file format.
# #
# use_only_tar_bz2:

# # repodata_threads (int)
# # Threads to use when downloading and reading repodata. When not set,
# # defaults to None, which uses the default ThreadPoolExecutor behavior.
# #
# repodata_threads: 0

# # fetch_threads (int)
# # Threads to use when downloading packages. When not set, defaults to
# # None, which uses the default ThreadPoolExecutor behavior.
# #
# fetch_threads: 5

# # experimental (sequence: primitive)
# # env var string delimiter: ','
# # List of experimental features to enable.
# #
# experimental: []

# #####
# ##          Basic Conda Configuration          ##
# #####

```

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```

# # envs_dirs (sequence: primitive)
# #   aliases: envs_path
# #   env var string delimiter: ':'
# #   The list of directories to search for named environments. When
# #   creating a new named environment, the environment will be placed in
# #   the first writable location.
# #
# # envs_dirs: []

# # pkgs_dirs (sequence: primitive)
# #   env var string delimiter: ','
# #   The list of directories where locally-available packages are linked
# #   from at install time. Packages not locally available are downloaded
# #   and extracted into the first writable directory.
# #
# # pkgs_dirs: []

# # default_threads (int)
# #   Threads to use by default for parallel operations. Default is None,
# #   which allows operations to choose themselves. For more specific
# #   control, see the other *_threads parameters:      * repodata_threads -
# #   for fetching/loading repodata      * verify_threads - for verifying
# #   package contents in transactions      * execute_threads - for carrying
# #   out the unlinking and linking steps
# #
# # default_threads: 0

# #####
# ##                               Network Configuration                               ##
# #####

# # client_ssl_cert (NoneType, str)
# #   aliases: client_cert
# #   A path to a single file containing a private key and certificate (e.g.
# #   .pem file). Alternately, use client_ssl_cert_key in conjunction with
# #   client_ssl_cert for individual files.
# #
# # client_ssl_cert:

# # client_ssl_cert_key (NoneType, str)
# #   aliases: client_cert_key
# #   Used in conjunction with client_ssl_cert for a matching key file.
# #
# # client_ssl_cert_key:

# # local_repodata_ttl (bool, int)
# #   For a value of False or 0, always fetch remote repodata (HTTP 304
# #   responses respected). For a value of True or 1, respect the HTTP
# #   Cache-Control max-age header. Any other positive integer values is the
# #   number of seconds to locally cache repodata before checking the remote

```

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```
# # server for an update.
# #
# local_repodata_ttl: 1

# # offline (bool)
# # Restrict conda to cached download content and file:// based urls.
# #
# offline: false

# # proxy_servers (map: primitive)
# # A mapping to enable proxy settings. Keys can be either (1) a
# # scheme://hostname form, which will match any request to the given
# # scheme and exact hostname, or (2) just a scheme, which will match
# # requests to that scheme. Values are the actual proxy server, and
# # are of the form 'scheme://[user:password@]host[:port]'. The optional
# # 'user:password' inclusion enables HTTP Basic Auth with your proxy.
# #
# proxy_servers: {}

# # remote_connect_timeout_secs (float)
# # The number seconds conda will wait for your client to establish a
# # connection to a remote url resource.
# #
# remote_connect_timeout_secs: 9.15

# # remote_max_retries (int)
# # The maximum number of retries each HTTP connection should attempt.
# #
# remote_max_retries: 3

# # remote_backoff_factor (int)
# # The factor determines the time HTTP connection should wait for
# # attempt.
# #
# remote_backoff_factor: 1

# # remote_read_timeout_secs (float)
# # Once conda has connected to a remote resource and sent an HTTP
# # request, the read timeout is the number of seconds conda will wait for
# # the server to send a response.
# #
# remote_read_timeout_secs: 60.0

# # ssl_verify (bool, str)
# # aliases: verify_ssl
# # Conda verifies SSL certificates for HTTPS requests, just like a web
# # browser. By default, SSL verification is enabled, and conda operations
# # will fail if a required url's certificate cannot be verified. Setting
# # ssl_verify to False disables certification verification. The value for
# # ssl_verify can also be (1) a path to a CA bundle file, or (2) a path
# # to a directory containing certificates of trusted CA.
# #
```

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```

# ssl_verify: true

#####
# ## Solver Configuration ##
#####

# # aggressive_update_packages (sequence: primitive)
# #   env var string delimiter: ','
# #   A list of packages that, if installed, are always updated to the
# #   latest possible version.
# #
# aggressive_update_packages:
#   - ca-certificates
#   - certifi
#   - openssl

# # auto_update_conda (bool)
# #   aliases: self_update
# #   Automatically update conda when a newer or higher priority version is
# #   detected.
# #
# auto_update_conda: true

# # channel_priority (ChannelPriority)
# #   Accepts values of 'strict', 'flexible', and 'disabled'. The default
# #   value is 'flexible'. With strict channel priority, packages in lower
# #   priority channels are not considered if a package with the same name
# #   appears in a higher priority channel. With flexible channel priority,
# #   the solver may reach into lower priority channels to fulfill
# #   dependencies, rather than raising an unsatisfiable error. With channel
# #   priority disabled, package version takes precedence, and the
# #   configured priority of channels is used only to break ties. In
# #   previous versions of conda, this parameter was configured as either
# #   True or False. True is now an alias to 'flexible'.
# #
# channel_priority: flexible

# # create_default_packages (sequence: primitive)
# #   env var string delimiter: ','
# #   Packages that are by default added to a newly created environments.
# #
# create_default_packages: []

# # disallowed_packages (sequence: primitive)
# #   aliases: disallow
# #   env var string delimiter: '&'
# #   Package specifications to disallow installing. The default is to allow
# #   all packages.
# #
# disallowed_packages: []

```

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```

# # force_reinstall (bool)
# #   Ensure that any user-requested package for the current operation is
# #   uninstalled and reinstalled, even if that package already exists in
# #   the environment.
# #
# force_reinstall: false

# # pinned_packages (sequence: primitive)
# #   env var string delimiter: '&'
# #   A list of package specs to pin for every environment resolution. This
# #   parameter is in BETA, and its behavior may change in a future release.
# #
# pinned_packages: []

# # pip_interop_enabled (bool)
# #   Allow the conda solver to interact with non-conda-installed python
# #   packages.
# #
# pip_interop_enabled: false

# # track_features (sequence: primitive)
# #   env var string delimiter: ','
# #   A list of features that are tracked by default. An entry here is
# #   similar to adding an entry to the create_default_packages list.
# #
# track_features: []

# # solver (str)
# #   aliases: experimental_solver
# #   A string to choose between the different solver logics implemented in
# #   conda. A solver logic takes care of turning your requested packages
# #   into a list of specs to add and/or remove from a given environment,
# #   based on their dependencies and specified constraints.
# #
# solver: classic

# #####
# ## Package Linking and Install-time Configuration ##
# #####

# # allow_softlinks (bool)
# #   When allow_softlinks is True, conda uses hard-links when possible, and
# #   soft-links (symlinks) when hard-links are not possible, such as when
# #   installing on a different filesystem than the one that the package
# #   cache is on. When allow_softlinks is False, conda still uses hard-
# #   links when possible, but when it is not possible, conda copies files.
# #   Individual packages can override this setting, specifying that certain
# #   files should never be soft-linked (see the no_link option in the build
# #   recipe documentation).
# #
# allow_softlinks: false

```

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```
# # always_copy (bool)
# #   aliases: copy
# #   Register a preference that files be copied into a prefix during
# #   install rather than hard-linked.
# #
# always_copy: false

# # always_softlink (bool)
# #   aliases: softlink
# #   Register a preference that files be soft-linked (symlinked) into a
# #   prefix during install rather than hard-linked. The link source is the
# #   'pkgs_dir' package cache from where the package is being linked.
# #   WARNING: Using this option can result in corruption of long-lived
# #   conda environments. Package caches are *caches*, which means there is
# #   some churn and invalidation. With this option, the contents of
# #   environments can be switched out (or erased) via operations on other
# #   environments.
# #
# always_softlink: false

# # path_conflict (PathConflict)
# #   The method by which conda handle's conflicting/overlapping paths
# #   during a create, install, or update operation. The value must be one
# #   of 'clobber', 'warn', or 'prevent'. The '--clobber' command-line flag
# #   or clobber configuration parameter overrides path_conflict set to
# #   'prevent'.
# #
# path_conflict: clobber

# # rollback_enabled (bool)
# #   Should any error occur during an unlink/link transaction, revert any
# #   disk mutations made to that point in the transaction.
# #
# rollback_enabled: true

# # safety_checks (SafetyChecks)
# #   Enforce available safety guarantees during package installation. The
# #   value must be one of 'enabled', 'warn', or 'disabled'.
# #
# safety_checks: warn

# # extra_safety_checks (bool)
# #   Spend extra time validating package contents. Currently, runs sha256
# #   verification on every file within each package during installation.
# #
# extra_safety_checks: false

# # signing_metadata_url_base (NoneType, str)
# #   Base URL for obtaining trust metadata updates (i.e., the '*.root.json'
# #   and 'key_mgr.json' files) used to verify metadata and (eventually)
# #   package signatures.
```

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```

# #
# signing_metadata_url_base:

# # shortcuts (bool)
# #   Allow packages to create OS-specific shortcuts (e.g. in the Windows
# #   Start Menu) at install time.
# #
# shortcuts: true

# # non_admin_enabled (bool)
# #   Allows completion of conda's create, install, update, and remove
# #   operations, for non-privileged (non-root or non-administrator) users.
# #
# non_admin_enabled: true

# # separate_format_cache (bool)
# #   Treat .tar.bz2 files as different from .conda packages when filenames
# #   are otherwise similar. This defaults to False, so that your package
# #   cache doesn't churn when rolling out the new package format. If you'd
# #   rather not assume that a .tar.bz2 and .conda from the same place
# #   represent the same content, set this to True.
# #
# separate_format_cache: false

# # verify_threads (int)
# #   Threads to use when performing the transaction verification step.
# #   When not set, defaults to 1.
# #
# verify_threads: 0

# # execute_threads (int)
# #   Threads to use when performing the unlink/link transaction. When not
# #   set, defaults to 1. This step is pretty strongly I/O limited, and you
# #   may not see much benefit here.
# #
# execute_threads: 0

# #####
# ##           Conda-build Configuration           ##
# #####

# # bld_path (str)
# #   The location where conda-build will put built packages. Same as
# #   'croot', but 'croot' takes precedence when both are defined. Also used
# #   in construction of the 'local' multichannel.
# #
# bld_path: ''

# # croot (str)
# #   The location where conda-build will put built packages. Same as
# #   'bld_path', but 'croot' takes precedence when both are defined. Also

```

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```

# # used in construction of the 'local' multichannel.
# #
# croot: ''

# # anaconda_upload (NoneType, bool)
# # aliases: binstar_upload
# # Automatically upload packages built with conda build to anaconda.org.
# #
# anaconda_upload:

# # conda_build (map: primitive)
# # aliases: conda-build
# # General configuration parameters for conda-build.
# #
# conda_build: {}

# #####
# ## Output, Prompt, and Flow Control Configuration ##
# #####

# # always_yes (NoneType, bool)
# # aliases: yes
# # Automatically choose the 'yes' option whenever asked to proceed with a
# # conda operation, such as when running `conda install`.
# #
# always_yes:

# # auto_activate_base (bool)
# # Automatically activate the base environment during shell
# # initialization.
# #
# auto_activate_base: true

# # auto_stack (int)
# # Implicitly use --stack when using activate if current level of nesting
# # (as indicated by CONDA_SHLVL environment variable) is less than or
# # equal to specified value. 0 or false disables automatic stacking, 1 or
# # true enables it for one level.
# #
# auto_stack: 0

# # change_ps1 (bool)
# # When using activate, change the command prompt ($PS1) to include the
# # activated environment.
# #
# change_ps1: true

# # env_prompt (str)
# # Template for prompt modification based on the active environment.
# # Currently supported template variables are '{prefix}', '{name}', and
# # '{default_env}'. '{prefix}' is the absolute path to the active

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```

# # environment. '{name}' is the basename of the active environment
# # prefix. '{default_env}' holds the value of '{name}' if the active
# # environment is a conda named environment ('-n' flag), or otherwise
# # holds the value of '{prefix}'. Templating uses python's str.format()
# # method.
# #
# env_prompt: '({default_env}) '

# # json (bool)
# # Ensure all output written to stdout is structured json.
# #
# json: false

# # notify_outdated_conda (bool)
# # Notify if a newer version of conda is detected during a create,
# # install, update, or remove operation.
# #
# notify_outdated_conda: true

# # quiet (bool)
# # Disable progress bar display and other output.
# #
# quiet: false

# # report_errors (NoneType, bool)
# # Opt in, or opt out, of automatic error reporting to core maintainers.
# # Error reports are anonymous, with only the error stack trace and
# # information given by `conda info` being sent.
# #
# report_errors:

# # show_channel_urls (NoneType, bool)
# # Show channel URLs when displaying what is going to be downloaded.
# #
# show_channel_urls:

# # verbosity (int)
# # aliases: verbose
# # Sets output log level. 0 is warn. 1 is info. 2 is debug. 3 is trace.
# #
# verbosity: 0

# # unsatisfiable_hints (bool)
# # A boolean to determine if conda should find conflicting packages in
# # the case of a failed install.
# #
# unsatisfiable_hints: true

# # unsatisfiable_hints_check_depth (int)
# # An integer that specifies how many levels deep to search for
# # unsatisfiable dependencies. If this number is 1 it will complete the
# # unsatisfiable hints fastest (but perhaps not the most complete). The

```

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```
# # higher this number, the longer the generation of the unsat hint will
# # take. Defaults to 3.
# #
# unsatisfiable_hints_check_depth: 2

# # number_channel_notices (int)
# # Sets the number of channel notices to be displayed when running
# # commands the "install", "create", "update", "env create", and "env
# # update" . Defaults to 5. In order to completely suppress channel
# # notices, set this to 0.
# #
# number_channel_notices: 5

# #####
# ##                Plugin Configuration                ##
# #####

# # no_plugins (bool)
# # Disable all currently-registered plugins, except built-in conda
# # plugins.
# #
# no_plugins: false
```

COMMAND REFERENCE

- *Conda vs. pip vs. virtualenv commands*

Conda provides many commands for managing packages and environments. The links on this page provide help for each command. You can also access help from the command line with the `--help` flag:

```
conda install --help
```

The following commands are part of conda:

3.1 conda clean

Remove unused packages and caches.

```
usage: conda clean [-h] [-a] [-i] [-p] [-t] [-f] [-c [TEMPFILES ...]] [-l]
                  [--json] [-v] [-q] [-d] [-y]
```

3.1.1 Removal Targets

-a, --all	Remove index cache, lock files, unused cache packages, tarballs, and logfiles.
-i, --index-cache	Remove index cache.
-p, --packages	Remove unused packages from writable package caches. WARNING: This does not check for packages installed using symlinks back to the package cache.
-t, --tarballs	Remove cached package tarballs.
-f, --force-pkgs-dirs	Remove <i>all</i> writable package caches. This option is not included with the <code>--all</code> flag. WARNING: This will break environments with packages installed using symlinks back to the package cache.
-c, --tempfiles	Remove temporary files that could not be deleted earlier due to being in-use. The argument for the <code>--tempfiles</code> flag is a path (or list of paths) to the environment(s) where the tempfiles should be found and removed.
-l, --logfiles	Remove log files.

3.1.2 Output, Prompt, and Flow Control Options

--json	Report all output as json. Suitable for using conda programmatically.
-v, --verbose	Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.
-q, --quiet	Do not display progress bar.
-d, --dry-run	Only display what would have been done.
-y, --yes	Sets any confirmation values to 'yes' automatically. Users will not be asked to confirm any adding, deleting, backups, etc.

Examples:

```
conda clean --tarballs
```

3.2 conda compare

Compare packages between conda environments.

```
usage: conda compare [-h] [--json] [-v] [-q] [-n ENVIRONMENT | -p PATH] file
```

3.2.1 Positional Arguments

file	Path to the environment file that is to be compared against.
-------------	--

3.2.2 Output, Prompt, and Flow Control Options

--json	Report all output as json. Suitable for using conda programmatically.
-v, --verbose	Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.
-q, --quiet	Do not display progress bar.

3.2.3 Target Environment Specification

-n, --name	Name of environment.
-p, --prefix	Full path to environment location (i.e. prefix).

Examples:

Compare packages in the current environment with respect to 'environment.yml' located in the current working directory:

```
conda compare environment.yml
```

Compare packages installed into the environment 'myenv' with respect to 'environment.yml' in a different directory:

```
conda compare -n myenv path/to/file/environment.yml
```

3.3 conda config

This is modeled after the git config command. Writes to the user .condarc file (/home/docs/.condarc) by default. Use the --show-sources flag to display all identified configuration locations on your computer.

```
usage: conda config [-h] [--json] [-v] [-q] [--system | --env | --file FILE]
                  [--show [SHOW ...] | --show-sources | --validate |
                  --describe [DESCRIBE ...] | --write-default]
                  [--get [KEY ...] | --append KEY VALUE | --prepend KEY
                  VALUE | --set KEY VALUE | --remove KEY VALUE |
                  --remove-key KEY | --stdin]
```

3.3.1 Output, Prompt, and Flow Control Options

--json	Report all output as json. Suitable for using conda programmatically.
-v, --verbose	Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.
-q, --quiet	Do not display progress bar.

3.3.2 Config File Location Selection

Without one of these flags, the user config file at '/home/docs/.condarc' is used.

--system	Write to the system .condarc file at '/home/docs/checkouts/readthedocs.org/user_builds/continuumio-conda/envs/23.7.x/.condarc'.
--env	Write to the active conda environment .condarc file (<no active environment>). If no environment is active, write to the user config file (/home/docs/.condarc).
--file	Write to the given file.

3.3.3 Config Subcommands

--show	Display configuration values as calculated and compiled. If no arguments given, show information for all configuration values.
--show-sources	Display all identified configuration sources.
--validate	Validate all configuration sources. Iterates over all .condarc files and checks for parsing errors.
--describe	Describe given configuration parameters. If no arguments given, show information for all configuration parameters.
--write-default	Write the default configuration to a file. Equivalent to <i>conda config --describe > ~/.condarc</i> .

3.3.4 Config Modifiers

--get	Get a configuration value.
--append	Add one configuration value to the end of a list key.
--prepend, --add	Add one configuration value to the beginning of a list key.
--set	Set a boolean or string key.
--remove	Remove a configuration value from a list key. This removes all instances of the value.
--remove-key	Remove a configuration key (and all its values).
--stdin	Apply configuration information given in yaml format piped through stdin.

See `conda config --describe` or <https://conda.io/docs/config.html> for details on all the options that can go in `.condarc`.

Examples:

Display all configuration values as calculated and compiled:

```
conda config --show
```

Display all identified configuration sources:

```
conda config --show-sources
```

Print the descriptions of all available configuration options to your command line:

```
conda config --describe
```

Print the description for the "channel_priority" configuration option to your command line:

```
conda config --describe channel_priority
```

Add the conda-canary channel:

```
conda config --add channels conda-canary
```

Set the output verbosity to level 3 (highest) for the current activate environment:

```
conda config --set verbosity 3 --env
```

Add the 'conda-forge' channel as a backup to 'defaults':

```
conda config --append channels conda-forge
```


3.4 conda create

Create a new conda environment from a list of specified packages. To use the newly-created environment, use 'conda activate envname'. This command requires either the -n NAME or -p PREFIX option.

```
usage: conda create [-h] [--clone ENV] (-n ENVIRONMENT | -p PATH) [-c CHANNEL]
                  [--use-local] [--override-channels]
                  [--repodata-fn REPODATA_FNS] [--experimental {jlap,lock}]
                  [--strict-channel-priority] [--no-channel-priority]
                  [--no-deps | --only-deps] [--no-pin] [--copy] [-C] [-k]
                  [--offline] [--json] [-v] [-q] [-d] [-y] [--download-only]
                  [--show-channel-urls] [--file FILE]
                  [--no-default-packages]
                  [--solver {classic} | --experimental-solver {classic}]
                  [--dev]
                  [package_spec ...]
```

3.4.1 Positional Arguments

package_spec List of packages to install or update in the conda environment.

3.4.2 options

--clone Create a new environment as a copy of an existing local environment.

--file Read package versions from the given file. Repeated file specifications can be passed (e.g. --file=file1 --file=file2).

--dev Use *sys.executable -m conda* in wrapper scripts instead of CONDA_EXE. This is mainly for use during tests where we test new conda sources against old Python versions.

3.4.3 Target Environment Specification

-n, --name Name of environment.

-p, --prefix Full path to environment location (i.e. prefix).

3.4.4 Channel Customization

-c, --channel Additional channel to search for packages. These are URLs searched in the order they are given (including local directories using the 'file://' syntax or simply a path like '/home/conda/mychan' or './mychan'). Then, the defaults or channels from .condarc are searched (unless --override-channels is given). You can use 'defaults' to get the default packages for conda. You can also use any name and the .condarc channel_alias value will be prepended. The default channel_alias is <https://conda.anaconda.org/>.

--use-local Use locally built packages. Identical to '-c local'.

--override-channels Do not search default or .condarc channels. Requires --channel.

- repodata-fn** Specify file name of repodata on the remote server where your channels are configured or within local backups. Conda will try whatever you specify, but will ultimately fall back to repodata.json if your specs are not satisfiable with what you specify here. This is used to employ repodata that is smaller and reduced in time scope. You may pass this flag more than once. Leftmost entries are tried first, and the fallback to repodata.json is added for you automatically. For more information, see `conda config --describe repodata_fns`.
- experimental** Possible choices: `jlap`, `lock`
- `jlap`: Download incremental package index data from repodata.jlap; implies 'lock'.
`lock`: use locking when reading, updating index (repodata.json) cache.

3.4.5 Solver Mode Modifiers

- strict-channel-priority** Packages in lower priority channels are not considered if a package with the same name appears in a higher priority channel.
- no-channel-priority** Package version takes precedence over channel priority. Overrides the value given by `conda config --show channel_priority`.
- no-deps** Do not install, update, remove, or change dependencies. This WILL lead to broken environments and inconsistent behavior. Use at your own risk.
- only-deps** Only install dependencies.
- no-pin** Ignore pinned file.
- no-default-packages** Ignore `create_default_packages` in the `.condarc` file.
- solver** Possible choices: `classic`
- Choose which solver backend to use.
- experimental-solver** Possible choices: `classic`
- `--experimental-solver` is pending deprecation and will be removed in 24.3. Use `--solver` instead.

3.4.6 Package Linking and Install-time Options

- copy** Install all packages using copies instead of hard- or soft-linking.

3.4.7 Networking Options

- C, --use-index-cache** Use cache of channel index files, even if it has expired. This is useful if you don't want conda to check whether a new version of the repodata file exists, which will save bandwidth.
- k, --insecure** Allow conda to perform "insecure" SSL connections and transfers. Equivalent to setting `'ssl_verify'` to `'false'`.
- offline** Offline mode. Don't connect to the Internet.

3.4.8 Output, Prompt, and Flow Control Options

--json	Report all output as json. Suitable for using conda programmatically.
-v, --verbose	Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.
-q, --quiet	Do not display progress bar.
-d, --dry-run	Only display what would have been done.
-y, --yes	Sets any confirmation values to 'yes' automatically. Users will not be asked to confirm any adding, deleting, backups, etc.
--download-only	Solve an environment and ensure package caches are populated, but exit prior to unlinking and linking packages into the prefix.
--show-channel-urls	Show channel urls. Overrides the value given by <code>conda config --show show_channel_urls</code> .

Examples:

Create an environment containing the package 'sqlite':

```
conda create -n myenv sqlite
```

Create an environment (env2) as a clone of an existing environment (env1):

```
conda create -n env2 --clone path/to/file/env1
```

3.5 conda doctor

Display a health report for your environment.

```
usage: conda doctor doctor [-v] [-h] [-n ENVIRONMENT | -p PATH]
```

3.5.1 options

-v, --verbose	Generate a detailed environment health report.
----------------------	--

3.5.2 Target Environment Specification

-n, --name	Name of environment.
-p, --prefix	Full path to environment location (i.e. prefix).

3.6 conda env

```
usage: conda env [-h] command ...
```

3.6.1 Positional Arguments

command Possible choices: create, export, list, remove, update, config

3.6.2 conda env config

Configure a conda environment

```
usage: conda env config [-h] {vars} ...
```

examples: conda env config vars list conda env config --append channels conda-forge

conda env config vars

Interact with environment variables associated with Conda environments

```
usage: conda env config vars [-h] {list,set,unset} ...
```

examples: conda env config vars list -n my_env conda env config vars set MY_VAR=something
OTHER_THING=ohhhhya conda env config vars unset MY_VAR

conda env config vars list

List environment variables for a conda environment

```
usage: conda env config vars list [-h] [-n ENVIRONMENT | -p PATH] [--json]
                                   [-v] [-q]
```

Target Environment Specification

-n, --name	Name of environment.
-p, --prefix	Full path to environment location (i.e. prefix).

Output, Prompt, and Flow Control Options

--json	Report all output as json. Suitable for using conda programmatically.
-v, --verbose	Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.
-q, --quiet	Do not display progress bar.

examples: `conda env config vars list -n my_env`

`conda env config vars set`

Set environment variables for a conda environment

```
usage: conda env config vars set [-h] [-n ENVIRONMENT | -p PATH] [vars ...]
```

Positional Arguments

vars	Environment variables to set in the form <KEY>=<VALUE> separated by spaces
-------------	--

Target Environment Specification

-n, --name	Name of environment.
-p, --prefix	Full path to environment location (i.e. prefix).

example: `conda env config vars set MY_VAR=weee`

`conda env config vars unset`

Unset environment variables for a conda environment

```
usage: conda env config vars unset [-h] [-n ENVIRONMENT | -p PATH] [vars ...]
```

Positional Arguments

vars Environment variables to unset in the form <KEY> separated by spaces

Target Environment Specification

-n, --name Name of environment.
-p, --prefix Full path to environment location (i.e. prefix).

example: `conda env config vars unset MY_VAR`

3.6.3 conda env create

Create an environment based on an environment definition file.

If using an environment.yml file (the default), you can name the environment in the first line of the file with 'name: envname' or you can specify the environment name in the CLI command using the `-n/--name` argument. The name specified in the CLI will override the name specified in the environment.yml file.

Unless you are in the directory containing the environment definition file, use `-f` to specify the file path of the environment definition file you want to use.

```
usage: conda env create [-h] [-f FILE] [-n ENVIRONMENT | -p PATH] [-C] [-k]
                        [--offline] [--force] [--no-default-packages] [--json]
                        [-v] [-q] [-d] [-y]
                        [--solver {classic} | --experimental-solver {classic}]
                        [remote_definition]
```

Positional Arguments

remote_definition Remote environment definition / IPython notebook

options

-f, --file Environment definition file (default: environment.yml)
--force `--force` is pending deprecation and will be removed in 24.3. Use `--yes` instead.
--no-default-packages Ignore create_default_packages in the .condarc file.
--solver Possible choices: classic
Choose which solver backend to use.
--experimental-solver Possible choices: classic
`--experimental-solver` is pending deprecation and will be removed in 24.3. Use `--solver` instead.

Target Environment Specification

-n, --name	Name of environment.
-p, --prefix	Full path to environment location (i.e. prefix).

Networking Options

-C, --use-index-cache	Use cache of channel index files, even if it has expired. This is useful if you don't want conda to check whether a new version of the repodata file exists, which will save bandwidth.
-k, --insecure	Allow conda to perform "insecure" SSL connections and transfers. Equivalent to setting 'ssl_verify' to 'false'.
--offline	Offline mode. Don't connect to the Internet.

Output, Prompt, and Flow Control Options

--json	Report all output as json. Suitable for using conda programmatically.
-v, --verbose	Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.
-q, --quiet	Do not display progress bar.
-d, --dry-run	Only display what would have been done.
-y, --yes	Sets any confirmation values to 'yes' automatically. Users will not be asked to confirm any adding, deleting, backups, etc.

examples: `conda env create` `conda env create -n envname` `conda env create folder/envname` `conda env create -f /path/to/environment.yml` `conda env create -f /path/to/requirements.txt -n envname` `conda env create -f /path/to/requirements.txt -p /home/user/envname`

3.6.4 conda env export

Export a given environment

```
usage: conda env export [-h] [-c CHANNEL] [--override-channels]
                        [-n ENVIRONMENT | -p PATH] [-f FILE] [--no-builds]
                        [--ignore-channels] [--json] [-v] [-q]
                        [--from-history]
```

options

-c, --channel	Additional channel to include in the export
--override-channels	Do not include .condarc channels
-f, --file	File name or path for the exported environment. Note: This will silently overwrite any existing file of the same name in the current directory.
--no-builds	Remove build specification from dependencies
--ignore-channels	Do not include channel names with package names.
--from-history	Build environment spec from explicit specs in history

Target Environment Specification

-n, --name	Name of environment.
-p, --prefix	Full path to environment location (i.e. prefix).

Output, Prompt, and Flow Control Options

--json	Report all output as json. Suitable for using conda programmatically.
-v, --verbose	Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.
-q, --quiet	Do not display progress bar.

examples: conda env export conda env export --file SOME_FILE

3.6.5 conda env list

List the Conda environments

usage: conda env list [-h] [--json] [-v] [-q]

Output, Prompt, and Flow Control Options

--json	Report all output as json. Suitable for using conda programmatically.
-v, --verbose	Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.
-q, --quiet	Do not display progress bar.

examples: conda env list conda env list --json

3.6.6 conda env remove

Remove an environmentRemoves a provided environment. You must deactivate the existing environment before you can remove it.

```
usage: conda env remove [-h] [-n ENVIRONMENT | -p PATH]
                        [--solver {classic} | --experimental-solver {classic}]
                        [--json] [-v] [-q] [-d] [-y]
```

options

--solver Possible choices: classic
Choose which solver backend to use.

--experimental-solver Possible choices: classic
--experimental-solver is pending deprecation and will be removed in 24.3. Use *--solver* instead.

Target Environment Specification

-n, --name Name of environment.

-p, --prefix Full path to environment location (i.e. prefix).

Output, Prompt, and Flow Control Options

--json Report all output as json. Suitable for using conda programmatically.

-v, --verbose Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.

-q, --quiet Do not display progress bar.

-d, --dry-run Only display what would have been done.

-y, --yes Sets any confirmation values to 'yes' automatically. Users will not be asked to confirm any adding, deleting, backups, etc.

Examples:

```
conda env remove --name FOO conda env remove -n FOO
```

3.6.7 conda env update

Update the current environment based on environment file

```
usage: conda env update [-h] [-n ENVIRONMENT | -p PATH] [-f FILE] [--prune]
                        [--json] [-v] [-q]
                        [--solver {classic} | --experimental-solver {classic}]
                        [remote_definition]
```

Positional Arguments

remote_definition remote environment definition / IPython notebook

options

-f, --file environment definition (default: environment.yml)

--prune remove installed packages not defined in environment.yml

--solver Possible choices: classic
Choose which solver backend to use.

--experimental-solver Possible choices: classic
--experimental-solver is pending deprecation and will be removed in 24.3. Use *--solver* instead.

Target Environment Specification

-n, --name Name of environment.

-p, --prefix Full path to environment location (i.e. prefix).

Output, Prompt, and Flow Control Options

--json Report all output as json. Suitable for using conda programmatically.

-v, --verbose Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.

-q, --quiet Do not display progress bar.

examples: conda env update conda env update -n=foo conda env update -f=/path/to/environment.yml conda env update --name=foo --file=environment.yml conda env update vader/deathstar

3.7 conda info

Display information about current conda install.

```
usage: conda info [-h] [--json] [-v] [-q] [-a] [--base] [-e] [-s]
                  [--unsafe-channels]
```

3.7.1 options

-a, --all	Show all information.
--base	Display base environment path.
-e, --envs	List all known conda environments.
-s, --system	List environment variables.
--unsafe-channels	Display list of channels with tokens exposed.

3.7.2 Output, Prompt, and Flow Control Options

--json	Report all output as json. Suitable for using conda programmatically.
-v, --verbose	Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.
-q, --quiet	Do not display progress bar.

3.8 conda init

Initialize conda for shell interaction.

```
usage: conda init [-h] [--all] [--user] [--no-user] [--system] [--reverse]
                  [--json] [-v] [-q] [-d]
                  [SHELLS ...]
```

3.8.1 Positional Arguments

SHELLS	Possible choices: bash, fish, tcsh, xonsh, zsh, powershell
	One or more shells to be initialized. If not given, the default value is 'bash' on unix and 'cmd.exe' & 'powershell' on Windows. Use the '--all' flag to initialize all shells. Available shells: ['bash', 'fish', 'powershell', 'tcsh', 'xonsh', 'zsh']

3.8.2 options

--all	Initialize all currently available shells.
-d, --dry-run	Only display what would have been done.

3.8.3 setup type

--user	Initialize conda for the current user (default).
--no-user	Don't initialize conda for the current user.
--system	Initialize conda for all users on the system.
--reverse	Undo effects of last conda init.

3.8.4 Output, Prompt, and Flow Control Options

--json	Report all output as json. Suitable for using conda programmatically.
-v, --verbose	Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.
-q, --quiet	Do not display progress bar.

Key parts of conda's functionality require that it interact directly with the shell within which conda is being invoked. The *conda activate* and *conda deactivate* commands specifically are shell-level commands. That is, they affect the state (e.g. environment variables) of the shell context being interacted with. Other core commands, like *conda create* and *conda install*, also necessarily interact with the shell environment. They're therefore implemented in ways specific to each shell. Each shell must be configured to make use of them.

This command makes changes to your system that are specific and customized for each shell. To see the specific files and locations on your system that will be affected before, use the '--dry-run' flag. To see the exact changes that are being or will be made to each location, use the '--verbose' flag.

IMPORTANT: After running *conda init*, most shells will need to be closed and restarted for changes to take effect.

3.9 conda install

Install a list of packages into a specified conda environment.

This command accepts a list of package specifications (e.g. `bitarray=0.8`) and installs a set of packages consistent with those specifications and compatible with the underlying environment. If full compatibility cannot be assured, an error is reported and the environment is not changed.

Conda attempts to install the newest versions of the requested packages. To accomplish this, it may update some packages that are already installed, or install additional packages. To prevent existing packages from updating, use the `--freeze-installed` option. This may force conda to install older versions of the requested packages, and it does not prevent additional dependency packages from being installed.

If you wish to skip dependency checking altogether, use the `--no-deps` option. This may result in an environment with incompatible packages, so this option must be used with great caution.

conda can also be called with a list of explicit conda package filenames (e.g. `./xml-3.2.0-py27_0.tar.bz2`). Using conda in this mode implies the `--no-deps` option, and should likewise be used with great caution. Explicit filenames and package specifications cannot be mixed in a single command.

```
usage: conda install [-h] [--revision REVISION] [-n ENVIRONMENT | -p PATH]
                    [-c CHANNEL] [--use-local] [--override-channels]
                    [--repodata-fn REPODATA_FNS] [--experimental {jlap,lock}]
                    [--strict-channel-priority] [--no-channel-priority]
                    [--no-deps | --only-deps] [--no-pin] [--copy] [-C] [-k]
                    [--offline] [--json] [-v] [-q] [-d] [-y]
                    [--download-only] [--show-channel-urls] [--file FILE]
                    [--solver {classic} | --experimental-solver {classic}]
                    [--force-reinstall]
                    [--freeze-installed | --update-deps | -S | --update-all | --update-
→specs]
                    [-m] [--clobber] [--dev]
                    [package_spec ...]
```

3.9.1 Positional Arguments

package_spec List of packages to install or update in the conda environment.

3.9.2 options

--revision Revert to the specified REVISION.

--file Read package versions from the given file. Repeated file specifications can be passed (e.g. `--file=file1 --file=file2`).

--dev Use `sys.executable -m conda` in wrapper scripts instead of `CONDA_EXE`. This is mainly for use during tests where we test new conda sources against old Python versions.

3.9.3 Target Environment Specification

-n, --name Name of environment.

-p, --prefix Full path to environment location (i.e. prefix).

3.9.4 Channel Customization

-c, --channel Additional channel to search for packages. These are URLs searched in the order they are given (including local directories using the `'file:/'` syntax or simply a path like `/home/conda/mychan` or `./mychan`). Then, the defaults or channels from `.condarc` are searched (unless `--override-channels` is given). You can use `'defaults'` to get the default packages for conda. You can also use any name and the `.condarc` `channel_alias` value will be prepended. The default `channel_alias` is <https://conda.anaconda.org/>.

--use-local Use locally built packages. Identical to `'-c local'`.

--override-channels Do not search default or `.condarc` channels. Requires `--channel`.

- repodata-fn** Specify file name of repodata on the remote server where your channels are configured or within local backups. Conda will try whatever you specify, but will ultimately fall back to repodata.json if your specs are not satisfiable with what you specify here. This is used to employ repodata that is smaller and reduced in time scope. You may pass this flag more than once. Leftmost entries are tried first, and the fallback to repodata.json is added for you automatically. For more information, see `conda config --describe repodata_fns`.
- experimental** Possible choices: `jlap`, `lock`
- `jlap`: Download incremental package index data from repodata.jlap; implies 'lock'.
- `lock`: use locking when reading, updating index (repodata.json) cache.

3.9.5 Solver Mode Modifiers

- strict-channel-priority** Packages in lower priority channels are not considered if a package with the same name appears in a higher priority channel.
- no-channel-priority** Package version takes precedence over channel priority. Overrides the value given by `conda config --show channel_priority`.
- no-deps** Do not install, update, remove, or change dependencies. This WILL lead to broken environments and inconsistent behavior. Use at your own risk.
- only-deps** Only install dependencies.
- no-pin** Ignore pinned file.
- solver** Possible choices: `classic`
- Choose which solver backend to use.
- experimental-solver** Possible choices: `classic`
- `--experimental-solver` is pending deprecation and will be removed in 24.3. Use `--solver` instead.
- force-reinstall** Ensure that any user-requested package for the current operation is uninstalled and reinstalled, even if that package already exists in the environment.
- freeze-installed, --no-update-deps** Do not update or change already-installed dependencies.
- update-deps** Update dependencies that have available updates.
- S, --satisfied-skip-solve** Exit early and do not run the solver if the requested specs are satisfied. Also skips aggressive updates as configured by the 'aggressive_update_packages' config setting. Use 'conda info --describe aggressive_update_packages' to view your setting. `--satisfied-skip-solve` is similar to the default behavior of 'pip install'.
- update-all, --all** Update all installed packages in the environment.
- update-specs** Update based on provided specifications.

3.9.6 Package Linking and Install-time Options

--copy	Install all packages using copies instead of hard- or soft-linking.
-m, --mkdir	Create the environment directory, if necessary.
--clobber	Allow clobbering (i.e. overwriting) of overlapping file paths within packages and suppress related warnings.

3.9.7 Networking Options

-C, --use-index-cache	Use cache of channel index files, even if it has expired. This is useful if you don't want conda to check whether a new version of the repodata file exists, which will save bandwidth.
-k, --insecure	Allow conda to perform "insecure" SSL connections and transfers. Equivalent to setting 'ssl_verify' to 'false'.
--offline	Offline mode. Don't connect to the Internet.

3.9.8 Output, Prompt, and Flow Control Options

--json	Report all output as json. Suitable for using conda programmatically.
-v, --verbose	Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.
-q, --quiet	Do not display progress bar.
-d, --dry-run	Only display what would have been done.
-y, --yes	Sets any confirmation values to 'yes' automatically. Users will not be asked to confirm any adding, deleting, backups, etc.
--download-only	Solve an environment and ensure package caches are populated, but exit prior to unlinking and linking packages into the prefix.
--show-channel-urls	Show channel urls. Overrides the value given by <code>conda config --show show_channel_urls</code> .

Examples:

Install the package 'scipy' into the currently-active environment:

```
conda install scipy
```

Install a list of packages into an environment, myenv:

```
conda install -n myenv scipy curl wheel
```

Install a specific version of 'python' into an environment, myenv:

```
conda install -p path/to/myenv python=3.11
```

3.10 conda list

List installed packages in a conda environment.

```
usage: conda list [-h] [-n ENVIRONMENT | -p PATH] [--json] [-v] [-q]
                  [--show-channel-urls] [--reverse] [-c] [-f] [--explicit]
                  [--md5] [-e] [-r] [--no-pip]
                  [regex]
```

3.10.1 Positional Arguments

regex	List only packages matching this regular expression.
--------------	--

3.10.2 options

--show-channel-urls	Show channel urls. Overrides the value given by <i>conda config --show show_channel_urls</i> .
--reverse	List installed packages in reverse order.
-c, --canonical	Output canonical names of packages only.
-f, --full-name	Only search for full names, i.e., <code>^<regex>\$</code> . <code>--full-name NAME</code> is identical to <code>regex '^NAME\$'</code> .
--explicit	List explicitly all installed conda packages with URL (output may be used by <i>conda create --file</i>).
--md5	Add MD5 hashsum when using <code>--explicit</code> .
-e, --export	Output explicit, machine-readable requirement strings instead of human-readable lists of packages. This output may be used by <i>conda create --file</i> .
-r, --revisions	List the revision history.
--no-pip	Do not include pip-only installed packages.

3.10.3 Target Environment Specification

-n, --name	Name of environment.
-p, --prefix	Full path to environment location (i.e. prefix).

3.10.4 Output, Prompt, and Flow Control Options

--json	Report all output as json. Suitable for using conda programmatically.
-v, --verbose	Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.
-q, --quiet	Do not display progress bar.

Examples:

List all packages in the current environment:

```
conda list
```

List all packages in reverse order:

```
conda list --reverse
```

List all packages installed into the environment 'myenv':

```
conda list -n myenv
```

List all packages that begin with the letters "py", using regex:

```
conda list ^py
```

Save packages for future use:

```
conda list --export > package-list.txt
```

Reinstall packages from an export file:

```
conda create -n myenv --file package-list.txt
```

3.11 conda notices

Retrieve latest channel notifications.

Conda channel maintainers have the option of setting messages that users will see intermittently. Some of these notices are informational while others are messages concerning the stability of the channel.

```
usage: conda notices [-h] [-c CHANNEL] [--use-local] [--override-channels]
                    [--repodata-fn REPODATA_FNS] [--experimental {jlap,lock}]
```

3.11.1 Channel Customization

- c, --channel** Additional channel to search for packages. These are URLs searched in the order they are given (including local directories using the 'file://' syntax or simply a path like '/home/conda/mychan' or './mychan'). Then, the defaults or channels from .condarc are searched (unless --override-channels is given). You can use 'defaults' to get the default packages for conda. You can also use any name and the .condarc channel_alias value will be prepended. The default channel_alias is <https://conda.anaconda.org/>.
- use-local** Use locally built packages. Identical to '-c local'.
- override-channels** Do not search default or .condarc channels. Requires --channel.

--repodata-fn	Specify file name of repodata on the remote server where your channels are configured or within local backups. Conda will try whatever you specify, but will ultimately fall back to repodata.json if your specs are not satisfiable with what you specify here. This is used to employ repodata that is smaller and reduced in time scope. You may pass this flag more than once. Leftmost entries are tried first, and the fallback to repodata.json is added for you automatically. For more information, see <code>conda config --describe repodata_fns</code> .
--experimental	Possible choices: <code>jlapp</code> , <code>lock</code> <code>jlapp</code> : Download incremental package index data from repodata.jlapp; implies 'lock'. <code>lock</code> : use locking when reading, updating index (repodata.json) cache.

Examples:

`conda notices`

`conda notices -c defaults`

3.12 conda package

Create low-level conda packages. (EXPERIMENTAL)

```
usage: conda package [-h] [-n ENVIRONMENT | -p PATH] [-w PATH [PATH ...]] [-r]
                    [-u] [--pkg-name PKG_NAME] [--pkg-version PKG_VERSION]
                    [--pkg-build PKG_BUILD]
```

3.12.1 options

-w, --which	Given some file's PATH, print which conda package the file came from.
-r, --reset	Remove all untracked files and exit.
-u, --untracked	Display all untracked files and exit.
--pkg-name	Designate package name of the package being created.
--pkg-version	Designate package version of the package being created.
--pkg-build	Designate package build number of the package being created.

3.12.2 Target Environment Specification

-n, --name	Name of environment.
-p, --prefix	Full path to environment location (i.e. prefix).

3.13 conda remove

Remove a list of packages from a specified conda environment. "Use `--all` flag to remove all packages and the environment itself."

This command will also remove any package that depends on any of the specified packages as well---unless a replacement can be found without that dependency. If you wish to skip this dependency checking and remove just the requested packages, add the `'--force'` option. Note however that this may result in a broken environment, so use this with caution.

```
usage: conda remove [-h] [-n ENVIRONMENT | -p PATH] [-c CHANNEL] [--use-local]
                  [--override-channels] [--repodata-fn REPODATA_FNS]
                  [--experimental {jlap,lock}] [--all] [--features]
                  [--force-remove] [--no-pin]
                  [--solver {classic} | --experimental-solver {classic}]
                  [-C] [-k] [--offline] [--json] [-v] [-q] [-d] [-y] [--dev]
                  [package_name ...]
```

3.13.1 Positional Arguments

package_name Package names to remove from the environment.

3.13.2 options

--dev Use `sys.executable -m conda` in wrapper scripts instead of `CONDA_EXE`. This is mainly for use during tests where we test new conda sources against old Python versions.

3.13.3 Target Environment Specification

-n, --name Name of environment.

-p, --prefix Full path to environment location (i.e. prefix).

3.13.4 Channel Customization

-c, --channel Additional channel to search for packages. These are URLs searched in the order they are given (including local directories using the `'file://'` syntax or simply a path like `'/home/conda/mychan'` or `'./mychan'`). Then, the defaults or channels from `.condarc` are searched (unless `--override-channels` is given). You can use `'defaults'` to get the default packages for conda. You can also use any name and the `.condarc` `channel_alias` value will be prepended. The default `channel_alias` is <https://conda.anaconda.org/>.

--use-local Use locally built packages. Identical to `'-c local'`.

--override-channels Do not search default or `.condarc` channels. Requires `--channel`.

--repodata-fn Specify file name of repodata on the remote server where your channels are configured or within local backups. Conda will try whatever you specify, but will ultimately fall back to `repodata.json` if your specs are not satisfiable with what you specify here. This is used to employ repodata that is smaller and reduced in

time scope. You may pass this flag more than once. Leftmost entries are tried first, and the fallback to repodata.json is added for you automatically. For more information, see `conda config --describe repodata_fns`.

--experimental Possible choices: `jlap`, `lock`

`jlap`: Download incremental package index data from `repodata.jlap`; implies 'lock'.
`lock`: use locking when reading, updating index (`repodata.json`) cache.

3.13.5 Solver Mode Modifiers

--all Remove all packages, i.e., the entire environment.

--features Remove features (instead of packages).

--force-remove, --force Forces removal of a package without removing packages that depend on it. Using this option will usually leave your environment in a broken and inconsistent state.

--no-pin Ignore pinned package(s) that apply to the current operation. These pinned packages might come from a `.condarc` file or a file in `<TARGET_ENVIRONMENT>/conda-meta/pinned`.

--solver Possible choices: `classic`

Choose which solver backend to use.

--experimental-solver Possible choices: `classic`

--experimental-solver is pending deprecation and will be removed in 24.3. Use *--solver* instead.

3.13.6 Networking Options

-C, --use-index-cache Use cache of channel index files, even if it has expired. This is useful if you don't want conda to check whether a new version of the repodata file exists, which will save bandwidth.

-k, --insecure Allow conda to perform "insecure" SSL connections and transfers. Equivalent to setting 'ssl_verify' to 'false'.

--offline Offline mode. Don't connect to the Internet.

3.13.7 Output, Prompt, and Flow Control Options

--json Report all output as json. Suitable for using conda programmatically.

-v, --verbose Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.

-q, --quiet Do not display progress bar.

-d, --dry-run Only display what would have been done.

-y, --yes Sets any confirmation values to 'yes' automatically. Users will not be asked to confirm any adding, deleting, backups, etc.

Examples:

Remove the package 'scipy' from the currently-active environment:

```
conda remove scipy
```

Remove a list of packages from an environment 'myenv':

```
conda remove -n myenv scipy curl wheel
```

Remove all packages from environment *myenv* and the environment itself:

```
conda remove -n myenv --all
```

3.14 conda rename

Rename an existing environment.

This command renames a conda environment via its name (-n/--name) or its prefix (-p/--prefix).

The base environment and the currently-active environment cannot be renamed.

```
usage: conda rename [-h] [-n ENVIRONMENT | -p PATH] [--force] [-d] destination
```

3.14.1 Positional Arguments

destination	New name for the conda environment.
--------------------	-------------------------------------

3.14.2 options

--force	Force rename of an environment.
-d, --dry-run	Only display what would have been done by the current command, arguments, and other flags.

3.14.3 Target Environment Specification

-n, --name	Name of environment.
-p, --prefix	Full path to environment location (i.e. prefix).

Examples:

```
conda rename -n test123 test321

conda rename --name test123 test321
```

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```
conda rename -p path/to/test123 test321
conda rename --prefix path/to/test123 test321
```

3.15 conda run

Run an executable in a conda environment.

```
usage: conda run [-h] [-n ENVIRONMENT | -p PATH] [-v] [--dev]
                [--debug-wrapper-scripts] [--cwd CWD] [--no-capture-output]
                ...
```

3.15.1 Positional Arguments

executable_call	Executable name, with additional arguments to be passed to the executable on invocation.
------------------------	--

3.15.2 options

-v, --verbose	Use once for info, twice for debug, three times for trace.
--dev	Sets <i>CONDA_EXE</i> to <i>python -m conda</i> , assuming the current working directory contains the root of conda development sources. This is mainly for use during tests where we test new conda sources against old Python versions.
--debug-wrapper-scripts	When this is set, where implemented, the shell wrapper scripts will use the echo command to print debugging information to stderr (standard error).
--cwd	Current working directory for command to run in. Defaults to the user's current working directory if no directory is specified.
--no-capture-output, --live-stream	Don't capture stdout/stderr (standard out/standard error).

3.15.3 Target Environment Specification

-n, --name	Name of environment.
-p, --prefix	Full path to environment location (i.e. prefix).

Example usage:

```
$ conda create -y -n my-python-env python=3
$ conda run -n my-python-env python --version
```

3.16 conda search

Search for packages and display associated information using the MatchSpec format. MatchSpec is a query language for conda packages.

```
usage: conda search [-h] [--envs] [-i] [--subdir SUBDIR] [-c CHANNEL]
                  [--use-local] [--override-channels]
                  [--repodata-fn REPODATA_FNS] [--experimental {jlap,lock}]
                  [-C] [-k] [--offline] [--json] [-v] [-q]
```

3.16.1 options

- envs** Search all of the current user's environments. If run as Administrator (on Windows) or UID 0 (on unix), search all known environments on the system.
- i, --info** Provide detailed information about each package.
- subdir, --platform** Search the given subdir. Should be formatted like 'osx-64', 'linux-32', 'win-64', and so on. The default is to search the current platform.

3.16.2 Channel Customization

- c, --channel** Additional channel to search for packages. These are URLs searched in the order they are given (including local directories using the 'file://' syntax or simply a path like '/home/conda/mychan' or './mychan'). Then, the defaults or channels from .condarc are searched (unless --override-channels is given). You can use 'defaults' to get the default packages for conda. You can also use any name and the .condarc channel_alias value will be prepended. The default channel_alias is <https://conda.anaconda.org/>.
- use-local** Use locally built packages. Identical to '-c local'.
- override-channels** Do not search default or .condarc channels. Requires --channel.
- repodata-fn** Specify file name of repodata on the remote server where your channels are configured or within local backups. Conda will try whatever you specify, but will ultimately fall back to repodata.json if your specs are not satisfiable with what you specify here. This is used to employ repodata that is smaller and reduced in time scope. You may pass this flag more than once. Leftmost entries are tried first, and the fallback to repodata.json is added for you automatically. For more information, see conda config --describe repodata_fns.
- experimental** Possible choices: jlap, lock
 jlap: Download incremental package index data from repodata.jlap; implies 'lock'.
 lock: use locking when reading, updating index (repodata.json) cache.

3.16.3 Networking Options

- C, --use-index-cache** Use cache of channel index files, even if it has expired. This is useful if you don't want conda to check whether a new version of the repodata file exists, which will save bandwidth.
- k, --insecure** Allow conda to perform "insecure" SSL connections and transfers. Equivalent to setting 'ssl_verify' to 'false'.
- offline** Offline mode. Don't connect to the Internet.

3.16.4 Output, Prompt, and Flow Control Options

- json** Report all output as json. Suitable for using conda programmatically.
- v, --verbose** Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.
- q, --quiet** Do not display progress bar.

Examples:

Search for a specific package named 'scikit-learn':

```
conda search scikit-learn
```

Search for packages containing 'scikit' in the package name:

```
conda search *scikit*
```

Note that your shell may expand '*' before handing the command over to conda. Therefore, it is sometimes necessary to use single or double quotes around the query:

```
conda search '*scikit'  
conda search "**scikit**"
```

Search for packages for 64-bit Linux (by default, packages for your current platform are shown):

```
conda search numpy[subdir=linux-64]
```

Search for a specific version of a package:

```
conda search 'numpy>=1.12'
```

Search for a package on a specific channel:

```
conda search conda-forge::numpy  
conda search 'numpy[channel=conda-forge, subdir=osx-64]'
```


3.17 conda update

Update conda packages to the latest compatible version.

This command accepts a list of package names and updates them to the latest versions that are compatible with all other packages in the environment.

Conda attempts to install the newest versions of the requested packages. To accomplish this, it may update some packages that are already installed, or install additional packages. To prevent existing packages from updating, use the `--no-update-deps` option. This may force conda to install older versions of the requested packages, and it does not prevent additional dependency packages from being installed.

```
usage: conda update [-h] [-n ENVIRONMENT | -p PATH] [-c CHANNEL] [--use-local]
                  [--override-channels] [--repodata-fn REPODATA_FNS]
                  [--experimental {jlap,lock}] [--strict-channel-priority]
                  [--no-channel-priority] [--no-deps | --only-deps]
                  [--no-pin] [--copy] [-C] [-k] [--offline] [--json] [-v]
                  [-q] [-d] [-y] [--download-only] [--show-channel-urls]
                  [--file FILE]
                  [--solver {classic} | --experimental-solver {classic}]
                  [--force-reinstall]
                  [--freeze-installed | --update-deps | -S | --update-all | --update-
↪ specs]
                  [--clobber]
                  [package_spec ...]
```

3.17.1 Positional Arguments

package_spec List of packages to install or update in the conda environment.

3.17.2 options

--file Read package versions from the given file. Repeated file specifications can be passed (e.g. `--file=file1 --file=file2`).

3.17.3 Target Environment Specification

-n, --name Name of environment.
-p, --prefix Full path to environment location (i.e. prefix).

3.17.4 Channel Customization

-c, --channel	Additional channel to search for packages. These are URLs searched in the order they are given (including local directories using the 'file://' syntax or simply a path like '/home/conda/mychan' or './mychan'). Then, the defaults or channels from .condarc are searched (unless --override-channels is given). You can use 'defaults' to get the default packages for conda. You can also use any name and the .condarc channel_alias value will be prepended. The default channel_alias is https://conda.anaconda.org/ .
--use-local	Use locally built packages. Identical to '-c local'.
--override-channels	Do not search default or .condarc channels. Requires --channel.
--repodata-fn	Specify file name of repodata on the remote server where your channels are configured or within local backups. Conda will try whatever you specify, but will ultimately fall back to repodata.json if your specs are not satisfiable with what you specify here. This is used to employ repodata that is smaller and reduced in time scope. You may pass this flag more than once. Leftmost entries are tried first, and the fallback to repodata.json is added for you automatically. For more information, see conda config --describe repodata_fns.
--experimental	Possible choices: jlap, lock jlap: Download incremental package index data from repodata.jlap; implies 'lock'. lock: use locking when reading, updating index (repodata.json) cache.

3.17.5 Solver Mode Modifiers

--strict-channel-priority	Packages in lower priority channels are not considered if a package with the same name appears in a higher priority channel.
--no-channel-priority	Package version takes precedence over channel priority. Overrides the value given by <i>conda config --show channel_priority</i> .
--no-deps	Do not install, update, remove, or change dependencies. This WILL lead to broken environments and inconsistent behavior. Use at your own risk.
--only-deps	Only install dependencies.
--no-pin	Ignore pinned file.
--solver	Possible choices: classic Choose which solver backend to use.
--experimental-solver	Possible choices: classic <i>--experimental-solver</i> is pending deprecation and will be removed in 24.3. Use <i>--solver</i> instead.
--force-reinstall	Ensure that any user-requested package for the current operation is uninstalled and reinstalled, even if that package already exists in the environment.
--freeze-installed, --no-update-deps	Do not update or change already-installed dependencies.
--update-deps	Update dependencies that have available updates.
-S, --satisfied-skip-solve	Exit early and do not run the solver if the requested specs are satisfied. Also skips aggressive updates as configured by the 'aggressive_update_packages' config setting. Use 'conda info --describe aggressive_update_packages' to view your setting. --satisfied-skip-solve is similar to the default behavior of 'pip install'.

- update-all, --all** Update all installed packages in the environment.
- update-specs** Update based on provided specifications.

3.17.6 Package Linking and Install-time Options

- copy** Install all packages using copies instead of hard- or soft-linking.
- clobber** Allow clobbering of overlapping file paths within packages, and suppress related warnings.

3.17.7 Networking Options

- C, --use-index-cache** Use cache of channel index files, even if it has expired. This is useful if you don't want conda to check whether a new version of the repodata file exists, which will save bandwidth.
- k, --insecure** Allow conda to perform "insecure" SSL connections and transfers. Equivalent to setting 'ssl_verify' to 'false'.
- offline** Offline mode. Don't connect to the Internet.

3.17.8 Output, Prompt, and Flow Control Options

- json** Report all output as json. Suitable for using conda programmatically.
- v, --verbose** Can be used multiple times. Once for INFO, twice for DEBUG, three times for TRACE.
- q, --quiet** Do not display progress bar.
- d, --dry-run** Only display what would have been done.
- y, --yes** Sets any confirmation values to 'yes' automatically. Users will not be asked to confirm any adding, deleting, backups, etc.
- download-only** Solve an environment and ensure package caches are populated, but exit prior to unlinking and linking packages into the prefix.
- show-channel-urls** Show channel urls. Overrides the value given by `conda config --show show_channel_urls`.

Examples:

```
conda update -n myenv scipy
```

3.18 Conda vs. pip vs. virtualenv commands

If you have used pip and virtualenv in the past, you can use conda to perform all of the same operations. Pip is a package manager and virtualenv is an environment manager. conda is both.

Scroll to the right to see the entire table.

Task	Conda package and environment manager command	Pip package manager command	Virtualenv environment manager command
Install a package	<code>conda install \$PACKAGE_NAME</code>	<code>pip install \$PACKAGE_NAME</code>	X
Update a package	<code>conda update --name \$ENVIRONMENT_NAME \$PACKAGE_NAME</code>	<code>pip install --upgrade \$PACKAGE_NAME</code>	X
Update package manager	<code>conda update conda</code>	Linux/macOS: <code>pip install -U pip</code> Win: <code>python -m pip install -U pip</code>	X
Uninstall a package	<code>conda remove --name \$ENVIRONMENT_NAME \$PACKAGE_NAME</code>	<code>pip uninstall \$PACKAGE_NAME</code>	X
Create an environment	<code>conda create --name \$ENVIRONMENT_NAME python</code>	X	<code>cd \$ENV_BASE_DIR;</code> <code>virtualenv \$ENVIRONMENT_NAME</code>
Activate an environment	<code>conda activate \$ENVIRONMENT_NAME*</code>	X	<code>source \$ENV_BASE_DIR/\$ENVIRONMENT_NAME/bin/activate</code>
Deactivate an environment	<code>conda deactivate</code>	X	<code>deactivate</code>
Search available packages	<code>conda search \$SEARCH_TERM</code>	<code>pip search \$SEARCH_TERM</code>	X
Install package from specific source	<code>conda install --channel \$URL \$PACKAGE_NAME</code>	<code>pip install --index-url \$URL \$PACKAGE_NAME</code>	X
List installed packages	<code>conda list --name \$ENVIRONMENT_NAME</code>	<code>pip list</code>	X
Create requirements file	<code>conda list --export</code>	<code>pip freeze</code>	X
List all environments	<code>conda info --envs</code>	X	Install virtualenv wrapper, then <code>lsvirtualenv</code>
Install other package manager	<code>conda install pip</code>	<code>pip install conda</code>	X
Install Python	<code>conda install python=x.x</code>	X	X
Update Python	<code>conda update python*</code>	X	X

* `conda activate` only works on conda 4.6 and later versions. For conda versions prior to 4.6, type:

- Windows: `activate`
- Linux and macOS: `source activate`

* `conda update python` updates to the most recent in the series, so any Python 2.x would update to the latest 2.x and any Python 3.x to the latest 3.x.

GLOSSARY

- *.condarc*
- *Activate/Deactivate environment*
- *Anaconda*
- *Anaconda.org*
- *Anaconda Navigator*
- *Channels*
- *conda*
- *conda environment*
- *conda package*
- *conda repository*
- *Metapackage*
- *Miniconda*
- *Noarch package*
- *Package manager*
- *Packages*
- *Plugins*
- *Repository*
- *Silent mode installation*

4.1 .condarc

The Conda Runtime Configuration file, an optional `.yaml` file that allows you to configure many aspects of conda, such as which channels it searches for packages, proxy settings, and environment directories. A `.condarc` file is not included by default, but it is automatically created in your home directory when you use the `conda config` command. The `.condarc` file can also be located in a root environment, in which case it overrides any `.condarc` in the home directory. For more information, see *Using the .condarc conda configuration file* and *Administering a multi-user conda installation*. Pronounced "conda r-c".

4.2 Activate/Deactivate environment

Conda commands used to switch or move between installed environments. The `conda activate` command prepends the path of your current environment to the `PATH` environment variable so that you do not need to type it each time. `deactivate` removes it. Even when an environment is deactivated, you can still execute programs in that environment by specifying their paths directly, as in `~/anaconda/envs/envname/bin/program_name`. When an environment is activated, you can execute the program in that environment with just `program_name`.

Note: Replace `envname` with the name of the environment and replace `program_name` with the name of the program.

4.3 Anaconda

A downloadable, free, open-source, high-performance, and optimized Python and R distribution. Anaconda includes [conda](#), `conda-build`, Python, and 250+ automatically installed, open-source scientific packages and their dependencies that have been tested to work well together, including SciPy, NumPy, and many others. Use the `conda install` command to easily install 7,500+ popular open-source packages for data science--including advanced and scientific analytics--from the Anaconda repository. Use the `conda` command to install thousands more open-source packages.

Because Anaconda is a Python distribution, it can make installing Python quick and easy even for new users.

Available for Windows, macOS, and Linux, all versions of Anaconda are supported by the community.

See also [Miniconda](#) and [conda](#).

4.4 Anaconda.org

A web-based, repository hosting service in the cloud. Packages created locally can be published to the cloud to be shared with others. [Anaconda.org](#) is a public version of Anaconda Repository and was formerly known as Anaconda Cloud.

4.5 Anaconda Navigator

A desktop graphical user interface (GUI) included in all versions of Anaconda that allows you to easily manage conda packages, environments, channels, and notebooks without a command line interface (CLI). See more about [Navigator](#).

4.6 Channels

The locations of the repositories where conda looks for packages. Channels may point to a Cloud repository or a private location on a remote or local repository that you or your organization created. The `conda channel` command has a default set of channels to search, beginning with <https://repo.anaconda.com/pkg/>, which you may override, for example, to maintain a private or internal channel. These default channels are referred to in conda commands and in the `.condarc` file by the channel name "defaults."

4.7 conda

The package and environment manager program bundled with Anaconda that installs and updates conda packages and their dependencies. Conda also lets you easily switch between conda environments on your local computer.

4.8 conda environment

A folder or directory that contains a specific collection of conda packages and their dependencies, so they can be maintained and run separately without interference from each other. For example, you may use a conda environment for only Python 2 and Python 2 packages, maintain another conda environment with only Python 3 and Python 3 packages, and maintain another for R language packages. Environments can be created from:

- The Navigator GUI
- The command line
- An environment specification file with the name `your-environment-name.yml`

4.9 conda package

A compressed file that contains everything that a software program needs in order to be installed and run, so that you do not have to manually find and install each dependency separately. A conda package includes system-level libraries, Python or R language modules, executable programs, and other components. You manage conda packages with conda.

4.10 conda repository

A cloud-based repository that contains 7,500+ open-source certified packages that are easily installed locally with the `conda install` command. Anyone can access the repository from:

- The Navigator GUI
- A terminal or Anaconda Prompt using conda commands
- <https://repo.anaconda.com/pkg/>

4.11 Metapackage

A metapackage is a very simple package that has at least a name and a version. It need not have any dependencies or build steps. *Metapackages* may list dependencies to several core, low-level libraries and may contain links to software files that are automatically downloaded when executed.

4.12 Miniconda

A free minimal installer for conda. [Miniconda](#) is a small, bootstrap version of Anaconda that includes only conda, Python, the packages they depend on, and a small number of other useful packages, including pip, zlib, and a few others. Use the `conda install` command to install 7,500+ additional conda packages from the Anaconda repository.

Miniconda is a Python distribution that can make installing Python quick and easy even for new users.

See also [Anaconda](#) and [conda](#).

4.13 Noarch package

A conda package that contains nothing specific to any system architecture, so it may be installed from any system. When conda searches for packages on any system in a channel, conda checks both the system-specific subdirectory, such as `linux-64`, and the `noarch` directory. Noarch is a contraction of "no architecture".

4.14 Package manager

A collection of software tools that automates the process of installing, updating, configuring, and removing computer programs for a computer's operating system. Also known as a package management system. Conda is a package manager.

4.15 Packages

Software files and information about the software, such as its name, the specific version, and a description, bundled into a file that can be installed and managed by a package manager.

4.16 Plugins

Plugins, sometimes referred to as add-ons or extensions, are software or modules that add new functions to a host program (*e.g.*, conda) without directly altering the host program itself. Amongst other uses, plugins support is utilized to enable third-party developers to extend an application, support easily adding new features, and to reduce the size of an application by not loading unused features.

4.17 Repository

Any storage location from which software assets may be retrieved and installed on a local computer. See also [Anaconda.org](#) and [conda repository](#).

4.18 Silent mode installation

When installing Miniconda or Anaconda in silent mode, screen prompts are not shown on screen and default settings are automatically accepted.

DEVELOPER GUIDE

5.1 Architecture

Conda is a complex system of many components and can be hard to understand for users and developers alike. The following [C4 model](#) based architecture diagrams should help in that regard. As a refresher, the C4 model tries to visualize complex software systems at different levels of detail, and explaining the functionality to different types of audience.

Note: These diagrams represent the state of conda at the time when the documentation was automatically build as part of the development process for conda 23.7.4.dev7 (Sep 12, 2023).

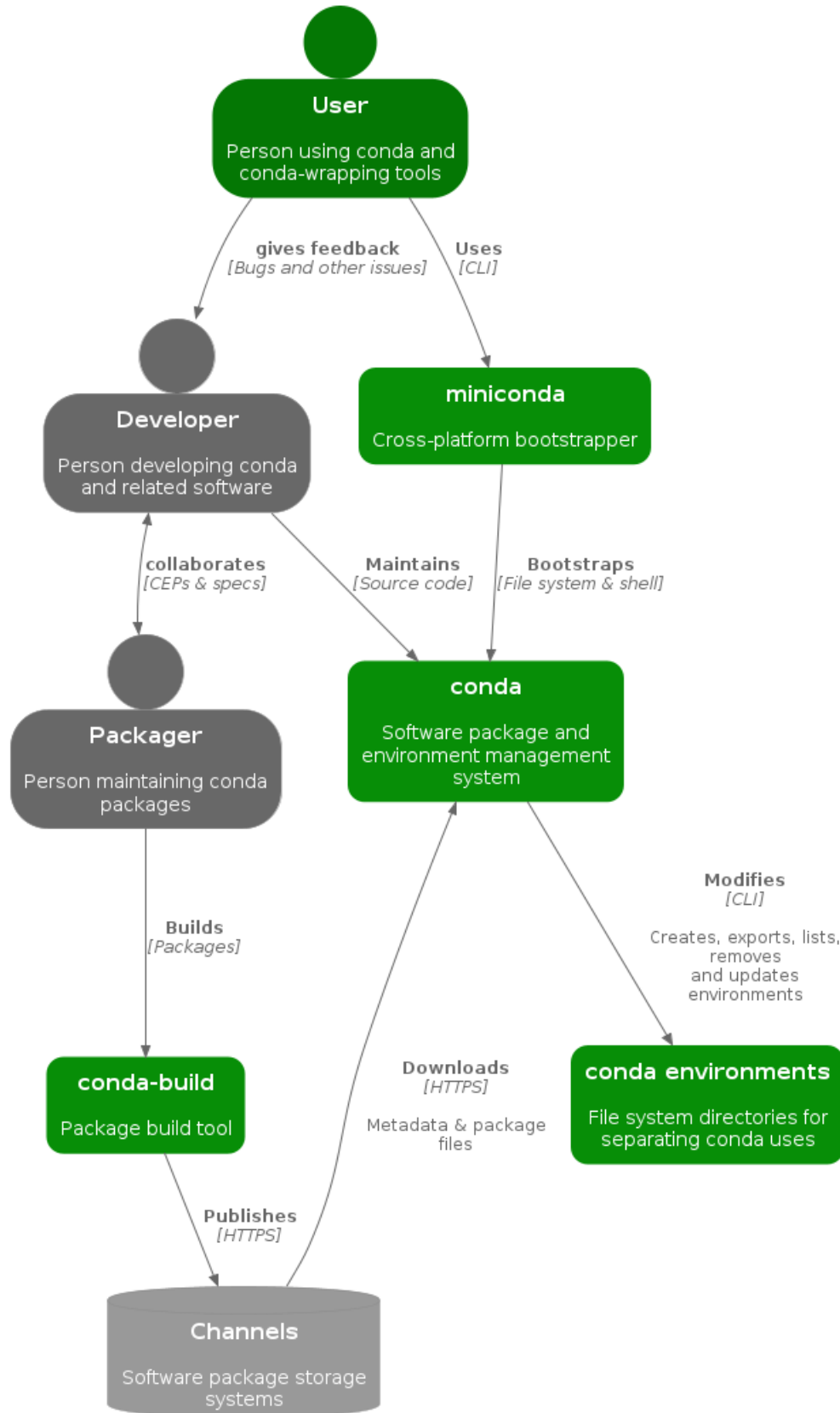
C4 stands for the for levels:

1. *Context*
2. *Container*
3. *Component*
4. *Code*

5.1.1 Level 1: Context

This is the overview, 30,000 feet view on conda, to better understand how conda in the center of the diagram interacts with other systems and how users relate to it.

More information about how to interpret this diagram can be found in the [C4 model](#) documentation about the [System Context diagram](#).



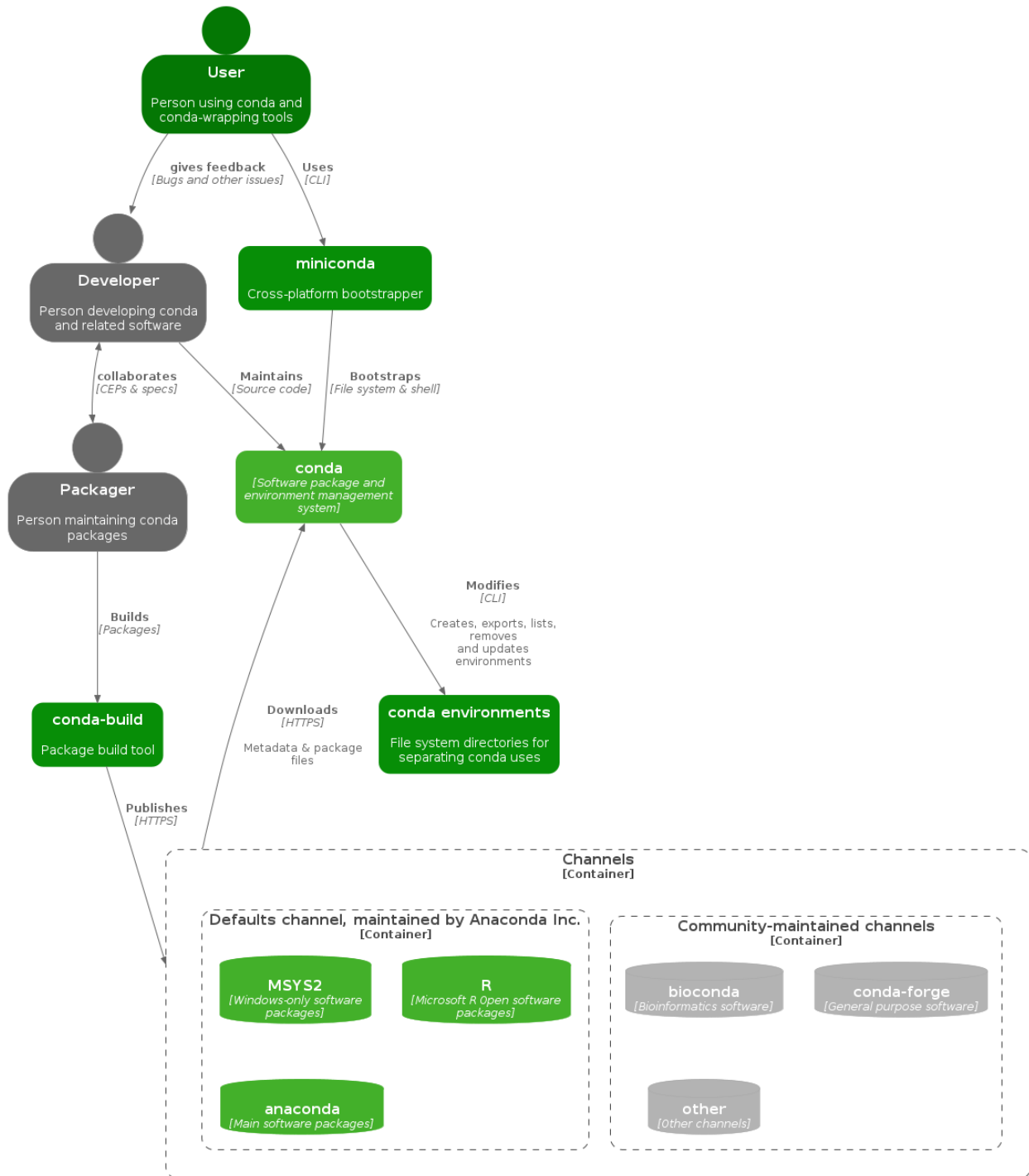
5.1.2 Level 2: Container

This level is zooming in to conda on a system level, which was in the center of the Level 1 diagram, to show the high-level shape of the software architecture of and the various responsibilities in conda, including major technology choices and communication patterns between the various containers.

More information about how to interpret the following diagrams can be found in the [C4 model](#) documentation about the [Container diagram](#).

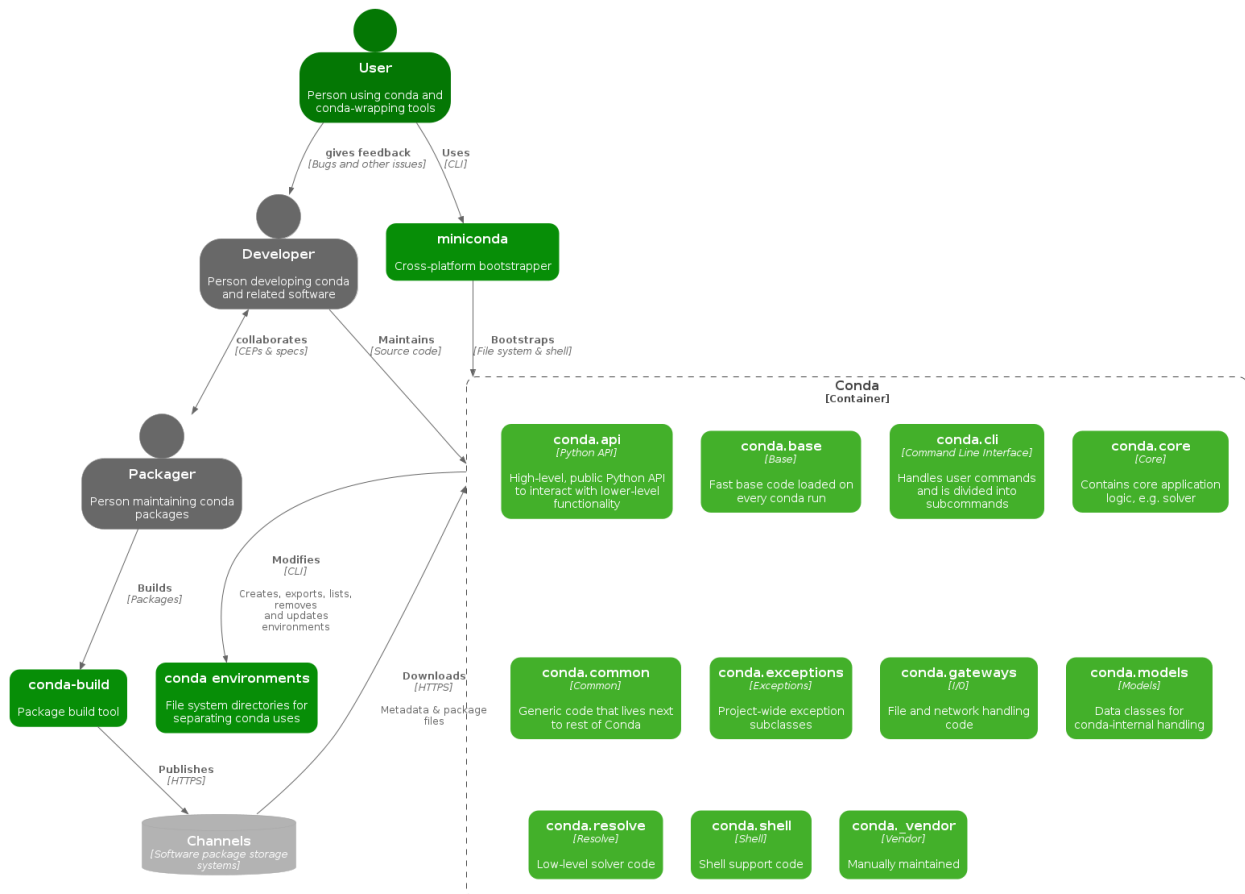
Channels

The following diagram focuses on the channels container from the level 1 diagram.



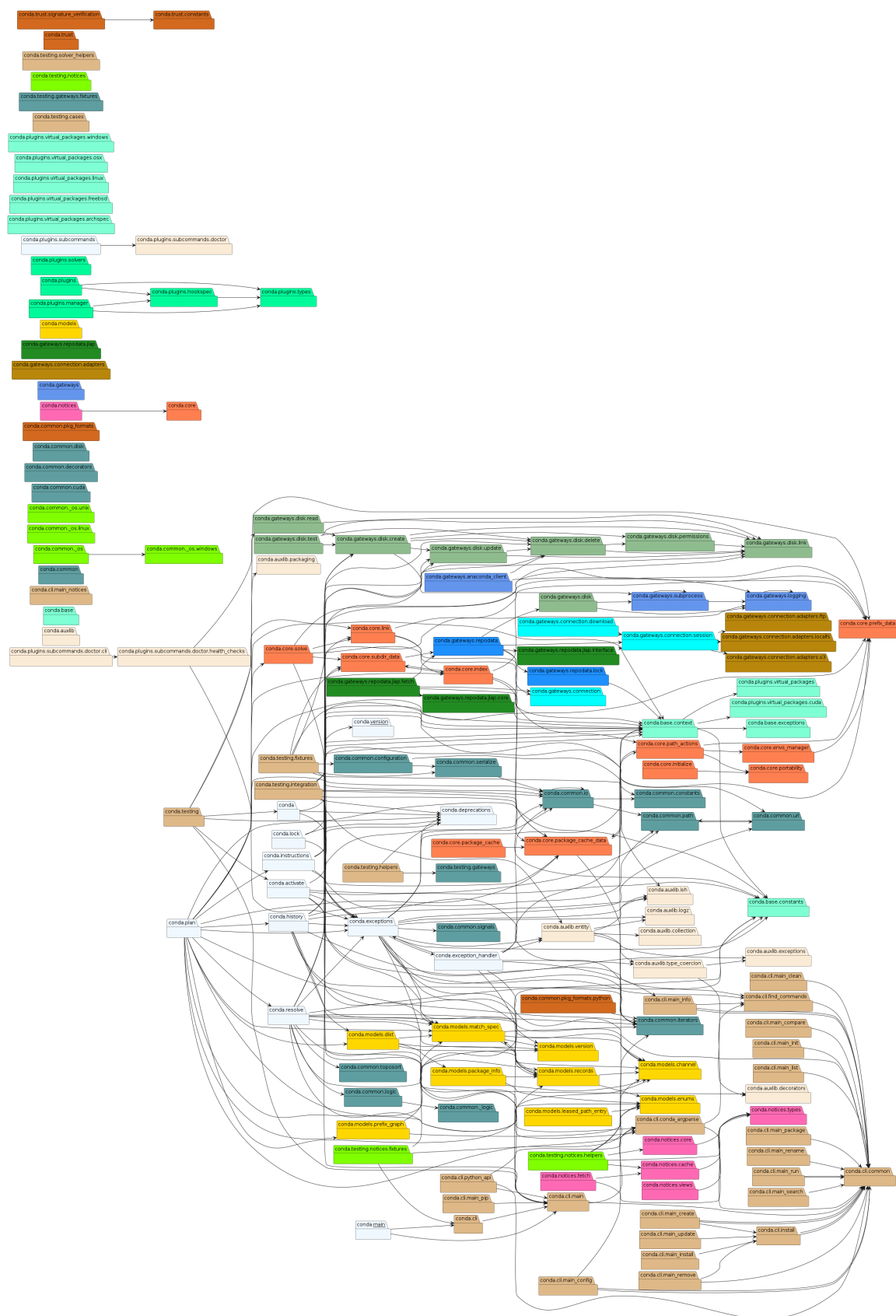
Conda

The following diagram focuses on the conda container from the level 1 diagram.



5.1.3 Level 3: Component

Yet another zoom-in, in which individual containers from Level 2 are decomposed to show major building blocks in conda and their interactions. Those building blocks are called components in the sense that they each have a higher function and relate to an identifiable responsibility and implementation details.

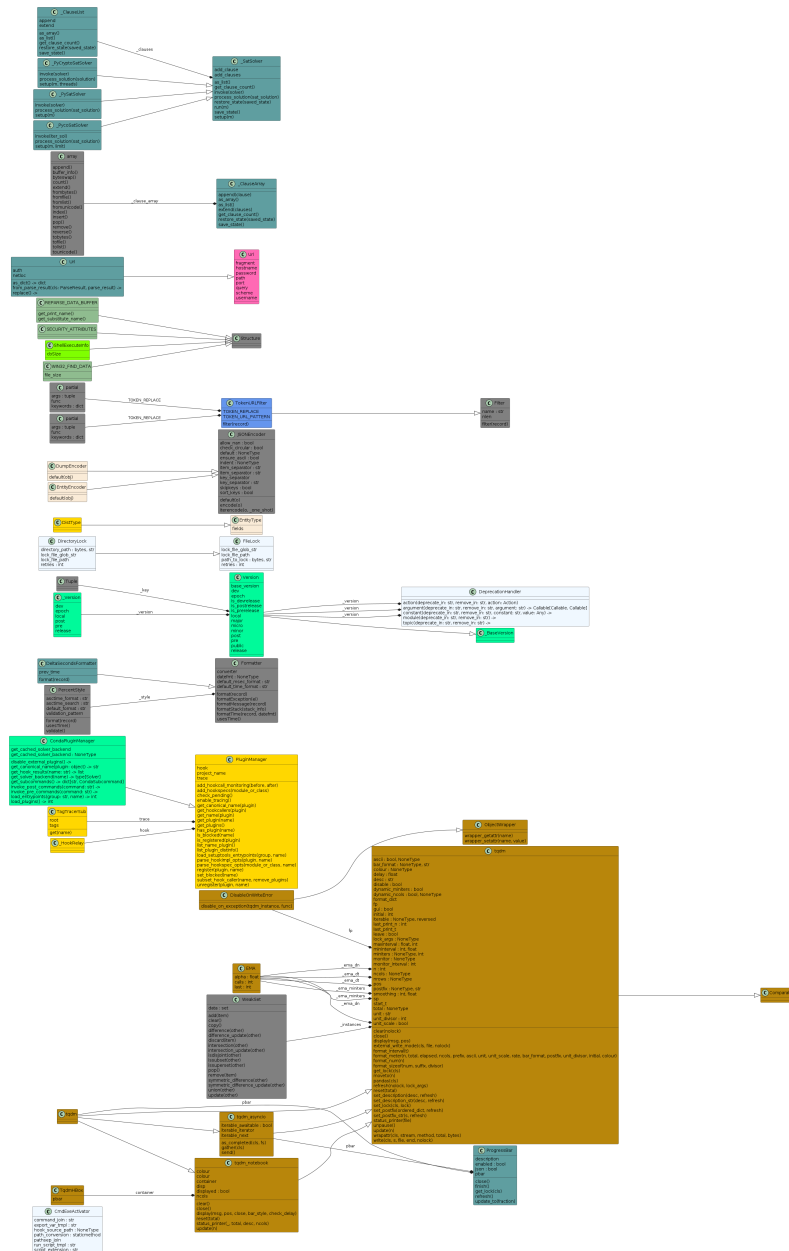


More information about how to interpret this diagram can be found in the [C4 model](#) documentation about the [Component diagram](#).

5.1.4 Level 4: Code

This part is auto-generated based on the current code and shows how the code is structured and how it interacts. For brevity this ignores a number of subsystems like the public API and exports modules, utility and vendor packages.

More information about how to interpret this diagram can be found in the [C4 model](#) documentation about the [Code diagram](#).



5.2 Contributing to Conda

Thank you for your interest in improving conda! Below, we describe how our development process works and how you can be a part of it.

Already know how to contribute and need help setting up your development environment? [Read the development environment guide here](#)

5.2.1 Hosted on GitHub

All development currently takes place on [GitHub](#). This means we make extensive use of the project management tools they provide such as [issues](#) and [projects](#).

5.2.2 Code of Conduct

When you decide to contribute to this project, it is important to adhere to our code of conduct, which is currently the [NumFOCUS Code of Conduct](#). Please read it carefully.

5.2.3 Conda Contributor License Agreement

To begin contributing to this repository, you need to sign the Conda Contributor License Agreement (CLA). In case you're new to CLAs, this is a rather standard procedure for larger projects. [Django](#) and [Python](#) for example both use similar agreements.

[Click here to sign the Conda Contributor License Agreement.](#)

A record of prior signatories is kept in a [separate repo in conda's GitHub](#) organization.

5.2.4 Ways to contribute

Below are all the ways you can get involved in with conda.

Bug reports and feature requests

Bug reports and feature requests are always welcome. To file a new issue, [head to the issue form](#).

It should be noted that `conda-build` issues need to be filed separately at [its issue tracker](#).

For all other types of issues, please head to [Anaconda.org's "Report a Bug" page](#). For even more information and documentation on everything related to Anaconda, head to the [Support Center at Anaconda Nucleus](#).

Before submitting an issue via any of these channels, make sure to document it as well as possible and follow the submission guidelines (this makes everyone's job a lot easier!).

Contributing your changes to conda

Here are the steps you need to take to contribute to conda:

1. [Signup for a GitHub account](#) (if you haven't already) and [install Git on your system](#).
2. Sign the [Conda Contributor License Agreement](#).
3. Fork the conda repository to your personal GitHub account by clicking the “Fork” button on <https://github.com/conda/conda> and follow GitHub's instructions.
4. Work on your proposed solution. *[Visit this page if you need help getting your development environment setup](#)*
5. When you are ready to submit a change, create a new pull request so that we can merge your changes to our repository.

Issue sorting

Issue sorting is how we filter incoming issues and get them ready for active development. To see how this process works for this project, read “[The Issue Sorting Process at conda](#)”.

The project maintainers are currently not seeking help with issue sorting, but this may change in the future

5.2.5 Conda capitalization standards

1. Conda should be written in lowercase, whether in reference to the tool, ecosystem, packages, or organization.
2. References to the conda command should use code formatting (i.e. `conda`).
3. If the use of conda is not a command and if conda is at the beginning of a sentence, conda should be uppercase.

Examples

In sentences

Beginning a sentence:

- Conda is an open-source package and environment management system.
- `conda install` can be used to install packages.

Conda in the middle of a sentence:

- If a newer version of conda is available, you can use `conda update conda` to update to that version.
- You can find conda packages within conda channels. The `conda` command can search these channels.

In titles and headers

Titles and headers should use the same capitalization and formatting standards as sentences.

In links

Links should use the same capitalization conventions as sentences. Because the conda docs currently use reStructuredText (RST) as a markup language, and RST does not support nested inline markup, documentation writers should avoid using code backtick formatting inside links.

5.3 Development Environment

1. Clone the repo you just forked on GitHub to your local machine. Configure your repo to point to both “upstream” (the main conda repo) and your fork (“origin”). For detailed directions, see below:

Bash (macOS, Linux, Windows)

```
# choose the repository location
# warning: not the location of an existing conda installation!
$ CONDA_PROJECT_ROOT="$HOME/conda"

# clone the project
# replace `your-username` with your actual GitHub username
$ git clone git@github.com:your-username/conda "$CONDA_PROJECT_ROOT"
$ cd "$CONDA_PROJECT_ROOT"

# set the `upstream` as the the main repository
$ git remote add upstream git@github.com:conda/conda
```

cmd.exe (Windows)

```
# choose the repository location
# warning: not the location of an existing conda installation!
> set "CONDA_PROJECT_ROOT=%HOMEPATH%\conda"

# clone the project
# replace `your-username` with your actual GitHub username
> git clone git@github.com:your-username/conda "%CONDA_PROJECT_ROOT%"
> cd "%CONDA_PROJECT_ROOT%"

# set the `upstream` as the main repository
> git remote add upstream git@github.com:conda/conda
```

2. One option is to create a local development environment and activate that environment

Bash (macOS, Linux, Windows)

```
$ source ./dev/start
```

cmd.exe (Windows)

```
> .\dev\start.bat
```

This command will create a project-specific base environment (see devenv in your repo directory after running this command). If the base environment already exists this command will simply activate the already-created devenv environment.

To be sure that the conda code being interpreted is the code in the project directory, look at the value of `conda location`: in the output of `conda info --all`.

3. Alternatively, for Linux development only, you can use the same Docker image the CI pipelines use. Note that you can run this from all three operating systems! We are using `docker compose`, which provides three actions for you:

- `unit-tests`: Run all unit tests.
- `integration-tests`: Run all integration tests.
- `interactive`: You are dropped in a pre-initialized Bash session, where you can run all your `pytest` commands as required.

Use them with `docker compose run <action>`. For example:

Any shell (macOS, Linux, Windows)

```
$ docker compose run unit-tests
```

This builds the same Docker image as used in continuous integration from the [Github Container Registry](#) and starts `bash` with the conda development mode already enabled.

By default, it will use Miniconda-based, Python 3.9 installation configured for the `defaults` channel. You can customize this with two environment variables:

- `CONDA_DOCKER_PYTHON`: `major.minor` value; e.g. `3.11`.
- `CONDA_DOCKER_DEFAULT_CHANNEL`: either `defaults` or `conda-forge`

For example, if you need a conda-forge based 3.11 image:

Bash (macOS, Linux, Windows)

```
$ CONDA_DOCKER_PYTHON=3.11 CONDA_DOCKER_DEFAULT_CHANNEL=conda-forge docker compose_
↪ build --no-cache
# --- in some systems you might also need to re-supply the same values as CLI flags:
# CONDA_DOCKER_PYTHON=3.11 CONDA_DOCKER_DEFAULT_CHANNEL=conda-forge docker compose_
↪ build --no-cache --build-arg python_version=3.11 --build-arg default_
↪ channel=conda-forge
$ CONDA_DOCKER_PYTHON=3.11 CONDA_DOCKER_DEFAULT_CHANNEL=conda-forge docker compose_
↪ run interactive
```

cmd.exe (Windows)

```
> set CONDA_DOCKER_PYTHON=3.11
> set CONDA_DOCKER_DEFAULT_CHANNEL=conda-forge
> docker compose build --no-cache
> docker compose run interactive
> set "CONDA_DOCKER_PYTHON="
> set "CONDA_DOCKER_DEFAULT_CHANNEL="
```

The conda repository will be mounted to `/opt/conda-src`, so all changes done in your editor will be reflected live while the Docker container is running.

5.3.1 Static Code Analysis

This project is configured with `pre-commit` to automatically run linting and other static code analysis on every commit. Running these tools prior to the PR/code review process helps in two ways:

1. it helps *you* by automating the nitpicky process of identifying and correcting code style/quality issues
2. it helps *us* where during code review we can focus on the substance of your contribution

Feel free to read up on everything `pre-commit` related in their [docs](#) but we've included the gist of what you need to get started below:

Bash (macOS, Linux, Windows)

```
# reuse the development environment created above
$ source ./dev/start
# or start the Docker image in interactive mode
# $ docker compose run interactive

# install pre-commit hooks for conda
$ cd "$CONDA_PROJECT_ROOT"
$ pre-commit install

# manually running pre-commit on current changes
# note: by default pre-commit only runs on staged files
$ pre-commit run

# automatically running pre-commit during commit
$ git commit
```

cmd.exe (Windows)

```
:: reuse the development environment created above
> .\dev\start.bat
:: or start the Docker image in interactive mode
:: > docker compose run interactive

:: install pre-commit hooks for conda
> cd "%CONDA_PROJECT_ROOT%"
> pre-commit install

:: manually running pre-commit on current changes
:: note: by default pre-commit only runs on staged files
> pre-commit run

:: automatically running pre-commit during commit
> git commit
```

Beware that some of the tools run by `pre-commit` can potentially modify the code (see [black](#), [blacken-docs](#), and [darker](#)). If `pre-commit` detects that any files were modified it will terminate the commit giving you the opportunity to review the code before committing again.

Strictly speaking using `pre-commit` on your local machine for commits is optional (if you don't install `pre-commit` you will still be able to commit normally). But once you open a PR to contribute your changes, `pre-commit` will be automatically run at which point any errors that occur will need to be addressed prior to proceeding.

5.3.2 Testing

We use pytest to run our test suite. Please consult [pytest's docs](#) for detailed instructions but generally speaking all you need is the following:

Bash (macOS, Linux, Windows)

```
# reuse the development environment created above
$ source ./dev/start
# or start the Docker image in interactive mode
# $ docker compose run interactive

# run conda's unit tests using GNU make
$ make unit

# or alternately with pytest
$ pytest --cov -m "not integration" conda tests

# or you can use pytest to focus on one specific test
$ pytest --cov tests/test_create.py -k create_install_update_remove_smoketest
```

cmd.exe (Windows)

```
:: reuse the development environment created above
> .\dev\start.bat
:: or start the Docker image in interactive mode
:: > docker compose run interactive

:: run conda's unit tests with pytest
> pytest --cov -m "not integration" conda tests

:: or you can use pytest to focus on one specific test
> pytest --cov tests\test_create.py -k create_install_update_remove_smoketest
```

If you are not measuring code coverage, pytest can be run without the `--cov` option. The `docker compose tests pass --cov`.

Note: Some integration tests require you build a package with `conda-build` beforehand. This is taking care of if you run `docker compose run integration-tests`, but you need to do it manually in other modes:

Bash (macOS, Linux, Windows)

```
$ conda install conda-build
$ conda-build tests/test-recipes/activate_deactivate_package tests/test-recipes/pre_link_
  ↳ messages_package
```

Check `dev/linux/integration.sh` and `dev\windows\integration.bat` for more details.

5.4 Deep dives

This section contains a series of deep dives into particularly complex parts of conda.

5.4.1 conda install

In this document we will explore what happens in Conda from the moment a user types their installation command until the process is finished successfully. For the sake of completeness, we will consider the following situation:

- The user is running commands on a Linux x64 machine with a working installation of Miniconda.
- This means we have a base environment with `conda`, `python`, and their dependencies.
- The base environment is already preactivated for Bash. For more details on activation, check [*conda init and conda activate*](#).

Ok, so... what happens when you run `conda install numpy`? Roughly, these steps:

1. Command line interface
 - `argparse` parsers
 - Environment variables
 - Configuration files
 - Context initialization
 - Delegation of the task
2. Fetching the index
 - Retrieving all the channels and platforms
 - A note on channel priorities
3. Solving the install request
 - Requested packages + prefix state = list of specs
 - Index reduction (sometimes)
 - Running the solver
 - Post-processing the list of packages
4. Generating the transaction and the corresponding actions
5. Download and extraction
6. Integrity verification
7. Linking and unlinking files
8. Post-linking and post-activation tasks

What happens when you type `conda install ...` ?

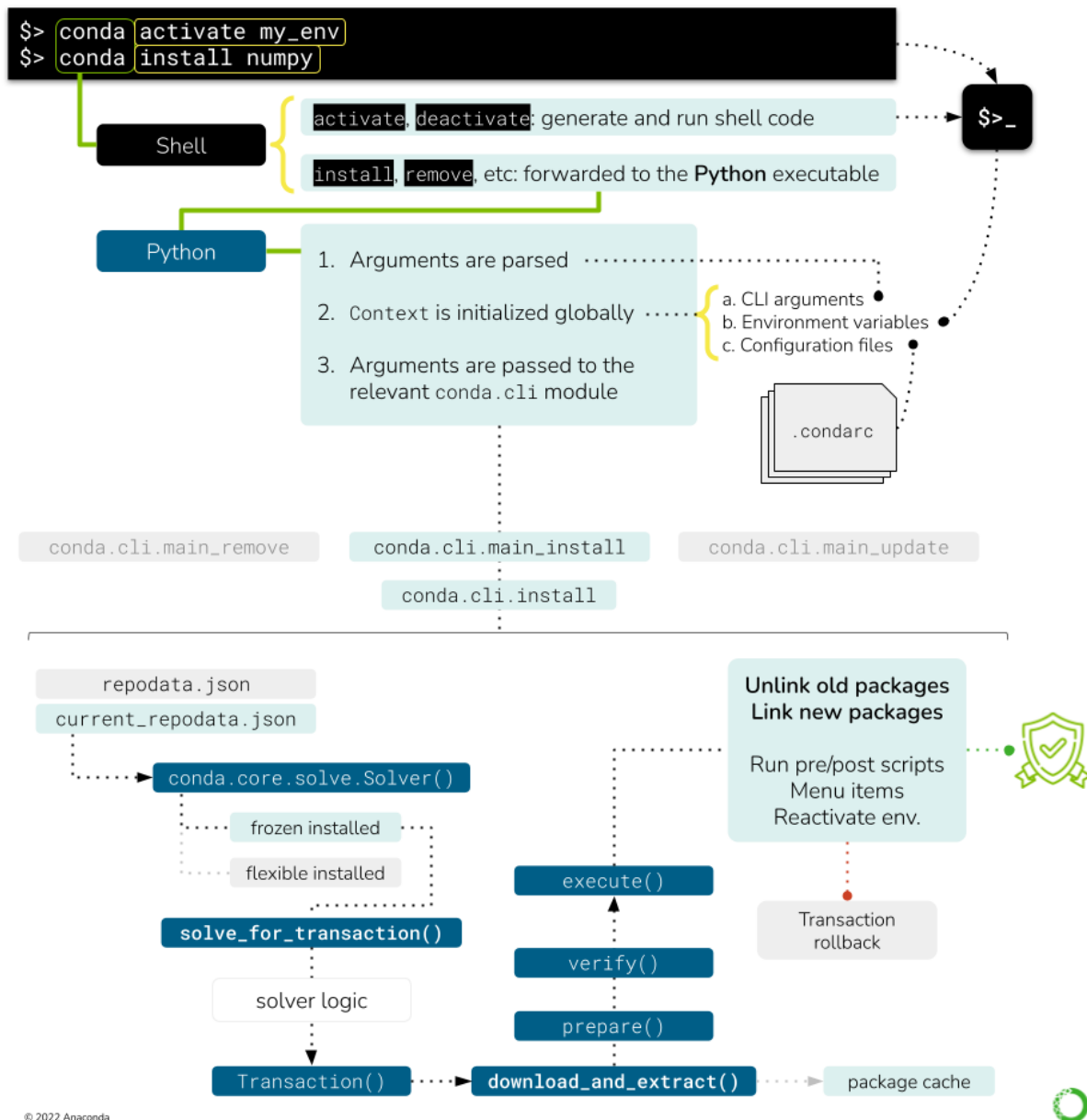


Fig. 1: This figure shows the different processes and objects involved in handling a simple `conda install` command.

Command line interface

First, a quick note on an implementation detail that might be not obvious.

When you type `conda install numpy` in your terminal, Bash takes those three words and looks for a `conda` command to pass a list of arguments `['conda', 'install', 'numpy']`. Before finding the `conda` executable located at `CONDA_HOME/condabin`, it probably finds the shell function defined [here](#). This shell function runs the activation/deactivation logic on the shell if requested, or delegates over to the actual Python entry-points otherwise. This part of the logic can be found in `conda.shell`.

Once we are running the Python entry-point, we are in the `conda.cli` realm. The function called by the entry point is `conda.cli.main:main()`. Here, another check is done for `shell.*` subcommands, which generate the shell initializers you see in `~/.bashrc` and others. If you are curious where this happens, it's `conda.activate`.

Since our command is `conda install ...`, we still need to arrive somewhere else. You will notice that the rest of the logic is delegated to `conda.cli.main:_main()`, which will invoke the parser generators, initialize the context and loggers, and, eventually, pass the argument list over to the corresponding command function. These four steps are implemented in four functions/classes:

1. `conda.cli.conda_argparse:generate_parser()`: This uses `argparse` to generate the CLI. Each subcommand is initialized in separate functions. Note that the command line options are not generated dynamically from the `Context` object, but annotated manually. If this is needed (e.g. `--repodata-fn` is exposed in `Context.repodata_fn`), the dest variable of each CLI option should [match the target attribute in the context object](#).
2. `conda.base.context.Context`: This object stores the configuration options in `conda` and will be initialized taking into account, among other things, the arguments parsed in the step above. This is covered in more detail in a separate deep dive: [conda config and context](#).
3. `conda.gateways.logging:initialize_logging()`: Not too exciting and easy to follow. This part of the code base is more or less self-explanatory.
4. `conda.cli.conda_argparse:do_call()`: The argument parsing will populate a `func` value that contains the import path to the function responsible for that subcommand. For example, `conda install` is [taken care of](#) by `conda.cli.main_install`. By design, all the modules reported by `func` must contain an `execute()` function that implements the command logic. `execute()` takes the parsed arguments and the parser itself as arguments. For example, in the case of `conda install`, `execute()` only [redirects](#) to a certain mode in `conda.cli.install:install()`.

Let's go take a look at that module now. `conda.cli.install:install()` implements the logic behind `conda create`, `conda install`, `conda update` and `conda remove`. In essence, they all deal with the same task: changing which packages are present in an environment. If you go and read that function, you will see there are several lines of code handling diverse situations (new environments, clones, etc.) before we arrive to the next section. We will not discuss them here, but feel free to explore [that section](#). It's mostly ensuring that the destination prefix exists, whether we are creating a new environment and massaging some command line flags that would allow us to skip the solver (e.g. `--clone`).

More information on environments

Check the concepts for [Conda environments](#).

Fetching the index

At this point, we are ready to start doing some work! All of the previous code was telling us what to do, and now we know. We want conda to *install* numpy on our base environment. The first thing we need to know is where we can find packages with the name numpy. The answer is... the channels!

Users download packages from conda channels. These are normally hosted at `anaconda.org`. A channel is essentially a directory structure with these elements:

```
<channel>
├── channeldata.json
├── index.html
├── <platform> (e.g. linux-64)
│   ├── current_repodata.json
│   ├── current_repodata.json.bz2
│   ├── index.html
│   ├── repodata.json
│   ├── repodata.json.bz2
│   ├── repodata_from_packages.json
│   └── repodata_from_packages.json.bz2
└── noarch
    ├── current_repodata.json
    ├── current_repodata.json.bz2
    ├── index.html
    ├── repodata.json
    ├── repodata.json.bz2
    ├── repodata_from_packages.json
    └── repodata_from_packages.json.bz2
```

More info on Channels

You can find some more user-oriented notes on Channels at [What is a "conda channel"?](#) and [Repository structure and index](#). If you are interested in more technical details, check the corresponding [documentation pages at conda-build](#).

The important bits are:

- A channel contains one or more platform-specific directories (`linux-64`, `osx-64`, etc.), plus a platform-agnostic directory called `noarch`. In conda jargon, these are also referred to as channel *subdirs*. Officially, the `noarch` subdirectory is enough to make it a conda channel; e.g. no platform subdirectory is necessary.
- Each *subdir* contains at least a `repodata.json` file: a gigantic dictionary with *all* the metadata for each package available on that platform.
- In most cases, the same subdirs also contain the `*.tar.bz2` files for each of the published packages. This is what conda downloads and extracts once solving is complete. The anatomy of these files is well defined, both in content and naming structure. See [What is a conda package?](#), [Package metadata](#) and/or [Package naming conventions](#) for more details.

Additionally, the channel's main directory might contain a `channeldata.json` file, with channel-wide metadata (this is not specific per platform). Not all channels include this, and in general it is not currently something that is commonly utilized.

Since conda's philosophy is to keep all packages ever published around for reproducibility, `repodata.json` is always growing, which presents a problem both for the download itself and the solver engine. To reduce download times and bandwidth usage, `repodata.json` is also served as a BZIP2 compressed file, `repodata.json.bz2`. This is what most conda clients end up downloading.

Note on ‘current_repodata.json’

More *repodatas* variations can be found in some channels, but they are always reduced versions of the main one for the sake of performance. For example, `current_repodata.json` only contains the most recent version of each package, plus their dependencies. The rationale behind this optimization trick can be found [here](#).

So, in essence, fetching the channel information means it can be expressed in pseudo-code like this:

```
platform = {}
noarch = {}
for channel in reversed(context.channels):
    platform_repodata = fetch_extract_and_read(
        channel.full_url / context.subdir / "repodata.json.bz2"
    )
    platform.update(platform_repodata)
    noarch_repodata = fetch_extract_and_read(
        channel.full_url / "noarch" / "repodata.json.bz2"
    )
    noarch.update(noarch_repodata)
```

Note that these dictionaries are keyed by *filename*, so higher priority channels will overwrite entries with the exact same filename (e.g. `numpy-1.19-py36h87ha43_0.tar.bz2`). If they don't have the same *filename* (e.g., same version and build number but different hash), this ambiguity will be resolved later in the solver, taking into account the channel priority mode.

In this example, `context.channels` has been populated through different, cascading mechanisms:

- The default settings as found in `~/condarc` or equivalent.
- The `CONDA_CHANNELS` environment variable (rare usage).
- The command-line flags, such as `-c <channel>`, `--use-local` or `--override-channels`.
- The channels present in a command-line *spec*. Remember that users can say `channel : numpy` instead of simply `numpy` to require that numpy comes from that specific channel. That means that the repodata for such channel needs to be fetched, too!

The items in `context.channels` are supposed to be `conda.models.channels.Channel` objects, but the Solver API also allows strings that refer to their name, alias or full URL. In that case, you can use `Channel` objects to parse and retrieve the full URL for each subdir using the `Channel.urls()` method. Several helper functions can be found in `conda.core.index`, if needed.

Sadly, `fetch_extract_and_read()` does not exist as such, but as a combination of objects. The main driving function is actually `get_index()`, which passes the channel URLs to `fetch_index`, a wrapper that delegates directly to `conda.core.subdir_data.SubdirData` objects. This object implements caching, authentication, proxies and other things that complicate the simple idea of “just download the file, please”. Most of the logic is in `SubdirData._load()`, which ends up calling `conda.core.subdir_data.fetch_repodata_remote_request()` to process the request. Finally, `SubdirData._process_raw_repodata_str()` does the parsing and loading.

Internally, the `SubdirData` stores all the package metadata as a list of `PackageRecord` objects. Its main usage is via `.query()` (one result at a time) or `.query_all()` (all possible matches). These `.query*` methods accept spec strings (e.g. `numpy =1.14`), `MatchSpec` and `PackageRecord` instances. Alternatively, if you want *all* records with no queries, use `SubdirData.iter_records()`.

Tricks to reduce the size of the index

conda supports the notion of trying with different versions of the index in an effort to minimize the solution space. A smaller index means a faster search, after all! The default logic starts with `current_repodata.json` files in the channel, which contain only the latest versions of each package plus their dependencies. If that fails, then the full `repodata.json` is used. This happens *before* the Solver is even invoked.

The second trick is done within the solver logic: an informed index reduction. In essence, the index (whether it's `current_repodata.json` or full `repodata.json`) is pruned by the solver, trying to keep only the parts that it anticipates will be needed. More details can be found on the [get_reduced_index function](#). Interestingly, this optimization step also takes longer the bigger the index gets.

Channel priorities

`context.channels` returns an `IndexedSet` of `Channel` objects; essentially a list of unique items. The different channels in this list can have overlapping or even conflicting information for the same package name. For example, `defaults` and `conda-forge` will for sure contain packages that fulfill the `conda install numpy` request. Which one is chosen by conda in this case? It depends on the `context.channel_priority` setting: From the help message:

Accepts values of 'strict', 'flexible', and 'disabled'. The default value is 'flexible'. With strict channel priority, packages in lower priority channels are not considered if a package with the same name appears in a higher priority channel. With flexible channel priority, the solver may reach into lower priority channels to fulfill dependencies, rather than raising an unsatisfiable error. With channel priority disabled, package version takes precedence, and the configured priority of channels is used only to break ties.

In practice, `channel_priority=strict` is often the recommended setting for most users. It's faster to solve and causes fewer problems down the line. Check more details [here](#).

Solving the install request

At this point, we can start asking the solver things. After all, we have loaded the channels into our index, building the catalog of available packages and versions we can install. We also have the command line instructions and configurations needed to customize the solver request. So, let's just do it: "Solver, please install numpy on this prefix using these channels as package sources".

The details are complicated, but in essence, the Solver will:

1. Express the requested packages, command line options and prefix state as `MatchSpec` objects
2. Query the index for the best possible match that satisfy those constraints
3. Return a list of `PackageRecord` objects

The full details are covered in [Solvers](#) if you are curious. Just keep in mind that point (1) is conda-specific, while (2) can be tackled, in principle, by any SAT solver.

Generating the transaction and the corresponding actions

The Solver API defines three public methods:

- `.solve_final_state()`: this is the core function, described in the section above. Given some input state, it returns an `IndexedSet` of `PackageRecord` objects that reflect what the final state of the environment should look like. This is the largest method, and its details are fully covered [here](#).
- `.solve_for_diff()`: this method takes the final state and diffs it with the current state of the environment, discovering which old records need to be removed, and which ones need to be added.

- `.solve_for_transaction()`: this method takes the diff and creates a `Transaction` object for this operation. This is what the main CLI logic expects back from the solver.

So what is a `Transaction` object and why is it needed? [Transactional actions](#) were introduced in conda 4.3. They seem to be the last iteration of a set of changes designed to check whether conda would be able to download and link the needed packages (e.g. check that there is enough space on disk, whether the user has enough permissions for the target paths, etc.). For more info, refer to PRs [#3571](#), [#3301](#), and [#3034](#).

The transaction is essentially a set of `action` objects. Each action is allowed to run some checks to determine whether it can be executed successfully. If that's not the case, the failed checks will signal the parent transaction that the whole operation needs to be aborted and rolled back to leave things in the state they were before running that conda command. It is also responsible for some of the messages you will see in the CLI output, like the reports of what will be installed, updated or removed.

Transactions and parallelism

Since the transaction object knows about all the actions that need to happen, it also enables parallelism for verifying, downloading and (un)linking tasks. The level of parallelism can be changed through the following `context` settings:

- `default_threads`
 - `verify_threads`
 - `execute_threads`
 - `reodata_threads`
 - `fetch_threads`
-

There's only one class of transaction in conda: `LinkUnlinkTransaction`. It only accepts one input parameter: a list of `PrefixSetup` objects, which are just `namedtuple` objects with the following fields. These are populated by `Solver.solve_for_transaction` after running `Solver.solve_for_diff`:

- `target_prefix`: the environment path the command is running on.
- `unlink_precs`: `PackageRecord` objects that need to be unlinked (removed).
- `link_precs`: `PackageRecord` objects that need to be linked (added).
- `remove_specs`: `MatchSpec` objects that need to be marked as removed in the history (the user asked for these packages to be uninstalled).
- `update_specs`: `MatchSpec` objects that need to be marked as added in the history (the user asked for these packages to be installed or updated).
- `neutered_specs`: `MatchSpec` objects that were already in history but had to be relaxed in order to avoid solving conflicts.

Whatever happens after instantiation depends on the content of these `PrefixSetup` objects. Sometimes, the transaction results in no actions (see the `nothing_to_do` property) because the request asked by the user is already fulfilled by the current state of the environment.

However, most of the time the transaction will involve a number of actions. This is done via two public methods:

- `download_and_extract()`: essentially a forwarder to instantiate and call `ProgressiveFetchExtract`, responsible for deciding which `PackageRecords` need to be downloaded and extracted to the packages cache.
- `execute()`: the core logic is laid out here. It involves preparing, verifying and performing the rest of the actions. Among others:
 - Unlinking packages (removing a package from the environment)
 - Linking (adding a package to the environment)

- Compiling bytecode (generating the `pyc` counterpart for each `py` module)
- Adding entry points (generate command line executables for the configured functions)
- Adding the JSON records (for each package, a JSON file is added to `conda-meta/`)
- Make menu items (create shortcuts for packages featuring a JSON file under `Menu/`)
- Remove menu items (remove the shortcuts created by that package)

It's important to notice that download and extraction happen separately from all the other actions. This separation is important and core to the idea of what a conda environment is. Essentially, when you create a new conda environment, you are not necessarily *copying* files over to the target prefix location. Instead, conda maintains a cache of every package ever downloaded to disk (both the tarball and the extracted contents). To save space and speed up environment creation and deletion, files are not copied over, but instead they are linked (usually via a hardlink). That's why these two tasks are separated in the transaction logic: you don't need to download and extract packages that are already in the cache; you only need to link them!

Transactions also drive reports

The type and number of actions can also be calculated by `_make_legacy_action_groups()`, which returns a list of *action groups* (one per `PrefixSetup`). Each action group is a just a dictionary following this specification:

```
{
  "FETCH": Iterable[PackageRecord], # estimated by `ProgressiveFetchExtract`
  "PREFIX": str,
  "UNLINK": Iterable[PackageRecord],
  "LINK": Iterable[PackageRecord],
}
```

These simpler action groups are only used for reporting, either via a processed text report (via `print_transaction_summary`) or just the raw JSON (via `stdout_json_success`). As you can see, they do not know anything about other types of tasks.

Download and extraction

conda maintains a cache of downloaded tarballs and their extracted contents to save disk space and improve the performance of environment modifications. This requires some code to check whether a given `PackageRecord` is already present in the cache, and, if it's not, how to download the tarball and extract its contents in a performant way. This is all handled by the `ProgressiveFetchExtract` class, which can instantiate up to two `Action` objects for each passed `PackageRecord`:

- `CacheUrlAction`: downloads (if remote) or copies (if local) a tarball to the cache location.
- `ExtractPackageAction`: extracts the contents of the tarball.

These two actions only take place *if* the package is not in cache yet and if it has already been extracted, respectively. They can also revert the changes if the transaction is aborted (either due to an error or because the user pressed `Ctrl+C`).

Populating the prefix

When all the necessary packages have been downloaded and extracted to the cache, it is time to start populating the prefix with the needed files. This means we need to:

1. For each package that needs to be unlinked, run the pre-unlink logic (deactivate and pre-unlink scripts, as well as shortcut removal, if needed) and then unlink the package files.
2. For each package that needs to be linked, create the links and run the post-link logic (post-link and activate scripts, as well as creating the shortcuts, if needed).

Note that when you are updating a package version, you are actually removing the installed version entirely and then adding the new one. In other words, an update is just unlink+link.

How is this implemented? For each `PrefixSetup` object passed to `UnlinkLinkTransaction`, a number of `ActionGroup` namedtuples (one per task *category*) will be instantiated and grouped together in a `PrefixActionGroup` namedtuple. These are then passed to `.verify()`. This method will take each action, run its checks and, if all of them passed, will allow us to perform the actual execution in `.execute()`. If one of them fails, the transaction can be aborted and rolled back.

For all this to work, each action object follows the [PathAction API contract](#):

```
class PathAction:
    _verified = False

    def verify(self):
        "Run checks to assess if the action can proceed"

    def execute(self):
        "Perform the action"

    def reverse(self):
        "Undo execute"

    def cleanup(self):
        "Remove artifacts from verification, execution or reversal"

    @property
    def verified(self):
        "True if verification was run and successful"
```

Additional `PathAction` subclasses will add more methods and properties, but this is what the transaction execution logic expects. To support all the different actions involved in populating the prefix, the `PathAction` class tree holds quite the graph:

```
PathAction
  PrefixPathAction
    CreateInPrefixPathAction
    LinkPathAction
      PrefixReplaceLinkAction
    MakeMenuAction
    CreateNonadminAction
    CreatePythonEntryPointAction
    CreatePrefixRecordAction
    UpdateHistoryAction
    RemoveFromPrefixPathAction
```

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```

    UnlinkPathAction
    RemoveLinkedPackageRecordAction
    RemoveMenuAction
RegisterEnvironmentLocationAction
UnregisterEnvironmentLocationAction
CacheUrlAction
ExtractPackageAction

MultiPathAction
    CompileMultiPycAction
    AggregateCompileMultiPycAction

```

You are welcome to read on the docstring for each of those classes to understand which each one is doing; all of them are listed under `conda.core.path_actions`. In the following sections, we will only comment on the most important ones.

Linking the files in the environment

When conda *links* a file from the cache location to the prefix location, it can actually mean three different actions:

1. Creating a soft link
2. Creating a hard link
3. Copying the file

The difference between soft links and hard links is subtle, but important. You can find more info on the differences elsewhere (e.g. [here](#)), but for our purposes it means that:

- Hard links are cheaper to resolve, behave like a real file, but can only link files in the same mount point.
- Soft links can link files across mount points, but they don't behave exactly like files (more like forwarders), so it's possible that they break assumptions made in certain pieces of code.

Most of the time, conda will try to hard link files and, if that fails, it will copy them over. Copying a file is an expensive disk operation, both in terms of time and space, so it should be the last option. However, sometimes it's the only way. Especially, when the file needs to be modified to be used in the target prefix.

Ummm... what? Why would conda modify a file to install it? This has to do with relocatability. When a conda package is created, conda-build creates up to three temporary environments:

- Build environment: where compilers and other build tools are installed, separate from the host environment to support cross-compilation.
- Host environment: where build-time dependencies are installed, together with the package you are building.
- Test environment: where run-time dependencies are installed, together with the package you just built. It simulates what will happen when a user installs the package so you can run arbitrary checks on your package.

When you are building a package, references to the build-time paths can leak into the content of some files, both text and binary. This is not a problem for users who build their own packages from source, since they can choose this path and leave the files there. However, this is almost never true for conda packages. They are created in one machine and installed in another. To avoid “path not found” issues and other problems, conda-build marks those packages that hold references to the build-time paths by replacing them with placeholders. At install-time, conda will replace those placeholders with the target prefix and everything works!

But there's a problem: we can't modify the files on the cache location because they might be used across environments (with obviously different paths). In these cases, files are not linked, but copied; the path replacement only happens on the target copy, of course!

How does conda know how to link a given package or, more precisely, its extracted files? All of this is determined in the preparation routines contained in `UnlinkLinkTransaction._prepare()` (more specifically, through `determine_link_type()`), as well as `LinkPathAction.create_file_link_actions()`.

Note that the (un)linking actions also include the execution of pre-(un)link and post-(un)link scripts, if listed.

Action groups and actions, in detail

Once the old packages have been removed and the new ones have been linked through the appropriate means, we are done, right? Not yet! There's one step left: the post-linking logic.

It turns out that there's a number of smaller tasks that need to happen to make conda as convenient as it is. You can find all of them listed a few paragraphs above, but we'll cover them here, too. The execution order is determined in `UnlinkLinkTransaction._execute`. All the possible groups are listed under `PrefixActionGroup`. Their order is roughly how they happen in practice:

1. `remove_menu_action_groups`, composed of `RemoveMenuAction` actions.
2. `unlink_action_groups`, includes `UnlinkPathAction`, `RemoveLinkedPackageRecordAction`, as well as the logic to run the pre- and post-unlink scripts.
3. `unregister_action_groups`, basically a single `UnregisterEnvironmentLocationAction` action.
4. `link_action_groups`, includes `LinkPathAction`, `PrefixReplaceLinkAction`, as well as the logic to run pre- and post-link scripts.
5. `entry_point_action_groups`, a collection of `CreatePythonEntryPointAction` actions.
6. `register_action_groups`, a single `RegisterEnvironmentLocationAction` action.
7. `compile_action_groups`, several `CompileMultiPycAction` that end up aggregated as a `AggregateCompileMultiPycAction` for performance.
8. `make_menu_action_groups`, composed of `MakeMenuAction` actions.
9. `prefix_record_groups`, records installed packages in the environment via `CreatePrefixRecordAction` actions.

Let's discuss these actions groups for the command we are describing in this guide: `conda install numpy`. The solution given by the solver says we need to:

- unlink Python 3.9.6
- link Python 3.9.9
- link numpy 1.19

This is what would happen:

1. No menu items are removed because Python 3.9.6 didn't create any.
2. Pre-unlink scripts for Python 3.9.6 would run, but in this case there are none.
3. Python 3.9.6 files are removed from the environment. This can be parallelized.
4. Post-unlink scripts are run, if any.
5. Pre-link scripts are run for Python 3.9.9 and numpy 1.19, if any.
6. Files in the Python 3.9.9 and numpy 1.19 packages are linked and/or copied to the prefix. This can be parallelized.

7. Entry points are created for the new packages, if any.
8. Post-link scripts are run.
9. `pyc` files are generated for the new packages.
10. The new packages are registered under `conda-meta/`.
11. The menu shortcuts are created for the new packages, if any.

Any of these steps can fail with a given exception. If that's the case, the first of those exceptions is printed to `STDOUT`. Additionally, if `rollback_enabled` is properly configured in the `context`, the transaction will be rolled back by calling the `.reverse()` method in each action, from last to first.

If no exceptions are reported, then the actions can run their cleanup routines.

And that's it! If this command had resulted in a new environment being created, you would get a message telling you how to activate the newly created environment.

Conclusion

This is what happens when you type `conda install`. It might be a bit more involved than you initially thought, but it all boils down to only some steps. TL;DR:

1. Parse arguments and initialize the context
2. Download and build the index
3. Tell the solver what we want
4. Convert the solution into a transaction
5. Verify and run each action contained in the transaction

5.4.2 conda init and conda activate

`conda` ships *virtual environments* by design. When you install Anaconda or Miniconda, you obtain a *base* environment that is essentially a regular environment with some extra checks. These checks have to do with what the `conda` command really is and how it is installed in your system.

Base prefix vs target prefix

Originally, the base installation for `conda` was called the *root* environment. Every other environment lived under `envs/` in that root environment. The root environment was later renamed to *base*, but the code still distinguishes between base and target using the old terminology:

- `context.root_prefix`: the path where the base `conda` installation is located.
 - `context.target_prefix`: the environment `conda` is running a command on. Usually defaults to the activated environment, unless `-n` (name) or `-p` (prefix) is specified in the command line. Note that if you are operating on the base environment, the target prefix will have the same value as the root prefix.
-

When you type `conda` in your terminal, your shell will try to find either:

- a shell function named `conda`
- an executable file named `conda` in your `PATH` directories

If your conda installation has been properly initialized, it will find the shell function. If not, it might find the conda executable if it *happens* to be in PATH, but this is most often not the case. That's why initialization is there to begin with!

Conda initialization

Why is initialization needed at all to begin with? There are several reasons:

- Activation requires interacting with the shell context very closely
- It does not pollute PATH unnecessarily
- Improves performance in certain operations

The main idea behind initialization is to provide a conda shell function that allows the Python code to interact with the shell context more intimately. It also allows a cleaner PATH manipulation and snappier responses in some conda commands.

The conda shell function is mainly a [forwarder function](#). It will delegate most of the commands to the real conda executable driven by the Python library. However, it will intercept two very specific subcommands:

- `conda activate`
- `conda deactivate`

This interception is needed because activation/deactivation requires exporting (or unsetting) environment variables back to the shell session (and not just temporarily in the Python process). This will be discussed in the next section.

So how is initialization performed? This is the job of the `conda init` subcommand, driven by the `conda.cli.main_init` module, which depends directly on the `conda.core.initialize` module. Let's see how this is implemented.

`conda init` will initialize a shell permanently by writing some shell code in the relevant startup scripts of your shell (e.g. `~/.bashrc`). This is done through different functions defined in `conda.core.initialize`, namely:

- `init_sh_user`: initializes a Posix shell (like Bash) for the current user.
- `init_sh_system`: initializes a Posix shell (like Bash) globally, for all users.
- `init_fish_user`: initializes the Fish shell for the current user.
- `init_xonsh_user`: initializes the Xonsh shell for the current user.
- `init_cmd_exe_registry`: initializes Cmd.exe through the Windows Registry.
- `init_powershell_user`: initializes Powershell for the current user.
- `init_long_path`: configures Windows to support longer paths.

What each function does depends on the nature of each shell. In the case of Bash shells, the underlying `Activator` subclass (more below) can generate the hook code dynamically. In other Posix shells and Powershell, a script is sourced from its location in the base environment. With Cmd, the changes are introduced through the Windows Registry. The end result is the same: they will end up defining a conda shell function with the behavior described above.

Conda activate

All Activator classes can be found under `conda.activate`. Their job is essentially to write shell-native code programmatically. As of conda 4.11, these are the supported shells and their corresponding activators

- `posix`, `ash`, `bash`, `dash`, `zsh`: all driven by `PosixActivator`.
- `csh`, `tcsh`: `CshActivator`.
- `xonsh`: `XonshActivator`.
- `cmd.exe`: `CmdExeActivator`.
- `fish`: `FishActivator`.
- `powershell`: `PowerShellActivator`.

You can add all these classes through the `conda shell.<key>` command, where `key` is any of the names in the list above. These CLI interface offers several subcommands, connected directly to methods of the same name:

- `activate`: writes the shell code to activate a given environment.
- `deactivate`: writes the shell code to deactivate a given environment.
- `hook`: writes the shell code to register the initialization code for the conda shell code.
- `commands`: writes the shell code needed for autocompletion engines.
- `reactivate`: writes the shell code for deactivation followed by activation.

To be clear, we are saying these functions only *write* shell code. They do *not* execute it! This needs to be done by the shell itself! That's why we need a conda shell function, so these shell strings can be eval'd or source'd in-session.

Let's see what happens when you run `conda shell.bash activate`:

```
$ conda shell.bash activate
export PATH='/Users/username/.local/anaconda/bin:/opt/homebrew/bin:/opt/homebrew/sbin:/
↪usr/local/bin:/usr/bin:/bin:/usr/sbin:/sbin:/Users/username/.local/anaconda/condabin:/
↪opt/homebrew/bin:/opt/homebrew/sbin'
unset CONDA_PREFIX_1
PS1='(base) '
export CONDA_PREFIX='/Users/username/.local/anaconda'
export CONDA_SHLVL='1'
export CONDA_DEFAULT_ENV='base'
export CONDA_PROMPT_MODIFIER='(base) '
export CONDA_EXE='/Users/username/.local/anaconda/bin/conda'
export _CE_M=''
export _CE_CONDA=''
export CONDA_PYTHON_EXE='/Users/username/.local/anaconda/bin/python'
```

See? It only wrote some shell code to stdout, but it wasn't executed. We would need to do this to actually run it:

```
$ eval "$(conda shell.bash activate)"
```

And this is essentially what `conda activate` does: it calls the registered shell activator to obtain the required shell code and then it evals it. In some shells with no `eval` equivalent, a temporary script is written and sourced or called. The final effect is the same.

Ok, but what is that shell code doing? Mainly setting your `PATH` correctly so the executables of your base environment can be found (like `python`). It also sets some extra variables to keep a reference to the path of the currently active environment, the shell prompt modifiers and other information for conda internals.

This command can also generate the code for any other environment you want, not just base. Just pass the name or path:

```
$ conda shell.bash activate mamba-poc
PS1='(mamba-poc) '
export PATH='/Users/username/.local/anaconda/envs/mamba-poc/bin:/opt/homebrew/bin:/opt/
↳homebrew/sbin:/usr/local/bin:/usr/bin:/bin:/usr/sbin:/sbin:/Users/username/.local/
↳anaconda/condabin:/opt/homebrew/bin:/opt/homebrew/sbin'
export CONDA_PREFIX='/Users/username/.local/anaconda/envs/mamba-poc'
export CONDA_SHLVL='2'
export CONDA_DEFAULT_ENV='mamba-poc'
export CONDA_PROMPT_MODIFIER='(mamba-poc) '
export CONDA_EXE='/Users/username/.local/anaconda/bin/conda'
export _CE_M=''
export _CE_CONDA=''
export CONDA_PYTHON_EXE='/Users/username/.local/anaconda/bin/python'
export CONDA_PREFIX_1='/Users/username/.local/anaconda'
```

Now the paths are different, as well as some numbers (e.g. `CONDA_SHLVL`). This is used by conda to keep track of what was activated before, so when you deactivate the last one, you can get back to the previous one seamlessly.

Activation/deactivation scripts

The activation/deactivation code can also include calls to activation/deactivation scripts. If present in the appropriate directories for your shell (e.g. `CONDA_PREFIX/etc/conda/activate.d/`), they will be called before deactivation or after activation, respectively. For example, compilers usually set up some environment variables to help configure the default flags. This is what happens when you activate an environment that contains Clang and Gfortran:

```
$ conda shell.bash activate compilers
PS1='(compilers) '
export PATH='/Users/username/.local/anaconda/envs/compilers/bin:/opt/homebrew/bin:/opt/
↳homebrew/sbin:/usr/local/bin:/usr/bin:/bin:/usr/sbin:/sbin:/Users/username/.local/
↳anaconda/condabin:/opt/homebrew/bin:/opt/homebrew/sbin'
export CONDA_PREFIX='/Users/username/.local/anaconda/envs/compilers'
export CONDA_SHLVL='2'
export CONDA_DEFAULT_ENV='compilers'
export CONDA_PROMPT_MODIFIER='(compilers) '
export CONDA_EXE='/Users/username/.local/anaconda/bin/conda'
export _CE_M=''
export _CE_CONDA=''
export CONDA_PYTHON_EXE='/Users/username/.local/anaconda/bin/python'
export CONDA_PREFIX_1='/Users/username/.local/anaconda'
. "/Users/username/.local/anaconda/envs/compilers/etc/conda/activate.d/activate-gfortran_
↳osx-arm64.sh"
. "/Users/username/.local/anaconda/envs/compilers/etc/conda/activate.d/activate_clang_
↳osx-arm64.sh"
. "/Users/username/.local/anaconda/envs/compilers/etc/conda/activate.d/activate_clangxx_
↳osx-arm64.sh"
```

Those three lines are sourcing the relevant scripts. Similarly, for deactivation, notice how the deactivation scripts are executed first this time:

```
$ conda shell.bash deactivate
export PATH='/Users/username/.local/anaconda/bin:/opt/homebrew/bin:/opt/homebrew/sbin:/
↳usr/local/bin:/usr/bin:/bin:/usr/sbin:/sbin:/Users/username/.local/anaconda/condabin:/
↳opt/homebrew/bin:/opt/homebrew/sbin'
. "/Users/username/.local/anaconda/envs/compilers/etc/conda/deactivate.d/deactivate_
↳clangxx_osx-arm64.sh"
. "/Users/username/.local/anaconda/envs/compilers/etc/conda/deactivate.d/deactivate_
↳clang_osx-arm64.sh"
. "/Users/username/.local/anaconda/envs/compilers/etc/conda/deactivate.d/deactivate-
↳gfortran_osx-arm64.sh"
unset CONDA_PREFIX_1
PS1='(base) '
export CONDA_PREFIX='/Users/username/.local/anaconda'
export CONDA_SHLVL='1'
export CONDA_DEFAULT_ENV='base'
export CONDA_PROMPT_MODIFIER='(base) '
export CONDA_EXE='/Users/username/.local/anaconda/bin/conda'
export _CE_M=''
export _CE_CONDA=''
export CONDA_PYTHON_EXE='/Users/username/.local/anaconda/bin/python'
```

5.4.3 conda config and context

The `context` object is central to many parts of the conda codebase. It serves as a centralized repository of settings. You normally import the singleton and access its (many) attributes directly:

```
from conda.base.context import context

context.quiet
# False
```

This singleton is initialized from a cascade of different possible sources. From lower to higher precedence:

1. Default values hardcoded in the `Context` class. These are defined via class attributes.
2. Values defined in the configuration files (`.condarc`), which have their own *precedence*.
3. Values set by the corresponding command line arguments, if any.
4. Values defined by their corresponding `CONDA_*` environment variables, if present.

The mechanism implementing this behavior is an elaborate object with several types of objects involved.

Anatomy of the Context class

`conda.base.context.Context` is an conda-specific subclass of the application-agnostic `conda.common.configuration.Configuration` class. This class implements the precedence order for the instantiation of each defined attribute, as well as the overall validation logic and help message reporting. But that's it, it's merely a storage of `ParameterLoader` objects which, in turn, instantiate the relevant `Parameter` subclasses in each attribute. Roughly:

```
class MyConfiguration(Configuration):
    string_field = ParameterLoader(PrimitiveParameter("default", str))
    list_of_int_field = ParameterLoader(SequenceParameter([1, 2, 3], int))
    map_of_float_values_field = ParameterLoader(MapParameter({"key": 1.0}, float))
```

When `MyConfiguration` is instantiated, those class attributes are populated by the `.raw_data` dictionary that has been filled in with the values coming from the precedence chain stated above. The `raw_data` dictionary contains `RawParameter` objects, subclassed to deal with the specifics of their origin (YAML file, environment variable, command line flag). Each `ParameterLoader` object will pass the `RawParameter` object to the `.load()` method of its relevant `Parameter` subclass, which are designed to return their corresponding `LoadedParameter` object counterpart.

It's a bit confusing, but the delegation happens like this:

1. The `Configuration` subclass parses the raw values of the possible origins and stores them as the relevant `RawParameter` objects, which can be:
 - `EnvRawParameter`: for those coming from an environment variable
 - `ArgParseRawParameter`: for those coming from a command line flag
 - `YamlRawParameter`: for those coming from a configuration file
 - `DefaultValueRawParameter`: for those coming from the default value given to `ParameterLoader`
2. Each `Configuration` attribute is a `ParameterLoader`, which implements the property protocol via `__get__`. This means that, upon attribute access (e.g. `MyConfiguration.string_field`), the `ParameterLoader` can execute the loading logic. This means finding potential type matches in the raw data, loading them as `LoadedParameter` objects and merging them with the adequate precedence order.

The merging policy depends on the (Loaded)Parameter subtype. Below is a list of available subtypes:

- `PrimitiveParameter`: holds a single scalar value of type `str`, `int`, `float`, `complex`, `bool` or `NoneType`.
- `SequenceParameter`: holds an iterable (`list`) of other `Parameter` objects.
- `MapParameter`: holds a mapping (`dict`) of other `Parameter` objects.
- `ObjectParameter`: holds an object with attributes set to `Parameter` objects.

The main goal of the `Parameter` objects is to implement how to typify and turn the raw values into their `Loaded` counterparts. These implement the validation routines and define how parameters for the same key should be merged:

- `PrimitiveLoadedParameter`: value with highest precedence replaces the existing one.
- `SequenceLoadedParameter`: extends with no duplication, keeping precedence.
- `MapLoadedParameter`: cascading updates, highest precedence kept.
- `ObjectLoadedParameter`: same as `Map`.

After all of this, the `LoadedParameter` objects are *typified*: this is when type validation is performed. If everything goes well, you obtain your values just fine. If not, the validation errors are raised.

Take into account that the result is cached for faster subsequent access. This means that even if you change the value of the environment variables responsible for a given setting, this won't be reflected in the `context` object until you refresh it with `conda.base.context.reset_context()`.

Do not modify the Context object!

`ParameterLoader` does not implement the `__set__` method of the property protocol, so you can freely override an attribute defined in a `Configuration` subclass. You might think that this will redefine the value after passing through the validation machinery, but that's not true. You will simply overwrite it entirely with the raw value and that's probably not what you want.

Instead, consider the `context` object immutable. If you need to change a setting at runtime, it is probably *A Bad Idea*. The only situation where this is acceptable is during testing.

Setting values in the different origins

There's some magic behind the possible origins for the settings values. How these are tied to the final `Configuration` object might not be obvious at first. This is different for each `RawParameter` subclass:

- `DefaultValueRawParameter`: Users will never see this one. It only wraps the default value passed to the `ParameterLoader` class. Safe to ignore.
- `YamlRawParameter`: This one takes a YAML file and parses it as a dictionary. The keys in this file must match the attribute names in the `Configuration` class exactly (or one of their aliases). Matching happens automatically once this is properly set up. How the values are parsed depends on the YAML Loader, set internally by conda.
- `EnvRawParameter`: Values coming from certain environment variables can make it to the `Configuration` instance, provided they are formatted as `<APP_NAME>_<PARAMETER_NAME>`, all uppercase. The app name is defined by the `Configuration` subclass. The parameter name is defined by the attribute name in the class, transformed to upper case. For example, `context.ignore_pinned` can be set with `CONDA_IGNORE_PINNED`. The value of the variable is parsed in different ways depending on the type:
 - `PrimitiveParameter` is the easy one. The environment variable string is parsed as the expected type. Booleans are a bit different since several strings are recognized as such, and in a case-insensitive way:
 - * True can be set with `true`, `yes`, `on` and `y`.
 - * False can be set with `false`, `off`, `n`, `no`, `non`, `none` and `""` (empty string).
 - `SequenceParameter` can specify their own delimiter (e.g. `,`), so the environment variable string is processed into a list.
 - `MapParameter` and `ObjectParameter` do not support being set with environment variables.
- `ArgParseRawParameter`: These are a bit different because there is no automated mechanism that ties a given command line flag to the context object. This means that if you add a new setting to the `Context` class and you want that available in the CLI as a command line flag, you have to add it yourself. If that's the case, refer to `conda.cli.conda_argparse` and make sure that the `dest` value of your `argparse.Argument` matches the attribute name in `Context`. This way, `Configuration.__init__` can take the `argparse.Namespace` object, turn it into a dictionary, and make it pass through the loading machinery.

5.4.4 Solvers

The guide [conda install](#) didn't go into details of the solver black box. It did mention the high-level `Solver` API and how conda expects a transaction out of it, but we never got to learn what happens *inside* the solver itself. We only covered these three steps:

The details are complicated, but in essence, the solver will:

1. Express the requested packages, command line options and prefix state as `MatchSpec` objects
2. Query the index for the best possible match that satisfy those constraints
3. Return a list of `PackageRecord` objects.

How do we transform the prefix state and configurations into a list of `MatchSpec` objects? How are those turned into a list of `PackageRecord` objects? Where are those `PackageRecord` objects coming from? We are going to cover these aspects in detail here.

MatchSpec vs PackageRecord

First, let's define what each object does:

- **PackageRecord** objects represent a concrete package tarball and its contents. They follow [specific naming conventions](#) and expose several fields. Inspect them directly in the [class code](#).
- **MatchSpec** objects are essentially a query language to find **PackageRecord** objects. Internally, conda will translate your command line requests, like `numpy>=1.19`, `python=3.*` or `pytorch=1.8.*=*cuda*`, into instances of this class. This query language has its own syntax and rules, detailed [here](#). The most important fields of a **MatchSpec** object are:
 - **name**: the name of the package (e.g. `pytorch`); always expected.
 - **version**: the version constraints (e.g. `1.8.*`); can be empty but if **build** is set, set it to `*` to avoid issues with the `.conda_build_form()` method.
 - **build**: the build string constraints (e.g. `*cuda*`); can be empty.

Create a MatchSpec object from a PackageRecord instance

You can create a **MatchSpec** object from a **PackageRecord** instance using the `.to_match_spec()` method. This will create a **MatchSpec** object with its fields set to exactly match the originating **PackageRecord**.

Note that there are two **PackageRecord** subclasses with extra fields, so we need to distinguish between three types, all of them useful:

- **PackageRecord**: A record as present in the index (channel).
- **PackageCacheRecord**: A record already extracted in the cache. Contains extra fields for the tarball path in disk and its extracted directory.
- **PrefixRecord**: A record installed in a prefix. Same as above, plus fields for the files that make the package and how they were linked in the prefix. It can also host information about which **MatchSpec** string resulted in this record being installed.

Remote state: the index

So the solver takes **MatchSpec** objects, queries the index for the best match and returns **PackageRecord** objects. Perfect. What's the index? It's the result of aggregating the requested conda channels in a single entity. For more information, check [Fetching the index](#).

Local state: the prefix and context

When you do `conda install numpy`, do you think the solver will just see something like `specs=[MatchSpec("numpy")]`? Well, not that quick. The explicit instructions given by the user are only one part of the request we will send to the solver. Other pieces of implicit state are taken into account to build the final request. Namely, the state of your prefix. In total, these are the ingredients of the solver request:

1. Packages already present in your environment, if you are not *creating* a new one. This is exposed through the `conda.core.prefix_data.PrefixData` class, which provides an iterator method via `.iter_records()`. As we saw before, this yields `conda.models.records.PrefixRecord` objects, a **PackageRecord** subclass for installed records.
2. Past actions you have performed in that environment; the *History*. This is a journal of all the `conda install|update|remove` commands you have run in the past. In other words, the *specs* matched by those previous actions will receive extra protections in the solver.

3. Packages included in the *aggressive updates* list. These packages are always included in any requests to make sure they stay up-to-date under all circumstances.
4. Packages pinned to a specific version, either via `pinned_packages` in your `.condarc` or defined in a `$PREFIX/conda-meta/pinned` file.
5. In new environments, packages included in the `create_default_packages` list. These specs are injected in each `conda create` command, so the solver will see them as explicitly requested by the user.
6. And, finally, the specs the user is asking for. Sometimes this is explicit (e.g. `conda install numpy`) and sometimes a bit implicit (e.g. `conda update --all` is telling the solver to add all installed packages to the update list).

All of those sources of information produce a number a of `MatchSpec` objects, which are then combined and modified in very specific ways depending on the command line flags and their origin (e.g. specs coming from the pinned packages won't be modified, unless the user asks for it explicitly). This logic is intricate and will be covered in the next sections. A more technical description is also available in [Technical specification: solver state](#).

Inside the Solver: formulating the problem

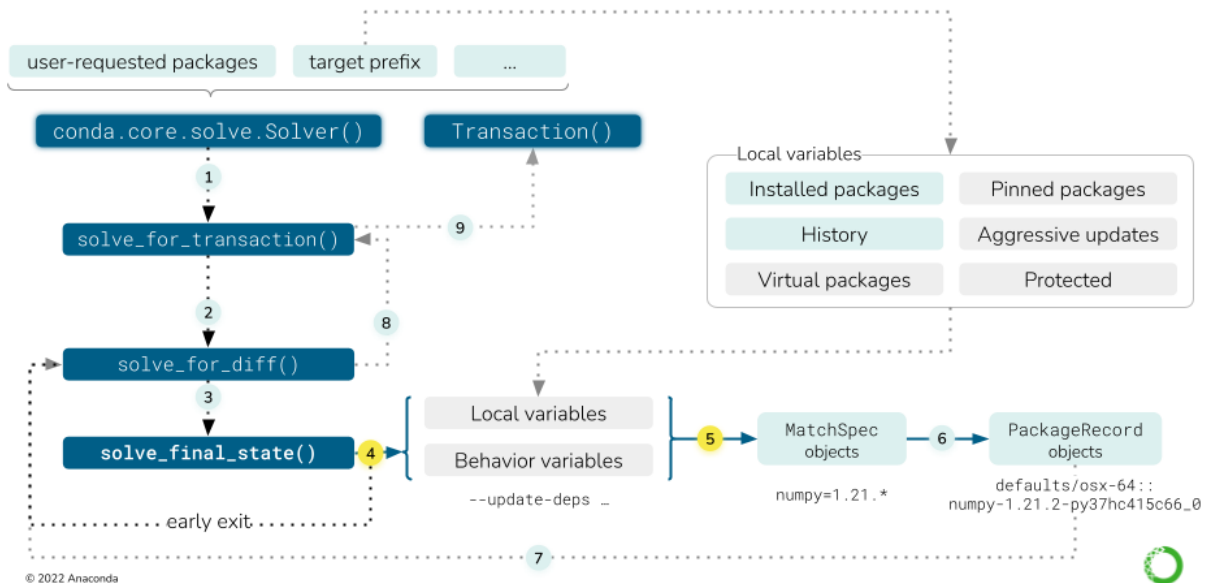


Fig. 2: Local variables affect the solving process explicitly and implicitly. As seen in [in the conda install deep dive](#), the main actor is the `conda.core.solve.Solver` class. Before invoking the SAT solver, we can describe nine steps:

1. Instantiate the `Solver` class with the user-requested packages and the active environment (target prefix)
2. Call the `solve_for_transaction()` method on the instance, which calls `solve_for_diff()`.
3. Call `solve_final_state()`, which takes some more arguments from the CLI.
4. Under some circumstances, we can return early (e.g. the packages are already installed).
5. If we didn't return early, we collect all the local variables into a list of `MatchSpec` objects.

For steps six to nine, see [this figure](#).

Inside the Solver: formulating the problem

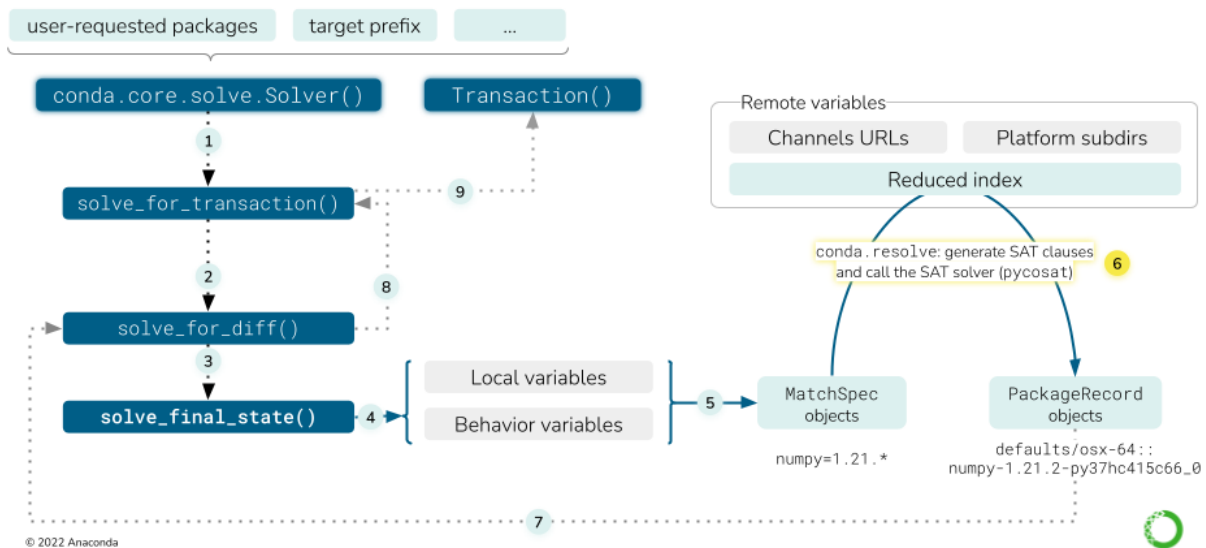


Fig. 3: The remote variables in a solve refer to, essentially, the package index (channels). This figure describes nine steps, focusing on 6-9. For steps 1-5, see [the previous figure](#).

1. All the channels need to be fetched by now, but they have to be aggregated and reduced so the solver only handles the relevant bits. This step transforms “channels” into a list of available `PackageRecord` objects.
2. This is where the SAT solver will act. It will use the list of `MatchSpec` objects to pick a number of `PackageRecord` entries from the index, thus building the “final state of the solved environment”. This is detailed later in this deep dive guide, if you need more info.
3. `solve_for_diff` takes the final state and compares it to the initial state, generating the differences between them (e.g. package A was updated to version 1.2, package B was removed).
4. `solve_for_transaction` takes the diff and some more metadata in the instance to generate the `Transaction` object.

The high-level logic in `conda.cli.install`

The full solver logic does not start at the `conda.core.solve.Solver` API, but before that, all the way up in the `conda.cli.install` module. Here, some important decisions are already made:

- Whether the solver is not needed at all because:
 - The operation is an explicit package install
 - The user requested to roll back to a history checkpoint
 - We are just creating a copy of an existing environment (cloning)
- Which `repodata` source to use (see [here](#)). It not only depends on the current configuration (via `.condarc` or command line flags), but also on the value of `use_only_tar_bz2`.
- Whether the solver should start by freezing all installed packages (default for `conda install` and `conda remove` in existing environments).
- If the solver does not find a solution, whether we need to retry again without freezing the installed packages for the current `repodata` variant or if we should try with the next one.

So, roughly, the global logic there follows this pseudocode:

```
if operation in (explicit, rollback, clone):
    transaction = handle_without_solver()
else:
    repodatas = from_config or ("current_repodata.json", "repodata.json")
    freeze = (is_install or is_remove) and env_exists and update_modifier not in argv
    for repodata in repodatas:
        try:
            transaction = solve_for_transaction(...)
        except:
            if repodata is last:
                raise
            elif freeze:
                transaction = solve_for_transaction(freeze_installed=False)
            else:
                continue # try next repodata
    handle_txn(transaction)
```

Check [this other figure](#) for a schematic representation of this pseudocode.

We have, then, two reasons to re-run the full solver logic:

- Freezing the installed packages didn't work, so we try without freezing again.
- Using `current_repodata` did not work, so we try with full `repodata`.

These two strategies are stacked so in the end, before eventually failing, we will have tried four things:

1. Solve with `current_repodata.json` and `freeze_installed=True`
2. Solve with `current_repodata.json` and `freeze_installed=False`
3. Solve with `repodata.json` and `freeze_installed=True`
4. Solve with `repodata.json` and `freeze_installed=False`

Interestingly, those strategies are designed to improve `conda`'s average performance, but they should be seen as a risky bet. Those attempts can get expensive!

How to ask for a simpler approach

If you want to try the full thing without checking whether the optimized solves work, you can override the default behaviour with these flags in your `conda install` commands:

- `--repodata-fn=repodata.json`: do not use `current_repodata.json`
 - `--update-specs`: do not try to freeze installed
-

Then, the `Solver` class has its own internal logic, which also features some retry loops. This will be discussed later and summarized.

Early exit tasks

Some tasks do not involve the solver at all. Let's enumerate them:

- Explicit package installs: no index or prefix state needed.
- Cloning an environment: the index might be needed if the cache has been cleared.
- History rollback: currently broken.
- Forced removal: prefix state needed. This happens in the `Solver` class.
- Skip solve if already satisfied: prefix state needed. This happens in the `Solver` class.

Explicit package installs

These commands do not need a solver because the requested packages are expressed with a direct URL or path to a specific tarball. Instead of a `MatchSpec`, we already have a `PackageRecord`-like entity! For this to work, all the requested packages need to be URLs or paths. They can be typed in the command line or in a text file including a `@EXPLICIT` line.

Since the solver is not involved, the dependencies of the explicit package(s) are not processed at all. This can leave the environment in an *inconsistent state*, which can be fixed by running `conda update --all`, for example.

Explicit installs are taken care of by the `explicit` function.

Cloning an environment

`conda create` has a `--clone` flag that allows you to create a fully-working copy of an existing environment. This is needed because you cannot relocate an environment using `cp`, `mv`, or your favorite file manager without unintended consequences. Some files in a conda environment might contain hardcoded paths to existing files in the original location, and those references will break if `cp` or `mv` is utilized (conda environments *can* be renamed via the `conda rename` command, however; see the following section for more information).

The `clone_env` function implements this functionality. It essentially takes the source environment, generates the URLs for each installed packages (filtering `conda`, `conda-env` and their dependencies) and passes the list of URLs to `explicit()`. If the source tarballs are not in the cache anymore, it will query the index for the best possible match for the current channels. As such, there's a slim chance that the copy is not exactly a clone of the original environment.

Renaming an environment

When the `conda rename` command is used to rename an already-existing environment, please keep in mind that the solver is not invoked at all, since the command essentially does a `conda create --clone` and `conda remove --all` of the environment.

History rollback

`conda install` has a `--revision` flag, which allows you to revert the state of the environment to a previous one. This is done through the `History` file, but its [current implementation](#) can be considered broken. Once fixed, we will cover it in detail.

Forced removals

Similar to explicit installs, you can remove a package without performing a full solve. If `conda remove` is invoked with `--force`, the specified package(s) will be removed directly, without analyzing their dependency tree and pruning the orphans. This can only happen after querying the active prefix for the installed packages, so it is [handled](#) in the `Solver` class. This part of the logic returns the list of `PackageRecord` objects already found in the `PrefixData` list after filtering out the ones that should be removed.

Skip solve if already satisfied

`conda install` and `update` have a rather obscure flag: `-S, --satisfied-skip-solve`:

Exit early and do not run the solver if the requested specs are satisfied. Also skips aggressive updates as configured by `'aggressive_update_packages'`. Similar to the default behavior of `'pip install'`.

This is also [implemented](#) at the `Solver` level, because we also need a `PrefixData` instance. It essentially checks if all of the passed `MatchSpec` objects can match a `PackageRecord` already in prefix. If that's the case, we return the installed state as-is. If not, we proceed for the full solve.

Details of `Solver.solve_final_state()`

This is where most of the intricacies of the `conda` logic are defined. In this step, the configuration, command line flags, user-requested specs and prefix state are aggregated to query the current index for the best match.

The aggregation of all those state bits will result in a list of `MatchSpec` objects. While it's easy to establish which package names will make it to the list, deciding which version and build string constraints the specs carry is a bit more involved.

This is currently implemented in the `conda.core.solve.Solver` class. Its main goal is to populate the `specs_map` dictionary, which maps package names (`str`) to `MatchSpec` objects. This happens at the beginning of the `.solve_final_state()` method. The full details of the `specs_map` population are covered in the [solver state technical specification](#), but here's a little map of what submethods are involved:

1. Initialization of the `SolverStateContainer`: Often abbreviated as `ssc`, it's a helper class to store some state across attempts (remember there are several retry loops). Most importantly, it stores two key attributes (among others):
 - `specs_map`: same as above. This is where it lives across solver attempts.
 - `solution_precs`: a list of `PackageRecord` objects. It stores the solution returned by the SAT solver. It's always initialized to reflect the installed packages in the target prefix.

2. `Solver._collect_all_metadata()`: Initializes the `specs_map` with the specs found in the history or with the specs corresponding to the installed records. This method delegates to `Solver._prepare()`. This initializes the index by fetching the channels and reducing it. Then, a `conda.resolve.Resolve` instance is created with that index. The index is stored in the `Solver` instance as `._index` and the `Resolve` object as `._r`. They are also kept around in the `SolverStateContainer`, but as public attributes: `.index` and `.r`, respectively.
3. `Solver._remove_specs()`: If `conda remove` was called, it removes the relevant specs from `specs_map`.
4. `Solver._add_specs()`: For all the other `conda` commands (`create`, `install`, `update`), it adds (or modifies) the relevant specs to `specs_map`. This is one of the most complicated pieces of logic in the class!

Check the other parts of the Solver API

You can check the rest of the Solver API [here](#).

At this point, the `specs_map` is adequately populated and we can call the SAT solver wrapped by the `conda.resolve.Resolve` class. This is done in `Solver._run_sat()`, but this method does some other things before actually solving the SAT problem:

- Before calling `._run_sat()`, inconsistency analysis is performed via `Solver._find_inconsistent_packages`. This will preemptively remove certain `PackageRecord` objects from `ssc.solution_precs` if `Resolve.bad_installed()` determined they were causing inconsistencies. This actually runs a series of small solves to check that the installed records form a satisfiable set of clauses. Those that prevent that solution from being found are annotated as such and ignored during the real solve later.
- Make sure the requested package names are available in the index.
- Anticipate and minimize potentially conflicting specs. This happens in a `while` loop fed by `Resolve.get_conflicting_specs()`. If a spec is found to be conflicting, it is *neutered*: a new `MatchSpec` object is created, but without version and build string constraints (e.g. `numpy >=1.19` becomes just `numpy`). Then, `Resolve.get_conflicting_specs()` is called again, and the loop continues until convergence: the list of conflicts cannot be reduced further, either because there are no conflicts left or because the existing conflicts cannot be resolved by constraint relaxation.
- Now, the SAT solver is called. This happens via `Resolve.solve()`. More on this below.
- If the solver failed, then `UnsatisfiableError` is raised. Depending on which attempt we are on, `conda` will try again with non-frozen installed packages or a different repodata, or it will give up and analyze the conflict cause core. This will be detailed later.
- If the solver succeeded, some bookkeeping needs to be done:
 - Neutered specs that happened to be in the history are annotated as such.
 - Inconsistent packages are added back to the solution, including potential orphans.
 - Constraint analysis is run via `Solver.get_constrained_packages()` and `Solver.determine_constricting_specs()` to help the user understand why some packages were not updated.

We are not done yet, though. After `Solver._run_sat()`, we still need to run the post-solver logic! After the solve, the final list of `PackageRecord` objects might still change if certain modifiers are set. This is handled in the `Solver._post_sat_handling()`:

- `--no-deps` (`DepsModifier.NO_DEPS`): Remove dependencies of the explicitly requested packages from the final solution.
- `--only-deps` (`DepsModifier.ONLY_DEPS`): Remove explicitly requested packages from the final solution but leave their dependencies. This is done via `PrefixGraph.remove_youngest_descendant_nodes_with_specs()`.

- `--update-deps` (`UpdateModifier.UPDATE_DEPS`): This is the most interesting one. It actually runs a second solve (!) where the user-requested specs are the originally requested specs plus their (now determined) dependencies.
- `--prune`: Removes orphan packages from the solution.

The Solver also checks for Conda updates

Interestingly, the Solver API is also responsible of checking if new conda versions are available in the configured channels. This is done here to take advantage of the fact that the index has been already built for the rest of the class.

Details of `conda.resolve.Resolve`

This is the class that actually wraps the SAT solver. `conda.core.solve.Solver` is a higher level API that configures the solver *request* and prepares the transaction. The actual solution is computed in this other module we are discussing now.

The `Resolve` object will mostly receive two arguments:

- The fetched `index`, as processed by `conda.index.get_index()`.
- The configured `channels`, so *channel priority* can be sorted out.

It will also hold certain states:

- The `index` will be grouped by name under a `.groups` dictionary (`str`, `[PackageRecord]`). Each group is later sorted so newer packages are listed first, helping reduce the index better.
- Another dictionary of `PackageRecord` groups will be created, keyed by their `track_features` entries, under the `.trackers` attribute.
- Some other dictionaries are initialized as caches.

The main methods in this class are:

- `bad_installed()`: This method uses a series of small solves to check if the installed packages are in a consistent state. In other words, if all the `PackageRecord` entries were expressed as `MatchSpec` objects, would the environment be solvable?
- `get_reduced_index()`: This method takes a full index and trims out the parts that are not necessary for the current request, thus reducing the solution space and speeding up the solver.
- `gen_clauses()`: This instantiates and configures the `Clauses` object, which is the real SAT solver wrapper. More on this later.
- `solve()`: The main method in the `Resolve` class. It will be discussed in the next section.
- `find_conflicts()`: If the solver didn't succeed, this method performs a conflict analysis to find the most plausible explanation for the current conflicts. It essentially relies on `build_conflict_map()` to “find the common dependencies that might be the cause of conflicts”. conda can spend a lot of time in this method.

Disabling conflict analysis

Conflict analysis can be disabled through the `context.unsatisfiable_hints` options, but unfortunately that gets in the way of conda's iterative logic. It will shortcut early in the chain of attempts and prevent the solver from trying less constrained specs. This is a part of the logic that should be improved.

Resolve.solve()

As introduced above, this is the main method in the `Resolve` class. It will perform the following actions:

1. Reduce the index via `get_reduced_index`. If unsuccessful, try to detect if packages are missing or the wrong version was requested. We can raise early to trigger a new attempt in `conda.cli.install` (remember, unfrozen or next repodata) or, if it's the last attempt, we go straight to `find_conflicts()` to understand what's wrong.
2. Instantiate a new `Resolve` object with the reduced index to generate the `Clauses` object via `gen_clauses()`. This method relies on `push_MatchSpec()` to turn the `MatchSpec` object into an SAT clause inside the `Clauses` object (referred to as C).
3. Run `Clauses.sat()` to solve the SAT problem. If a solution cannot be found, deal with the error in the usual way: raise early to trigger another attempt or call `find_conflicts()` to try explaining why.
4. If no errors are found, then we have one or more solutions available, and we need to post-process them to find the *best* one. This is done in several steps:
 1. Minimize the amount of removed packages. The SAT clauses are generated via `Resolve.generate_removal_count()` and then `Clauses.minimize()` will use it to optimize the current solution.
 2. Maximize how well each record in the solution matches the spec. The SAT clauses are now generated in `Resolve.generate_version_metrics()`. This returns five sets of clauses: channel, version, build, arch or noarch, and timestamp. At this point, only channels and versions are optimized.
 3. Minimize the number of records with `track_feature` entries. SAT clauses are coming from `Resolve.generate_feature_count()`.
 4. Minimize the number of records with `features` entries. SAT clauses are coming from `Resolve.generate_feature_metric()`.
 5. Now, we continue the work started at (2). We will maximize the build number and choose arch-specific packages over noarch variants.
 6. We also want to include as many *optional* specs in the solution as possible. Optimize for that thanks to the clauses generated by `Resolve.generate_install_count()`.
 7. At the same time, we will minimize the number of necessary updates if keeping the installed versions also satisfies the request. Clauses generated with `Resolve.generate_update_count()`.
 8. Steps (2) and (5) are also applied to indirect dependencies.
 9. Minimize the number of packages in the solution. This is done by removing unnecessary packages.
 10. Finally, maximize timestamps until convergence so the most recent packages are preferred.
5. At this point, the SAT solution indices can be translated back to *SAT names*. This is done in the `clean()` local function you can find in `Resolve.sat()`.
6. There's a chance we can find alternate solutions for the problem, and this is explored now, but eventually only the first one will be returned while translating the *SAT names* to `PackageRecord` objects.

The Clauses object wraps the SAT solver using several layers

The `Resolve` class exposes the solving logic, but when it comes to interacting with the SAT solver engine, that's done through the `Clauses` object tree. And we say “tree” because the actual engines are wrapped in several layers:

- `Resolve` generates `conda.common.logic.Clauses` objects as needed.
- `Clauses` is a tight wrapper around its private `conda.common._logic.Clauses` counterpart. Let's call the former `_Clauses`. It simply wraps the `_Clauses` API with `._eval()` calls and other shortcuts for convenience.
- `_Clauses` provides an API to process the raw SAT formulas or clauses. It will wrap one of the `conda.common._logic._SatSolver` subclasses. *These* are the ones that wrap the SAT solver engines! So far, there are three subclasses, selectable via the `context.sat_solver` setting:
 - `_PycoSatSolver`, keyed as `pycosat`. This is the default one, a [Python wrapper](#) around the [picoSAT project](#).
 - `_PySatSolver`, keyed as `pysat`. Uses the Glucose4 solver found in the [pysat project](#).
 - `_PyCryptoSatSolver`, keyed as `pycryptosat`. Uses the Python bindings for the [CryptoMiniSat project](#).

In principle, more SAT solvers can be added to conda if a wrapper that subscribes to the `_SatSolver` API is used. However, if the reason is choosing a better performing engine, consider the following:

- The wrapped SAT solvers are already using compiled languages.
- Generating the clauses is indeed written in pure Python and has a non-trivial overhead.
- Optimization tricks like reducing the index and constraining the solution space have their costs if the “bets” were not successful.

More about SAT solvers in general

This guide did not cover the details of what SAT solvers are or do. If you want to read about them, consider checking the following resources:

- [Aaron Meurer's slides about Conda internals](#). These slides reveal a lot of details of conda back in 2015. Some things have changed, but the core SAT solver behaviour is still well explained there.
 - [“Understanding and Improving Conda's performance”](#)
 - [All the talks regarding solvers from Packaging-Con 2021](#). Check which talks belong to the [Solvers track](#) and enjoy!
-

5.5 Writing Tests

This section contains a series of guides and guidelines for writing tests in the conda repository.

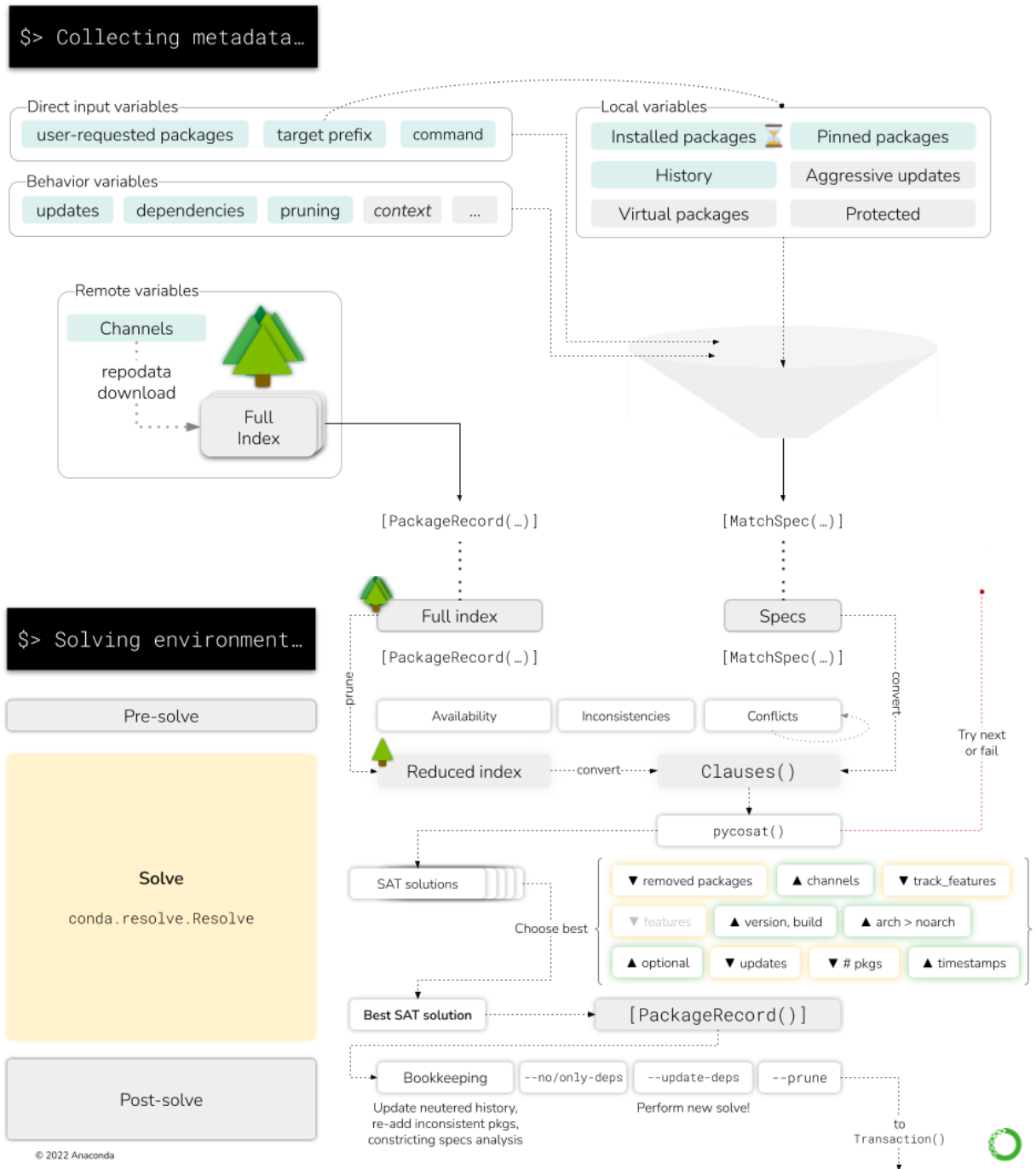


Fig. 4: Here you can see how the high level Solver API interacts with the low-level Resolve and Clauses objects. The *Collecting metadata* step in the CLI report only compiles the necessary information from the CLI arguments, the prefix state and the chosen channels, presenting the SAT solver adapters with two critical pieces of information:

- The list of MatchSpec objects (“what the user wants in this environment”)
- The list of PackageRecord objects (“the packages available in the channels”)

So, in essence, the SAT solver takes the MatchSpec objects to select which PackageRecord objects satisfy the user request in the best way. The necessary computations are part of the “Solving environment...” step in the CLI report.

5.5.1 Guides

Integration Tests This guide gives an overview of how to write integration tests using full command invocation. It also covers creating fixtures to use with these types of tests.

Integration Tests

Integration tests in conda test the application from a high level where each test can potentially cover large portions of the code. These tests may also use the local file system and/or perform network calls. In the following sections, we cover several examples of exactly how these tests look. When writing your own integration tests, these should serve as a good starting point.

conda_cli Fixture: Running CLI level tests

CLI level tests are the highest level integration tests you can write. This means that the code in the test is executed as if you were running it from the command line. For example, you may want to write a test to confirm that an environment is created after successfully running `conda create`. A test like this would look like the following:

Listing 1: Integration test for `conda create`

```
1 import json
2 from pathlib import Path
3
4 from conda.testing.integration import CondaCLIFixture
5
6
7 def test_conda_create(conda_cli: CondaCLIFixture, tmp_path: Path):
8     # setup, create environment
9     out, err, code = conda_cli("create", "--prefix", tmp_path, "--yes")
10
11     assert f"conda activate {tmp_path}" in out
12     assert not err # no errors
13     assert not code # success!
14
15     # verify everything worked using the `conda env list` command
16     out, err, code = conda_cli("env", "list", "--json")
17
18     assert any(
19         tmp_path.samefile(path)
20         for path in json.loads(out).get("envs", [])
21     )
22     assert not err # no errors
23     assert not code # success!
24
25     # cleanup, remove environment
26     out, err, code = conda_cli("remove", "--all", "--prefix", tmp_path)
27
28     assert out
29     assert not err # no errors
30     assert not code # success!
```

Let's break down exactly what is going on in the code snippet above:

First, we rely on a fixture (`conda_cli`) that allows us to run a command using the current running process. This is much more efficient and quicker than running CLI tests via subprocesses.

In the test itself, we first create a new environment by effectively running `conda create`. This function returns the standard out, standard error, and the exit code of the command. This allows us to perform our inspections in order to determine whether the command ran successfully.

The second part of the test again uses the `conda_cli` fixture to call `conda env list`. This time, we pass the `--json` flag, which allows capturing JSON that we can better parse and more easily inspect. We then assert whether the environment we just created is actually in the list of environments available.

Finally, we destroy the environment we just created and ensure the standard error and the exit code are what we expect them to be.

Warning: It is preferred to use temporary directories (e.g., `tmp_path`) whenever possible for automatic cleanup after tests are run. Otherwise, remember to remove anything created during the test since it will be present when other tests are run and may result in unexpected race conditions.

`tmp_env` Fixture: Creating a temporary environment

The `tmp_env` fixture is a convenient way to create a temporary environment for use in tests:

Listing 2: Integration test for creating an environment with `numpy`

```

1 from conda.testing.integration import CondaCLIFixture, TmpEnvFixture
2
3
4 def test_environment_with_numpy(
5     tmp_env: TmpEnvFixture,
6     conda_cli: CondaCLIFixture,
7 ):
8     with tmp_env("numpy") as prefix:
9         out, err, code = conda_cli("list", "--prefix", prefix)
10
11         assert out
12         assert not err # no error
13         assert not code # success!

```

`path_factory` Fixture: Creating a unique (non-existing) path

The `path_factory` fixture extends `pytest`'s `tmp_path` fixture to provide unique, unused paths. This makes it easier to generate new paths in tests:

Listing 3: Integration test for renaming an environment

```

1 from conda.testing.integration import (
2     CondaCLIFixture,
3     PathFactoryFixture,
4     TmpEnvFixture,
5 )
6

```

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```

7
8 def test_conda_rename(
9     path_factory: PathFactoryFixture,
10    tmp_env: TmpEnvFixture,
11    conda_cli: CondaCLIFixture,
12    tmp_path: Path,
13 ):
14     # each call to `path_factory` returns a unique path
15     assert path_factory() != path_factory()
16
17     # each call to `path_factory` returns a path that is a child of `tmp_path`
18     assert path_factory().parent == path_factory().parent == tmp_path
19
20     with tmp_env() as prefix:
21         out, err, code = conda_cli("rename", "--prefix", prefix, path_factory())
22
23         assert out
24         assert not err # no error
25         assert not code # success!

```

Tests with fixtures

Sometimes in integration tests, you may want to re-use the same type of environment more than once. Copying and pasting this setup and teardown code into each individual test can make these tests more difficult to read and harder to maintain.

To overcome this, conda tests make extensive use of `pytest` fixtures. Below is an example of the previously-shown test, except that we now make the focus of the test the `conda env list` command and move the creation and removal of the environment into a fixture:

Listing 4: Integration test for `conda create`

```

1 import json
2 from pathlib import Path
3
4 from conda.testing.integration import CondaCLIFixture
5
6
7 @pytest.fixture
8 def env_one(tmp_env: TmpEnvFixture) -> Path:
9     with tmp_env() as prefix:
10         yield prefix
11
12
13 def test_conda_create(env_one: Path, conda_cli: CondaCLIFixture):
14     # verify everything worked using the `conda env list` command
15     out, err, code = conda_cli("env", "list", "--json")
16
17     assert any(
18         env_one.samefile(path)
19         for path in json.loads(out).get("envs", [])

```

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```

20 )
21     assert not err # no errors
22     assert not code # success!

```

In the fixture named `env_one`, we create a new environment using the `tmp_env` fixture. We yield to mark the end of the setup. Since the `tmp_env` fixture extends `tmp_path` no additional teardown is needed.

This fixture will be run using the default scope in `pytest`, which is `function`. This means that the setup and teardown will occur before and after each test that requests this fixture. If you need to share an environment or other pieces of data between tests, just remember to set the fixture scope appropriately. [Read here](#) for more information on `pytest` fixture scopes.

5.5.2 General Guidelines

- *Preferred test style (pytest)*
- *Organizing tests*
- *The "conda.testing" module*
- *Adding new fixtures*
- *The context object*

Note: It should be noted that existing tests may deviate from these guidelines, and that is okay. These guidelines are here to inform how we would like all new tests to look and function.

Preferred test style (pytest)

Although our codebase includes class-based `unittest` tests, our preferred format for all new tests are `pytest` style tests. These tests are written using functions and handle the setup and teardown of context for tests using fixtures. We recommend familiarizing yourself with `pytest` first before attempting to write tests for `conda`. Head over to their [Getting Started Guide](#) to learn more.

Organizing tests

Tests should be organized in a way that mirrors the main `conda` module. For example, if you were writing a test for a function in `conda/base/context.py`, you would place this test in `tests/base/test_context.py`.

The "conda.testing" module

This is a module that contains anything that could possibly help with writing tests, including fixtures, functions, and classes. Feel free to make additions to this module as you see fit, but be mindful of organization. For example, if your testing utilities are primarily only for the `base` module considering storing these in `conda.testing.base`.

Adding new fixtures

For fixtures that have a very limited scope or purpose, it is okay to define these alongside the tests themselves. However, if these fixtures could be used across multiple tests, then they should be saved in a separate `fixtures.py` file. The `conda.testing` module already contains several of these files.

If you want to add new fixtures within a new file, be sure to add a reference to this module in `tests/conftest.py::pytest_plugins`. This is our preferred way of making fixtures available to our tests. Because of the way these are included in the environment, you should be mindful of naming schemes and choose ones that likely will not collide with each other. Consider using a prefix to achieve this.

The context object

The context object in `conda` is used as a singleton. This means that everytime the `conda` command runs, only a single object is instantiated. This makes sense as it holds all the configuration for the program and re-instantiating it or making multiple copies would be inefficient.

Where this causes problems is during tests where you may want to run `conda` commands potentially hundreds of times within the same process. Therefore, it is important to always reset this object to a fresh state when writing tests.

This can be accomplished by using the `reset_context` function, which also lives in the `conda.base.context` module. The following example shows how you would modify the context object and then reset it using the `reset_conda_context` pytest fixture:

```
import os
import tempfile

from conda.base.context import reset_context, context
from conda.testing.fixtures import reset_conda_context

TEST_CONDARC = """
channels:
  - test-channel
"""

def test_that_uses_context(reset_conda_context):
    # We first created a temporary file to hold our test configuration
    with tempfile.TemporaryDirectory() as tmpdir:
        condarc_file = os.path.join(tmpdir, "condarc")

        with open(condarc_file, "w") as tmp_file:
            tmp_file.write(TEST_CONDARC)

        # We use the reset_context function to load our new configuration
        reset_context(search_path=(condarc_file,))

        # Run various test assertions, below is an example
        assert "test-channel" in context.channels
```

Using this testing fixture ensures that your context object is returned to the way it was before the test. For this specific test, it means that the `channels` setting will be returned to its default configuration. If you ever need to manually reset the context during a test, you can do so by manually invoking the `reset_context` command like in the following example:

```

from conda.base.context import reset_context

def test_updating_context_manually():
    # Load some custom variables into context here like above...

    reset_context()

    # Continue testing with a fresh context...

```

5.6 Deprecations

Conda abides by the Deprecation Schedule defined in [CEP-9](#). To help make deprecations as much of a no-brainer as possible we provide several helper decorators and functions to facilitate the correct deprecation process.

5.6.1 Functions, Methods, Properties, and Classes

Warning: To deprecate Enums treat them like constants (see *Constants and Enums*).

The simplest use case is for deprecating any function, method, or property:

Listing 5: Example file, `foo.py`.

```

from conda.deprecations import deprecated

@deprecated("23.9", "24.3")
def bar():
    ...

```

Listing 6: Example invocation.

```

>>> import foo
>>> foo.bar()
<stdin>:1: PendingDeprecationWarning: foo.bar is pending deprecation and will be removed_
↳ in 24.3.

```

As a minimum we must always specify two versions:

1. the future deprecation release in which the function, method, or property will be marked as deprecated; prior to that the feature will show up as pending deprecation (which we treat as a commenting period), and
2. the subsequent deprecation release in which the function, method, or property will be removed from the code base.

Additionally, you may provide an addendum to inform the user what they should do instead:

Listing 7: Example file, `foo.py`.

```
from conda.deprecations import deprecated

@deprecated("23.9", "24.3", addendum="Use `qux` instead.")
def bar():
    ...
```

Listing 8: Example invocation.

```
>>> import foo
>>> foo.bar()
<stdin>:1: PendingDeprecationWarning: foo.bar is pending deprecation and will be removed
↳ in 24.3. Use `qux` instead.
```

5.6.2 Keyword Arguments

Warning: Deprecating or renaming a positional argument is unnecessarily complicated and is not supported. Instead, it is recommended to either (1) devise a custom way of detecting usage of a deprecated positional argument (e.g., type checking) and use the `conda.deprecations.deprecated.topic` function (see [Topics](#)) or (2) deprecate the function/method itself and define a new function/method without the deprecated argument.

Similarly to deprecating a function or method it is common to deprecate a keyword argument:

Listing 9: Example file, `foo.py`.

```
from conda.deprecations import deprecated

# prior implementation
# def bar(is_true=True):
#     ...

@deprecated.argument("23.9", "24.3", "is_true")
def bar():
    ...
```

Listing 10: Example invocation.

```
>>> import foo
>>> foo.bar(is_true=True)
<stdin>:1: PendingDeprecationWarning: foo.bar(is_true) is pending deprecation and will
↳ be removed in 24.3.
```

Or to rename the keyword argument:

Listing 11: Example file, foo.py.

```

from conda.deprecations import deprecated

# prior implementation
# def bar(is_true=True):
#     ...

@deprecated.argument("23.9", "24.3", "is_true", rename="enabled")
def bar(enabled=True):
    ...

```

Listing 12: Example invocation.

```

>>> import foo
>>> foo.bar(is_true=True)
<stdin>:1: PendingDeprecationWarning: foo.bar(is_true) is pending deprecation and will
↳ be removed in 24.3. Use 'enabled' instead.

```

5.6.3 argparse.Action

Occasionally, there is a need to deprecate CLI arguments. For this, we provide a helper function to monkeypatch any `argparse.Action`:

Listing 13: Example file, foo.py.

```

import argparse
from conda.deprecations import deprecated

parser = argparse.ArgumentParser()
parser.add_argument(
    "--force",
    dest="yes",
    action=deprecated.action(
        "23.9",
        "24.3",
        argparse._StoreTrueAction,
        addendum="Use `--yes` instead.",
    ),
    default=False,
)
parser.parse_args()

```

```

python foo.py --force
foo.py:16: PendingDeprecationWarning: `--force` is pending deprecation and will be
↳ removed in 24.3. Use `--yes` instead.

```

5.6.4 Constants and Enums

We also offer a way to deprecate global variables or constants:

Listing 14: Example file, `foo.py`.

```
from conda.deprecations import deprecated

deprecated.constant("23.9", "24.3", "ULTIMATE_CONSTANT", 42)
```

Listing 15: Example invocation.

```
>>> import foo
>>> foo.ULTIMATE_CONSTANT
<stdin>:1: PendingDeprecationWarning: foo.ULTIMATE_CONSTANT is pending deprecation and
↳ will be removed in 24.3.
```

Enums work similarly:

Listing 16: Example file, `foo.py`.

```
from enum import Enum
from conda.deprecations import deprecated

class Bar(Enum):
    ULTIMATE_CONSTANT = 42

deprecated.constant("23.9", "24.3", "Bar", Bar)
del Bar
```

Listing 17: Example invocation.

```
>>> from foo import Bar
<stdin>:1: PendingDeprecationWarning: foo.Bar is pending deprecation and will be removed.
↳ in 24.3.
```

Note: Constants deprecation relies on the module's `__getattr__` introduced in [PEP-562](#).

5.6.5 Modules

Entire modules can be also be deprecated:

Listing 18: Example file, `foo.py`.

```
from conda.deprecations import deprecated

deprecated.module("23.9", "24.3")
```


Listing 19: Example invocation.

```
>>> import foo
<stdin>:1: PendingDeprecationWarning: foo is pending deprecation and will be removed in 24.3.
```

5.6.6 Topics

Finally, there are a multitude of other ways in which code may be run that also needs to be deprecated. To this end we offer a general purpose deprecation function:

Listing 20: Example file, `foo.py`.

```
from conda.deprecations import deprecated

def bar(...):
    # some logic

    if ...:
        deprecated.topic("23.9", "24.3", topic="The <TOPIC>")

    # some more logic
```

Listing 21: Example invocation.

```
>>> import foo
>>> foo.bar(...)
<stdin>:1: PendingDeprecationWarning: The <TOPIC> is pending deprecation and will be removed in 24.3.
```

5.7 Releasing

Conda's releases may be performed via the `rever` command. Rever is configured to perform the activities for a typical conda release. To cut a release, simply run `rever <X.Y.Z>` where `<X.Y.Z>` is the release number that you want bump to. For example, `rever 1.2.3`.

However, it is always good idea to make sure that the you have permissions everywhere to actually perform the release. So it is customary to run `rever check` before the release, just to make sure.

The standard workflow is thus:

```
$ rever check
$ rever 1.2.3
```

If for some reason a release fails partway through, or you want to claw back a release that you have made, rever allows you to undo activities. If you find yourself in this pickle, you can pass the `--undo` option a comma-separated list of activities you'd like to undo. For example:

```
$ rever --undo tag,changelog,authors 1.2.3
```

Happy releasing!

5.8 Plugins

As of version 22.11.0, conda has support for user plugins, enabling extension and/or alterations to some of its functionality.

5.8.1 Quick start

This is an example of a minimal working conda plugin that defines a new subcommand:

Listing 22: example_plugin.py

```
import conda.plugins
from conda.base.context import context

def command(arguments: list[str]):
    print("Conda subcommand!")

@conda.plugins.hookimpl
def conda_subcommands():
    yield plugins.CondaSubcommand(
        name="example",
        action=command,
        summary="Example of a conda subcommand",
    )
```

Let's break down what's going on here step-by-step:

1. First, we create the function `command` that serves as our subcommand. This function is passed a list of arguments which equal to `sys.argv[2:]`.
2. Next, we register this subcommand by using the `conda_subcommands` plugin hook. We do this by creating a function called `conda_subcommands` and then decorating it with `conda.plugins.hookimpl`.
3. The object we return from this function is `conda.plugins.CondaSubcommand`, which does several things:
 1. **name** is what we use to call this subcommand via the command line (i.e. "conda example")
 2. **action** is the function that will be called when we invoke "conda example"
 3. **summary** is the description of the of the subcommand that appears when users call "conda --help"

In order to actually use conda plugins, they must be packaged as Python packages. Furthermore, we also need to take advantage of a feature known as [Python package entrypoints](#). We can define our Python package and the entry points by either using a `pyproject.toml` file (preferred) or a `setup.py` (legacy) for our project:

Listing 23: pyproject.toml

```
[build-system]
requires = ["setuptools", "setuptools-scm"]
build-backend = "setuptools.build_meta"

[project]
name = "conda-example-plugin"
version = "1.0.0"
```

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```
description = "Example conda plugin"
requires-python = ">=3.8"
dependencies = ["conda"]

[project.entry-points."conda"]
conda-example-plugin = "example_plugin"
```

Listing 24: setup.py

```
from setuptools import setup

setup(
    name="conda-example-plugin",
    install_requires="conda",
    entry_points={"conda": ["conda-example-plugin = example_plugin"]},
    py_modules=["example_plugin"],
)
```

In both examples shown above, we define an entry point for conda. It's important to make sure that the entry point is for "conda" and that it points to the correct module in your plugin package. Our package only consists a single Python module called `example_plugin`. If you have a large project, be sure to always point the entry point to the module containing the plugin hook declarations (i.e. where `conda.plugins.hookimpl` is used). We recommend using the *plugin* submodule in these cases, e.g. *large_project.plugin* (in *large_project/plugin.py*).

5.8.2 More examples

To see more examples of conda plugins, please visit the following resources:

- [conda-plugins-template](#): This is a repository with full examples that could be used a starting point for your plugin

5.8.3 Using other plugin hooks

For examples of how to use other plugin hooks, please read their respective documentation pages:

Post-commands

Conda commands can be extended with the `conda_post_commands` plugin hook. By specifying the set of commands you would like to use in the `run_for` configuration option, you can execute code via the `action` option after these commands are run. The functions are provided a `command` argument representing the name of the command currently running. If the command fails for any reason, this plugin hook will not be run.

If you would like to target `conda env` commands, prefix the command name with `env_`. For example, `conda env list` would be passed to `run_for` as `env_list`.

class `CondaPostCommand`

Return type to use when defining a conda post-command plugin hook.

For details on how this is used, see [conda_post_commands\(\)](#).

Parameters

- **name** -- Post-command name (e.g., `custom_plugin_post_commands`).
- **action** -- Callable which contains the code to be run.

- **run_for** -- Represents the command(s) this will be run on (e.g. install or create).

action

name

run_for

conda_post_commands()

Register post-command functions in conda.

Example:

```
from conda import plugins

def example_post_command(command):
    print("post-command action")

@plugins.hookimpl
def conda_post_commands():
    yield CondaPostCommand(
        name="example-post-command",
        action=example_post_command,
        run_for={"install", "create"},
    )
```

Pre-commands

Conda commands can be extended with the `conda_pre_commands` plugin hook. By specifying the set of commands you would like to use in the `run_for` configuration option, you can execute code via the `action` option before these commands are run. The functions are provided a `command` argument representing the name of the command currently running.

If you would like to target `conda env` commands, prefix the command name with `env_`. For example, `conda env list` would be passed to `run_for` as `env_list`.

class CondaPreCommand

Return type to use when defining a conda pre-command plugin hook.

For details on how this is used, see [`conda_pre_commands\(\)`](#).

Parameters

- **name** -- Pre-command name (e.g., `custom_plugin_pre_commands`).
- **action** -- Callable which contains the code to be run.
- **run_for** -- Represents the command(s) this will be run on (e.g. install or create).

action

name

run_for

conda_pre_commands()

Register pre-command functions in conda.

Example:

```

from conda import plugins

def example_pre_command(command):
    print("pre-command action")

@plugins.hookimpl
def conda_pre_commands():
    yield CondaPreCommand(
        name="example-pre-command",
        action=example_pre_command,
        run_for={"install", "create"},
    )

```

Solvers

The conda solvers can be extended with additional backends with the `conda_solvers` plugin hook. Registered solvers will be available for configuration with the `solver` configuration and `--solver` command line option.

class CondaSolver

Return type to use when defining a conda solver plugin hook.

For details on how this is used, see [conda_solvers\(\)](#).

Parameters

- **name** -- Solver name (e.g., `custom-solver`).
- **backend** -- Type that will be instantiated as the solver backend.

backend

name

conda_solvers()

Register solvers in conda.

Example:

```

import logging

from conda import plugins
from conda.core import solve

log = logging.getLogger(__name__)

class VerboseSolver(solve.Solver):
    def solve_final_state(self, *args, **kwargs):
        log.info("My verbose solver!")
        return super().solve_final_state(*args, **kwargs)

@plugins.hookimpl
def conda_solvers():

```

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```

yield plugins.CondaSolver(
    name="verbose-classic",
    backend=VerboseSolver,
)

```

Returns An iterable of solver entries.

Subcommands

The conda CLI can be extended with the `conda_subcommands` plugin hook. Registered subcommands will be available under the conda `<subcommand>` command.

class CondaSubcommand

Return type to use when defining a conda subcommand plugin hook.

For details on how this is used, see [conda_subcommands\(\)](#).

Parameters

- **name** -- Subcommand name (e.g., conda my-subcommand-name).
- **summary** -- Subcommand summary, will be shown in conda --help.
- **action** -- Callable that will be run when the subcommand is invoked.
- **configure_parser** -- Callable that will be run when the subcommand parser is initialized.

action

configure_parser

name

summary

conda_subcommands()

Register external subcommands in conda.

Example:

```

from conda import plugins

def example_command(args):
    print("This is an example command!")

@plugins.hookimpl
def conda_subcommands():
    yield plugins.CondaSubcommand(
        name="example",
        summary="example command",
        action=example_command,
    )

```

Returns An iterable of subcommand entries.

Virtual Packages

Conda allows for the registering of virtual packages in the index data via the plugin system. This mechanism lets users write plugins that provide version identification for properties only known at runtime (e.g., OS information).

class CondaVirtualPackage

Return type to use when defining a conda virtual package plugin hook.

For details on how this is used, see [`conda_virtual_packages\(\)`](#).

Parameters

- **name** -- Virtual package name (e.g., `my_custom_os`).
- **version** -- Virtual package version (e.g., `1.2.3`).
- **build** -- Virtual package build string (e.g., `x86_64`).

build

name

version

conda_virtual_packages()

Register virtual packages in Conda.

Example:

```
from conda import plugins

@plugins.hookimpl
def conda_virtual_packages():
    yield plugins.CondaVirtualPackage(
        name="my_custom_os",
        version="1.2.3",
        build="x86_64",
    )
```

Returns An iterable of virtual package entries.

5.8.4 More information about how plugins work

Plugins in conda are implemented with the use of [Pluggy](#), a Python framework used by other projects, such as `pytest`, `tox`, and `devpi`. `pluggy` provides the ability to extend and modify the behavior of conda via function hooking, which results in plugin systems that are discoverable with the use of [Python package entrypoints](#).

For more information about how it works, we suggest heading over to their [documentation](#).

5.8.5 API

For even more detailed information about our plugin system, please see the [Plugin API](#) section.

5.8.6 A note on licensing

For more information on which license to use for your custom plugin, please reference the "[Choose an Open Source License](#)" site. If you need help figuring out exactly which one to use, we advise communicating with a qualified legal professional.

5.9 Specifications

This section contains an incomplete list of conda specifications that may or may not be related to [Conda Enhancement Proposals](#).

Work in progress

This page of the documentation is not yet finished and only contains a draft of the content.

5.9.1 Technical specification: solver state

Note

This document is a technical specification, which might not be the best way to learn about how the solver works. For that, refer to [conda install](#) and [Solvers](#).

The Solver API will pass a collection of MatchSpec objects (from now on, we will refer to them as specs) to the underlying SAT solver. How this list is built from the prefix state and context options is not a straightforward process, but an elaborate logic. This is better understood if we examine the *ingredients* that participate in the construction of specs. We will label them like this:

These groups below will *not* change during the solver attempts:

1. **requested**: MatchSpec objects the user is *explicitly* asking for.
2. **installed**: Installed packages, expressed as PrefixRecord objects. Empty if the environment did not exist.
3. **history**: Specs asked in the past: the History. Empty if the environment did not exist.
4. **aggressive_updates**: Packages included in the *aggressive updates* list. These packages are always included in any requests to make sure they stay up-to-date under all circumstances.
5. **pinned**: Packages pinned to a specific version, either via `pinned_packages` in your `.condarc` or defined in a `$PREFIX/conda-meta/pinned` file.
6. **virtual**: System properties exposed as virtual packages (e.g. `__glibc=2.17`). They can't really be installed or uninstalled, but they do participate in the solver by adding runtime constraints.
7. **do_not_remove**: A fixed list of packages that receive special treatment by the solver due to poor metadata in the early days of conda packaging. A legacy leftover.

This one group *does* change during the solver lifetime:

1. **conflicting**: Specs that are suspected to be a conflict for the solver.

Also, two more sources that are not obvious at first. These are not labeled as a *source*, but they do participate in the specs collection:

- In new environments, packages included in the `context.create_default_packages` list. These `MatchSpec` objects are injected in each `conda create` command, so the solver will see them as explicitly requested by the user (`requested`).
- Specs added by command line modifiers. The specs here present aren't new (they are already in other categories), but they might end up in the `specs` list only when a flag is added. For example, `update --all` will add all the installed packages to the `specs` list, with no version constraint. Without this flag, the installed packages will still end up in the `specs` list, but with full constraints (`--freeze-installed` defaults for the first attempt) unless:
 - Frozen attempt failed.
 - `--update-specs` (or any other `UpdateModifier`) was passed, overriding `--freeze-installed`.

See? It gets involved. We will also use this vocabulary to help narrow down the type of change being done:

Types of `spec` objects:

- `specs`: map of package name to its currently corresponding `MatchSpec` instance.
- `spec`: specific instance of a `MatchSpec` object.
- Exact or frozen `spec`: a `spec` where both the `version` and `build` fields are constrained with `==` operators (exact match).
- Fully constrained or tight `spec`: a `spec` where both `version` and `build` are populated, but not necessarily with equality operators. It can also be inequalities (`>`, `<`, etc.) and fuzzy matches (`*something*`).
- Version-only `spec`: a `spec` where *only* the `version` field is populated. The `build` is not.
- Name-only, bare, or unconstrained `spec`: a `spec` with no `version` or `build` fields. Just the name of the package.
- Targeted `spec`: a `spec` with the `target` field populated. Extracted from the comments in the solver logic:

`target` is a reference to the package currently existing in the environment. Setting `target` instructs the solver to not disturb that package if it's not necessary. If the `spec.name` is being modified by inclusion in `specs_to_add`, we don't set `target`, since we *want* the solver to modify/update that package.

TL;DR: when working with `MatchSpec` objects,

 - to minimize the version change, set `MatchSpec(name=name, target=prec.dist_str())`
 - to freeze the package, set all the components of `MatchSpec` individually
- if the `spec` object does not have an adjective, it should be assumed it's being added to the `specs` map unmodified, as it came from its origin.

Pools (collections of `PackageRecord` objects):

- Installed pool: The installed packages, grouped by name. Each group should only contain one record!
- Explicit pool: The full index, but reduced for the specs in `requested`.

The following sections will get dry and to the point. They will state what output to expect from a given set of initial conditions. At least we'll try. Take into account that the `specs` list is kept around across attempts! In other words, the `specs` list is only really empty in the first attempt; if this fails, the subsequent attempts will only overwrite (update) the existing one. In practice, this should only affect how constrained packages are. The names should be the same.

It will also depend on whether we are adding (`conda install|create|update`) or removing (`conda remove`) packages. There's a common initialization part for both, but after that the logic is separate.

5.9.2 Common initialization

Note: This happens in `Solver._collect_all_metadata()`

This happens regardless of the type of command we are using (`install`, `update`, `create` or `remove`).

1. Add specs from `history`, if any.
2. Add specs from `do_not_remove`, but only if:
 - There's no spec for that name in `specs` already, *and*
 - A package with that name is *not* installed.
3. Add `virtual` packages as unconstrained specs.
4. Add all those installed packages, as unconstrained specs, that satisfy any of these conditions:
 - The history is empty (in that case, all installed packages are added)
 - The package name is part of `aggressive_updates`
 - The package was not installed by `conda`, but by `pip` or other PyPI tools instead.

Preparing the index

At this point, the populated specs and the requested specs are merged together. This temporary collection is used to determine how to reduce the index.

5.9.3 Processing specs for `conda install`

Preparation

1. Generate the explicit pool for the requested specs (via `Resolve._get_package_pool()`).
2. Detect potential conflicts (via `(Resolve.get_conflicting_specs())`).

Refine specs that match installed records

1. Check that each of `specs` match a single installed package or none! If there are two or more matches, it means that the environment is in bad shape and is basically broken. If the spec matches one installed package (let's call it *installed match*), we will modify the original spec.
2. We will turn the spec into an *exact* (frozen) spec if:
 1. The installed match is unmanageable (installed by `pip`, `virtual`, etc.)
 2. There's no history, we are not in `--freeze-installed` mode, and:
 - The spec is not a potential conflict, *and*
 - The package name *cannot* be found in the explicit pool index or, if it is, the installed match can be found in that explicit pool (to guarantee it will be found instead of creating one more conflict *just because*).
3. We relax the spec to a name-only spec if it's part of the aggressive updates list.
4. We turn it into a targeted spec if:
 1. The spec is in `history`. In that case, we take its *historic* spec counterpart and set the target to the installed match version and build.

2. None of the above conditions were met. In other words, we'll try our best to match the installed package if none of the above applies, but if we fail we'll stick to whatever was already present in the specs.

Handle pinned specs

5.9.4 Processing specs for conda remove

5.10 API

As of conda 4.4, conda can be installed in any environment, not just environments with names starting with _ (underscore). That change was made, in part, so that conda can be used as a Python library.

As of conda 4.5, we do not support `pip install conda`. However, we are considering that as a supported bootstrap method in the future.

5.10.1 conda

OS-agnostic, system-level binary package manager.

`__main__`

Conda as a module entry point.

`__version__`

`_vendor`

Conda's pure-python dependencies will be `vendored` until conda 5.0 when conda will be isolated in its own private environment.

Introduction of dependencies for the 4.x series is discussed in <https://github.com/conda/conda/issues/2825>.

`appdirs`

Utilities for determining application-specific dirs.

See <http://github.com/ActiveState/appdirs> for details and usage.

Classes

AppDirs

Convenience wrapper for getting application dirs.

Functions

<code>user_data_dir</code> (appname[, appauthor, version, roaming])	Return full path to the user-specific data dir for this application.
<code>site_data_dir</code> (appname[, appauthor, version])	Return full path to the user-shared data dir for this application.
<code>user_cache_dir</code> (appname[, appauthor, version, opinion])	Return full path to the user-specific cache dir for this application.
<code>user_log_dir</code> (appname[, appauthor, version, opinion])	Return full path to the user-specific log dir for this application.
<code>_get_win_folder_from_registry</code> (csidl_name)	This is a fallback technique at best. I'm not sure if using the
<code>_get_win_folder_with_pywin32</code> (csidl_name)	
<code>_get_win_folder_with_ctypes</code> (csidl_name)	

Attributes

<code>__version_info__</code>
<code>__version__</code>
<code>PY3</code>
<code>unicode</code>
<code>_get_win_folder</code>
<code>appname</code>

`__version_info__ = (1, 2, 0)`

`__version__`

`PY3`

`unicode`

exception AppDirsError

Bases: `Exception`

Common base class for all non-exit exceptions.

user_data_dir(appname, appauthor=None, version=None, roaming=False)

Return full path to the user-specific data dir for this application.

"appname" is the name of application. "appauthor" (only required and used on Windows) is the name of the

appauthor or distributing body for this application. Typically it is the owning company name.

"version" is an optional version path element to append to the path. You might want to use this if you want multiple versions of your app to be able to run independently. If used, this would typically be "<major>.<minor>".

"roaming" (boolean, default False) can be set True to use the Windows roaming appdata directory. That means that for users on a Windows network setup for roaming profiles, this user data will be sync'd on login. See <[http://technet.microsoft.com/en-us/library/cc766489\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/cc766489(WS.10).aspx)> for a discussion of issues.

Typical user data directories are: Mac OS X: ~/Library/Application Support/<AppName> Unix: ~/.config/<appname> # or in \$XDG_CONFIG_HOME if defined Win XP (not roaming): C:\Documents and Settings<username>\Application Data<AppAuthor>\<AppName> Win XP (roaming): C:\Documents and Settings<username>\Local Settings\Application Data<AppAuthor>\<AppName> Win 7 (not roaming): C:\Users<username>\AppDataLocal<AppAuthor>\<AppName> Win 7 (roaming): C:\Users<username>\AppDataRoaming<AppAuthor>\<AppName>

For Unix, we follow the XDG spec and support \$XDG_CONFIG_HOME. We don't use \$XDG_DATA_HOME as that data dir is mostly used at the time of installation, instead of the application adding data during runtime. Also, in practice, Linux apps tend to store their data in "~/.config/<appname>" instead of "~/.local/share/<appname>".

site_data_dir(*appname*, *appauthor*=None, *version*=None)

Return full path to the user-shared data dir for this application.

"appname" is the name of application. "appauthor" (only required and used on Windows) is the name of the

appauthor or distributing body for this application. Typically it is the owning company name.

"version" is an optional version path element to append to the path. You might want to use this if you want multiple versions of your app to be able to run independently. If used, this would typically be "<major>.<minor>".

Typical user data directories are: Mac OS X: ~/Library/Application Support/<AppName> Unix: /etc/xdg/<appname> Win XP: C:\Documents and SettingsAll Users\Application Data<AppAuthor>\<AppName> Vista: (Fail! "C:\ProgramData" is a hidden *system* directory on Vista.) Win 7: C:\ProgramData<AppAuthor>\<AppName> # Hidden, but writeable on Win 7.

For Unix, this is using the \$XDG_CONFIG_DIRS[0] default.

WARNING: Do not use this on Windows. See the Vista-Fail note above for why.

user_cache_dir(*appname*, *appauthor*=None, *version*=None, *opinion*=True)

Return full path to the user-specific cache dir for this application.

"appname" is the name of application. "appauthor" (only required and used on Windows) is the name of the

appauthor or distributing body for this application. Typically it is the owning company name.

"version" is an optional version path element to append to the path. You might want to use this if you want multiple versions of your app to be able to run independently. If used, this would typically be "<major>.<minor>".

"opinion" (boolean) can be False to disable the appending of "Cache" to the base app data dir for Windows. See discussion below.

Typical user cache directories are: Mac OS X: ~/Library/Caches/<AppName>
Unix: ~/.cache/<appname> (XDG default) Win XP: C:Documents and Settings<username>Local SettingsApplication Data<AppAuthor><AppName>Cache Vista:
C:Users<username>AppDataLocal<AppAuthor><AppName>Cache

On Windows the only suggestion in the MSDN docs is that local settings go in the *CSIDL_LOCAL_APPDATA* directory. This is identical to the non-roaming app data dir (the default returned by *user_data_dir* above). Apps typically put cache data somewhere *under* the given dir here. Some examples:

...MozillaFirefoxProfiles<ProfileName>Cache ...AcmeSuperAppCache1.0

OPINION: This function appends "Cache" to the *CSIDL_LOCAL_APPDATA* value. This can be disabled with the *opinion=False* option.

user_log_dir(*appname*, *appauthor=None*, *version=None*, *opinion=True*)

Return full path to the user-specific log dir for this application.

"appname" is the name of application. "appauthor" (only required and used on Windows) is the name of the

appauthor or distributing body for this application. Typically it is the owning company name.

"version" is an optional version path element to append to the path. You might want to use this if you want multiple versions of your app to be able to run independently. If used, this would typically be "<major>.<minor>".

"opinion" (boolean) can be False to disable the appending of "Logs" to the base app data dir for Windows, and "log" to the base cache dir for Unix. See discussion below.

Typical user cache directories are: Mac OS X: ~/Library/Logs/<AppName> Unix: ~/.cache/<appname>/log
or under \$XDG_CACHE_HOME if defined Win XP: C:Documents and Settings<username>Local SettingsApplication Data<AppAuthor><AppName>Logs Vista:
C:Users<username>AppDataLocal<AppAuthor><AppName>Logs

On Windows the only suggestion in the MSDN docs is that local settings go in the *CSIDL_LOCAL_APPDATA* directory. (Note: I'm interested in examples of what some windows apps use for a logs dir.)

OPINION: This function appends "Logs" to the *CSIDL_LOCAL_APPDATA* value for Windows and appends "log" to the user cache dir for Unix. This can be disabled with the *opinion=False* option.

class AppDirs(*appname*, *appauthor*, *version=None*, *roaming=False*)

Bases: `object`

Convenience wrapper for getting application dirs.

property user_data_dir

property site_data_dir

property user_cache_dir

property user_log_dir

_get_win_folder_from_registry(*csidl_name*)

This is a fallback technique at best. I'm not sure if using the registry for this guarantees us the correct answer for all CSIDL_* names.

_get_win_folder_with_pywin32(*csidl_name*)

_get_win_folder_with_ctypes(*csidl_name*)

_get_win_folder

```
appname = 'MyApp'
```

boltons

setutils

The `set` type brings the practical expressiveness of set theory to Python. It has a very rich API overall, but lacks a couple of fundamental features. For one, sets are not ordered. On top of this, sets are not indexable, i.e. `my_set[8]` will raise an `TypeError`. The `IndexedSet` type remedies both of these issues without compromising on the excellent complexity characteristics of Python's built-in set implementation.

Classes

<code>IndexedSet</code>	<code>IndexedSet</code> is a <code>collections.MutableSet</code> that maintains
-------------------------	---

Functions

<code>complement(wrapped)</code>	Given a <code>set</code> , convert it to a complement set .
----------------------------------	--

class `IndexedSet`(*other=None*)

Bases: `collections.abc.MutableSet`

`IndexedSet` is a `collections.MutableSet` that maintains insertion order and uniqueness of inserted elements. It's a hybrid type, mostly like an `OrderedSet`, but also `list`-like, in that it supports indexing and slicing.

Parameters `other` (*iterable*) -- An optional iterable used to initialize the set.

```
>>> x = IndexedSet(list(range(4)) + list(range(8)))
>>> x
IndexedSet([0, 1, 2, 3, 4, 5, 6, 7])
>>> x - set(range(2))
IndexedSet([2, 3, 4, 5, 6, 7])
>>> x[-1]
7
>>> fcr = IndexedSet('freecreditreport.com')
>>> ''.join(fcr[:fcr.index('.')])
'freeditpo'
```

Standard set operators and interoperation with `set` are all supported:

```
>>> fcr & set('cash4gold.com')
IndexedSet(['c', 'd', 'o', '.', 'm'])
```

As you can see, the `IndexedSet` is almost like a `UniqueList`, retaining only one copy of a given value, in the order it was first added. For the curious, the reason why `IndexedSet` does not support setting items based on index (i.e. `__setitem__()`), consider the following dilemma:

```
my_indexed_set = [A, B, C, D]
my_indexed_set[2] = A
```

At this point, a set requires only one *A*, but a `list` would overwrite *C*. Overwriting *C* would change the length of the list, meaning that `my_indexed_set[2]` would not be *A*, as expected with a list, but rather *D*. So, no `__setitem__()`.

Otherwise, the API strives to be as complete a union of the `list` and `set` APIs as possible.

property `_dead_index_count`

`__sub__`

`_compact()`

`_cull()`

`_get_real_index(index)`

`_get_apparent_index(index)`

`_add_dead(start, stop=None)`

`__len__()`

`__contains__(item)`

`__iter__()`

`__reversed__()`

`__repr__()`

Return `repr(self)`.

`__eq__(other)`

Return `self==value`.

classmethod `from_iterable(it)`

`from_iterable(it)` -> create a set from an iterable

add(*item*)

`add(item)` -> add item to the set

remove(*item*)

`remove(item)` -> remove item from the set, raises if not present

discard(*item*)

`discard(item)` -> discard item from the set (does not raise)

clear()

`clear()` -> empty the set

isdisjoint(*other*)

`isdisjoint(other)` -> return True if no overlap with other

issubset(*other*)

`issubset(other)` -> return True if other contains this set

issuperset(*other*)

`issuperset(other)` -> return True if set contains other

union(**others*)

`union(*others)` -> return a new set containing this set and others

iter_intersection(**others*)

`iter_intersection(*others)` -> iterate over elements also in others

intersection(**others*)

`intersection(*others)` -> get a set with overlap of this and others

iter_difference(*others)
 iter_difference(*others) -> iterate over elements not in others
difference(*others)
 difference(*others) -> get a new set with elements not in others
symmetric_difference(*others)
 symmetric_difference(*others) -> XOR set of this and others
__rsub__(other)
update(*others)
 update(*others) -> add values from one or more iterables
intersection_update(*others)
 intersection_update(*others) -> discard self.difference(*others)
difference_update(*others)
 difference_update(*others) -> discard self.intersection(*others)
symmetric_difference_update(other)
 symmetric_difference_update(other) -> in-place XOR with other
__ior__(*others)
__iand__(*others)
__isub__(*others)
__ixor__(*others)
iter_slice(start, stop, step=None)
 iterate over a slice of the set
__getitem__(index)
pop(index=None)
 pop(index) -> remove the item at a given index (-1 by default)
count(val)
 count(val) -> count number of instances of value (0 or 1)
reverse()
 reverse() -> reverse the contents of the set in-place
sort(**kwargs)
 sort() -> sort the contents of the set in-place
index(val)
 index(val) -> get the index of a value, raises if not present
complement(wrapped)
 Given a **set**, convert it to a **complement set**.

Whereas a **set** keeps track of what it contains, a **complement set** keeps track of what it does *not* contain. For example, look what happens when we intersect a normal set with a complement set:

```
>>> list(set(range(5)) & complement(set([2, 3])))
```

```
[0, 1, 4]
```

We get the everything in the left that wasn't in the right, because intersecting with a complement is the same as subtracting a normal set.

Parameters `wrapped` (`set`) -- A set or any other iterable which should be turned into a complement set.

All set methods and operators are supported by complement sets, between other `complement()`-wrapped sets and/or regular `set` objects.

Because a complement set only tracks what elements are *not* in the set, functionality based on set contents is unavailable: `len()`, `iter()` (and for loops), and `.pop()`. But a complement set can always be turned back into a regular set by complementing it again:

```
>>> s = set(range(5))
>>> complement(complement(s)) == s
True
```

Note: An empty complement set corresponds to the concept of a `universal set` from mathematics.

Many uses of sets can be expressed more simply by using a complement. Rather than trying to work out in your head the proper way to invert an expression, you can just throw a complement on the set. Consider this example of a name filter:

```
>>> class NamesFilter(object):
...     def __init__(self, allowed):
...         self._allowed = allowed
...
...     def filter(self, names):
...         return [name for name in names if name in self._allowed]
>>> NamesFilter(set(['alice', 'bob'])).filter(['alice', 'bob', 'carol'])
['alice', 'bob']
```

What if we want to just express "let all the names through"?

We could try to enumerate all of the expected names:

```
``NamesFilter({'alice', 'bob', 'carol'})``
```

But this is very brittle -- what if at some point over this object is changed to filter `['alice', 'bob', 'carol', 'dan']`?

Even worse, what about the poor programmer who next works on this piece of code? They cannot tell whether the purpose of the large allowed set was "allow everything", or if 'dan' was excluded for some subtle reason.

A complement set lets the programmer intention be expressed succinctly and directly:

```
NamesFilter(complement(set()))
```

Not only is this code short and robust, it is easy to understand the intention.

timeutils

Python's `datetime` module provides some of the most complex and powerful primitives in the Python standard library. Time is nontrivial, but thankfully its support is first-class in Python. `dateutils` provides some additional tools for working with time.

Additionally, `timeutils` provides a few basic utilities for working with timezones in Python. The Python `datetime` module's documentation describes how to create a `datetime`-compatible `tzinfo` subtype. It even provides a few examples.

The following module defines usable forms of the timezones in those docs, as well as a couple other useful ones, `UTC` (aka GMT) and `LocalTZ` (representing the local timezone as configured in the operating system). For timezones beyond these, as well as a higher degree of accuracy in corner cases, check out `pytz` and ``dateutil`_`.

Classes

<code>ConstantTZInfo</code>	A <code>tzinfo</code> subtype whose <i>offset</i> remains constant
<code>LocalTZInfo</code>	The <code>LocalTZInfo</code> type takes data available in the time module
<code>USTimeZone</code>	Copied directly from the Python docs, the <code>USTimeZone</code> is a

Functions

<code>total_seconds(td)</code>	For those with older versions of Python, a pure-Python
<code>dt_to_timestamp(dt)</code>	Converts from a <code>datetime</code> object to an integer
<code>isoparse(iso_str)</code>	Parses the limited subset of <code>ISO8601-formatted time</code> strings as
<code>parse_timedelta(text)</code>	Robustly parses a short text description of a time period into a
<code>_cardinalize_time_unit(unit, value)</code>	
<code>decimal_relative_time(d[, other, ndigits, cardinalize])</code>	Get a tuple representing the relative time difference between two
<code>relative_time(d[, other, ndigits])</code>	Get a string representation of the difference between two
<code>strpdate(string, format)</code>	Parse the date string according to the format in <i>format</i> . Returns a
<code>daterange(start, stop[, step, inclusive])</code>	In the spirit of <code>range()</code> and <code>xrange()</code> , the <i>daterange</i>
<code>_first_sunday_on_or_after(dt)</code>	

Attributes

_NONDIGIT_RE

_BOUNDS

_BOUNDS

_BOUND_DELTAS

_FLOAT_PATTERN

_PARSE_TD_RE

_PARSE_TD_KW_MAP

parse_td

ZERO

HOURL

UTC

EPOCH_AWARE

EPOCH_NAIVE

LocalTZ

DSTSTART_2007

DSTEND_2007

DSTSTART_1987_2006

DSTEND_1987_2006

DSTSTART_1967_1986

DSTEND_1967_1986

Eastern

Central

Mountain

Pacific

total_seconds(td)

For those with older versions of Python, a pure-Python implementation of Python 2.7's `total_seconds()`.

Parameters `td` (`datetime.timedelta`) -- The timedelta to convert to seconds.

Returns total number of seconds

Return type `float`

```
>>> td = timedelta(days=4, seconds=33)
>>> total_seconds(td)
345633.0
```

dt_to_timestamp(dt)

Converts from a `datetime` object to an integer timestamp, suitable interoperability with `time.time()` and other *Epoch-based timestamps*.

```
>>> abs(round(time.time() - dt_to_timestamp(datetime.utcnow()), 2))
0.0
```

`dt_to_timestamp` supports both timezone-aware and naïve `datetime` objects. Note that it assumes naïve `datetime` objects are implied UTC, such as those generated with `datetime.datetime.utcnow()`. If your `datetime` objects are local time, such as those generated with `datetime.datetime.now()`, first convert it using the `datetime.datetime.replace()` method with `tzinfo=LocalTZ` object in this module, then pass the result of that to `dt_to_timestamp`.

_NONDIGIT_RE**isoparse(iso_str)**

Parses the limited subset of ISO8601-formatted time strings as returned by `datetime.datetime.isoformat()`.

```
>>> epoch_dt = datetime.utcfromtimestamp(0)
>>> iso_str = epoch_dt.isoformat()
>>> print(iso_str)
1970-01-01T00:00:00
>>> isoparse(iso_str)
datetime.datetime(1970, 1, 1, 0, 0)
```

```
>>> utcnow = datetime.utcnow()
>>> utcnow == isoparse(utcnow.isoformat())
True
```

For further `datetime` parsing, see the `iso8601` package for strict ISO parsing and `'dateutil'` package for loose parsing and more.

_BOUNDS = [(0,), (1,), (1,), (1,), (1,), (2,), (1,)]

_BOUNDS

_BOUND_DELTAS

_FLOAT_PATTERN = '[+-]?\\ * (\\d+(\\.\\d*)?|\\.\\d+)([eE][+-]?\\d+)?'

_PARSE_TD_RE

_PARSE_TD_KW_MAP

parse_timedelta(*text*)

Robustly parses a short text description of a time period into a `datetime.timedelta`. Supports weeks, days, hours, minutes, and seconds, with or without decimal points:

Parameters `text` (*str*) -- Text to parse.

Returns `datetime.timedelta`

Raises `ValueError` -- on parse failure.

```
>>> parse_td('1d 2h 3.5m 0s') == timedelta(days=1, seconds=7410)
True
```

Also supports full words and whitespace.

```
>>> parse_td('2 weeks 1 day') == timedelta(days=15)
True
```

Negative times are supported, too:

```
>>> parse_td('-1.5 weeks 3m 20s') == timedelta(days=-11, seconds=43400)
True
```

parse_td**_cardinalize_time_unit**(*unit*, *value*)**decimal_relative_time**(*d*, *other=None*, *ndigits=0*, *cardinalize=True*)

Get a tuple representing the relative time difference between two `datetime` objects or one `datetime` and now.

Parameters

- **d** (*datetime*) -- The first datetime object.
- **other** (*datetime*) -- An optional second datetime object. If unset, defaults to the current time as determined `datetime.utcnow()`.
- **ndigits** (*int*) -- The number of decimal digits to round to, defaults to 0.
- **cardinalize** (*bool*) -- Whether to pluralize the time unit if appropriate, defaults to True.

Returns

A tuple of the `float` difference and respective unit of time, pluralized if appropriate and *cardinalize* is set to True.

Return type (`float`, `str`)

Unlike `relative_time()`, this method's return is amenable to localization into other languages and custom phrasing and formatting.

```
>>> now = datetime.utcnow()
>>> decimal_relative_time(now - timedelta(days=1, seconds=3600), now)
(1.0, 'day')
>>> decimal_relative_time(now - timedelta(seconds=0.002), now, ndigits=5)
(0.002, 'seconds')
>>> decimal_relative_time(now, now - timedelta(days=900), ndigits=1)
(-2.5, 'years')
```

relative_time(*d*, *other=None*, *ndigits=0*)

Get a string representation of the difference between two `datetime` objects or one `datetime` and the current time. Handles past and future times.

Parameters

- **d** (*datetime*) -- The first datetime object.
- **other** (*datetime*) -- An optional second datetime object. If unset, defaults to the current time as determined `datetime.utcnow()`.
- **ndigits** (*int*) -- The number of decimal digits to round to, defaults to 0.

Returns A short English-language string.

```
>>> now = datetime.utcnow()
>>> relative_time(now, ndigits=1)
'0 seconds ago'
>>> relative_time(now - timedelta(days=1, seconds=36000), ndigits=1)
'1.4 days ago'
>>> relative_time(now + timedelta(days=7), now, ndigits=1)
'1 week from now'
```

strptime(string, format)

Parse the date string according to the format in *format*. Returns a date object. Internally, `datetime.strptime()` is used to parse the string and thus conversion specifiers for time fields (e.g. *%H*) may be provided; these will be parsed but ignored.

Parameters

- **string** (*str*) -- The date string to be parsed.
- **format** (*str*) -- The `strptime`-style date format string.

Returns `datetime.date`

```
>>> strptime('2016-02-14', '%Y-%m-%d')
datetime.date(2016, 2, 14)
>>> strptime('26/12 (2015)', '%d/%m (%Y)')
datetime.date(2015, 12, 26)
>>> strptime('20151231 23:59:59', '%Y%m%d %H:%M:%S')
datetime.date(2015, 12, 31)
>>> strptime('20160101 00:00:00.001', '%Y%m%d %H:%M:%S.%f')
datetime.date(2016, 1, 1)
```

daterange(start, stop, step=1, inclusive=False)

In the spirit of `range()` and `xrange()`, the *daterange* generator that yields a sequence of `date` objects, starting at *start*, incrementing by *step*, until *stop* is reached.

When *inclusive* is `True`, the final date may be *stop*, if *step* falls evenly on it. By default, *step* is one day. See details below for many more details.

Parameters

- **start** (*datetime.date*) -- The starting date The first value in the sequence.
- **stop** (*datetime.date*) -- The stopping date. By default not included in return. Can be *None* to yield an infinite sequence.
- **step** (*int*) -- The value to increment *start* by to reach *stop*. Can be an *int* number of days, a `datetime.timedelta`, or a *tuple* of integers, (*year*, *month*, *day*). Positive and negative *step* values are supported.
- **inclusive** (*bool*) -- Whether or not the *stop* date can be returned. *stop* is only returned when a *step* falls evenly on it.

```
>>> christmas = date(year=2015, month=12, day=25)
>>> boxing_day = date(year=2015, month=12, day=26)
>>> new_year = date(year=2016, month=1, day=1)
>>> for day in daterange(christmas, new_year):
...     print(repr(day))
datetime.date(2015, 12, 25)
datetime.date(2015, 12, 26)
datetime.date(2015, 12, 27)
datetime.date(2015, 12, 28)
datetime.date(2015, 12, 29)
datetime.date(2015, 12, 30)
datetime.date(2015, 12, 31)
>>> for day in daterange(christmas, boxing_day):
...     print(repr(day))
datetime.date(2015, 12, 25)
>>> for day in daterange(date(2017, 5, 1), date(2017, 8, 1),
...                       step=(0, 1, 0), inclusive=True):
...     print(repr(day))
datetime.date(2017, 5, 1)
datetime.date(2017, 6, 1)
datetime.date(2017, 7, 1)
datetime.date(2017, 8, 1)
```

Be careful when using stop=None, as this will yield an infinite sequence of dates.

ZERO

HOURL

class `ConstantTZInfo`(name='ConstantTZ', offset=ZERO)

Bases: `datetime.tzinfo`

A `tzinfo` subtype whose *offset* remains constant (no daylight savings).

Parameters

- **name** (`str`) -- Name of the timezone.
- **offset** (`datetime.timedelta`) -- Offset of the timezone.

property `utcoffset_hours`

`utcoffset(dt)`

datetime -> timedelta, positive for east of UTC, negative for west of UTC

`tzname(dt)`

datetime -> string name of time zone.

`dst(dt)`

datetime -> DST offset as timedelta, positive for east of UTC.

Return 0 if DST not in effect. `utcoffset()` must include the DST offset.

`__repr__()`

Return `repr(self)`.

UTC

EPOCH_AWARE

EPOCH_NAIVE

class LocalTZInfoBases: `datetime.tzinfo`

The LocalTZInfo type takes data available in the time module about the local timezone and makes a practical `datetime.tzinfo` to represent the timezone settings of the operating system.

For a more in-depth integration with the operating system, check out `tzlocal`. It builds on `pytz` and implements heuristics for many versions of major operating systems to provide the official `pytz` tzinfo, instead of the LocalTZ generalization.

_std_offset**_dst_offset****is_dst(dt)****utcoffset(dt)**

datetime -> timedelta, positive for east of UTC, negative for west of UTC

dst(dt)

datetime -> DST offset as timedelta, positive for east of UTC.

Return 0 if DST not in effect. utcoffset() must include the DST offset.

tzname(dt)

datetime -> string name of time zone.

__repr__()

Return repr(self).

LocalTZ**_first_sunday_on_or_after(dt)****DSTSTART_2007****DSTEND_2007****DSTSTART_1987_2006****DSTEND_1987_2006****DSTSTART_1967_1986****DSTEND_1967_1986****class USTimeZone(hours, reprname, stdname, dstname)**Bases: `datetime.tzinfo`

Copied directly from the Python docs, the USTimeZone is a `datetime.tzinfo` subtype used to create the *Eastern*, *Central*, *Mountain*, and *Pacific* tzinfo types.

__repr__()

Return repr(self).

tzname(dt)

datetime -> string name of time zone.

utcoffset(dt)

datetime -> timedelta, positive for east of UTC, negative for west of UTC

dst(dt)

datetime -> DST offset as timedelta, positive for east of UTC.

Return 0 if DST not in effect. utcoffset() must include the DST offset.

Eastern

Central

Mountain

Pacific

deprecated

cpuinfo

cpuinfo

Classes

Trace

DataSource

ASM

CPUID

Functions

_program_paths(program_name)

_run_and_get_stdout(command[, pipe_command])

_read_windows_registry_key(key_name,
field_name)

_check_arch()

_obj_to_b64(thing)

_b64_to_obj(thing)

_utf_to_str(input)

_copy_new_fields(info, new_info)

_get_field_actual(cant_be_number, raw_string,
field_names)

_get_field(cant_be_number, raw_string, convert_to,
...)

_to_decimal_string(ticks)

_hz_short_to_full(ticks, scale)

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Table 10 – continued from previous page

<code>_hz_friendly_to_full(hz_string)</code>	
<code>_hz_short_to_friendly(ticks, scale)</code>	
<code>_to_friendly_bytes(input)</code>	
<code>_friendly_bytes_to_int(friendly_bytes)</code>	
<code>_parse_cpu_brand_string(cpu_string)</code>	
<code>_parse_cpu_brand_string_dx(cpu_string)</code>	
<code>_parse_dmesg_output(output)</code>	
<code>_parse_arch(arch_string_raw)</code>	
<code>_is_bit_set(reg, bit)</code>	
<code>_is_selinux_enforcing(trace)</code>	
<code>_filter_dict_keys_with_empty_values(info[, ...])</code>	
<code>_get_cpu_info_from_cpuid_actual()</code>	Warning! This function has the potential to crash the Python runtime.
<code>_get_cpu_info_from_cpuid_subprocess_wrapper(queue)</code>	
<code>_get_cpu_info_from_cpuid()</code>	Returns the CPU info gathered by querying the X86 cpuid register in a new process.
<code>_get_cpu_info_from_proc_cpuinfo()</code>	Returns the CPU info gathered from /proc/cpuinfo.
<code>_get_cpu_info_from_cpufreq_info()</code>	Returns the CPU info gathered from cpufreq-info.
<code>_get_cpu_info_from_lscpu()</code>	Returns the CPU info gathered from lscpu.
<code>_get_cpu_info_from_dmesg()</code>	Returns the CPU info gathered from dmesg.
<code>_get_cpu_info_from_ibm_pa_features()</code>	Returns the CPU info gathered from lsprop /proc/device-tree/cpus/*/ibm,pa-features
<code>_get_cpu_info_from_cat_var_run_dmesg_boot()</code>	Returns the CPU info gathered from /var/run/dmesg.boot.
<code>_get_cpu_info_from_sysctl()</code>	Returns the CPU info gathered from sysctl.
<code>_get_cpu_info_from_sysinfo()</code>	Returns the CPU info gathered from sysinfo.
<code>_get_cpu_info_from_sysinfo_v1()</code>	Returns the CPU info gathered from sysinfo.
<code>_get_cpu_info_from_sysinfo_v2()</code>	Returns the CPU info gathered from sysinfo.
<code>_get_cpu_info_from_wmic()</code>	Returns the CPU info gathered from WMI.
<code>_get_cpu_info_from_registry()</code>	Returns the CPU info gathered from the Windows Registry.
<code>_get_cpu_info_from_kstat()</code>	Returns the CPU info gathered from isainfo and kstat.
<code>_get_cpu_info_from_platform_uname()</code>	
<code>_get_cpu_info_internal()</code>	Returns the CPU info by using the best sources of information for your OS.
<code>get_cpu_info_json()</code>	Returns the CPU info by using the best sources of information for your OS.

continues on next page

Table 10 – continued from previous page

<code>get_cpu_info()</code>	Returns the CPU info by using the best sources of information for your OS.
<code>main()</code>	

Attributes

<code>CPUINFO_VERSION</code>
<code>CPUINFO_VERSION_STRING</code>
<code>CAN_CALL_CPUID_IN_SUBPROCESS</code>
<code>g_trace</code>
<code>g_trace</code>

`CPUINFO_VERSION = (9, 0, 0)`

`CPUINFO_VERSION_STRING`

`CAN_CALL_CPUID_IN_SUBPROCESS = True`

`g_trace`

`class Trace(is_active, is_stored_in_string)`

Bases: `object`

`header(msg)`

`success()`

`fail(msg)`

`command_header(msg)`

`command_output(msg, output)`

`keys(keys, info, new_info)`

`write(msg)`

`to_dict(info, is_fail)`

`class DataSource`

Bases: `object`

`bits`

`cpu_count`

`is_windows`

`arch_string_raw`

`uname_string_raw`

`can_cpuid = True`

```

static has_proc_cpuinfo()
static has_dmesg()
static has_var_run_dmesg_boot()
static has_cpufreq_info()
static has_sestatus()
static has_sysctl()
static has_isainfo()
static has_kstat()
static has_sysinfo()
static has_lscpu()
static has_ibm_pa_features()
static has_wmic()
static cat_proc_cpuinfo()
static cpufreq_info()
static sestatus_b()
static dmesg_a()
static cat_var_run_dmesg_boot()
static sysctl_machdep_cpu_hw_cpufrequency()
static isainfo_vb()
static kstat_m_cpu_info()
static sysinfo_cpu()
static lscpu()
static ibm_pa_features()
static wmic_cpu()
static winreg_processor_brand()
static winreg_vendor_id_raw()
static winreg_arch_string_raw()
static winreg_hz_actual()
static winreg_feature_bits()
_program_paths(program_name)
_run_and_get_stdout(command, pipe_command=None)
_read_windows_registry_key(key_name, field_name)
_check_arch()
_obj_to_b64(thing)
_b64_to_obj(thing)
_utf_to_str(input)

```

```
_copy_new_fields(info, new_info)
_get_field_actual(cant_be_number, raw_string, field_names)
_get_field(cant_be_number, raw_string, convert_to, default_value, *field_names)
_to_decimal_string(ticks)
_hz_short_to_full(ticks, scale)
_hz_friendly_to_full(hz_string)
_hz_short_to_friendly(ticks, scale)
_to_friendly_bytes(input)
_friendly_bytes_to_int(friendly_bytes)
_parse_cpu_brand_string(cpu_string)
_parse_cpu_brand_string_dx(cpu_string)
_parse_dmesg_output(output)
_parse_arch(arch_string_raw)
_is_bit_set(reg, bit)
_is_selinux_enforcing(trace)
_filter_dict_keys_with_empty_values(info, acceptable_values={})
class ASM(restype=None, argtypes=(), machine_code=[])
    Bases: object
    compile()
    run()
    free()
class CPUID(trace=None)
    Bases: object
    _asm_func(restype=None, argtypes=(), machine_code=[])
    _run_asm(*machine_code)
    get_vendor_id()
    get_info()
    get_max_extension_support()
    get_flags(max_extension_support)
    get_processor_brand(max_extension_support)
    get_cache(max_extension_support)
    get_ticks_func()
    get_raw_hz()
_get_cpu_info_from_cpuid_actual()
    Warning! This function has the potential to crash the Python runtime. Do not call it directly. Use the
    _get_cpu_info_from_cpuid function instead. It will safely call this function in another process.
_get_cpu_info_from_cpuid_subprocess_wrapper(queue)
```

_get_cpu_info_from_cpuid()

Returns the CPU info gathered by querying the X86 cpuid register in a new process. Returns {} on non X86 cpus. Returns {} if SELinux is in enforcing mode.

_get_cpu_info_from_proc_cpuinfo()

Returns the CPU info gathered from /proc/cpuinfo. Returns {} if /proc/cpuinfo is not found.

_get_cpu_info_from_cpufreq_info()

Returns the CPU info gathered from cpufreq-info. Returns {} if cpufreq-info is not found.

_get_cpu_info_from_lscpu()

Returns the CPU info gathered from lscpu. Returns {} if lscpu is not found.

_get_cpu_info_from_dmesg()

Returns the CPU info gathered from dmesg. Returns {} if dmesg is not found or does not have the desired info.

_get_cpu_info_from_ibm_pa_features()

Returns the CPU info gathered from lsprop /proc/device-tree/cpus/*/ibm,pa-features Returns {} if lsprop is not found or ibm,pa-features does not have the desired info.

_get_cpu_info_from_cat_var_run_dmesg_boot()

Returns the CPU info gathered from /var/run/dmesg.boot. Returns {} if dmesg is not found or does not have the desired info.

_get_cpu_info_from_sysctl()

Returns the CPU info gathered from sysctl. Returns {} if sysctl is not found.

_get_cpu_info_from_sysinfo()

Returns the CPU info gathered from sysinfo. Returns {} if sysinfo is not found.

_get_cpu_info_from_sysinfo_v1()

Returns the CPU info gathered from sysinfo. Returns {} if sysinfo is not found.

_get_cpu_info_from_sysinfo_v2()

Returns the CPU info gathered from sysinfo. Returns {} if sysinfo is not found.

_get_cpu_info_from_wmic()

Returns the CPU info gathered from WMI. Returns {} if not on Windows, or wmic is not installed.

_get_cpu_info_from_registry()

Returns the CPU info gathered from the Windows Registry. Returns {} if not on Windows.

_get_cpu_info_from_kstat()

Returns the CPU info gathered from isainfo and kstat. Returns {} if isainfo or kstat are not found.

_get_cpu_info_from_platform_uname()**_get_cpu_info_internal()**

Returns the CPU info by using the best sources of information for your OS. Returns {} if nothing is found.

get_cpu_info_json()

Returns the CPU info by using the best sources of information for your OS. Returns the result in a json string

get_cpu_info()

Returns the CPU info by using the best sources of information for your OS. Returns the result in a dict

main()**g_trace**

Classes

Trace

DataSource

ASM

CPUID

Functions

_program_paths(program_name)

_run_and_get_stdout(command[, pipe_command])

*_read_windows_registry_key(key_name,
field_name)*

_check_arch()

_obj_to_b64(thing)

_b64_to_obj(thing)

_utf_to_str(input)

_copy_new_fields(info, new_info)

*_get_field_actual(cant_be_number, raw_string,
field_names)*

*_get_field(cant_be_number, raw_string, convert_to,
...)*

_to_decimal_string(ticks)

_hz_short_to_full(ticks, scale)

_hz_friendly_to_full(hz_string)

_hz_short_to_friendly(ticks, scale)

_to_friendly_bytes(input)

_friendly_bytes_to_int(friendly_bytes)

_parse_cpu_brand_string(cpu_string)

_parse_cpu_brand_string_dx(cpu_string)

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Table 13 – continued from previous page

<code>_parse_dmesg_output(output)</code>	
<code>_parse_arch(arch_string_raw)</code>	
<code>_is_bit_set(reg, bit)</code>	
<code>_is_selinux_enforcing(trace)</code>	
<code>_filter_dict_keys_with_empty_values(info[, ...])</code>	
<code>_get_cpu_info_from_cpuid_actual()</code>	Warning! This function has the potential to crash the Python runtime.
<code>_get_cpu_info_from_cpuid_subprocess_wrapper(queue)</code>	
<code>_get_cpu_info_from_cpuid()</code>	Returns the CPU info gathered by querying the X86 cpuid register in a new process.
<code>_get_cpu_info_from_proc_cpuinfo()</code>	Returns the CPU info gathered from /proc/cpuinfo.
<code>_get_cpu_info_from_cpufreq_info()</code>	Returns the CPU info gathered from cpufreq-info.
<code>_get_cpu_info_from_lscpu()</code>	Returns the CPU info gathered from lscpu.
<code>_get_cpu_info_from_dmesg()</code>	Returns the CPU info gathered from dmesg.
<code>_get_cpu_info_from_ibm_pa_features()</code>	Returns the CPU info gathered from lsprop /proc/device-tree/cpus/*/ibm,pa-features
<code>_get_cpu_info_from_cat_var_run_dmesg_boot()</code>	Returns the CPU info gathered from /var/run/dmesg.boot.
<code>_get_cpu_info_from_sysctl()</code>	Returns the CPU info gathered from sysctl.
<code>_get_cpu_info_from_sysinfo()</code>	Returns the CPU info gathered from sysinfo.
<code>_get_cpu_info_from_sysinfo_v1()</code>	Returns the CPU info gathered from sysinfo.
<code>_get_cpu_info_from_sysinfo_v2()</code>	Returns the CPU info gathered from sysinfo.
<code>_get_cpu_info_from_wmic()</code>	Returns the CPU info gathered from WMI.
<code>_get_cpu_info_from_registry()</code>	Returns the CPU info gathered from the Windows Registry.
<code>_get_cpu_info_from_kstat()</code>	Returns the CPU info gathered from isainfo and kstat.
<code>_get_cpu_info_from_platform_uname()</code>	
<code>_get_cpu_info_internal()</code>	Returns the CPU info by using the best sources of information for your OS.
<code>get_cpu_info_json()</code>	Returns the CPU info by using the best sources of information for your OS.
<code>get_cpu_info()</code>	Returns the CPU info by using the best sources of information for your OS.
<code>main()</code>	

Attributes

CPUINFO_VERSION

CPUINFO_VERSION_STRING

CAN_CALL_CPUID_IN_SUBPROCESS

g_trace

CPUINFO_VERSION = (9, 0, 0)**CPUINFO_VERSION_STRING****CAN_CALL_CPUID_IN_SUBPROCESS = True****g_trace****class Trace**(*is_active, is_stored_in_string*)Bases: **object****header**(*msg*)**success**()**fail**(*msg*)**command_header**(*msg*)**command_output**(*msg, output*)**keys**(*keys, info, new_info*)**write**(*msg*)**to_dict**(*info, is_fail*)**class DataSource**Bases: **object****bits****cpu_count****is_windows****arch_string_raw****uname_string_raw****can_cpuid = True****static has_proc_cpuinfo**()**static has_dmesg**()**static has_var_run_dmesg_boot**()**static has_cpufreq_info**()**static has_sestatus**()**static has_sysctl**()

```

static has_isainfo()
static has_kstat()
static has_sysinfo()
static has_lscpu()
static has_ibm_pa_features()
static has_wmic()
static cat_proc_cpuinfo()
static cpufreq_info()
static sestatus_b()
static dmesg_a()
static cat_var_run_dmesg_boot()
static sysctl_machdep_cpu_hw_cpufrequency()
static isainfo_vb()
static kstat_m_cpu_info()
static sysinfo_cpu()
static lscpu()
static ibm_pa_features()
static wmic_cpu()
static winreg_processor_brand()
static winreg_vendor_id_raw()
static winreg_arch_string_raw()
static winreg_hz_actual()
static winreg_feature_bits()
_program_paths(program_name)
_run_and_get_stdout(command, pipe_command=None)
_read_windows_registry_key(key_name, field_name)
_check_arch()
_obj_to_b64(thing)
_b64_to_obj(thing)
_utf_to_str(input)
_copy_new_fields(info, new_info)
_get_field_actual(cant_be_number, raw_string, field_names)
_get_field(cant_be_number, raw_string, convert_to, default_value, *field_names)
_to_decimal_string(ticks)
_hz_short_to_full(ticks, scale)
_hz_friendly_to_full(hz_string)

```

```
_hz_short_to_friendly(ticks, scale)
_to_friendly_bytes(input)
_friendly_bytes_to_int(friendly_bytes)
_parse_cpu_brand_string(cpu_string)
_parse_cpu_brand_string_dx(cpu_string)
_parse_dmesg_output(output)
_parse_arch(arch_string_raw)
_is_bit_set(reg, bit)
_is_selinux_enforcing(trace)
_filter_dict_keys_with_empty_values(info, acceptable_values={})
class ASM(restype=None, argtypes=(), machine_code=[])
    Bases: object
    compile()
    run()
    free()
class CPUID(trace=None)
    Bases: object
    _asm_func(restype=None, argtypes=(), machine_code=[])
    _run_asm(*machine_code)
    get_vendor_id()
    get_info()
    get_max_extension_support()
    get_flags(max_extension_support)
    get_processor_brand(max_extension_support)
    get_cache(max_extension_support)
    get_ticks_func()
    get_raw_hz()
_get_cpu_info_from_cpuid_actual()
    Warning! This function has the potential to crash the Python runtime. Do not call it directly. Use the
    _get_cpu_info_from_cpuid function instead. It will safely call this function in another process.
_get_cpu_info_from_cpuid_subprocess_wrapper(queue)
_get_cpu_info_from_cpuid()
    Returns the CPU info gathered by querying the X86 cpuid register in a new process. Returns {} on non X86
    cpus. Returns {} if SELinux is in enforcing mode.
_get_cpu_info_from_proc_cpuinfo()
    Returns the CPU info gathered from /proc/cpuinfo. Returns {} if /proc/cpuinfo is not found.
_get_cpu_info_from_cpufreq_info()
    Returns the CPU info gathered from cpufreq-info. Returns {} if cpufreq-info is not found.
```

`_get_cpu_info_from_lscpu()`

Returns the CPU info gathered from `lscpu`. Returns `{}` if `lscpu` is not found.

`_get_cpu_info_from_dmesg()`

Returns the CPU info gathered from `dmesg`. Returns `{}` if `dmesg` is not found or does not have the desired info.

`_get_cpu_info_from_ibm_pa_features()`

Returns the CPU info gathered from `lsprop /proc/device-tree/cpus/*/ibm,pa-features`. Returns `{}` if `lsprop` is not found or `ibm,pa-features` does not have the desired info.

`_get_cpu_info_from_cat_var_run_dmesg_boot()`

Returns the CPU info gathered from `/var/run/dmesg.boot`. Returns `{}` if `dmesg` is not found or does not have the desired info.

`_get_cpu_info_from_sysctl()`

Returns the CPU info gathered from `sysctl`. Returns `{}` if `sysctl` is not found.

`_get_cpu_info_from_sysinfo()`

Returns the CPU info gathered from `sysinfo`. Returns `{}` if `sysinfo` is not found.

`_get_cpu_info_from_sysinfo_v1()`

Returns the CPU info gathered from `sysinfo`. Returns `{}` if `sysinfo` is not found.

`_get_cpu_info_from_sysinfo_v2()`

Returns the CPU info gathered from `sysinfo`. Returns `{}` if `sysinfo` is not found.

`_get_cpu_info_from_wmic()`

Returns the CPU info gathered from WMI. Returns `{}` if not on Windows, or `wmic` is not installed.

`_get_cpu_info_from_registry()`

Returns the CPU info gathered from the Windows Registry. Returns `{}` if not on Windows.

`_get_cpu_info_from_kstat()`

Returns the CPU info gathered from `isainfo` and `kstat`. Returns `{}` if `isainfo` or `kstat` are not found.

`_get_cpu_info_from_platform_uname()`**`_get_cpu_info_internal()`**

Returns the CPU info by using the best sources of information for your OS. Returns `{}` if nothing is found.

`get_cpu_info_json()`

Returns the CPU info by using the best sources of information for your OS. Returns the result in a json string

`get_cpu_info()`

Returns the CPU info by using the best sources of information for your OS. Returns the result in a dict

`main()`**`distro`**

The `distro` package (`distro` stands for Linux Distribution) provides information about the Linux distribution it runs on, such as a reliable machine-readable `distro ID`, or version information.

It is a renewed alternative implementation for Python's original `platform.linux_distribution()` function, but it provides much more functionality. An alternative implementation became necessary because Python 3.5 deprecated this function, and Python 3.7 is expected to remove it altogether. Its predecessor function `platform.dist()` was already deprecated since Python 2.6 and is also expected to be removed in Python 3.7. Still, there are many cases in which access to Linux distribution information is needed. See [Python issue 1322](#) for more information.

Classes

<i>LinuxDistribution</i>	Provides information about a Linux distribution.
--------------------------	--

Functions

<i>linux_distribution</i> ([full_distribution_name])	Return information about the current Linux distribution as a tuple
<i>id</i> ()	Return the distro ID of the current Linux distribution, as a
<i>name</i> ([pretty])	Return the name of the current Linux distribution, as a human-readable
<i>version</i> ([pretty, best])	Return the version of the current Linux distribution, as a human-readable
<i>version_parts</i> ([best])	Return the version of the current Linux distribution as a tuple
<i>major_version</i> ([best])	Return the major version of the current Linux distribution, as a string,
<i>minor_version</i> ([best])	Return the minor version of the current Linux distribution, as a string,
<i>build_number</i> ([best])	Return the build number of the current Linux distribution, as a string,
<i>like</i> ()	Return a space-separated list of distro IDs of distributions that are
<i>codename</i> ()	Return the codename for the release of the current Linux distribution,
<i>info</i> ([pretty, best])	Return certain machine-readable information items about the current Linux
<i>os_release_info</i> ()	Return a dictionary containing key-value pairs for the information items
<i>lsb_release_info</i> ()	Return a dictionary containing key-value pairs for the information items
<i>distro_release_info</i> ()	Return a dictionary containing key-value pairs for the information items
<i>os_release_attr</i> (attribute)	Return a single named information item from the os-release file data source
<i>lsb_release_attr</i> (attribute)	Return a single named information item from the lsb_release command output
<i>distro_release_attr</i> (attribute)	Return a single named information item from the distro release file
<i>main</i> ()	

Attributes

`_UNIXCONFDIR`

`_OS_RELEASE_BASENAME`

`NORMALIZED_OS_ID`

`NORMALIZED_LSB_ID`

`NORMALIZED_DISTRO_ID`

`_DISTRO_RELEASE_CONTENT_REVERSED_PATTERN`

`_DISTRO_RELEASE_BASENAME_PATTERN`

`_DISTRO_RELEASE_IGNORE_BASENAMES`

`_distro`

`_UNIXCONFDIR`

`_OS_RELEASE_BASENAME = 'os-release'`

`NORMALIZED_OS_ID`

`NORMALIZED_LSB_ID`

`NORMALIZED_DISTRO_ID`

`_DISTRO_RELEASE_CONTENT_REVERSED_PATTERN`

`_DISTRO_RELEASE_BASENAME_PATTERN`

`_DISTRO_RELEASE_IGNORE_BASENAMES = ('debian_version', 'lsb-release', 'oem-release')`

linux_distribution(*full_distribution_name=True*)

Return information about the current Linux distribution as a tuple (id_name, version, codename) with items as follows:

- **id_name**: If *full_distribution_name* is false, the result of `distro.id()`. Otherwise, the result of `distro.name()`.
- **version**: The result of `distro.version()`.
- **codename**: The result of `distro.codename()`.

The interface of this function is compatible with the original `platform.linux_distribution()` function, supporting a subset of its parameters.

The data it returns may not exactly be the same, because it uses more data sources than the original function, and that may lead to different data if the Linux distribution is not consistent across multiple data sources it provides (there are indeed such distributions ...).

Another reason for differences is the fact that the `distro.id()` method normalizes the distro ID string to a reliable machine-readable value for a number of popular Linux distributions.

id()

Return the distro ID of the current Linux distribution, as a machine-readable string.

For a number of Linux distributions, the returned distro ID value is *reliable*, in the sense that it is documented and that it does not change across releases of the distribution.

This package maintains the following reliable distro ID values:

Distro ID	Distribution
"ubuntu"	Ubuntu
"debian"	Debian
"rhel"	RedHat Enterprise Linux
"centos"	CentOS
"fedora"	Fedora
"sles"	SUSE Linux Enterprise Server
"opensuse"	openSUSE
"amazon"	Amazon Linux
"arch"	Arch Linux
"cloudlinux"	CloudLinux OS
"exherbo"	Exherbo Linux
"gentoo"	GenToo Linux
"ibm_powerkvm"	IBM PowerKVM
"kvmibm"	KVM for IBM z Systems
"linuxmint"	Linux Mint
"mageia"	Mageia
"mandriva"	Mandriva Linux
"parallels"	Parallels
"pidora"	Pidora
"raspbian"	Raspbian
"oracle"	Oracle Linux (and Oracle Enterprise Linux)
"scientific"	Scientific Linux
"slackware"	Slackware
"xenserver"	XenServer

If you have a need to get distros for reliable IDs added into this set, or if you find that the `distro.id()` function returns a different distro ID for one of the listed distros, please create an issue in the [`distro issue tracker`](#).

Lookup hierarchy and transformations:

First, the ID is obtained from the following sources, in the specified order. The first available and non-empty value is used:

- the value of the "ID" attribute of the os-release file,
- the value of the "Distributor ID" attribute returned by the `lsb_release` command,
- the first part of the file name of the distro release file,

The so determined ID value then passes the following transformations, before it is returned by this method:

- it is translated to lower case,
- blanks (which should not be there anyway) are translated to underscores,
- a normalization of the ID is performed, based upon [`normalization tables`](#). The purpose of this normalization is to ensure that the ID is as reliable as possible, even across incompatible changes in the Linux distributions. A common reason for an incompatible change is the addition of an os-release file, or the addition of the `lsb_release` command, with ID values that differ from what was previously determined from the distro release file name.

name(*pretty=False*)

Return the name of the current Linux distribution, as a human-readable string.

If *pretty* is false, the name is returned without version or codename. (e.g. "CentOS Linux")

If *pretty* is true, the version and codename are appended. (e.g. "CentOS Linux 7.1.1503 (Core)")

Lookup hierarchy:

The name is obtained from the following sources, in the specified order. The first available and non-empty value is used:

- If *pretty* is false:
 - the value of the "NAME" attribute of the os-release file,
 - the value of the "Distributor ID" attribute returned by the lsb_release command,
 - the value of the "<name>" field of the distro release file.
- If *pretty* is true:
 - the value of the "PRETTY_NAME" attribute of the os-release file,
 - the value of the "Description" attribute returned by the lsb_release command,
 - the value of the "<name>" field of the distro release file, appended with the value of the pretty version ("<version_id>" and "<codename>" fields) of the distro release file, if available.

version(*pretty=False, best=False*)

Return the version of the current Linux distribution, as a human-readable string.

If *pretty* is false, the version is returned without codename (e.g. "7.0").

If *pretty* is true, the codename in parenthesis is appended, if the codename is non-empty (e.g. "7.0 (Maipo)").

Some distributions provide version numbers with different precisions in the different sources of distribution information. Examining the different sources in a fixed priority order does not always yield the most precise version (e.g. for Debian 8.2, or CentOS 7.1).

The *best* parameter can be used to control the approach for the returned version:

If *best* is false, the first non-empty version number in priority order of the examined sources is returned.

If *best* is true, the most precise version number out of all examined sources is returned.

Lookup hierarchy:

In all cases, the version number is obtained from the following sources. If *best* is false, this order represents the priority order:

- the value of the "VERSION_ID" attribute of the os-release file,
- the value of the "Release" attribute returned by the lsb_release command,
- the version number parsed from the "<version_id>" field of the first line of the distro release file,
- the version number parsed from the "PRETTY_NAME" attribute of the os-release file, if it follows the format of the distro release files.
- the version number parsed from the "Description" attribute returned by the lsb_release command, if it follows the format of the distro release files.

version_parts(*best=False*)

Return the version of the current Linux distribution as a tuple (major, minor, build_number) with items as follows:

- major: The result of `distro.major_version()`.

- `minor`: The result of `distro.minor_version()`.
- `build_number`: The result of `distro.build_number()`.

For a description of the *best* parameter, see the `distro.version()` method.

major_version(*best=False*)

Return the major version of the current Linux distribution, as a string, if provided. Otherwise, the empty string is returned. The major version is the first part of the dot-separated version string.

For a description of the *best* parameter, see the `distro.version()` method.

minor_version(*best=False*)

Return the minor version of the current Linux distribution, as a string, if provided. Otherwise, the empty string is returned. The minor version is the second part of the dot-separated version string.

For a description of the *best* parameter, see the `distro.version()` method.

build_number(*best=False*)

Return the build number of the current Linux distribution, as a string, if provided. Otherwise, the empty string is returned. The build number is the third part of the dot-separated version string.

For a description of the *best* parameter, see the `distro.version()` method.

like()

Return a space-separated list of distro IDs of distributions that are closely related to the current Linux distribution in regards to packaging and programming interfaces, for example distributions the current distribution is a derivative from.

Lookup hierarchy:

This information item is only provided by the `os-release` file. For details, see the description of the "ID_LIKE" attribute in the [os-release man page](#).

codename()

Return the codename for the release of the current Linux distribution, as a string.

If the distribution does not have a codename, an empty string is returned.

Note that the returned codename is not always really a codename. For example, openSUSE returns "x86_64". This function does not handle such cases in any special way and just returns the string it finds, if any.

Lookup hierarchy:

- the codename within the "VERSION" attribute of the `os-release` file, if provided,
- the value of the "Codename" attribute returned by the `lsb_release` command,
- the value of the "<codename>" field of the distro release file.

info(*pretty=False, best=False*)

Return certain machine-readable information items about the current Linux distribution in a dictionary, as shown in the following example:

```
{
  'id': 'rhel',
  'version': '7.0',
  'version_parts': {
    'major': '7',
    'minor': '0',
    'build_number': ''
  },
  'like': 'fedora',
```

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```
{
  'codename': 'Maipo'
}
```

The dictionary structure and keys are always the same, regardless of which information items are available in the underlying data sources. The values for the various keys are as follows:

- **id**: The result of `distro.id()`.
- **version**: The result of `distro.version()`.
- **version_parts** -> **major**: The result of `distro.major_version()`.
- **version_parts** -> **minor**: The result of `distro.minor_version()`.
- **version_parts** -> **build_number**: The result of `distro.build_number()`.
- **like**: The result of `distro.like()`.
- **codename**: The result of `distro.codename()`.

For a description of the *pretty* and *best* parameters, see the `distro.version()` method.

os_release_info()

Return a dictionary containing key-value pairs for the information items from the os-release file data source of the current Linux distribution.

See ``os-release file`` for details about these information items.

lsb_release_info()

Return a dictionary containing key-value pairs for the information items from the lsb_release command data source of the current Linux distribution.

See ``lsb_release command output`` for details about these information items.

distro_release_info()

Return a dictionary containing key-value pairs for the information items from the distro release file data source of the current Linux distribution.

See ``distro release file`` for details about these information items.

os_release_attr(attribute)

Return a single named information item from the os-release file data source of the current Linux distribution.

Parameters:

- **attribute** (string): Key of the information item.

Returns:

- (string): Value of the information item, if the item exists. The empty string, if the item does not exist.

See ``os-release file`` for details about these information items.

lsb_release_attr(attribute)

Return a single named information item from the lsb_release command output data source of the current Linux distribution.

Parameters:

- **attribute** (string): Key of the information item.

Returns:

- (string): Value of the information item, if the item exists. The empty string, if the item does not exist.

See ``lsb_release command output`` for details about these information items.

distro_release_attr(*attribute*)

Return a single named information item from the distro release file data source of the current Linux distribution.

Parameters:

- *attribute* (string): Key of the information item.

Returns:

- (string): Value of the information item, if the item exists. The empty string, if the item does not exist.

See ``distro release file`_` for details about these information items.

class LinuxDistribution(*include_lsb=True, os_release_file="", distro_release_file=""*)

Bases: `object`

Provides information about a Linux distribution.

This package creates a private module-global instance of this class with default initialization arguments, that is used by the ``consolidated accessor functions`_` and ``single source accessor functions`_`. By using default initialization arguments, that module-global instance returns data about the current Linux distribution (i.e. the distro this package runs on).

Normally, it is not necessary to create additional instances of this class. However, in situations where control is needed over the exact data sources that are used, instances of this class can be created with a specific distro release file, or a specific os-release file, or without invoking the `lsb_release` command.

__repr__()

Return repr of all info

linux_distribution(*full_distribution_name=True*)

Return information about the Linux distribution that is compatible with Python's `platform.linux_distribution()`, supporting a subset of its parameters.

For details, see `distro.linux_distribution()`.

id()

Return the distro ID of the Linux distribution, as a string.

For details, see `distro.id()`.

name(*pretty=False*)

Return the name of the Linux distribution, as a string.

For details, see `distro.name()`.

version(*pretty=False, best=False*)

Return the version of the Linux distribution, as a string.

For details, see `distro.version()`.

version_parts(*best=False*)

Return the version of the Linux distribution, as a tuple of version numbers.

For details, see `distro.version_parts()`.

major_version(*best=False*)

Return the major version number of the current distribution.

For details, see `distro.major_version()`.

minor_version(*best=False*)

Return the minor version number of the Linux distribution.

For details, see `distro.minor_version()`.

build_number(*best=False*)

Return the build number of the Linux distribution.

For details, see `distro.build_number()`.

like()

Return the IDs of distributions that are like the Linux distribution.

For details, see `distro.like()`.

codename()

Return the codename of the Linux distribution.

For details, see `distro.codename()`.

info(*pretty=False, best=False*)

Return certain machine-readable information about the Linux distribution.

For details, see `distro.info()`.

os_release_info()

Return a dictionary containing key-value pairs for the information items from the os-release file data source of the Linux distribution.

For details, see `distro.os_release_info()`.

lsb_release_info()

Return a dictionary containing key-value pairs for the information items from the lsb_release command data source of the Linux distribution.

For details, see `distro.lsb_release_info()`.

distro_release_info()

Return a dictionary containing key-value pairs for the information items from the distro release file data source of the Linux distribution.

For details, see `distro.distro_release_info()`.

os_release_attr(*attribute*)

Return a single named information item from the os-release file data source of the Linux distribution.

For details, see `distro.os_release_attr()`.

lsb_release_attr(*attribute*)

Return a single named information item from the lsb_release command output data source of the Linux distribution.

For details, see `distro.lsb_release_attr()`.

distro_release_attr(*attribute*)

Return a single named information item from the distro release file data source of the Linux distribution.

For details, see `distro.distro_release_attr()`.

_get_os_release_info()

Get the information items from the specified os-release file.

Returns A dictionary containing all information items.

static _parse_os_release_content(*lines*)

Parse the lines of an os-release file.

Parameters:

- **lines:** Iterable through the lines in the os-release file. Each line must be a unicode string or a UTF-8 encoded byte string.

Returns A dictionary containing all information items.

_get_lsb_release_info()

Get the information items from the lsb_release command output.

Returns A dictionary containing all information items.

static _parse_lsb_release_content(lines)

Parse the output of the lsb_release command.

Parameters:

- **lines: Iterable through the lines of the lsb_release output.** Each line must be a unicode string or a UTF-8 encoded byte string.

Returns A dictionary containing all information items.

_get_distro_release_info()

Get the information items from the specified distro release file.

Returns A dictionary containing all information items.

_parse_distro_release_file(filepath)

Parse a distro release file.

Parameters:

- **filepath:** Path name of the distro release file.

Returns A dictionary containing all information items.

static _parse_distro_release_content(line)

Parse a line from a distro release file.

Parameters: * **line:** Line from the distro release file. Must be a unicode string
or a UTF-8 encoded byte string.

Returns A dictionary containing all information items.

_distro

main()

frozendict

Classes

<i>frozendict</i>	An immutable wrapper around dictionaries that implements the complete <code>collections.Mapping</code>
<i>FrozenOrderedDict</i>	A frozendict subclass that maintains key order

Attributes

OrderedDict

iteritems

OrderedDict

iteritems

class **frozendict**(*args, **kwargs)

Bases: `collections.abc.Mapping`

An immutable wrapper around dictionaries that implements the complete `collections.Mapping` interface. It can be used as a drop-in replacement for dictionaries where immutability is desired.

dict_cls

__getitem__(key)

__contains__(key)

copy(**add_or_replace)

__iter__()

__len__()

__repr__()

Return repr(self).

__hash__()

Return hash(self).

__json__()

to_json()

class **FrozenOrderedDict**(*args, **kwargs)

Bases: `frozendict`

A frozendict subclass that maintains key order

dict_cls

toolz

compatibility

Functions

import_module(name)

Attributes

PY3

PY34

PYPY

map

PY3

PY34

PYPY

map

import_module(*name*)

dicttoolz

Functions

<i>merge</i> (*dicts, **kwargs)	Merge a collection of dictionaries
<i>merge_with</i> (func, *dicts, **kwargs)	Merge dictionaries and apply function to combined values
<i>valmap</i> (func, d[, factory])	Apply function to values of dictionary
<i>keymap</i> (func, d[, factory])	Apply function to keys of dictionary
<i>itemmap</i> (func, d[, factory])	Apply function to items of dictionary
<i>valfilter</i> (predicate, d[, factory])	Filter items in dictionary by value
<i>keyfilter</i> (predicate, d[, factory])	Filter items in dictionary by key
<i>itemfilter</i> (predicate, d[, factory])	Filter items in dictionary by item
<i>assoc</i> (d, key, value[, factory])	Return a new dict with new key value pair
<i>dissoc</i> (d, *keys)	Return a new dict with the given key(s) removed.
<i>assoc_in</i> (d, keys, value[, factory])	Return a new dict with new, potentially nested, key value pair
<i>update_in</i> (d, keys, func[, default, factory])	Update value in a (potentially) nested dictionary
<i>get_in</i> (keys, coll[, default, no_default])	Returns coll[i0][i1]...[iX] where [i0, i1, ..., iX]==keys.

merge(*dicts, **kwargs)

Merge a collection of dictionaries

```
>>> merge({1: 'one'}, {2: 'two'})
{1: 'one', 2: 'two'}
```

Later dictionaries have precedence

```
>>> merge({1: 2, 3: 4}, {3: 3, 4: 4})
{1: 2, 3: 3, 4: 4}
```


See also:

merge_with

merge_with(*func*, **dicts*, ***kwargs*)

Merge dictionaries and apply function to combined values

A key may occur in more than one dict, and all values mapped from the key will be passed to the function as a list, such as func([val1, val2, ...]).

```
>>> merge_with(sum, {1: 1, 2: 2}, {1: 10, 2: 20})
{1: 11, 2: 22}
```

```
>>> merge_with(first, {1: 1, 2: 2}, {2: 20, 3: 30})
{1: 1, 2: 2, 3: 30}
```

See also:

merge

valmap(*func*, *d*, *factory=dict*)

Apply function to values of dictionary

```
>>> bills = {"Alice": [20, 15, 30], "Bob": [10, 35]}
>>> valmap(sum, bills)
{'Alice': 65, 'Bob': 45}
```

See also:

keymap itemmap

keymap(*func*, *d*, *factory=dict*)

Apply function to keys of dictionary

```
>>> bills = {"Alice": [20, 15, 30], "Bob": [10, 35]}
>>> keymap(str.lower, bills)
{'alice': [20, 15, 30], 'bob': [10, 35]}
```

See also:

valmap itemmap

itemmap(*func*, *d*, *factory=dict*)

Apply function to items of dictionary

```
>>> accountids = {"Alice": 10, "Bob": 20}
>>> itemmap(reversed, accountids)
{10: "Alice", 20: "Bob"}
```

See also:

keymap valmap

valfilter(*predicate*, *d*, *factory=dict*)

Filter items in dictionary by value

```
>>> iseven = lambda x: x % 2 == 0
>>> d = {1: 2, 2: 3, 3: 4, 4: 5}
>>> valfilter(iseven, d)
{1: 2, 3: 4}
```

See also:

keyfilter itemfilter valmap

keyfilter(*predicate, d, factory=dict*)

Filter items in dictionary by key

```
>>> iseven = lambda x: x % 2 == 0
>>> d = {1: 2, 2: 3, 3: 4, 4: 5}
>>> keyfilter(iseven, d)
{2: 3, 4: 5}
```

See also:

valfilter itemfilter keymap

itemfilter(*predicate, d, factory=dict*)

Filter items in dictionary by item

```
>>> def isvalid(item):
...     k, v = item
...     return k % 2 == 0 and v < 4
```

```
>>> d = {1: 2, 2: 3, 3: 4, 4: 5}
>>> itemfilter(isvalid, d)
{2: 3}
```

See also:

keyfilter valfilter itemmap

assoc(*d, key, value, factory=dict*)

Return a new dict with new key value pair

New dict has d[key] set to value. Does not modify the initial dictionary.

```
>>> assoc({'x': 1}, 'x', 2)
{'x': 2}
>>> assoc({'x': 1}, 'y', 3)
{'x': 1, 'y': 3}
```

dissoc(*d, *keys*)

Return a new dict with the given key(s) removed.

New dict has d[key] deleted for each supplied key. Does not modify the initial dictionary.

```
>>> dissoc({'x': 1, 'y': 2}, 'y')
{'x': 1}
>>> dissoc({'x': 1, 'y': 2}, 'y', 'x')
{}
>>> dissoc({'x': 1}, 'y') # Ignores missing keys
{'x': 1}
```

assoc_in(*d, keys, value, factory=dict*)

Return a new dict with new, potentially nested, key value pair

```
>>> purchase = {'name': 'Alice',
...             'order': {'items': ['Apple', 'Orange']},
```

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```

...             'costs': [0.50, 1.25]},
...             'credit card': '5555-1234-1234-1234'}
>>> assoc_in(purchase, ['order', 'costs'], [0.25, 1.00])
{'credit card': '5555-1234-1234-1234',
 'name': 'Alice',
 'order': {'costs': [0.25, 1.00], 'items': ['Apple', 'Orange']}}

```

update_in(*d, keys, func, default=None, factory=dict*)

Update value in a (potentially) nested dictionary

inputs: *d* - dictionary on which to operate
keys - list or tuple giving the location of the value to be changed in *d*
func - function to operate on that value

If *keys* == [*k0*, ..., *kX*] and *d*[*k0*][*kX*] == *v*, *update_in* returns a copy of the original dictionary with *v* replaced by *func(v)*, but does not mutate the original dictionary.

If *k0* is not a key in *d*, *update_in* creates nested dictionaries to the depth specified by the keys, with the innermost value set to *func(default)*.

```

>>> inc = lambda x: x + 1
>>> update_in({'a': 0}, ['a'], inc)
{'a': 1}

```

```

>>> transaction = {'name': 'Alice',
...                'purchase': {'items': ['Apple', 'Orange'],
...                               'costs': [0.50, 1.25]},
...                'credit card': '5555-1234-1234-1234'}
>>> update_in(transaction, ['purchase', 'costs'], sum)
{'credit card': '5555-1234-1234-1234',
 'name': 'Alice',
 'purchase': {'costs': 1.75, 'items': ['Apple', 'Orange']}}

```

```

>>> # updating a value when k0 is not in d
>>> update_in({}, [1, 2, 3], str, default="bar")
{1: {2: {3: 'bar'}}}
>>> update_in({1: 'foo'}, [2, 3, 4], inc, 0)
{1: 'foo', 2: {3: {4: 1}}}

```

get_in(*keys, coll, default=None, no_default=False*)

Returns *coll*[*i0*][*i1*]...[*iX*] where [*i0*, *i1*, ..., *iX*] == *keys*.

If *coll*[*i0*][*i1*]...[*iX*] cannot be found, returns *default*, unless *no_default* is specified, then it raises *KeyError* or *IndexError*.

get_in is a generalization of *operator.getitem* for nested data structures such as dictionaries and lists.

```

>>> transaction = {'name': 'Alice',
...                'purchase': {'items': ['Apple', 'Orange'],
...                               'costs': [0.50, 1.25]},
...                'credit card': '5555-1234-1234-1234'}
>>> get_in(['purchase', 'items', 0], transaction)
'Apple'
>>> get_in(['name'], transaction)
'Alice'

```

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```

>>> get_in(['purchase', 'total'], transaction)
>>> get_in(['purchase', 'items', 'apple'], transaction)
>>> get_in(['purchase', 'items', 10], transaction)
>>> get_in(['purchase', 'total'], transaction, 0)
0
>>> get_in(['y'], {}, no_default=True)
Traceback (most recent call last):
...
KeyError: 'y'

```

See also:

itertools.get operator, getitem

itertools

Functions

<i>remove</i> (predicate, seq)	Return those items of sequence for which predicate(item) is False
<i>accumulate</i> (binop, seq[, initial])	Repeatedly apply binary function to a sequence, accumulating results
<i>groupby</i> (key, seq)	Group a collection by a key function
<i>merge_sorted</i> (*seqs, **kwargs)	Merge and sort a collection of sorted collections
<i>interleave</i> (seqs)	Interleave a sequence of sequences
<i>unique</i> (seq[, key])	Return only unique elements of a sequence
<i>isiterable</i> (x)	Is x iterable?
<i>isdistinct</i> (seq)	All values in sequence are distinct
<i>take</i> (n, seq)	The first n elements of a sequence
<i>tail</i> (n, seq)	The last n elements of a sequence
<i>drop</i> (n, seq)	The sequence following the first n elements
<i>take_nth</i> (n, seq)	Every nth item in seq
<i>first</i> (seq)	The first element in a sequence
<i>second</i> (seq)	The second element in a sequence
<i>nth</i> (n, seq)	The nth element in a sequence
<i>last</i> (seq)	The last element in a sequence
<i>get</i> (ind, seq[, default])	Get element in a sequence or dict
<i>concat</i> (seqs)	Concatenate zero or more iterables, any of which may be infinite.
<i>concatv</i> (*seqs)	Variadic version of concat
<i>mapcat</i> (func, seqs)	Apply func to each sequence in seqs, concatenating results.
<i>cons</i> (el, seq)	Add el to beginning of (possibly infinite) sequence seq.
<i>interpose</i> (el, seq)	Introduce element between each pair of elements in seq
<i>frequencies</i> (seq)	Find number of occurrences of each value in seq
<i>reduceby</i> (key, binop, seq[, init])	Perform a simultaneous groupby and reduction
<i>iterate</i> (func, x)	Repeatedly apply a function func onto an original input
<i>sliding_window</i> (n, seq)	A sequence of overlapping subsequences
<i>partition</i> (n, seq[, pad])	Partition sequence into tuples of length n

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Table 23 – continued from previous page

<code>partition_all(n, seq)</code>	Partition all elements of sequence into tuples of length at most n
<code>count(seq)</code>	Count the number of items in seq
<code>pluck(ind, seqs[, default])</code>	plucks an element or several elements from each item in a sequence.
<code>join(leftkey, leftseq, rightkey, rightseq[, ...])</code>	Join two sequences on common attributes
<code>diff(*seqs, **kwargs)</code>	Return those items that differ between sequences
<code>topk(k, seq[, key])</code>	Find the k largest elements of a sequence
<code>peek(seq)</code>	Retrieve the next element of a sequence
<code>random_sample(prob, seq[, random_state])</code>	Return elements from a sequence with probability of prob

remove(*predicate, seq*)

Return those items of sequence for which predicate(item) is False

```
>>> def iseven(x):
...     return x % 2 == 0
>>> list(remove(iseven, [1, 2, 3, 4]))
[1, 3]
```

accumulate(*binop, seq, initial=no_default*)

Repeatedly apply binary function to a sequence, accumulating results

```
>>> from operator import add, mul
>>> list(accumulate(add, [1, 2, 3, 4, 5]))
[1, 3, 6, 10, 15]
>>> list(accumulate(mul, [1, 2, 3, 4, 5]))
[1, 2, 6, 24, 120]
```

Accumulate is similar to reduce and is good for making functions like cumulative sum:

```
>>> from functools import partial, reduce
>>> sum = partial(reduce, add)
>>> cumsum = partial(accumulate, add)
```

Accumulate also takes an optional argument that will be used as the first value. This is similar to reduce.

```
>>> list(accumulate(add, [1, 2, 3], -1))
[-1, 0, 2, 5]
>>> list(accumulate(add, [], 1))
[1]
```

See also:

itertools.accumulate : In standard itertools for Python 3.2+

groupby(*key, seq*)

Group a collection by a key function

```
>>> names = ['Alice', 'Bob', 'Charlie', 'Dan', 'Edith', 'Frank']
>>> groupby(len, names)
{3: ['Bob', 'Dan'], 5: ['Alice', 'Edith', 'Frank'], 7: ['Charlie']}
```

```
>>> iseven = lambda x: x % 2 == 0
>>> groupby(iseven, [1, 2, 3, 4, 5, 6, 7, 8])
{False: [1, 3, 5, 7], True: [2, 4, 6, 8]}
```

Non-callable keys imply grouping on a member.

```
>>> groupby('gender', [{ 'name': 'Alice', 'gender': 'F'},
...                      { 'name': 'Bob', 'gender': 'M'},
...                      { 'name': 'Charlie', 'gender': 'M'}])
{'F': [{ 'gender': 'F', 'name': 'Alice'}],
 'M': [{ 'gender': 'M', 'name': 'Bob'},
       { 'gender': 'M', 'name': 'Charlie'}]}
```

See also:

countby

merge_sorted(*seqs, **kwargs)

Merge and sort a collection of sorted collections

This works lazily and only keeps one value from each iterable in memory.

```
>>> list(merge_sorted([1, 3, 5], [2, 4, 6]))
[1, 2, 3, 4, 5, 6]
```

```
>>> ''.join(merge_sorted('abc', 'abc', 'abc'))
'aaabbbccc'
```

The "key" function used to sort the input may be passed as a keyword.

```
>>> list(merge_sorted([2, 3], [1, 3], key=lambda x: x // 3))
[2, 1, 3, 3]
```

interleave(seqs)

Interleave a sequence of sequences

```
>>> list(interleave([[1, 2], [3, 4]]))
[1, 3, 2, 4]
```

```
>>> ''.join(interleave(('ABC', 'XY'))))
'AXBYC'
```

Both the individual sequences and the sequence of sequences may be infinite

Returns a lazy iterator

unique(seq, key=None)

Return only unique elements of a sequence

```
>>> tuple(unique((1, 2, 3)))
(1, 2, 3)
>>> tuple(unique((1, 2, 1, 3)))
(1, 2, 3)
```

Uniqueness can be defined by key keyword

```
>>> tuple(unique(['cat', 'mouse', 'dog', 'hen'], key=len))
('cat', 'mouse')
```

isiterable(*x*)Is *x* iterable?

```
>>> isiterable([1, 2, 3])
True
>>> isiterable('abc')
True
>>> isiterable(5)
False
```

isdistinct(*seq*)

All values in sequence are distinct

```
>>> isdistinct([1, 2, 3])
True
>>> isdistinct([1, 2, 1])
False
```

```
>>> isdistinct("Hello")
False
>>> isdistinct("World")
True
```

take(*n*, *seq*)The first *n* elements of a sequence

```
>>> list(take(2, [10, 20, 30, 40, 50]))
[10, 20]
```

See also:

drop tail

tail(*n*, *seq*)The last *n* elements of a sequence

```
>>> tail(2, [10, 20, 30, 40, 50])
[40, 50]
```

See also:

drop take

drop(*n*, *seq*)The sequence following the first *n* elements

```
>>> list(drop(2, [10, 20, 30, 40, 50]))
[30, 40, 50]
```

See also:

take tail

take_nth(*n, seq*)Every *n*th item in *seq*

```
>>> list(take_nth(2, [10, 20, 30, 40, 50]))
[10, 30, 50]
```

first(*seq*)

The first element in a sequence

```
>>> first('ABC')
'A'
```

second(*seq*)

The second element in a sequence

```
>>> second('ABC')
'B'
```

nth(*n, seq*)The *n*th element in a sequence

```
>>> nth(1, 'ABC')
'B'
```

last(*seq*)

The last element in a sequence

```
>>> last('ABC')
'C'
```

get(*ind, seq, default=no_default*)

Get element in a sequence or dict

Provides standard indexing

```
>>> get(1, 'ABC')      # Same as 'ABC'[1]
'B'
```

Pass a list to get multiple values

```
>>> get([1, 2], 'ABC') # ('ABC'[1], 'ABC'[2])
('B', 'C')
```

Works on any value that supports indexing/getitem For example here we see that it works with dictionaries

```
>>> phonebook = {'Alice': '555-1234',
...             'Bob': '555-5678',
...             'Charlie': '555-9999'}
>>> get('Alice', phonebook)
'555-1234'
```

```
>>> get(['Alice', 'Bob'], phonebook)
('555-1234', '555-5678')
```

Provide a default for missing values


```
>>> get(['Alice', 'Dennis'], phonebook, None)
('555-1234', None)
```

See also:

pluck

concat(*seqs*)

Concatenate zero or more iterables, any of which may be infinite.

An infinite sequence will prevent the rest of the arguments from being included.

We use `chain.from_iterable` rather than `chain(*seqs)` so that `seqs` can be a generator.

```
>>> list(concat([], [1], [2, 3]))
[1, 2, 3]
```

See also:

`itertools.chain.from_iterable` equivalent

concatv(**seqs*)

Variadic version of `concat`

```
>>> list(concatv([], ["a"], ["b", "c"]))
['a', 'b', 'c']
```

See also:

`itertools.chain`

mapcat(*func, seqs*)

Apply `func` to each sequence in `seqs`, concatenating results.

```
>>> list(mapcat(lambda s: [c.upper() for c in s],
...             [["a", "b"], ["c", "d", "e"]]))
['A', 'B', 'C', 'D', 'E']
```

cons(*el, seq*)

Add `el` to beginning of (possibly infinite) sequence `seq`.

```
>>> list(cons(1, [2, 3]))
[1, 2, 3]
```

interpose(*el, seq*)

Introduce element between each pair of elements in `seq`

```
>>> list(interpose("a", [1, 2, 3]))
[1, 'a', 2, 'a', 3]
```

frequencies(*seq*)

Find number of occurrences of each value in `seq`

```
>>> frequencies(['cat', 'cat', 'ox', 'pig', 'pig', 'cat'])
{'cat': 3, 'ox': 1, 'pig': 2}
```

See also:

`countby` `groupby`

reduceby(*key*, *binop*, *seq*, *init=no_default*)

Perform a simultaneous groupby and reduction

The computation:

```
>>> result = reduceby(key, binop, seq, init)
```

is equivalent to the following:

```
>>> def reduction(group):
...     return reduce(binop, group, init)
```

```
>>> groups = groupby(key, seq)
>>> result = valmap(reduction, groups)
```

But the former does not build the intermediate groups, allowing it to operate in much less space. This makes it suitable for larger datasets that do not fit comfortably in memory

The *init* keyword argument is the default initialization of the reduction. This can be either a constant value like 0 or a callable like `lambda : 0` as might be used in `defaultdict`.

```
>>> from operator import add, mul
>>> iseven = lambda x: x % 2 == 0
```

```
>>> data = [1, 2, 3, 4, 5]
```

```
>>> reduceby(iseven, add, data)
{False: 9, True: 6}
```

```
>>> reduceby(iseven, mul, data)
{False: 15, True: 8}
```

```
>>> projects = [{'name': 'build roads', 'state': 'CA', 'cost': 1000000},
...             {'name': 'fight crime', 'state': 'IL', 'cost': 100000},
...             {'name': 'help farmers', 'state': 'IL', 'cost': 2000000},
...             {'name': 'help farmers', 'state': 'CA', 'cost': 200000}]
```

```
>>> reduceby('state',
...         lambda acc, x: acc + x['cost'],
...         projects, 0)
{'CA': 1200000, 'IL': 2100000}
```

```
>>> def set_add(s, i):
...     s.add(i)
...     return s
```

```
>>> reduceby(iseven, set_add, [1, 2, 3, 4, 1, 2, 3], set)
{True: set([2, 4]),
 False: set([1, 3])}
```

iterate(*func*, *x*)Repeatedly apply a function *func* onto an original inputYields *x*, then *func*(*x*), then *func*(*func*(*x*)), then *func*(*func*(*func*(*x*))), etc..

```
>>> def inc(x): return x + 1
>>> counter = iterate(inc, 0)
>>> next(counter)
0
>>> next(counter)
1
>>> next(counter)
2
```

```
>>> double = lambda x: x * 2
>>> powers_of_two = iterate(double, 1)
>>> next(powers_of_two)
1
>>> next(powers_of_two)
2
>>> next(powers_of_two)
4
>>> next(powers_of_two)
8
```

sliding_window(*n*, *seq*)

A sequence of overlapping subsequences

```
>>> list(sliding_window(2, [1, 2, 3, 4]))
[(1, 2), (2, 3), (3, 4)]
```

This function creates a sliding window suitable for transformations like sliding means / smoothing

```
>>> mean = lambda seq: float(sum(seq)) / len(seq)
>>> list(map(mean, sliding_window(2, [1, 2, 3, 4])))
[1.5, 2.5, 3.5]
```

partition(*n*, *seq*, *pad=no_pad*)

Partition sequence into tuples of length *n*

```
>>> list(partition(2, [1, 2, 3, 4]))
[(1, 2), (3, 4)]
```

If the length of *seq* is not evenly divisible by *n*, the final tuple is dropped if *pad* is not specified, or filled to length *n* by *pad*:

```
>>> list(partition(2, [1, 2, 3, 4, 5]))
[(1, 2), (3, 4)]
```

```
>>> list(partition(2, [1, 2, 3, 4, 5], pad=None))
[(1, 2), (3, 4), (5, None)]
```

See also:

`partition_all`

partition_all(*n*, *seq*)

Partition all elements of sequence into tuples of length at most *n*

The final tuple may be shorter to accommodate extra elements.

```
>>> list(partition_all(2, [1, 2, 3, 4]))
[(1, 2), (3, 4)]
```

```
>>> list(partition_all(2, [1, 2, 3, 4, 5]))
[(1, 2), (3, 4), (5,)]
```

See also:

partition

count(*seq*)

Count the number of items in seq

Like the builtin len but works on lazy sequences.

Not to be confused with `itertools.count`

See also:

len

pluck(*ind, seqs, default=no_default*)

plucks an element or several elements from each item in a sequence.

pluck maps `itertools.get` over a sequence and returns one or more elements of each item in the sequence.

This is equivalent to running `map(curried.get(ind), seqs)`

ind can be either a single string/index or a list of strings/indices. *seqs* should be sequence containing sequences or dicts.

e.g.

```
>>> data = [{'id': 1, 'name': 'Cheese'}, {'id': 2, 'name': 'Pies'}]
>>> list(pluck('name', data))
['Cheese', 'Pies']
>>> list(pluck([0, 1], [[1, 2, 3], [4, 5, 7]]))
[(1, 2), (4, 5)]
```

See also:

get map

join(*leftkey, leftseq, rightkey, rightseq, left_default=no_default, right_default=no_default*)

Join two sequences on common attributes

This is a semi-streaming operation. The LEFT sequence is fully evaluated and placed into memory. The RIGHT sequence is evaluated lazily and so can be arbitrarily large.

```
>>> friends = [('Alice', 'Edith'),
...            ('Alice', 'Zhao'),
...            ('Edith', 'Alice'),
...            ('Zhao', 'Alice'),
...            ('Zhao', 'Edith')]
```

```
>>> cities = [('Alice', 'NYC'),
...            ('Alice', 'Chicago'),
...            ('Dan', 'Sydney'),
...            ('Edith', 'Paris'),
```

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```
...         ('Edith', 'Berlin'),
...         ('Zhao', 'Shanghai')]
```

```
>>> # Vacation opportunities
>>> # In what cities do people have friends?
>>> result = join(second, friends,
...               first, cities)
>>> for ((a, b), (c, d)) in sorted(unique(result)):
...     print((a, d))
('Alice', 'Berlin')
('Alice', 'Paris')
('Alice', 'Shanghai')
('Edith', 'Chicago')
('Edith', 'NYC')
('Zhao', 'Chicago')
('Zhao', 'NYC')
('Zhao', 'Berlin')
('Zhao', 'Paris')
```

Specify outer joins with keyword arguments `left_default` and/or `right_default`. Here is a full outer join in which unmatched elements are paired with `None`.

```
>>> identity = lambda x: x
>>> list(join(identity, [1, 2, 3],
...             identity, [2, 3, 4],
...             left_default=None, right_default=None))
[(2, 2), (3, 3), (None, 4), (1, None)]
```

Usually the key arguments are callables to be applied to the sequences. If the keys are not obviously callable then it is assumed that indexing was intended, e.g. the following is a legal change

```
>>> # result = join(second, friends, first, cities)
>>> result = join(1, friends, 0, cities)
```

diff(*seqs, **kwargs)

Return those items that differ between sequences

```
>>> list(diff([1, 2, 3], [1, 2, 10, 100]))
[(3, 10)]
```

Shorter sequences may be padded with a `default` value:

```
>>> list(diff([1, 2, 3], [1, 2, 10, 100], default=None))
[(3, 10), (None, 100)]
```

A key function may also be applied to each item to use during comparisons:

```
>>> list(diff(['apples', 'bananas'], ['Apples', 'Oranges'], key=str.lower))
[('bananas', 'Oranges')]
```

topk(k, seq, key=None)

Find the k largest elements of a sequence

Operates lazily in $n \cdot \log(k)$ time

```
>>> topk(2, [1, 100, 10, 1000])
(1000, 100)
```

Use a key function to change sorted order

```
>>> topk(2, ['Alice', 'Bob', 'Charlie', 'Dan'], key=len)
('Charlie', 'Alice')
```

See also:

`heapq.nlargest`

peek(seq)

Retrieve the next element of a sequence

Returns the first element and an iterable equivalent to the original sequence, still having the element retrieved.

```
>>> seq = [0, 1, 2, 3, 4]
>>> first, seq = peek(seq)
>>> first
0
>>> list(seq)
[0, 1, 2, 3, 4]
```

random_sample(prob, seq, random_state=None)

Return elements from a sequence with probability of prob

Returns a lazy iterator of random items from seq.

`random_sample` considers each item independently and without replacement. See below how the first time it returned 13 items and the next time it returned 6 items.

```
>>> seq = list(range(100))
>>> list(random_sample(0.1, seq))
[6, 9, 19, 35, 45, 50, 58, 62, 68, 72, 78, 86, 95]
>>> list(random_sample(0.1, seq))
[6, 44, 54, 61, 69, 94]
```

Providing an integer seed for `random_state` will result in deterministic sampling. Given the same seed it will return the same sample every time.

```
>>> list(random_sample(0.1, seq, random_state=2016))
[7, 9, 19, 25, 30, 32, 34, 48, 59, 60, 81, 98]
>>> list(random_sample(0.1, seq, random_state=2016))
[7, 9, 19, 25, 30, 32, 34, 48, 59, 60, 81, 98]
```

`random_state` can also be any object with a method `random` that returns floats between 0.0 and 1.0 (exclusive).

```
>>> from random import Random
>>> randobj = Random(2016)
>>> list(random_sample(0.1, seq, random_state=randobj))
[7, 9, 19, 25, 30, 32, 34, 48, 59, 60, 81, 98]
```

recipes

Functions

<code>countby</code> (key, seq)	Count elements of a collection by a key function
<code>partitionby</code> (func, seq)	Partition a sequence according to a function

countby(key, seq)

Count elements of a collection by a key function

```
>>> countby(len, ['cat', 'mouse', 'dog'])
{3: 2, 5: 1}
```

```
>>> def iseven(x): return x % 2 == 0
>>> countby(iseven, [1, 2, 3])
{True: 1, False: 2}
```

See also:

groupby

partitionby(func, seq)

Partition a sequence according to a function

Partition *s* into a sequence of lists such that, when traversing *s*, every time the output of *func* changes a new list is started and that and subsequent items are collected into that list.

```
>>> is_space = lambda c: c == " "
>>> list(partitionby(is_space, "I have space"))
[('I',), (' ',), ('h', 'a', 'v', 'e'), (' ',), ('s', 'p', 'a', 'c', 'e')]
```

```
>>> is_large = lambda x: x > 10
>>> list(partitionby(is_large, [1, 2, 1, 99, 88, 33, 99, -1, 5]))
[(1, 2, 1), (99, 88, 33, 99), (-1, 5)]
```

See also:

partition groupby itertools.groupby

utils

Functions

<code>raises</code> (err, lamda)

Attributes

no_default

raises(*err, lamda*)

no_default = '__no__default__'

Classes

excepts

Attributes

deprecated

__version__

deprecated

class excepts(*exc, func, handler=lambda exc: ...*)

Bases: **object**

__call__(**args*, ***kwargs*)

__version__ = '0.9.0'

tqdm

__main__

_main

Functions

main([*fp, argv*])

Parameters (internal use only)

main(*fp=sys.stderr, argv=None*)

fp : file-like object for tqdm *argv* : list (default: sys.argv[1:])

`_monitor`

Classes

<code>TMonitor</code>	Monitoring thread for tqdm bars.
-----------------------	----------------------------------

exception `TqdmSynchronisationWarning`
 Bases: `RuntimeWarning`
 tqdm multi-thread/-process errors which may cause incorrect nesting but otherwise no adverse effects

class `TMonitor`(*tqdm_cls*, *sleep_interval*)
 Bases: `threading.Thread`
 Monitoring thread for tqdm bars. Monitors if tqdm bars are taking too much time to display and readjusts miniters automatically if necessary.

Parameters

- **`tqdm_cls`** (*class*) -- tqdm class to use (can be core tqdm or a submodule).
- **`sleep_interval`** (*float*) -- Time to sleep between monitoring checks.

`_test`
`exit()`
`get_instances()`
`run()`
 Method representing the thread's activity.
 You may override this method in a subclass. The standard `run()` method invokes the callable object passed to the object's constructor as the target argument, if any, with sequential and keyword arguments taken from the `args` and `kwargs` arguments, respectively.
`report()`

`_tqdm`

Classes

<code>tqdm</code>	Decorate an iterable object, returning an iterator which acts exactly
-------------------	---

Functions

<code>trange</code> (<i>*args</i> , <i>**kwargs</i>)	A shortcut for <code>tqdm(xrange(<i>*args</i>), <i>**kwargs</i>)</code> .
--	---

```
class tqdm(iterable=None, desc=None, total=None, leave=True, file=None, ncols=None, mininterval=0.1,
           maxinterval=10.0, miniters=None, ascii=None, disable=False, unit='it', unit_scale=False,
           dynamic_ncols=False, smoothing=0.3, bar_format=None, initial=0, position=None, postfix=None,
           unit_divisor=1000, write_bytes=None, lock_args=None, nrows=None, colour=None, delay=0,
           gui=False, **kwargs)
```

Bases: `conda._vendor.tqdm.utils.Comparable`

Decorate an iterable object, returning an iterator which acts exactly like the original iterable, but prints a dynamically updating progressbar every time a value is requested.

property `_comparable`

property `format_dict`

Public API for read-only member access.

monitor_interval = 10

monitor

_instances

static `format_sizeof(num, suffix='', divisor=1000)`

Formats a number (greater than unity) with SI Order of Magnitude prefixes.

Parameters

- **num** (*float*) -- Number (≥ 1) to format.
- **suffix** (*str*, *optional*) -- Post-postfix [default: "].
- **divisor** (*float*, *optional*) -- Divisor between prefixes [default: 1000].

Returns **out** -- Number with Order of Magnitude SI unit postfix.

Return type *str*

static `format_interval(t)`

Formats a number of seconds as a clock time, [H:]MM:SS

Parameters **t** (*int*) -- Number of seconds.

Returns **out** -- [H:]MM:SS

Return type *str*

static `format_num(n)`

Intelligent scientific notation (.3g).

Parameters **n** (*int* or *float* or *Numeric*) -- A Number.

Returns **out** -- Formatted number.

Return type *str*

static `status_printer(file)`

Manage the printing and in-place updating of a line of characters. Note that if the string is longer than a line, then in-place updating may not work (it will print a new line at each refresh).

static `format_meter(n, total, elapsed, ncols=None, prefix='', ascii=False, unit='it', unit_scale=False,
 rate=None, bar_format=None, postfix=None, unit_divisor=1000, initial=0,
 colour=None, **extra_kwargs)`

Return a string-based progress bar given some parameters

Parameters

- **n** (*int* or *float*) -- Number of finished iterations.
- **total** (*int* or *float*) -- The expected total number of iterations. If meaningless (None), only basic progress statistics are displayed (no ETA).
- **elapsed** (*float*) -- Number of seconds passed since start.
- **ncols** (*int*, *optional*) -- The width of the entire output message. If specified, dynamically resizes *{bar}* to stay within this bound [default: None]. If 0, will not print any bar (only stats). The fallback is *{bar:10}*.
- **prefix** (*str*, *optional*) -- Prefix message (included in total width) [default: "]. Use as {desc} in bar_format string.
- **ascii** (*bool*, *optional* or *str*, *optional*) -- If not set, use unicode (smooth blocks) to fill the meter [default: False]. The fallback is to use ASCII characters "123456789#".
- **unit** (*str*, *optional*) -- The iteration unit [default: 'it'].
- **unit_scale** (*bool* or *int* or *float*, *optional*) -- If 1 or True, the number of iterations will be printed with an appropriate SI metric prefix (k = 10³, M = 10⁶, etc.) [default: False]. If any other non-zero number, will scale *total* and *n*.
- **rate** (*float*, *optional*) -- Manual override for iteration rate. If [default: None], uses n/elapsed.
- **bar_format** (*str*, *optional*) -- Specify a custom bar string formatting. May impact performance. [default: '{l_bar}{bar}{r_bar}'], where l_bar='{desc}': {percentage:3.0f}% and r_bar='{n_fmt}/{total_fmt} [{elapsed}<{remaining},
'{rate_fmt}{postfix}]'

Possible vars: l_bar, bar, r_bar, n, n_fmt, total, total_fmt, percentage, elapsed, elapsed_s, ncols, nrows, desc, unit, rate, rate_fmt, rate_noinv, rate_noinv_fmt, rate_inv, rate_inv_fmt, postfix, unit_divisor, remaining, remaining_s, etc.

Note that a trailing ": " is automatically removed after {desc} if the latter is empty.

- **postfix** (*, *optional*) -- Similar to *prefix*, but placed at the end (e.g. for additional stats). Note: postfix is usually a string (not a dict) for this method, and will if possible be set to postfix = ', ' + postfix. However other types are supported (#382).
- **unit_divisor** (*float*, *optional*) -- [default: 1000], ignored unless *unit_scale* is True.
- **initial** (*int* or *float*, *optional*) -- The initial counter value [default: 0].
- **colour** (*str*, *optional*) -- Bar colour (e.g. 'green', '#00ff00').

Returns out

Return type Formatted meter and stats, ready to display.

classmethod `_get_free_pos`(*instance=None*)

Skips specified instance.

classmethod `_decr_instances`(*instance*)

Remove from list and reposition another unfixed bar to fill the new gap.

This means that by default (where all nested bars are unfixed), order is not maintained but screen flicker/blank space is minimised. (tqdm<=4.44.1 moved ALL subsequent unfixed bars up.)

classmethod `write`(*s*, *file=None*, *end='\n'*, *nolock=False*)

Print a message via tqdm (without overlap with bars).

classmethod `external_write_mode`(*file=None, nlock=False*)

Disable tqdm within context and refresh tqdm when exits. Useful when writing to standard output stream

classmethod `set_lock`(*lock*)

Set the global lock.

classmethod `get_lock`()

Get the global lock. Construct it if it does not exist.

classmethod `pandas`(***tqdm_kwargs*)

Registers the current *tqdm* class with `pandas.core. (frame.DataFrame | series.Series | groupby.(generic.)DataFrameGroupBy | groupby.(generic.)SeriesGroupBy).progress_apply`

A new instance will be create every time *progress_apply* is called, and each instance will automatically *close()* upon completion.

Parameters `tqdm_kwargs` (*arguments for the tqdm instance*)--

Examples

```
>>> import pandas as pd
>>> import numpy as np
>>> from tqdm import tqdm
>>> from tqdm.gui import tqdm as tqdm_gui
>>>
>>> df = pd.DataFrame(np.random.randint(0, 100, (100000, 6)))
>>> tqdm.pandas(ncols=50) # can use tqdm_gui, optional kwargs, etc
>>> # Now you can use `progress_apply` instead of `apply`
>>> df.groupby(0).progress_apply(lambda x: x**2)
```

References

<<https://stackoverflow.com/questions/18603270/progress-indicator-during-pandas-operations-python>>

`__bool__()`

`__nonzero__()`

`__len__()`

`__enter__()`

`__exit__(exc_type, exc_value, traceback)`

`__del__()`

`__str__()`

Return str(self).

`__hash__()`

Return hash(self).

`__iter__()`

Backward-compatibility to use: for x in tqdm(iterable)

`update(n=1)`

Manually update the progress bar, useful for streams such as reading files. E.g.: >>> t = tqdm(total=filesize)
Initialise >>> for current_buffer in stream: t.update(len(current_buffer)) >>> t.close() The last

line is highly recommended, but possibly not necessary if `t.update()` will be called in such a way that `filesize` will be exactly reached and printed.

Parameters `n` (`int` or `float`, *optional*) -- Increment to add to the internal counter of iterations [default: 1]. If using float, consider specifying `{n:.3f}` or similar in `bar_format`, or specifying `unit_scale`.

Returns `out` -- True if a `display()` was triggered.

Return type `bool` or `None`

close()

Cleanup and (if `leave=False`) close the progressbar.

clear(*nolock=False*)

Clear current bar display.

refresh(*nolock=False*, *lock_args=None*)

Force refresh the display of this bar.

Parameters

- **nolock** (`bool`, *optional*) -- If `True`, does not lock. If [default: `False`]: calls `acquire()` on internal lock.
- **lock_args** (`tuple`, *optional*) -- Passed to internal lock's `acquire()`. If specified, will only `display()` if `acquire()` returns `True`.

unpause()

Restart tqdm timer from last print time.

reset(*total=None*)

Resets to 0 iterations for repeated use.

Consider combining with `leave=True`.

Parameters `total` (`int` or `float`, *optional*. Total to use for the new bar.) --

set_description(*desc=None*, *refresh=True*)

Set/modify description of the progress bar.

Parameters

- **desc** (`str`, *optional*) --
- **refresh** (`bool`, *optional*) -- Forces refresh [default: `True`].

set_description_str(*desc=None*, *refresh=True*)

Set/modify description without ': ' appended.

set_postfix(*ordered_dict=None*, *refresh=True*, ***kwargs*)

Set/modify postfix (additional stats) with automatic formatting based on datatype.

Parameters

- **ordered_dict** (`dict` or `OrderedDict`, *optional*) --
- **refresh** (`bool`, *optional*) -- Forces refresh [default: `True`].
- **kwargs** (`dict`, *optional*) --

set_postfix_str(*s=""*, *refresh=True*)

Postfix without dictionary expansion, similar to prefix handling.

moveto(*n*)

display(*msg=None, pos=None*)

Use *self.sp* to display *msg* in the specified *pos*.

Consider overloading this function when inheriting to use e.g.: *self.some_frontend(**self.format_dict)* instead of *self.sp*.

Parameters

- **msg** (str, optional. What to display (default: *repr(self)*)). --
- **pos** (int, optional. Position to *moveto*) -- (default: *abs(self.pos)*).

classmethod wrapattr(*stream, method, total=None, bytes=True, **tqdm_kwargs*)

stream : file-like object. *method* : str, "read" or "write". The result of *read()* and

the first argument of *write()* should have a *len()*.

```
>>> with tqdm.wrapattr(file_obj, "read", total=file_obj.size) as fobj:
...     while True:
...         chunk = fobj.read(chunk_size)
...         if not chunk:
...             break
```

trange(**args, **kwargs*)

A shortcut for *tqdm(xrange(*args), **kwargs)*. On Python3+ *range* is used instead of *xrange*.

exception TqdmTypeError

Bases: [TypeError](#)

Inappropriate argument type.

exception TqdmKeyError

Bases: [KeyError](#)

Mapping key not found.

exception TqdmWarning(*msg, fp_write=None, *a, **k*)

Bases: [Warning](#)

base class for all tqdm warnings.

Used for non-external-code-breaking errors, such as garbled printing.

exception TqdmExperimentalWarning(*msg, fp_write=None, *a, **k*)

Bases: [TqdmWarning](#), [FutureWarning](#)

beta feature, unstable API and behaviour

exception TqdmDeprecationWarning(*msg, fp_write=None, *a, **k*)

Bases: [TqdmWarning](#), [DeprecationWarning](#)

base class for all tqdm warnings.

Used for non-external-code-breaking errors, such as garbled printing.

exception TqdmMonitorWarning(*msg, fp_write=None, *a, **k*)

Bases: [TqdmWarning](#), [RuntimeWarning](#)

tqdm monitor errors which do not affect external functionality

exception TqdmDeprecationWarning(*msg, fp_write=None, *a, **k*)

Bases: [TqdmWarning](#), [DeprecationWarning](#)

base class for all tqdm warnings.

Used for non-external-code-breaking errors, such as garbled printing.

_utils

asyncio

Asynchronous progressbar decorator for iterators. Includes a default *range* iterator printing to *stderr*.

Usage: >>> from tqdm.asyncio import trange, tqdm >>> async for i in trange(10):

Classes

<i>tqdm_asyncio</i>	Asynchronous-friendly version of tqdm (Python 3.6+).
---------------------	--

Functions

<i>tarange</i> (*args, **kwargs)	A shortcut for <i>tqdm.asyncio.tqdm(range(*args), **kwargs)</i> .
----------------------------------	---

Attributes

tqdm

trange

```

class tqdm_asyncio(iterable=None, *args, **kwargs)
    Bases: conda._vendor.tqdm.std.tqdm
    Asynchronous-friendly version of tqdm (Python 3.6+).
    __aiter__()
    async __anext__()
    send(*args, **kwargs)
    classmethod as_completed(fs, *, loop=None, timeout=None, total=None, **tqdm_kwargs)
        Wrapper for asyncio.as_completed.
    async classmethod gather(fs, *, loop=None, timeout=None, total=None, **tqdm_kwargs)
        Wrapper for asyncio.gather.
tarange(*args, **kwargs)
    A shortcut for tqdm.asyncio.tqdm(range(*args), **kwargs).
tqdm
trange

```

auto

Enables multiple commonly used features.

Method resolution order:

- `tqdm.autonotebook` without import warnings
- `tqdm.asyncio` on Python3.6+
- `tqdm.std` base class

Usage: `>>> from tqdm.auto import trange, tqdm >>> for i in trange(10): ...`

Classes

<code>tqdm</code>	Decorate an iterable object, returning an iterator which acts exactly
-------------------	---

Functions

<code>trange(*args, **kwargs)</code>	A shortcut for <code>tqdm(xrange(*args), **kwargs)</code> .
--------------------------------------	---

```
class tqdm(iterable=None, desc=None, total=None, leave=True, file=None, ncols=None, mininterval=0.1,  
maxinterval=10.0, miniters=None, ascii=None, disable=False, unit='it', unit_scale=False,  
dynamic_ncols=False, smoothing=0.3, bar_format=None, initial=0, position=None, postfix=None,  
unit_divisor=1000, write_bytes=None, lock_args=None, nrows=None, colour=None, delay=0,  
gui=False, **kwargs)
```

Bases: `conda._vendor.tqdm.utils.Comparable`

Decorate an iterable object, returning an iterator which acts exactly like the original iterable, but prints a dynamically updating progressbar every time a value is requested.

property `_comparable`

property `format_dict`

Public API for read-only member access.

monitor_interval = 10

monitor

_instances

static `format_sizeof(num, suffix="", divisor=1000)`

Formats a number (greater than unity) with SI Order of Magnitude prefixes.

Parameters

- **num** (*float*) -- Number (≥ 1) to format.
- **suffix** (*str*, *optional*) -- Post-postfix [default: "].
- **divisor** (*float*, *optional*) -- Divisor between prefixes [default: 1000].

Returns **out** -- Number with Order of Magnitude SI unit postfix.

Return type *str*

static format_interval(*t*)

Formats a number of seconds as a clock time, [H:]MM:SS

Parameters *t* (*int*) -- Number of seconds.

Returns *out* -- [H:]MM:SS

Return type *str*

static format_num(*n*)

Intelligent scientific notation (.3g).

Parameters *n* (*int* or *float* or *Numeric*) -- A Number.

Returns *out* -- Formatted number.

Return type *str*

static status_printer(*file*)

Manage the printing and in-place updating of a line of characters. Note that if the string is longer than a line, then in-place updating may not work (it will print a new line at each refresh).

static format_meter(*n*, *total*, *elapsed*, *ncols*=None, *prefix*="", *ascii*=False, *unit*='it', *unit_scale*=False, *rate*=None, *bar_format*=None, *postfix*=None, *unit_divisor*=1000, *initial*=0, *colour*=None, *extra_kwargs*)**

Return a string-based progress bar given some parameters

Parameters

- ***n*** (*int* or *float*) -- Number of finished iterations.
- ***total*** (*int* or *float*) -- The expected total number of iterations. If meaningless (None), only basic progress statistics are displayed (no ETA).
- ***elapsed*** (*float*) -- Number of seconds passed since start.
- ***ncols*** (*int*, *optional*) -- The width of the entire output message. If specified, dynamically resizes *{bar}* to stay within this bound [default: None]. If 0, will not print any bar (only stats). The fallback is *{bar:10}*.
- ***prefix*** (*str*, *optional*) -- Prefix message (included in total width) [default: "]. Use as *{desc}* in *bar_format* string.
- ***ascii*** (*bool*, *optional* or *str*, *optional*) -- If not set, use unicode (smooth blocks) to fill the meter [default: False]. The fallback is to use ASCII characters "123456789#".
- ***unit*** (*str*, *optional*) -- The iteration unit [default: 'it'].
- ***unit_scale*** (*bool* or *int* or *float*, *optional*) -- If 1 or True, the number of iterations will be printed with an appropriate SI metric prefix (k = 10³, M = 10⁶, etc.) [default: False]. If any other non-zero number, will scale *total* and *n*.
- ***rate*** (*float*, *optional*) -- Manual override for iteration rate. If [default: None], uses *n/elapsed*.
- ***bar_format*** (*str*, *optional*) -- Specify a custom bar string formatting. May impact performance. [default: '{l_bar}{bar}{r_bar}'], where *l_bar*='{desc}': '{percentage:3.0f}%' and *r_bar*='{n_fmt}/{total_fmt} [{elapsed}<{remaining}, '{rate_fmt}{postfix}]'

Possible vars: `l_bar`, `bar`, `r_bar`, `n`, `n_fmt`, `total`, `total_fmt`, `percentage`, `elapsed`, `elapsed_s`, `ncols`, `nrows`, `desc`, `unit`, `rate`, `rate_fmt`, `rate_noinv`, `rate_noinv_fmt`, `rate_inv`, `rate_inv_fmt`, `postfix`, `unit_divisor`, `remaining`, `remaining_s`, `eta`.

Note that a trailing `" "` is automatically removed after `{ desc }` if the latter is empty.

- **postfix** (*, optional) -- Similar to *prefix*, but placed at the end (e.g. for additional stats). Note: postfix is usually a string (not a dict) for this method, and will if possible be set to `postfix = ' ' + postfix`. However other types are supported (#382).
- **unit_divisor** (*float*, optional) -- [default: 1000], ignored unless *unit_scale* is True.
- **initial** (*int* or *float*, optional) -- The initial counter value [default: 0].
- **colour** (*str*, optional) -- Bar colour (e.g. 'green', '#00ff00').

Returns out

Return type Formatted meter and stats, ready to display.

classmethod `_get_free_pos`(*instance=None*)

Skips specified instance.

classmethod `_decr_instances`(*instance*)

Remove from list and reposition another unfixed bar to fill the new gap.

This means that by default (where all nested bars are unfixed), order is not maintained but screen flicker/blank space is minimised. (tqdm<=4.44.1 moved ALL subsequent unfixed bars up.)

classmethod `write`(*s*, *file=None*, *end='\n'*, *nolock=False*)

Print a message via tqdm (without overlap with bars).

classmethod `external_write_mode`(*file=None*, *nolock=False*)

Disable tqdm within context and refresh tqdm when exits. Useful when writing to standard output stream

classmethod `set_lock`(*lock*)

Set the global lock.

classmethod `get_lock`()

Get the global lock. Construct it if it does not exist.

classmethod `pandas`(***tqdm_kwargs*)

Registers the current *tqdm* class with `pandas.core.` (`frame.DataFrame` | `series.Series` | `groupby.(generic.)DataFrameGroupBy` | `groupby.(generic.)SeriesGroupBy`).`progress_apply`

A new instance will be create every time *progress_apply* is called, and each instance will automatically *close()* upon completion.

Parameters `tqdm_kwargs` (*arguments for the tqdm instance*) --

Examples

```
>>> import pandas as pd
>>> import numpy as np
>>> from tqdm import tqdm
>>> from tqdm.gui import tqdm as tqdm_gui
>>>
>>> df = pd.DataFrame(np.random.randint(0, 100, (1000000, 6)))
>>> tqdm.pandas(ncols=50) # can use tqdm_gui, optional kwargs, etc
>>> # Now you can use `progress_apply` instead of `apply`
>>> df.groupby(0).progress_apply(lambda x: x**2)
```

References

<[https://stackoverflow.com/questions/18603270/ progress-indicator-during-pandas-operations-python](https://stackoverflow.com/questions/18603270/progress-indicator-during-pandas-operations-python)>

`__bool__()`

`__nonzero__()`

`__len__()`

`__enter__()`

`__exit__(exc_type, exc_value, traceback)`

`__del__()`

`__str__()`

Return str(self).

`__hash__()`

Return hash(self).

`__iter__()`

Backward-compatibility to use: for x in tqdm(iterable)

update(*n=1*)

Manually update the progress bar, useful for streams such as reading files. E.g.: >>> t = tqdm(total=filesize)
Initialise >>> for current_buffer in stream: t.update(len(current_buffer)) >>> t.close() The last
line is highly recommended, but possibly not necessary if *t.update()* will be called in such a way that *filesize*
will be exactly reached and printed.

Parameters *n* (*int* or *float*, *optional*) -- Increment to add to the internal counter of iterations [default: 1]. If using float, consider specifying *{n:.3f}* or similar in *bar_format*, or specifying *unit_scale*.

Returns *out* -- True if a *display()* was triggered.

Return type *bool* or *None*

close()

Cleanup and (if *leave=False*) close the progressbar.

clear(*nolock=False*)

Clear current bar display.

refresh(*nolock=False*, *lock_args=None*)

Force refresh the display of this bar.

Parameters

- **no_lock** (*bool*, optional) -- If *True*, does not lock. If [default: *False*]: calls *acquire()* on internal lock.
- **lock_args** (*tuple*, optional) -- Passed to internal lock's *acquire()*. If specified, will only *display()* if *acquire()* returns *True*.

unpause()

Restart tqdm timer from last print time.

reset(*total=None*)

Resets to 0 iterations for repeated use.

Consider combining with *leave=True*.

Parameters **total** (*int* or *float*, optional. Total to use for the new bar.) --

set_description(*desc=None*, *refresh=True*)

Set/modify description of the progress bar.

Parameters

- **desc** (*str*, optional) --
- **refresh** (*bool*, optional) -- Forces refresh [default: *True*].

set_description_str(*desc=None*, *refresh=True*)

Set/modify description without ': ' appended.

set_postfix(*ordered_dict=None*, *refresh=True*, ***kwargs*)

Set/modify postfix (additional stats) with automatic formatting based on datatype.

Parameters

- **ordered_dict** (*dict* or *OrderedDict*, optional) --
- **refresh** (*bool*, optional) -- Forces refresh [default: *True*].
- **kwargs** (*dict*, optional) --

set_postfix_str(*s=""*, *refresh=True*)

Postfix without dictionary expansion, similar to prefix handling.

moveto(*n*)

display(*msg=None*, *pos=None*)

Use *self.sp* to display *msg* in the specified *pos*.

Consider overloading this function when inheriting to use e.g.: *self.some_frontend(**self.format_dict)* instead of *self.sp*.

Parameters

- **msg** (*str*, optional. What to display (default: *repr(self)*)). --
- **pos** (*int*, optional. Position to *moveto*) -- (default: *abs(self.pos)*).

classmethod wrapattr(*stream*, *method*, *total=None*, *bytes=True*, ***tqdm_kwargs*)

stream : file-like object. *method* : *str*, "read" or "write". The result of *read()* and

the first argument of *write()* should have a *len()*.

```
>>> with tqdm.wrapattr(file_obj, "read", total=file_obj.size) as fobj:
...     while True:
...         chunk = fobj.read(chunk_size)
...         if not chunk:
...             break
```

trange(*args, **kwargs)

A shortcut for `tqdm(xrange(*args), **kwargs)`. On Python3+ `range` is used instead of `xrange`.

cli

Module version for monitoring CLI pipes (... | *python -m tqdm* | ...).

Functions

<i>main</i> ([fp, argv])	Parameters (internal use only)
--------------------------	--------------------------------

main(fp=sys.stderr, argv=None)

fp : file-like object for tqdm argv : list (default: sys.argv[1:])

std

Customisable progressbar decorator for iterators. Includes a default *range* iterator printing to *stderr*.

Usage: >>> from tqdm import trange, tqdm >>> for i in trange(10):

Classes

<i>tqdm</i>	Decorate an iterable object, returning an iterator which acts exactly
-------------	---

Functions

<i>trange</i> (*args, **kwargs)	A shortcut for <code>tqdm(xrange(*args), **kwargs)</code> .
---------------------------------	---

exception TqdmTypeError

Bases: `TypeError`

Inappropriate argument type.

exception TqdmKeyError

Bases: `KeyError`

Mapping key not found.

exception TqdmWarning(msg, fp_write=None, *a, **k)

Bases: `Warning`

base class for all tqdm warnings.

Used for non-external-code-breaking errors, such as garbled printing.

exception TqdmExperimentalWarning(msg, fp_write=None, *a, **k)

Bases: `TqdmWarning`, `FutureWarning`

beta feature, unstable API and behaviour

exception `TqdmDeprecationWarning(msg, fp_write=None, *a, **k)`

Bases: `TqdmWarning`, `DeprecationWarning`

base class for all tqdm warnings.

Used for non-external-code-breaking errors, such as garbled printing.

exception `TqdmMonitorWarning(msg, fp_write=None, *a, **k)`

Bases: `TqdmWarning`, `RuntimeWarning`

tqdm monitor errors which do not affect external functionality

class `tqdm(iterable=None, desc=None, total=None, leave=True, file=None, ncols=None, mininterval=0.1, maxinterval=10.0, miniters=None, ascii=None, disable=False, unit='it', unit_scale=False, dynamic_ncols=False, smoothing=0.3, bar_format=None, initial=0, position=None, postfix=None, unit_divisor=1000, write_bytes=None, lock_args=None, nrows=None, colour=None, delay=0, gui=False, **kwargs)`

Bases: `conda._vendor.tqdm.utils.Comparable`

Decorate an iterable object, returning an iterator which acts exactly like the original iterable, but prints a dynamically updating progressbar every time a value is requested.

property `_comparable`

property `format_dict`

Public API for read-only member access.

monitor_interval = 10

monitor

_instances

static `format_sizeof(num, suffix="", divisor=1000)`

Formats a number (greater than unity) with SI Order of Magnitude prefixes.

Parameters

- **num** (*float*) -- Number (≥ 1) to format.
- **suffix** (*str*, optional) -- Post-postfix [default: "].
- **divisor** (*float*, optional) -- Divisor between prefixes [default: 1000].

Returns **out** -- Number with Order of Magnitude SI unit postfix.

Return type *str*

static `format_interval(t)`

Formats a number of seconds as a clock time, [H:]MM:SS

Parameters **t** (*int*) -- Number of seconds.

Returns **out** -- [H:]MM:SS

Return type *str*

static `format_num(n)`

Intelligent scientific notation (.3g).

Parameters **n** (*int* or *float* or *Numeric*) -- A Number.

Returns **out** -- Formatted number.

Return type *str*

static status_printer(*file*)

Manage the printing and in-place updating of a line of characters. Note that if the string is longer than a line, then in-place updating may not work (it will print a new line at each refresh).

static format_meter(*n, total, elapsed, ncols=None, prefix="", ascii=False, unit='it', unit_scale=False, rate=None, bar_format=None, postfix=None, unit_divisor=1000, initial=0, colour=None, **extra_kwargs*)

Return a string-based progress bar given some parameters

Parameters

- **n** (*int* or *float*) -- Number of finished iterations.
- **total** (*int* or *float*) -- The expected total number of iterations. If meaningless (None), only basic progress statistics are displayed (no ETA).
- **elapsed** (*float*) -- Number of seconds passed since start.
- **ncols** (*int*, *optional*) -- The width of the entire output message. If specified, dynamically resizes *{bar}* to stay within this bound [default: None]. If 0, will not print any bar (only stats). The fallback is *{bar:10}*.
- **prefix** (*str*, *optional*) -- Prefix message (included in total width) [default: "]. Use as *{desc}* in *bar_format* string.
- **ascii** (*bool*, *optional* or *str*, *optional*) -- If not set, use unicode (smooth blocks) to fill the meter [default: False]. The fallback is to use ASCII characters "123456789#".
- **unit** (*str*, *optional*) -- The iteration unit [default: 'it'].
- **unit_scale** (*bool* or *int* or *float*, *optional*) -- If 1 or True, the number of iterations will be printed with an appropriate SI metric prefix (k = 10³, M = 10⁶, etc.) [default: False]. If any other non-zero number, will scale *total* and *n*.
- **rate** (*float*, *optional*) -- Manual override for iteration rate. If [default: None], uses *n/elapsed*.
- **bar_format** (*str*, *optional*) -- Specify a custom bar string formatting. May impact performance. [default: '{l_bar}{bar}{r_bar}'], where *l_bar*='{desc}': '{percentage:3.0f}%' and *r_bar*='| {n_fmt}/{total_fmt} [{elapsed}<{remaining}, '{rate_fmt}{postfix}]'

Possible vars: *l_bar, bar, r_bar, n, n_fmt, total, total_fmt, percentage, elapsed, elapsed_s, ncols, nrows, desc, unit, rate, rate_fmt, rate_noinv, rate_noinv_fmt, rate_inv, rate_inv_fmt, postfix, unit_divisor, remaining, remaining_s, eta*.

Note that a trailing ": " is automatically removed after *{desc}* if the latter is empty.

- **postfix** (*, *optional*) -- Similar to *prefix*, but placed at the end (e.g. for additional stats). Note: postfix is usually a string (not a dict) for this method, and will if possible be set to *postfix = ', ' + postfix*. However other types are supported (#382).
- **unit_divisor** (*float*, *optional*) -- [default: 1000], ignored unless *unit_scale* is True.
- **initial** (*int* or *float*, *optional*) -- The initial counter value [default: 0].
- **colour** (*str*, *optional*) -- Bar colour (e.g. 'green', '#00ff00').

Returns out

Return type Formatted meter and stats, ready to display.

classmethod `_get_free_pos(instance=None)`

Skips specified instance.

classmethod `_decr_instances(instance)`

Remove from list and reposition another unfixed bar to fill the new gap.

This means that by default (where all nested bars are unfixed), order is not maintained but screen flicker/blank space is minimised. (tqdm<=4.44.1 moved ALL subsequent unfixed bars up.)

classmethod `write(s, file=None, end='\n', nolog=False)`

Print a message via tqdm (without overlap with bars).

classmethod `external_write_mode(file=None, nolog=False)`

Disable tqdm within context and refresh tqdm when exits. Useful when writing to standard output stream

classmethod `set_lock(lock)`

Set the global lock.

classmethod `get_lock()`

Get the global lock. Construct it if it does not exist.

classmethod `pandas(**tqdm_kwargs)`

Registers the current *tqdm* class with `pandas.core`. (`frame.DataFrame` | `series.Series` | `groupby.(generic.)DataFrameGroupBy` | `groupby.(generic.)SeriesGroupBy`).`progress_apply`

A new instance will be create every time *progress_apply* is called, and each instance will automatically *close()* upon completion.

Parameters *tqdm_kwargs* (arguments for the *tqdm* instance) --

Examples

```
>>> import pandas as pd
>>> import numpy as np
>>> from tqdm import tqdm
>>> from tqdm.gui import tqdm as tqdm_gui
>>>
>>> df = pd.DataFrame(np.random.randint(0, 100, (100000, 6)))
>>> tqdm.pandas(ncols=50) # can use tqdm_gui, optional kwargs, etc
>>> # Now you can use `progress_apply` instead of `apply`
>>> df.groupby(0).progress_apply(lambda x: x**2)
```

References

<<https://stackoverflow.com/questions/18603270/progress-indicator-during-pandas-operations-python>>

`__bool__()`

`__nonzero__()`

`__len__()`

`__enter__()`

`__exit__(exc_type, exc_value, traceback)`

`__del__()`

__str__()
Return str(self).

__hash__()
Return hash(self).

__iter__()
Backward-compatibility to use: for x in tqdm(iterable)

update(n=1)
Manually update the progress bar, useful for streams such as reading files. E.g.: >>> t = tqdm(total=filesize)
Initialise >>> for current_buffer in stream: t.update(len(current_buffer)) >>> t.close() The last
line is highly recommended, but possibly not necessary if *t.update()* will be called in such a way that *filesize*
will be exactly reached and printed.

Parameters *n* (*int* or *float*, optional) -- Increment to add to the internal counter of it-
erations [default: 1]. If using float, consider specifying *{n:.3f}* or similar in *bar_format*, or
specifying *unit_scale*.

Returns *out* -- True if a *display()* was triggered.

Return type *bool* or *None*

close()
Cleanup and (if *leave=False*) close the progressbar.

clear(nolock=False)
Clear current bar display.

refresh(nolock=False, lock_args=None)
Force refresh the display of this bar.

Parameters

- **nolock** (*bool*, optional) -- If *True*, does not lock. If [default: *False*]: calls *acquire()*
on internal lock.
- **lock_args** (*tuple*, optional) -- Passed to internal lock's *acquire()*. If specified, will
only *display()* if *acquire()* returns *True*.

unpause()
Restart tqdm timer from last print time.

reset(total=None)
Resets to 0 iterations for repeated use.

Consider combining with *leave=True*.

Parameters *total* (*int* or *float*, optional. Total to use for the new bar.)--

set_description(desc=None, refresh=True)
Set/modify description of the progress bar.

Parameters

- **desc** (*str*, optional) --
- **refresh** (*bool*, optional) -- Forces refresh [default: *True*].

set_description_str(desc=None, refresh=True)
Set/modify description without ': ' appended.

set_postfix(ordered_dict=None, refresh=True, **kwargs)
Set/modify postfix (additional stats) with automatic formatting based on datatype.

Parameters

- **ordered_dict** (*dict* or *OrderedDict*, optional) --
- **refresh** (*bool*, optional) -- Forces refresh [default: True].
- **kwargs** (*dict*, optional) --

set_postfix_str(*s*=", *refresh*=True)

Postfix without dictionary expansion, similar to prefix handling.

moveto(*n*)

display(*msg*=None, *pos*=None)

Use *self.sp* to display *msg* in the specified *pos*.

Consider overloading this function when inheriting to use e.g.: *self.some_frontend(**self.format_dict)* instead of *self.sp*.

Parameters

- **msg** (str, optional. What to display (default: *repr(self)*)). --
- **pos** (int, optional. Position to *moveto*) -- (default: *abs(self.pos)*).

classmethod wrapattr(*stream*, *method*, *total*=None, *bytes*=True, ***tqdm_kwargs*)

stream : file-like object. *method* : str, "read" or "write". The result of *read()* and

the first argument of *write()* should have a *len()*.

```
>>> with tqdm.wrapattr(file_obj, "read", total=file_obj.size) as fobj:
...     while True:
...         chunk = fobj.read(chunk_size)
...         if not chunk:
...             break
```

trange(**args*, ***kwargs*)

A shortcut for *tqdm(xrange(*args), **kwargs)*. On Python3+ *range* is used instead of *xrange*.

utils

General helpers required for *tqdm.std*.

Classes*FormatReplace*

```
>>> a = FormatReplace('something')
```

Comparable

Assumes child has *self._comparable attr/@property*

*ObjectWrapper**SimpleTextIOWrapper*

Change only *.write()* of the wrapped object by encoding the passed

DisableOnWriteError

Disable the given *tqdm_instance* upon *write()* or *flush()* errors.

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Table 41 – continued from previous page

*CallbackIOWrapper***Functions**

<i>_is_utf</i> (encoding)	
<i>_supports_unicode</i> (fp)	
<i>_is_ascii</i> (s)	
<i>_screen_shape_wrapper</i> ()	Return a function which returns console dimensions (width, height).
<i>_screen_shape_windows</i> (fp)	
<i>_screen_shape_tput</i> (*)_	cygwin xterm (windows)
<i>_screen_shape_linux</i> (fp)	
<i>_environ_cols_wrapper</i> ()	Return a function which returns console width.
<i>_term_move_up</i> ()	
<i>disp_len</i> (data)	Returns the real on-screen length of a string which may contain
<i>disp_trim</i> (data, length)	Trim a string which may contain ANSI control characters.

Attributes

<i>_range</i>
<i>_unich</i>
<i>_unicode</i>
<i>_basestring</i>
<i>CUR_OS</i>
<i>IS_WIN</i>
<i>IS_NIX</i>
<i>RE_ANSI</i>
<i>colorama</i>

continues on next page

Table 43 – continued from previous page

*_text_width***_range****_unich****_unicode****_basestring****CUR_OS****IS_WIN****IS_NIX****RE_ANSI****colorama****class FormatReplace**(*replace=""*)Bases: **object**

```
>>> a = FormatReplace('something')
>>> "{:5d}".format(a)
'something'
```

__format__(*_*)

Default object formatter.

class ComparableBases: **object**

Assumes child has self._comparable attr/@property

__lt__(*other*)

Return self<value.

__le__(*other*)

Return self<=value.

__eq__(*other*)

Return self==value.

__ne__(*other*)

Return self!=value.

__gt__(*other*)

Return self>value.

__ge__(*other*)

Return self>=value.

class ObjectWrapper(*wrapped*)Bases: **object****__getattr__**(*name*)**__setattr__**(*name, value*)

Implement setattr(self, name, value).

wrapper_getattr(*name*)
Actual *self.getattr* rather than *self._wrapped.getattr*

wrapper_setattr(*name, value*)
Actual *self.setattr* rather than *self._wrapped.setattr*

class SimpleTextIOWrapper(*wrapped, encoding*)

Bases: [ObjectWrapper](#)

Change only *.write()* of the wrapped object by encoding the passed value and passing the result to the wrapped object's *.write()* method.

write(*s*)
Encode *s* and pass to the wrapped object's *.write()* method.

__eq__(*other*)
Return *self==value*.

class DisableOnWriteError(*wrapped, tqdm_instance*)

Bases: [ObjectWrapper](#)

Disable the given *tqdm_instance* upon *write()* or *flush()* errors.

static disable_on_exception(*tqdm_instance, func*)
Quietly set *tqdm_instance.miniters=inf* if *func* raises *errno=5*.

__eq__(*other*)
Return *self==value*.

class CallbackIOWrapper(*callback, stream, method='read'*)

Bases: [ObjectWrapper](#)

_is_utf(*encoding*)

_supports_unicode(*fp*)

_is_ascii(*s*)

_screen_shape_wrapper()

Return a function which returns console dimensions (width, height). Supported: linux, osx, windows, cygwin.

_screen_shape_windows(*fp*)

_screen_shape_tput(*_*_*)
cygwin xterm (windows)

_screen_shape_linux(*fp*)

_environ_cols_wrapper()

Return a function which returns console width. Supported: linux, osx, windows, cygwin.

_term_move_up()

_text_width

disp_len(*data*)

Returns the real on-screen length of a string which may contain ANSI control codes and wide chars.

disp_trim(*data, length*)

Trim a string which may contain ANSI control characters.

version

tqdm version detector. Precedence: installed dist, git, 'UNKNOWN'.

```
__version__ = '4.61.1'
```

Classes

<i>TMonitor</i>	Monitoring thread for tqdm bars.
<i>tqdm</i>	Decorate an iterable object, returning an iterator which acts exactly

Functions

<i>main</i> ([fp, argv])	Parameters (internal use only)
<i>trange</i> (*args, **kwargs)	A shortcut for <code>tqdm(xrange(*args), **kwargs)</code> .

Attributes

<i>__version__</i>

class **TMonitor**(*tqdm_cls*, *sleep_interval*)

Bases: `threading.Thread`

Monitoring thread for tqdm bars. Monitors if tqdm bars are taking too much time to display and readjusts miniters automatically if necessary.

Parameters

- **tqdm_cls** (*class*) -- tqdm class to use (can be core tqdm or a submodule).
- **sleep_interval** (*float*) -- Time to sleep between monitoring checks.

_test

exit()

get_instances()

run()

Method representing the thread's activity.

You may override this method in a subclass. The standard `run()` method invokes the callable object passed to the object's constructor as the target argument, if any, with sequential and keyword arguments taken from the args and kwargs arguments, respectively.

report()

exception **TqdmSynchronisationWarning**

Bases: `RuntimeWarning`

tqdm multi-thread/-process errors which may cause incorrect nesting but otherwise no adverse effects

```

main(fp=sys.stderr, argv=None)
    fp : file-like object for tqdm argv : list (default: sys.argv[1:])

exception TqdmDeprecationWarning(msg, fp_write=None, *a, **k)
    Bases: TqdmWarning, DeprecationWarning

    base class for all tqdm warnings.

    Used for non-external-code-breaking errors, such as garbled printing.

exception TqdmExperimentalWarning(msg, fp_write=None, *a, **k)
    Bases: TqdmWarning, FutureWarning

    beta feature, unstable API and behaviour

exception TqdmKeyError
    Bases: KeyError

    Mapping key not found.

exception TqdmMonitorWarning(msg, fp_write=None, *a, **k)
    Bases: TqdmWarning, RuntimeWarning

    tqdm monitor errors which do not affect external functionality

exception TqdmTypeError
    Bases: TypeError

    Inappropriate argument type.

exception TqdmWarning(msg, fp_write=None, *a, **k)
    Bases: Warning

    base class for all tqdm warnings.

    Used for non-external-code-breaking errors, such as garbled printing.

class tqdm(iterable=None, desc=None, total=None, leave=True, file=None, ncols=None, mininterval=0.1,
    maxinterval=10.0, miniters=None, ascii=None, disable=False, unit='it', unit_scale=False,
    dynamic_ncols=False, smoothing=0.3, bar_format=None, initial=0, position=None, postfix=None,
    unit_divisor=1000, write_bytes=None, lock_args=None, nrows=None, colour=None, delay=0,
    gui=False, **kwargs)
    Bases: conda.\_vendor.tqdm.utils.Comparable

    Decorate an iterable object, returning an iterator which acts exactly like the original iterable, but prints a dynam-
    ically updating progressbar every time a value is requested.

property _comparable

property format_dict
    Public API for read-only member access.

monitor_interval = 10

monitor

_instances

static format_sizeof(num, suffix="", divisor=1000)
    Formats a number (greater than unity) with SI Order of Magnitude prefixes.

    Parameters
    • num (float) -- Number (>= 1) to format.
    • suffix (str, optional) -- Post-postfix [default: "].

```

- **divisor** (*float*, *optional*) -- Divisor between prefixes [default: 1000].

Returns out -- Number with Order of Magnitude SI unit postfix.

Return type *str*

static format_interval(*t*)

Formats a number of seconds as a clock time, [H:]MM:SS

Parameters *t* (*int*) -- Number of seconds.

Returns out -- [H:]MM:SS

Return type *str*

static format_num(*n*)

Intelligent scientific notation (.3g).

Parameters *n* (*int* or *float* or *Numeric*) -- A Number.

Returns out -- Formatted number.

Return type *str*

static status_printer(*file*)

Manage the printing and in-place updating of a line of characters. Note that if the string is longer than a line, then in-place updating may not work (it will print a new line at each refresh).

static format_meter(*n*, *total*, *elapsed*, *ncols*=None, *prefix*="", *ascii*=False, *unit*='it', *unit_scale*=False, *rate*=None, *bar_format*=None, *postfix*=None, *unit_divisor*=1000, *initial*=0, *colour*=None, ***extra_kwargs*)

Return a string-based progress bar given some parameters

Parameters

- *n* (*int* or *float*) -- Number of finished iterations.
- *total* (*int* or *float*) -- The expected total number of iterations. If meaningless (None), only basic progress statistics are displayed (no ETA).
- *elapsed* (*float*) -- Number of seconds passed since start.
- *ncols* (*int*, *optional*) -- The width of the entire output message. If specified, dynamically resizes *{bar}* to stay within this bound [default: None]. If 0, will not print any bar (only stats). The fallback is *{bar:10}*.
- *prefix* (*str*, *optional*) -- Prefix message (included in total width) [default: "]. Use as *{desc}* in *bar_format* string.
- *ascii* (*bool*, *optional* or *str*, *optional*) -- If not set, use unicode (smooth blocks) to fill the meter [default: False]. The fallback is to use ASCII characters "123456789#".
- *unit* (*str*, *optional*) -- The iteration unit [default: 'it'].
- *unit_scale* (*bool* or *int* or *float*, *optional*) -- If 1 or True, the number of iterations will be printed with an appropriate SI metric prefix (k = 10³, M = 10⁶, etc.) [default: False]. If any other non-zero number, will scale *total* and *n*.
- *rate* (*float*, *optional*) -- Manual override for iteration rate. If [default: None], uses *n/elapsed*.
- *bar_format* (*str*, *optional*) -- Specify a custom bar string formatting. May impact performance. [default: '{l_bar}{bar}{r_bar}'], where *l_bar*='{desc}': {percentage:3.0f}% and *r_bar*='{n_fmt}/{total_fmt} [{elapsed}<{remaining},'


```
'{rate_fmt}{postfix}{'
```

Possible vars: `l_bar`, `bar`, `r_bar`, `n`, `n_fmt`, `total`, `total_fmt`, `percentage`, `elapsed`, `elapsed_s`, `ncols`, `nrows`, `desc`, `unit`, `rate`, `rate_fmt`, `rate_noinv`, `rate_noinv_fmt`, `rate_inv`, `rate_inv_fmt`, `postfix`, `unit_divisor`, `remaining`, `remaining_s`, etc.

Note that a trailing " " is automatically removed after `{desc}` if the latter is empty.

- **postfix** (*, optional) -- Similar to *prefix*, but placed at the end (e.g. for additional stats). Note: postfix is usually a string (not a dict) for this method, and will if possible be set to `postfix = ', ' + postfix`. However other types are supported (#382).
- **unit_divisor** (*float*, optional) -- [default: 1000], ignored unless *unit_scale* is True.
- **initial** (*int* or *float*, optional) -- The initial counter value [default: 0].
- **colour** (*str*, optional) -- Bar colour (e.g. 'green', '#00ff00').

Returns out

Return type Formatted meter and stats, ready to display.

classmethod `_get_free_pos`(*instance=None*)

Skips specified instance.

classmethod `_decr_instances`(*instance*)

Remove from list and reposition another unfixed bar to fill the new gap.

This means that by default (where all nested bars are unfixed), order is not maintained but screen flicker/blank space is minimised. (tqdm<=4.44.1 moved ALL subsequent unfixed bars up.)

classmethod `write`(*s*, *file=None*, *end='\n'*, *nolock=False*)

Print a message via tqdm (without overlap with bars).

classmethod `external_write_mode`(*file=None*, *nolock=False*)

Disable tqdm within context and refresh tqdm when exits. Useful when writing to standard output stream

classmethod `set_lock`(*lock*)

Set the global lock.

classmethod `get_lock`()

Get the global lock. Construct it if it does not exist.

classmethod `pandas`(***tqdm_kwargs*)

Registers the current *tqdm* class with `pandas.core.` (`frame.DataFrame` | `series.Series` | `groupby.(generic.)DataFrameGroupBy` | `groupby.(generic.)SeriesGroupBy`).`progress_apply`

A new instance will be create every time *progress_apply* is called, and each instance will automatically *close()* upon completion.

Parameters `tqdm_kwargs` (*arguments for the tqdm instance*)--

Examples

```
>>> import pandas as pd
>>> import numpy as np
>>> from tqdm import tqdm
>>> from tqdm.gui import tqdm as tqdm_gui
>>>
>>> df = pd.DataFrame(np.random.randint(0, 100, (1000000, 6)))
>>> tqdm.pandas(ncols=50) # can use tqdm_gui, optional kwargs, etc
>>> # Now you can use `progress_apply` instead of `apply`
>>> df.groupby(0).progress_apply(lambda x: x**2)
```

References

<[https://stackoverflow.com/questions/18603270/ progress-indicator-during-pandas-operations-python](https://stackoverflow.com/questions/18603270/progress-indicator-during-pandas-operations-python)>

`__bool__()`

`__nonzero__()`

`__len__()`

`__enter__()`

`__exit__(exc_type, exc_value, traceback)`

`__del__()`

`__str__()`

Return str(self).

`__hash__()`

Return hash(self).

`__iter__()`

Backward-compatibility to use: for x in tqdm(iterable)

update(*n=1*)

Manually update the progress bar, useful for streams such as reading files. E.g.: >>> t = tqdm(total=filesize)
Initialise >>> for current_buffer in stream: t.update(len(current_buffer)) >>> t.close() The last
line is highly recommended, but possibly not necessary if *t.update()* will be called in such a way that *filesize*
will be exactly reached and printed.

Parameters *n* (*int* or *float*, *optional*) -- Increment to add to the internal counter of iterations [default: 1]. If using float, consider specifying *{n:.3f}* or similar in *bar_format*, or specifying *unit_scale*.

Returns *out* -- True if a *display()* was triggered.

Return type *bool* or *None*

close()

Cleanup and (if *leave=False*) close the progressbar.

clear(*nolock=False*)

Clear current bar display.

refresh(*nolock=False*, *lock_args=None*)

Force refresh the display of this bar.

Parameters

- **no_lock** (*bool*, optional) -- If *True*, does not lock. If [default: *False*]: calls *acquire()* on internal lock.
- **lock_args** (*tuple*, optional) -- Passed to internal lock's *acquire()*. If specified, will only *display()* if *acquire()* returns *True*.

unpause()

Restart tqdm timer from last print time.

reset(*total=None*)

Resets to 0 iterations for repeated use.

Consider combining with *leave=True*.

Parameters **total** (*int* or *float*, optional. Total to use for the new bar.) --

set_description(*desc=None*, *refresh=True*)

Set/modify description of the progress bar.

Parameters

- **desc** (*str*, optional) --
- **refresh** (*bool*, optional) -- Forces refresh [default: *True*].

set_description_str(*desc=None*, *refresh=True*)

Set/modify description without ': ' appended.

set_postfix(*ordered_dict=None*, *refresh=True*, ***kwargs*)

Set/modify postfix (additional stats) with automatic formatting based on datatype.

Parameters

- **ordered_dict** (*dict* or *OrderedDict*, optional) --
- **refresh** (*bool*, optional) -- Forces refresh [default: *True*].
- **kwargs** (*dict*, optional) --

set_postfix_str(*s=""*, *refresh=True*)

Postfix without dictionary expansion, similar to prefix handling.

moveto(*n*)

display(*msg=None*, *pos=None*)

Use *self.sp* to display *msg* in the specified *pos*.

Consider overloading this function when inheriting to use e.g.: *self.some_frontend(**self.format_dict)* instead of *self.sp*.

Parameters

- **msg** (*str*, optional. What to display (default: *repr(self)*)). --
- **pos** (*int*, optional. Position to *moveto*) -- (default: *abs(self.pos)*).

classmethod wrapattr(*stream*, *method*, *total=None*, *bytes=True*, ***tqdm_kwargs*)

stream : file-like object. *method* : *str*, "read" or "write". The result of *read()* and

the first argument of *write()* should have a *len()*.

```
>>> with tqdm.wrapattr(file_obj, "read", total=file_obj.size) as fobj:
...     while True:
...         chunk = fobj.read(chunk_size)
...         if not chunk:
...             break
```

trange(*args, **kwargs)

A shortcut for `tqdm(xrange(*args), **kwargs)`. On Python3+ `range` is used instead of `xrange`.

__version__ = '4.61.1'

activate

Conda activate and deactivate logic.

Implementation for all shell interface logic exposed via `conda shell.*[activate|deactivate|reactivate|hook|commands]`. This includes a custom argument parser, an abstract shell class, and special path handling for Windows.

See `conda.cli.main.main_sourced` for the entry point into this module.

Classes

<code>_Activator</code>	
<code>PosixActivator</code>	
<code>CshActivator</code>	
<code>XonshActivator</code>	
<code>CmdExeActivator</code>	
<code>FishActivator</code>	
<code>PowerShellActivator</code>	
<code>JSONFormatMixin</code>	Returns the necessary values for activation as JSON, so that tools can use them.

Functions

<code>expand(path)</code>	
<code>ensure_binary(value)</code>	
<code>ensure_fs_path_encoding(value)</code>	
<code>native_path_to_unix(→ str tuple[str, ...] None)</code>	
<code>path_identity(→ str tuple[str, ...] None)</code>	
<code>backslash_to_forwardslash(→ str tuple[str, ...] None)</code>	
<code>_build_activator_cls(shell)</code>	Dynamically construct the activator class.

Attributes

activator_map

formatter_map

class `_Activator`(*arguments=None*)

```

    pathsep_join: str
    sep: str
    path_conversion: collections.abc.Callable[[str | Iterable[str] | None], str |
    tuple[str, ...] | None]
    script_extension: str
    tempfile_extension: str | None
    command_join: str
    unset_var_tmpl: str
    export_var_tmpl: str
    set_var_tmpl: str
    run_script_tmpl: str
    hook_source_path: str
    get_export_unset_vars(export_metavars=True, **kwargs)

```

Parameters

- **export_metavars** -- whether to export *conda_exe_vars* meta variables.
- **kwargs** -- environment variables to export. .. if you pass and set any other variable to None, then it emits it to the dict with a value of None.

Returns A dict of env vars to export ordered the same way as kwargs. And a list of env vars to unset.

```

add_export_unset_vars(export_vars, unset_vars, **kwargs)
get_scripts_export_unset_vars(**kwargs)
_finalize(commands, ext)
activate()
deactivate()
reactivate()
hook(auto_activate_base=None)
execute()
commands()

```

Returns a list of possible subcommands that are valid immediately following *conda* at the command line. This method is generally only used by tab-completion.

```
abstract _hook_preamble() → str | None
_hook_postamble() → str | None
_parse_and_set_args(arguments)
_yield_commands(cmds_dict)
build_activate(env_name_or_prefix)
build_stack(env_name_or_prefix)
_build_activate_stack(env_name_or_prefix, stack)
build_deactivate()
build_reactivate()
_get_starting_path_list()
_get_path_dirs(prefix, extra_library_bin=False)
_add_prefix_to_path(prefix, starting_path_dirs=None)
_remove_prefix_from_path(prefix, starting_path_dirs=None)
_replace_prefix_in_path(old_prefix, new_prefix, starting_path_dirs=None)
_update_prompt(set_vars, conda_prompt_modifier)
_default_env(prefix)
_prompt_modifier(prefix, conda_default_env)
_get_activate_scripts(prefix)
_get_deactivate_scripts(prefix)
_get_environment_env_vars(prefix)
expand(path)
ensure_binary(value)
ensure_fs_path_encoding(value)
native_path_to_unix(paths: str | Iterable[str] | None) → str | tuple[str, ...] | None
path_identity(paths: str | Iterable[str] | None) → str | tuple[str, ...] | None
backslash_to_forwardslash(paths: str | Iterable[str] | None) → str | tuple[str, ...] | None
class PosixActivator(arguments=None)
    Bases: _Activator
    pathsep_join
    sep = '/'
    path_conversion
    script_extension = '.sh'
    tempfile_extension
    command_join = '\n'
    unset_var_tmpl = 'unset %s'
    export_var_tmpl = "export %s='%s'"
```

```

    set_var_tmpl = "%s='%s'"
    run_script_tmpl = '. "%s"'
    hook_source_path
    _update_prompt(set_vars, conda_prompt_modifier)
    _hook_preamble() → str
class CshActivator(arguments=None)
    Bases: _Activator
    pathsep_join
    sep = '/'
    path_conversion
    script_extension = '.csh'
    tempfile_extension
    command_join = ';\n'
    unset_var_tmpl = 'unsetenv %s'
    export_var_tmpl = 'setenv %s "%s"'
    set_var_tmpl = "set %s='%s'"
    run_script_tmpl = 'source "%s"'
    hook_source_path
    _update_prompt(set_vars, conda_prompt_modifier)
    _hook_preamble() → str
class XonshActivator(arguments=None)
    Bases: _Activator
    pathsep_join
    sep = '/'
    path_conversion
    script_extension
    tempfile_extension
    command_join = '\n'
    unset_var_tmpl = 'del %s'
    export_var_tmpl = "$%s = '%s'"
    set_var_tmpl = "$%s = '%s'"
    run_script_tmpl
    hook_source_path
    _hook_preamble() → str
class CmdExeActivator(arguments=None)
    Bases: _Activator
    pathsep_join

```

```
sep = '\\'  
path_conversion  
script_extension = '.bat'  
tempfile_extension = '.bat'  
command_join = '\\n'  
unset_var_tmpl = '@SET %s='  
export_var_tmpl = '@SET "%s=%s"'  
set_var_tmpl = '@SET "%s=%s"'  
run_script_tmpl = '@CALL "%s"'  
hook_source_path  
_hook_preamble() → None  
class FishActivator(arguments=None)  
    Bases: _Activator  
    pathsep_join  
    sep = '/'  
    path_conversion  
    script_extension = '.fish'  
    tempfile_extension  
    command_join = ';\n'  
    unset_var_tmpl = 'set -e %s'  
    export_var_tmpl = 'set -gx %s "%s"'  
    set_var_tmpl = 'set -g %s "%s"'  
    run_script_tmpl = 'source "%s"'  
    hook_source_path  
    _hook_preamble() → str  
class PowerShellActivator(arguments=None)  
    Bases: _Activator  
    pathsep_join  
    sep  
    path_conversion  
    script_extension = '.ps1'  
    tempfile_extension  
    command_join = '\\n'  
    unset_var_tmpl = '$Env:%s = ""'  
    export_var_tmpl = '$Env:%s = "%s"'  
    set_var_tmpl = '$Env:%s = "%s"'  
    run_script_tmpl = '. "%s"'
```



```
hook_source_path
_hook_preamble() → str
_hook_postamble() → str
```

```
class JSONFormatMixin(arguments=None)
```

```
Bases: _Activator
```

Returns the necessary values for activation as JSON, so that tools can use them.

```
pathsep_join
tempfile_extension
command_join
_hook_preamble()
get_scripts_export_unset_vars(**kwargs)
_finalize(commands, ext)
_yield_commands(cmds_dict)
```

```
activator_map: dict[str, type[_Activator]]
```

```
formatter_map
```

```
_build_activator_cls(shell)
```

Dynamically construct the activator class.

Detect the base activator and any number of formatters (appended using '+' to the base name). For example, *posix+json* (as in *conda shell.posix+json activate*) would use the *PosixActivator* base class and add the *JSON-FormatMixin*.

api

Collection of conda's high-level APIs.

Classes

<i>Solver</i>	Beta While in beta, expect both major and minor changes across minor releases.
<i>SubdirData</i>	Beta While in beta, expect both major and minor changes across minor releases.
<i>PackageCacheData</i>	Beta While in beta, expect both major and minor changes across minor releases.
<i>PrefixData</i>	Beta While in beta, expect both major and minor changes across minor releases.

Attributes

DepsModifier

UpdateModifier

DepsModifier

UpdateModifier

class Solver(*prefix, channels, subdirs=(), specs_to_add=(), specs_to_remove=()*)

Beta While in beta, expect both major and minor changes across minor releases.

A high-level API to conda's solving logic. Three public methods are provided to access a solution in various forms.

- *solve_final_state()*
- *solve_for_diff()*
- *solve_for_transaction()*

solve_final_state(*update_modifier=NULL, deps_modifier=NULL, prune=NULL, ignore_pinned=NULL, force_remove=NULL*)

Beta While in beta, expect both major and minor changes across minor releases.

Gives the final, solved state of the environment.

Parameters

- **deps_modifier** (*DepsModifier*) -- An optional flag indicating special solver handling for dependencies. The default solver behavior is to be as conservative as possible with dependency updates (in the case the dependency already exists in the environment), while still ensuring all dependencies are satisfied. Options include * NO_DEPS * ONLY_DEPS * UPDATE_DEPS * UPDATE_DEPS_ONLY_DEPS * FREEZE_INSTALLED
- **prune** (*bool*) -- If *True*, the solution will not contain packages that were previously brought into the environment as dependencies but are no longer required as dependencies and are not user-requested.
- **ignore_pinned** (*bool*) -- If *True*, the solution will ignore pinned package configuration for the prefix.
- **force_remove** (*bool*) -- Forces removal of a package without removing packages that depend on it.

Returns In sorted dependency order from roots to leaves, the package references for the solved state of the environment.

Return type *tuple*[*PackageRef*]

solve_for_diff(*update_modifier=NULL, deps_modifier=NULL, prune=NULL, ignore_pinned=NULL, force_remove=NULL, force_reinstall=False*)

Beta While in beta, expect both major and minor changes across minor releases.

Gives the package references to remove from an environment, followed by the package references to add to an environment.

Parameters

- **deps_modifier** (*DepsModifier*) -- See *solve_final_state()*.
- **prune** (*bool*) -- See *solve_final_state()*.
- **ignore_pinned** (*bool*) -- See *solve_final_state()*.
- **force_remove** (*bool*) -- See *solve_final_state()*.
- **force_reinstall** (*bool*) -- For requested specs_to_add that are already satisfied in the environment, instructs the solver to remove the package and spec from the environment, and then add it back--possibly with the exact package instance modified, depending on the spec exactness.

Returns A two-tuple of PackageRef sequences. The first is the group of packages to remove from the environment, in sorted dependency order from leaves to roots. The second is the group of packages to add to the environment, in sorted dependency order from roots to leaves.

Return type *tuple*[PackageRef], *tuple*[PackageRef]

solve_for_transaction(*update_modifier=NULL, deps_modifier=NULL, prune=NULL, ignore_pinned=NULL, force_remove=NULL, force_reinstall=False*)

Beta While in beta, expect both major and minor changes across minor releases.

Gives an UnlinkLinkTransaction instance that can be used to execute the solution on an environment.

Parameters

- **deps_modifier** (*DepsModifier*) -- See *solve_final_state()*.
- **prune** (*bool*) -- See *solve_final_state()*.
- **ignore_pinned** (*bool*) -- See *solve_final_state()*.
- **force_remove** (*bool*) -- See *solve_final_state()*.
- **force_reinstall** (*bool*) -- See *solve_for_diff()*.

Returns

Return type *UnlinkLinkTransaction*

class SubdirData(*channel*)

Beta While in beta, expect both major and minor changes across minor releases.

High-level management and usage of repodata.json for subdirs.

query(*package_ref_or_match_spec*)

Beta While in beta, expect both major and minor changes across minor releases.

Run a query against this specific instance of repodata.

Parameters **package_ref_or_match_spec** (*PackageRef* or *MatchSpec* or *str*) -- Either an exact PackageRef to match against, or a MatchSpec query object. A *str* will be turned into a MatchSpec automatically.

Returns *tuple*[PackageRecord]

static query_all(*package_ref_or_match_spec, channels=None, subdirs=None*)

Beta While in beta, expect both major and minor changes across minor releases.

Run a query against all repodata instances in channel/subdir matrix.

Parameters

- **package_ref_or_match_spec** (*PackageRef* or *MatchSpec* or *str*) -- Either an exact *PackageRef* to match against, or a *MatchSpec* query object. A *str* will be turned into a *MatchSpec* automatically.
- **channels** (*Iterable[Channel]* or *str* or *None*) -- An iterable of urls for channels or *Channel* objects. If *None*, will fall back to *context.channels*.
- **subdirs** (*Iterable[str]* or *None*) -- If *None*, will fall back to *context.subdirs*.

Returns tuple[*PackageRecord*]

iter_records()

Beta While in beta, expect both major and minor changes across minor releases.

Returns

A generator over all records contained in the *repodata.json* instance. Warning: this is a generator that is exhausted on first use.

Return type *Iterable[PackageRecord]*

reload()

Beta While in beta, expect both major and minor changes across minor releases.

Update the instance with new information. Backing information (i.e. *repodata.json*) is lazily downloaded/loaded on first use by the other methods of this class. You should only use this method if you are *sure* you have outdated data.

Returns *SubdirData*

class PackageCacheData(pkgs_dir)

Beta While in beta, expect both major and minor changes across minor releases.

High-level management and usage of package caches.

property is_writable

Beta While in beta, expect both major and minor changes across minor releases.

Indicates if the package cache location is writable or read-only.

Returns bool

get(package_ref, default=NULL)

Beta While in beta, expect both major and minor changes across minor releases.

Parameters

- **package_ref** (*PackageRef*) -- A *PackageRef* instance representing the key for the *PackageCacheRecord* being sought.
- **default** -- The default value to return if the record does not exist. If not specified and no record exists, *KeyError* is raised.

Returns *PackageCacheRecord*

query(package_ref_or_match_spec)

Beta While in beta, expect both major and minor changes across minor releases.

Run a query against this specific package cache instance.

Parameters **package_ref_or_match_spec** (*PackageRef* or *MatchSpec* or *str*) -- Either an exact *PackageRef* to match against, or a *MatchSpec* query object. A *str* will be turned into a *MatchSpec* automatically.

Returns tuple[*PackageCacheRecord*]

static query_all(*package_ref_or_match_spec*, *pkgs_dirs=None*)

Beta While in beta, expect both major and minor changes across minor releases.

Run a query against all package caches.

Parameters

- **package_ref_or_match_spec** (*PackageRef* or *MatchSpec* or *str*) -- Either an exact *PackageRef* to match against, or a *MatchSpec* query object. A *str* will be turned into a *MatchSpec* automatically.
- **pkgs_dirs** (*Iterable[str]* or *None*) -- If *None*, will fall back to *context.pkgs_dirs*.

Returns tuple[*PackageCacheRecord*]

iter_records()

Beta While in beta, expect both major and minor changes across minor releases.

Returns

A generator over all records contained in the package cache instance. Warning: this is a generator that is exhausted on first use.

Return type *Iterable[PackageCacheRecord]*

static first_writable(*pkgs_dirs=None*)

Beta While in beta, expect both major and minor changes across minor releases.

Get an instance object for the first writable package cache.

Parameters **pkgs_dirs** (*Iterable[str]*) -- If *None*, will fall back to *context.pkgs_dirs*.

Returns An instance for the first writable package cache.

Return type *PackageCacheData*

reload()

Beta While in beta, expect both major and minor changes across minor releases.

Update the instance with new information. Backing information (i.e. contents of the *pkgs_dir*) is lazily loaded on first use by the other methods of this class. You should only use this method if you are *sure* you have outdated data.

Returns *PackageCacheData*

class PrefixData(*prefix_path*)

Beta While in beta, expect both major and minor changes across minor releases.

High-level management and usage of conda environment prefixes.

property is_writable

Beta While in beta, expect both major and minor changes across minor releases.

Indicates if the prefix is writable or read-only.

Returns True if the prefix is writable. False if read-only. None if the prefix does not exist as a conda environment.

Return type *bool* or *None*

get(*package_ref*, *default=NULL*)

Beta While in beta, expect both major and minor changes across minor releases.

Parameters

- **package_ref** (*PackageRef*) -- A *PackageRef* instance representing the key for the *PrefixRecord* being sought.

- **default** -- The default value to return if the record does not exist. If not specified and no record exists, `KeyError` is raised.

Returns PrefixRecord

query(*package_ref_or_match_spec*)

Beta While in beta, expect both major and minor changes across minor releases.

Run a query against this specific prefix instance.

Parameters **package_ref_or_match_spec** (*PackageRef* or *MatchSpec* or *str*) -- Either an exact *PackageRef* to match against, or a *MatchSpec* query object. A *str* will be turned into a *MatchSpec* automatically.

Returns tuple[PrefixRecord]

iter_records()

Beta While in beta, expect both major and minor changes across minor releases.

Returns

A generator over all records contained in the prefix. Warning: this is a generator that is exhausted on first use.

Return type Iterable[*PrefixRecord*]

reload()

Beta While in beta, expect both major and minor changes across minor releases.

Update the instance with new information. Backing information (i.e. contents of the conda-meta directory) is lazily loaded on first use by the other methods of this class. You should only use this method if you are *sure* you have outdated data.

Returns PrefixData

auxlib

Auxlib is an auxiliary library to the python standard library.

The aim is to provide core generic features for app development in python. Auxlib fills in some python stdlib gaps much like *pytoolz* has for functional programming, *pyrsistent* has for data structures, or *boltons* has generally.

Major areas addressed include:

- packaging: package versioning, with a clean and less invasive alternative to versioneer
- entity: robust base class for type-enforced data models and transfer objects
- type_coercion: intelligent type coercion utilities
- *Configuration*: a map implementation designed specifically to hold application configuration and context information
- factory: factory pattern implementation
- path: file path utilities especially helpful when working with various python package formats
- logz: logging initialization routines to simplify python logging setup
- crypt: simple, but correct, pycrypto wrapper

[2021-11-09] Our version of auxlib has deviated from the upstream project by a significant amount (especially compared with the other vendored packages). Further, the upstream project has low popularity and is no longer actively maintained. Consequently it was decided to absorb, refactor, and replace auxlib. As a first step of this process we moved `conda._vendor.auxlib` to `conda.auxlib`.

collection

Common collection classes.

Classes

<code>AttrDict</code>	Sub-classes dict, and further allows attribute-like access to dictionary items.
-----------------------	---

Functions

<code>make_immutable(value)</code>	
<code>first(seq[, key, default, apply])</code>	Give the first value that satisfies the key test.
<code>firstitem(map[, key, default, apply])</code>	
<code>last(seq[, key, default, apply])</code>	
<code>call_each(seq)</code>	Calls each element of sequence to invoke the side effect.

make_immutable(*value*)

class `AttrDict(*args, **kwargs)`

Bases: `dict`

Sub-classes dict, and further allows attribute-like access to dictionary items.

Examples

```
>>> d = AttrDict({'a': 1})
>>> d.a, d['a'], d.get('a')
(1, 1, 1)
>>> d.b = 2
>>> d.b, d['b']
(2, 2)
```

first(*seq*, *key=bool*, *default=None*, *apply=lambda x: ...*)

Give the first value that satisfies the key test.

Parameters

- **seq** (*iterable*) --
- **key** (*callable*) -- test for each element of iterable
- **default** -- returned when all elements fail test
- **apply** (*callable*) -- applied to element before return, but not to default value

Returns: first element in seq that passes key, mutated with optional apply

Examples

```
>>> first([0, False, None, [], (), 42])
42
>>> first([0, False, None, [], ()]) is None
True
>>> first([0, False, None, [], ()], default='ohai')
'ohai'
>>> import re
>>> m = first(re.match(regex, 'abc') for regex in ['b.*', 'a(.*)'])
>>> m.group(1)
'bc'
```

The optional *key* argument specifies a one-argument predicate function like that used for *filter()*. The *key* argument, if supplied, must be in keyword form. For example: `>>> first([1, 1, 3, 4, 5], key=lambda x: x % 2 == 0)`

4

firstitem(*map*, *key*=*lambda k, v: ..., default=None, apply*=*lambda k, v: ...*)

last(*seq*, *key*=*bool, default=None, apply*=*lambda x: ...*)

call_each(*seq*)

Calls each element of sequence to invoke the side effect.

Parameters *seq* --

Returns: None

compat

Functions

isiterable(*obj*)

shlex_split_unicode(*to_split*[, *posix*])

utf8_writer(*fp*)

Utf8NamedTemporaryFile(*[mode, buffering, new-line, ...]*)

Attributes

NoneType

primitive_types

NoneType

primitive_types = ()

isiterable(*obj*)

`shlex_split_unicode(to_split, posix=True)`

`utf8_writer(fp)`

`Utf8NamedTemporaryFile(mode='w+b', buffering=-1, newline=None, suffix=None, prefix=None, dir=None, delete=True)`

decorators

Classes

classproperty

Functions

<i>memoize</i> (func)	Decorator to cause a function to cache it's results for each combination of
<i>memoizemethod</i> (method)	Decorator to cause a method to cache it's results in self for each
<i>clear_memoized_methods</i> (obj, *method_names)	Clear the memoized method or @memoizedproperty results for the given
<i>memoizedproperty</i> (func)	Decorator to cause a method to cache it's results in self for each

memoize(func)

Decorator to cause a function to cache it's results for each combination of inputs and return the cached result on subsequent calls. Does not support named arguments or arg values that are not hashable.

```
>>> @memoize
... def foo(x):
...     print('running function with', x)
...     return x+3
...
>>> foo(10)
running function with 10
13
>>> foo(10)
13
>>> foo(11)
running function with 11
14
>>> @memoize
... def range_tuple(limit):
...     print('running function')
...     return tuple(i for i in range(limit))
...
>>> range_tuple(3)
running function
(0, 1, 2)
```

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```

>>> range_tuple(3)
(0, 1, 2)
>>> @memoize
... def range_iter(limit):
...     print('running function')
...     return (i for i in range(limit))
...
>>> range_iter(3)
Traceback (most recent call last):
TypeError: Can't memoize a generator or non-hashable object!

```

memoizemethod(*method*)

Decorator to cause a method to cache its results in self for each combination of inputs and return the cached result on subsequent calls. Does not support named arguments or arg values that are not hashable.

```

>>> class Foo (object):
...     @memoizemethod
...     def foo(self, x, y=0):
...         print('running method with', x, y)
...         return x + y + 3
...
>>> foo1 = Foo()
>>> foo2 = Foo()
>>> foo1.foo(10)
running method with 10 0
13
>>> foo1.foo(10)
13
>>> foo2.foo(11, y=7)
running method with 11 7
21
>>> foo2.foo(11)
running method with 11 0
14
>>> foo2.foo(11, y=7)
21
>>> class Foo (object):
...     def __init__(self, lower):
...         self.lower = lower
...     @memoizemethod
...     def range_tuple(self, upper):
...         print('running function')
...         return tuple(i for i in range(self.lower, upper))
...     @memoizemethod
...     def range_iter(self, upper):
...         print('running function')
...         return (i for i in range(self.lower, upper))
...
>>> foo = Foo(3)
>>> foo.range_tuple(6)
running function
(3, 4, 5)

```

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```

>>> foo.range_tuple(7)
running function
(3, 4, 5, 6)
>>> foo.range_tuple(6)
(3, 4, 5)
>>> foo.range_iter(6)
Traceback (most recent call last):
TypeError: Can't memoize a generator or non-hashable object!

```

clear_memoized_methods(obj, *method_names)

Clear the memoized method or @memoizedproperty results for the given method names from the given object.

```

>>> v = [0]
>>> def inc():
...     v[0] += 1
...     return v[0]
...
>>> class Foo(object):
...     @memoizemethod
...     def foo(self):
...         return inc()
...     @memoizedproperty
...     def g(self):
...         return inc()
...
>>> f = Foo()
>>> f.foo(), f.foo()
(1, 1)
>>> clear_memoized_methods(f, 'foo')
>>> (f.foo(), f.foo(), f.g, f.g)
(2, 2, 3, 3)
>>> (f.foo(), f.foo(), f.g, f.g)
(2, 2, 3, 3)
>>> clear_memoized_methods(f, 'g', 'no_problem_if_undefined')
>>> f.g, f.foo(), f.g
(4, 2, 4)
>>> f.foo()
2

```

memoizedproperty(func)

Decorator to cause a method to cache its results in self for each combination of inputs and return the cached result on subsequent calls. Does not support named arguments or arg values that are not hashable.

```

>>> class Foo(object):
...     _x = 1
...     @memoizedproperty
...     def foo(self):
...         self._x += 1
...         print('updating and returning {}'.format(self._x))
...         return self._x
...
>>> foo1 = Foo()

```

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```

>>> foo2 = Foo()
>>> foo1.foo
updating and returning 2
2
>>> foo1.foo
2
>>> foo2.foo
updating and returning 2
2
>>> foo1.foo
2

```

```
class classproperty(getter=None, setter=None)
```

```
    __get__(obj, type_=None)
```

```
    __set__(obj, value)
```

```
    setter(setter)
```

entity

This module provides serializable, validatable, type-enforcing domain objects and data transfer objects. It has many of the same motivations as the python [Marshmallow](#) package. It is most similar to [Schematics](#).

Tutorial

Chapter 1: Entity and Field Basics

```

>>> class Color(Enum):
...     blue = 0
...     black = 1
...     red = 2
>>> class Car(Entity):
...     weight = NumberField(required=False)
...     wheels = IntField(default=4, validation=lambda x: 3 <= x <= 4)
...     color = EnumField(Color)

```

```

>>> # create a new car object
>>> car = Car(color=Color.blue, weight=4242.46)
>>> car
Car(weight=4242.46, color=0)

```

```

>>> # it has 4 wheels, all by default
>>> car.wheels
4

```

```

>>> # but a car can't have 5 wheels!
>>> # the `validation=` field is a simple callable that returns a

```

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```
>>> # boolean based on validity
>>> car.wheels = 5
Traceback (most recent call last):
ValidationError: Invalid value 5 for wheels
```

```
>>> # we can call .dump() on car, and just get back a standard
>>> # python dict actually, it's an ordereddict to match attribute
>>> # declaration order
>>> type(car.dump())
<class '...OrderedDict'>
>>> car.dump()
OrderedDict([('weight', 4242.46), ('wheels', 4), ('color', 0)])
```

```
>>> # and json too (note the order!)
>>> car.json()
'{"weight": 4242.46, "wheels": 4, "color": 0}'
```

```
>>> # green cars aren't allowed
>>> car.color = "green"
Traceback (most recent call last):
ValidationError: 'green' is not a valid Color
```

```
>>> # but black cars are!
>>> car.color = "black"
>>> car.color
<Color.black: 1>
```

```
>>> # car.color really is an enum, promise
>>> type(car.color)
<enum 'Color'>
```

```
>>> # enum assignment can be with any of (and preferentially)
>>> # (1) an enum literal,
>>> # (2) a valid enum value, or
>>> # (3) a valid enum name
>>> car.color = Color.blue; car.color.value
0
>>> car.color = 1; car.color.name
'black'
```

```
>>> # let's do a round-trip marshalling of this thing
>>> same_car = Car.from_json(car.json()) # or equally Car.from_json(json.dumps(car.
↳ dump()))
>>> same_car == car
True
```

```
>>> # actually, they're two different instances
>>> same_car is not car
True
```

```
>>> # this works too
>>> cloned_car = Car(**car.dump())
>>> cloned_car == car
True
```

```
>>> # while we're at it, these are all equivalent too
>>> car == Car.from_objects(car)
True
>>> car == Car.from_objects({"weight": 4242.46, "wheels": 4, "color": 1})
True
>>> car == Car.from_json('{"weight": 4242.46, "color": 1}')
True
```

```
>>> # .from_objects() even lets you stack and combine objects
>>> class DumbClass:
...     color = 0
...     wheels = 3
>>> Car.from_objects(DumbClass(), dict(weight=2222, color=1))
Car(weight=2222, wheels=3, color=0)
>>> # and also pass kwargs that override properties pulled
>>> # off any objects
>>> Car.from_objects(DumbClass(), {'weight': 2222, 'color': 1}, color=2, weight=33)
Car(weight=33, wheels=3, color=2)
```

Chapter 2: Entity and Field Composition

```
>>> # now let's get fancy
>>> # a ComposableField "nests" another valid Entity
>>> # a ListField's first argument is a "generic" type,
>>> #   which can be a valid Entity, any python primitive
>>> #   type, or a list of Entities/types
>>> class Fleet(Entity):
...     boss_car = ComposableField(Car)
...     cars = ListField(Car)
```

```
>>> # here's our fleet of company cars
>>> company_fleet = Fleet(boss_car=Car(color='red'), cars=[car, same_car, cloned_car])
>>> company_fleet.pretty_json()
{
  "boss_car": {
    "wheels": 4
    "color": 2,
  },
  "cars": [
    {
      "weight": 4242.46,
      "wheels": 4
      "color": 1,
    },
    {
```

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```

    "weight": 4242.46,
    "wheels": 4
    "color": 1,
  },
  {
    "weight": 4242.46,
    "wheels": 4
    "color": 1,
  }
]
}

```

```

>>> # the boss' car is red of course (and it's still an Enum)
>>> company_fleet.boss_car.color.name
'red'

```

```

>>> # and there are three cars left for the employees
>>> len(company_fleet.cars)
3

```

Chapter 3: Immutability

```

>>> class ImmutableCar(ImmutableEntity):
...     wheels = IntField(default=4, validation=lambda x: 3 <= x <= 4)
...     color = EnumField(Color)
>>> icar = ImmutableCar.from_objects({'wheels': 3, 'color': 'blue'})
>>> icar
ImmutableCar(wheels=3, color=0)

```

```

>>> icar.wheels = 4
Traceback (most recent call last):
AttributeError: Assignment not allowed. ImmutableCar is immutable.

```

```

>>> class FixedWheelCar(Entity):
...     wheels = IntField(default=4, immutable=True)
...     color = EnumField(Color)
>>> fwcar = FixedWheelCar.from_objects(icar)
>>> fwcar.json()
'{"wheels": 3, "color": 0}'

```

```

>>> # repainting the car is easy
>>> fwcar.color = Color.red
>>> fwcar.color.name
'red'

```

```

>>> # can't really change the number of wheels though
>>> fwcar.wheels = 18
Traceback (most recent call last):
AttributeError: The wheels field is immutable.

```

Chapter X: The del and null Weeds

```
>>> old_date = lambda: isoparse('1982-02-17')
>>> class CarBattery(Entity):
...     # NOTE: default value can be a callable!
...     first_charge = DateField(required=False) # default=None, nullable=False
...     latest_charge = DateField(default=old_date, nullable=True) # required=True
...     expiration = DateField(default=old_date, required=False, nullable=False)
```

```
>>> # starting point
>>> battery = CarBattery()
>>> battery
CarBattery()
>>> battery.json()
'{"latest_charge": "1982-02-17T00:00:00", "expiration": "1982-02-17T00:00:00"}'
```

```
>>> # first_charge is not assigned a default value. Once one is assigned, it can be_
↳ deleted,
>>> # but it can't be made null.
>>> battery.first_charge = isoparse('2016-03-23')
>>> battery
CarBattery(first_charge=datetime.datetime(2016, 3, 23, 0, 0))
>>> battery.first_charge = None
Traceback (most recent call last):
ValidationError: Value for first_charge not given or invalid.
>>> del battery.first_charge
>>> battery
CarBattery()
```

```
>>> # latest_charge can be null, but it can't be deleted. The default value is a callable.
>>> del battery.latest_charge
Traceback (most recent call last):
AttributeError: The latest_charge field is required and cannot be deleted.
>>> battery.latest_charge = None
>>> battery.json()
'{"latest_charge": null, "expiration": "1982-02-17T00:00:00"}'
```

```
>>> # expiration is assigned by default, can't be made null, but can be deleted.
>>> battery.expiration
datetime.datetime(1982, 2, 17, 0, 0)
>>> battery.expiration = None
Traceback (most recent call last):
ValidationError: Value for expiration not given or invalid.
>>> del battery.expiration
>>> battery.json()
'{"latest_charge": null}'
```


Classes

<i>Field</i>	Fields are doing something very similar to boxing and unboxing
<i>BooleanField</i>	Fields are doing something very similar to boxing and unboxing
<i>IntegerField</i>	Fields are doing something very similar to boxing and unboxing
<i>NumberField</i>	Fields are doing something very similar to boxing and unboxing
<i>StringField</i>	Fields are doing something very similar to boxing and unboxing
<i>DateField</i>	Fields are doing something very similar to boxing and unboxing
<i>EnumField</i>	Fields are doing something very similar to boxing and unboxing
<i>ListField</i>	Fields are doing something very similar to boxing and unboxing
<i>MapField</i>	Fields are doing something very similar to boxing and unboxing
<i>ComposableField</i>	Fields are doing something very similar to boxing and unboxing
<i>Entity</i>	
<i>ImmutableEntity</i>	

Attributes

<i>BoolField</i>
<i>IntField</i>

class Field(*default=NULL, required=True, validation=None, in_dump=True, default_in_dump=True, nullable=False, immutable=False, aliases=()*)

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, dump in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --
- **dump** (*boolean, optional*) --

```
property name
property required
property type
property default
property in_dump
property default_in_dump
property nullable
property is_nullable
property immutable
_order_helper = 0
set_name(name)
__get__(instance, instance_type)
__set__(instance, val)
__delete__(instance)
box(instance, instance_type, val)
unbox(instance, instance_type, val)
dump(instance, instance_type, val)
validate(instance, val)
```

Returns if val is valid

Return type True

Raises *ValidationError* --

```
class BooleanField(default=NULL, required=True, validation=None, in_dump=True, default_in_dump=True,
                  nullable=False, immutable=False, aliases=())
```

Bases: *Field*

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, `dump` in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --
- **dump** (*boolean, optional*) --

_type

```
box(instance, instance_type, val)
```

BoolField

```
class IntegerField(default=NULL, required=True, validation=None, in_dump=True, default_in_dump=True,
                    nullable=False, immutable=False, aliases=())
```

Bases: *Field*

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, dump in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --
- **dump** (*boolean, optional*) --

`_type`

IntegerField

```
class NumberField(default=NULL, required=True, validation=None, in_dump=True, default_in_dump=True,
                    nullable=False, immutable=False, aliases=())
```

Bases: *Field*

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, dump in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --
- **dump** (*boolean, optional*) --

`_type = ()`

```
class StringField(default=NULL, required=True, validation=None, in_dump=True, default_in_dump=True,
                    nullable=False, immutable=False, aliases=())
```

Bases: *Field*

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, dump in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --

- **dump** (boolean, optional) --

_type

box(instance, instance_type, val)

class DateField(default=NULL, required=True, validation=None, in_dump=True, default_in_dump=True, nullable=False, immutable=False, aliases=())

Bases: [Field](#)

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, `dump` in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (primitive literal or [type](#) or sequence of types) --
- **default** (any, callable, optional) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (boolean, optional) --
- **validation** (callable, optional) --
- **dump** (boolean, optional) --

_type

box(instance, instance_type, val)

dump(instance, instance_type, val)

class EnumField(enum_class, default=NULL, required=True, validation=None, in_dump=True, default_in_dump=True, nullable=False, immutable=False, aliases=())

Bases: [Field](#)

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, `dump` in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (primitive literal or [type](#) or sequence of types) --
- **default** (any, callable, optional) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (boolean, optional) --
- **validation** (callable, optional) --
- **dump** (boolean, optional) --

box(instance, instance_type, val)

dump(instance, instance_type, val)

class ListField(element_type, default=NULL, required=True, validation=None, in_dump=True, default_in_dump=True, nullable=False, immutable=False, aliases=())

Bases: [Field](#)

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, `dump` in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --
- **dump** (*boolean, optional*) --

_type

box(*instance, instance_type, val*)

unbox(*instance, instance_type, val*)

dump(*instance, instance_type, val*)

validate(*instance, val*)

Returns if val is valid

Return type True

Raises *ValidationError* --

class MapField(*default=NULL, required=True, validation=None, in_dump=True, default_in_dump=True, nullable=False, immutable=True, aliases=()*)

Bases: *Field*

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, `dump` in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --
- **dump** (*boolean, optional*) --

_type

box(*instance, instance_type, val*)

class ComposableField(*field_class, default=NULL, required=True, validation=None, in_dump=True, default_in_dump=True, nullable=False, immutable=False, aliases=()*)

Bases: *Field*

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, `dump` in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.

- **required**(*boolean, optional*) --
- **validation**(*callable, optional*) --
- **dump**(*boolean, optional*) --

box(*instance, instance_type, val*)

dump(*instance, instance_type, val*)

```
class Entity(**kwargs)

    property _initd
    __fields__
    _lazy_validate = False
    classmethod from_objects(*objects, **override_fields)
    classmethod from_json(json_str)
    classmethod load(data_dict)
    validate()
    __repr__()
        Return repr(self).
    classmethod __register__()
    json(indent=None, separators=None, **kwargs)
    pretty_json(indent=2, separators=(',', ': '), **kwargs)
    dump()
    classmethod __dump_fields()
    __eq__(other)
        Return self==value.
    __hash__()
        Return hash(self).

class ImmutableEntity(**kwargs)
    Bases: Entity
    __setattr__(attribute, value)
        Implement setattr(self, name, value).
    __delattr__(item)
        Implement delattr(self, name).
```

exceptions

Classes

<i>AuxlibError</i>	Mixin to identify exceptions associated with the auxlib package.
--------------------	--

Functions

Raise(exception)

Raise(*exception*)

class AuxlibError

Mixin to identify exceptions associated with the auxlib package.

exception AuthenticationError

Bases: *AuxlibError*, *ValueError*

Mixin to identify exceptions associated with the auxlib package.

exception NotFoundError

Bases: *AuxlibError*, *KeyError*

Mixin to identify exceptions associated with the auxlib package.

exception InitializationError

Bases: *AuxlibError*, *OSError*

Mixin to identify exceptions associated with the auxlib package.

exception SenderError

Bases: *AuxlibError*, *OSError*

Mixin to identify exceptions associated with the auxlib package.

exception AssignmentError

Bases: *AuxlibError*, *AttributeError*

Mixin to identify exceptions associated with the auxlib package.

exception ValidationError(*key*, *value=None*, *valid_types=None*, *msg=None*)

Bases: *AuxlibError*, *TypeError*

Mixin to identify exceptions associated with the auxlib package.

exception ThisShouldNeverHappenError

Bases: *AuxlibError*, *AttributeError*

Mixin to identify exceptions associated with the auxlib package.

ish

Functions

<code>dals(string)</code>	dedent and left-strip		
<code>_get_attr(obj, attr_name[, aliases])</code>			
<code>find_or_none(key, _map_index)</code>	<code>search_maps[, aliases,</code>	Return the value of the first key found in the list of search_maps,	
<code>find_or_raise(key, _map_index)</code>	<code>search_maps[, aliases,</code>		

dals(*string*)
dedent and left-strip

_get_attr(*obj, attr_name, aliases=()*)

find_or_none(*key, search_maps, aliases=(), _map_index=0*)
Return the value of the first key found in the list of search_maps, otherwise return None.

Examples

```
>>> from .collection import AttrDict
>>> d1 = AttrDict({'a': 1, 'b': 2, 'c': 3, 'e': None})
>>> d2 = AttrDict({'b': 5, 'e': 6, 'f': 7})
>>> find_or_none('c', (d1, d2))
3
>>> find_or_none('f', (d1, d2))
7
>>> find_or_none('b', (d1, d2))
2
>>> print(find_or_none('g', (d1, d2)))
None
>>> find_or_none('e', (d1, d2))
6
```

find_or_raise(*key, search_maps, aliases=(), _map_index=0*)

logz

Classes

<code>DumpEncoder</code>	Extensible JSON < https://json.org > encoder for Python data structures.
--------------------------	---

Functions

`set_root_level([level])`

`attach_stderr([level])`

`detach_stderr()`

`initialize_logging([level])`

`jsondumps(obj)`

`fullname(obj)`

`request_header_sort_key(item)`

`response_header_sort_key(item)`

`stringify(obj[, content_max_len])`

Attributes

`root_log`

`NullHandler`

`DEBUG_FORMATTER`

`INFO_FORMATTER`

`_DUMPS`

`request_header_sort_dict`

`response_header_sort_dict`

`root_log`
`NullHandler`
`DEBUG_FORMATTER`
`INFO_FORMATTER`
`set_root_level(level=INFO)`
`attach_stderr(level=INFO)`

`detach_stderr()`

`initialize_logging(level=INFO)`

`class DumpEncoder(*, skipkeys=False, ensure_ascii=True, check_circular=True, allow_nan=True, sort_keys=False, indent=None, separators=None, default=None)`

Bases: `json.JSONEncoder`

Extensible JSON <<https://json.org>> encoder for Python data structures.

Supports the following objects and types by default:

Python	JSON
dict	object
list, tuple	array
str	string
int, float	number
True	true
False	false
None	null

To extend this to recognize other objects, subclass and implement a `.default()` method with another method that returns a serializable object for `o` if possible, otherwise it should call the superclass implementation (to raise `TypeError`).

`default(obj)`

Implement this method in a subclass such that it returns a serializable object for `o`, or calls the base implementation (to raise a `TypeError`).

For example, to support arbitrary iterators, you could implement `default` like this:

```
def default(self, o):
    try:
        iterable = iter(o)
    except TypeError:
        pass
    else:
        return list(iterable)
    # Let the base class default method raise the TypeError
    return JSONEncoder.default(self, o)
```

`_DUMPS`

`jsondumps(obj)`

`fullname(obj)`

`request_header_sort_dict`

`request_header_sort_key(item)`

`response_header_sort_dict`

`response_header_sort_key(item)`

`stringify(obj, content_max_len=0)`

packaging

Method #1: `auxlib.packaging` as a run time dependency

Place the following lines in your package's main `__init__.py`

Method #2: `auxlib.packaging` as a build time-only dependency

Place the following lines in your package's main `__init__.py`

Method #3: write `.version` file

Configuring `python setup.py test` for Tox

must use `setuptools` (`distutils` doesn't have a test cmd)

Classes

<code>BuildPyCommand</code>	Enhanced 'build_py' command that includes data files with packages
<code>SDistCommand</code>	Smart sdist that finds anything supported by revision control

Functions

<code>call(command[, path, raise_on_error])</code>	
<code>_get_version_from_version_file(path)</code>	
<code>_git_describe_tags(path)</code>	
<code>_get_version_from_git_tag(tag)</code>	Return a PEP440-compliant version derived from the git status.
<code>_get_version_from_git_clone(path)</code>	
<code>get_version(dunder_file)</code>	Returns a version string for the current package, derived
<code>write_version_into_init(target_dir, version)</code>	
<code>write_version_file(target_dir, version)</code>	
<code>convert_path(pathname)</code>	Return 'pathname' as a name that will work on the native filesystem,
<code>find_packages([where, exclude])</code>	

Attributes

Response

GIT_DESCRIBE_REGEX

target_dir

Response

GIT_DESCRIBE_REGEX

call(*command*, *path=None*, *raise_on_error=True*)

_get_version_from_version_file(*path*)

_git_describe_tags(*path*)

_get_version_from_git_tag(*tag*)

Return a PEP440-compliant version derived from the git status. If that fails for any reason, return the changeset hash.

_get_version_from_git_clone(*path*)

get_version(*dunder_file*)

Returns a version string for the current package, derived either from git or from a .version file.

This function is expected to run in two contexts. In a development context, where .git/ exists, the version is pulled from git tags. Using the BuildPyCommand and SDistCommand classes for cmdclass in setup.py will write a .version file into any dist.

In an installed context, the .version file written at dist build time is the source of version information.

write_version_into_init(*target_dir*, *version*)

write_version_file(*target_dir*, *version*)

class BuildPyCommand(*dist*)

Bases: `setuptools.command.build_py.build_py`

Enhanced 'build_py' command that includes data files with packages

The data files are specified via a 'package_data' argument to 'setup()'. See 'setuptools.dist.Distribution' for more details.

Also, this version of the 'build_py' command allows you to specify both 'py_modules' and 'packages' in the same setup operation.

run()

Build modules, packages, and copy data files to build directory

class SDistCommand(*dist*)

Bases: `setuptools.command.sdist.sdist`

Smart sdist that finds anything supported by revision control

make_release_tree(*base_dir*, *files*)

Create the directory tree that will become the source distribution archive. All directories implied by the filenames in 'files' are created under 'base_dir', and then we hard link or copy (if hard linking is unavailable) those files into place. Essentially, this duplicates the developer's source tree, but in a directory named after the distribution, containing only the files to be distributed.

convert_path(*pathname*)

Return 'pathname' as a name that will work on the native filesystem, i.e. split it on '/' and put it back together again using the current directory separator. Needed because filenames in the setup script are always supplied in Unix style, and have to be converted to the local convention before we can actually use them in the filesystem. Raises ValueError on non-Unix-ish systems if 'pathname' either starts or ends with a slash.

Copied from `setuptools._distutils.util`: https://github.com/pypa/setuptools/blob/b545fc778583f644d6c331773dbe0ea53bfa41af/setuptools/_distutils/util.py#L125-L148

find_packages(*where='.'*, *exclude=()*)**target_dir****type_coercion**

Collection of functions to coerce conversion of types with an intelligent guess.

Functions

numberify(*value*)
Examples*boolify*(*value*[, *nullable*, *return_string*])

Convert a number, string, or sequence type into a pure boolean.

typify(*value*[, *type_hint*])

Take a primitive value, usually a string, and try to make a more relevant type out of it.

maybecall(*value*)*listify*(*val*[, *return_type*])**Examples**

numberify(*value*)

Examples

```
>>> [numberify(x) for x in ('1234', 1234, '0755', 0o0755, False, 0, '0', True, 1, '1
↳')]
[1234, 1234, 755, 493, 0, 0, 0, 1, 1, 1]
>>> [numberify(x) for x in ('12.34', 12.34, 1.2+3.5j, '1.2+3.5j')]
[12.34, 12.34, (1.2+3.5j), (1.2+3.5j)]
```

boolify(value, nullable=False, return_string=False)

Convert a number, string, or sequence type into a pure boolean.

Parameters **value** (*number, string, sequence*) -- pretty much anything

Returns boolean representation of the given value

Return type bool

Examples

```
>>> [boolify(x) for x in ('yes', 'no')]
[True, False]
>>> [boolify(x) for x in (0.1, 0+0j, True, '0', '0.0', '0.1', '2')]
[True, False, True, False, False, True, True]
>>> [boolify(x) for x in ("true", "yes", "on", "y")]
[True, True, True, True]
>>> [boolify(x) for x in ("no", "non", "none", "off", "")]
[False, False, False, False, False]
>>> [boolify(x) for x in ([], set(), dict(), tuple())]
[False, False, False, False]
>>> [boolify(x) for x in ([1], set([False]), dict({'a': 1}), tuple([2]))]
[True, True, True, True]
```

typify(value, type_hint=None)

Take a primitive value, usually a string, and try to make a more relevant type out of it. An optional type_hint will try to coerce the value to that type.

Parameters

- **value** (*Any*) -- Usually a string, not a sequence
- **type_hint** (*type or tuple[type]*) --

Examples

```
>>> typify('32')
32
>>> typify('32', float)
32.0
>>> typify('32.0')
32.0
>>> typify('32.0.0')
'32.0.0'
>>> [typify(x) for x in ('true', 'yes', 'on')]
[True, True, True]
```

(continues on next page)

(continued from previous page)

```
>>> [typify(x) for x in ('no', 'FALSe', 'off')]
[False, False, False]
>>> [typify(x) for x in ('none', 'None', None)]
[None, None, None]
```

maybecall(*value*)

listify(*val*, *return_type=tuple*)

Examples

```
>>> listify('abc', return_type=list)
['abc']
>>> listify(None)
()
>>> listify(False)
(False,)
>>> listify(('a', 'b', 'c'), return_type=list)
['a', 'b', 'c']
```

__version__ = '0.0.43'

__author__ = 'Kale Franz'

__email__ = 'kale@franz.io'

__url__ = 'https://github.com/kalefranz/auxlib'

__license__ = 'ISC'

__copyright__ = '(c) 2015 Kale Franz. All rights reserved.'

__summary__ = 'auxiliary library to the python standard library'

base

Code in `conda.base` is the lowest level of the application stack. It is loaded and executed virtually every time the application is executed. Any code within, and any of its imports, must be highly performant.

Conda modules importable from `conda.base` are

- `conda._vendor`
- `conda.base`
- `conda.common`

Modules prohibited from importing `conda.base` are:

- `conda._vendor`
- `conda.common`

All other conda modules may import from `conda.base`.

constants

This file should hold most string literals and magic numbers used throughout the code base. The exception is if a literal is specifically meant to be private to and isolated within a module. Think of this as a "more static" source of configuration information.

Another important source of "static" configuration is conda/models/enums.py.

Classes

<i>SafetyChecks</i>	Generic enumeration.
<i>PathConflict</i>	Generic enumeration.
<i>DepsModifier</i>	Flags to enable alternate handling of dependencies.
<i>UpdateModifier</i>	Generic enumeration.
<i>ChannelPriorityMeta</i>	Metaclass for Enum
<i>ValueEnum</i>	Subclass of enum that returns the value of the enum as its str representation
<i>ChannelPriority</i>	
<i>SatSolverChoice</i>	Subclass of enum that returns the value of the enum as its str representation
<i>NoticeLevel</i>	Subclass of enum that returns the value of the enum as its str representation

Attributes

<i>PREFIX_PLACEHOLDER</i>
<i>machine_bits</i>
<i>APP_NAME</i>
<i>SEARCH_PATH</i>
<i>DEFAULT_CHANNEL_ALIAS</i>
<i>CONDA_HOMEPAGE_URL</i>
<i>ERROR_UPLOAD_URL</i>
<i>DEFAULTS_CHANNEL_NAME</i>
<i>RECOGNIZED_URL_SCHEMES</i>
<i>DEFAULT_CHANNELS_UNIX</i>
<i>DEFAULT_CHANNELS_WIN</i>

continues on next page

Table 71 – continued from previous page

<i>DEFAULT_CUSTOM_CHANNELS</i>
<i>DEFAULT_CHANNELS</i>
<i>ROOT_ENV_NAME</i>
<i>ROOT_NO_RM</i>
<i>DEFAULT_AGGRESSIVE_UPDATE_PACKAGES</i>
<i>COMPATIBLE_SHELLS</i>
<i>MAX_CHANNEL_PRIORITY</i>
<i>CONDA_PACKAGE_EXTENSION_V1</i>
<i>CONDA_PACKAGE_EXTENSION_V2</i>
<i>CONDA_PACKAGE_EXTENSIONS</i>
<i>CONDA_TARBALL_EXTENSION</i>
<i>CONDA_TEMP_EXTENSION</i>
<i>CONDA_TEMP_EXTENSIONS</i>
<i>CONDA_LOGS_DIR</i>
<i>UNKNOWN_CHANNEL</i>
<i>REPODATA_FN</i>
<i>NOTICES_FN</i>
<i>NOTICES_CACHE_FN</i>
<i>NOTICES_CACHE_SUBDIR</i>
<i>NOTICES_DECORATOR_DISPLAY_INTERVAL</i>
<i>DRY_RUN_PREFIX</i>
<i>PREFIX_NAME_DISALLOWED_CHARS</i>
<i>PACKAGE_CACHE_MAGIC_FILE</i>
<i>PREFIX_MAGIC_FILE</i>
<i>PREFIX_STATE_FILE</i>

continues on next page

Table 71 – continued from previous page

<i>PACKAGE_ENV_VARS_DIR</i>
<i>CONDA_ENV_VARS_UNSET_VAR</i>
<i>NAMESPACES_MAP</i>
<i>NAMESPACE_PACKAGE_NAMES</i>
<i>NAMESPACES</i>
<i>NO_PLUGINS</i>
<code>PREFIX_PLACEHOLDER = '/opt/anaconda1anaconda2anaconda3'</code>
<code>machine_bits</code>
<code>APP_NAME = 'conda'</code>
<code>SEARCH_PATH = ('C:/ProgramData/conda/.condarc', 'C:/ProgramData/conda/condarc',</code> <code>'C:/ProgramData/conda/condarc.d')</code>
<code>DEFAULT_CHANNEL_ALIAS = 'https://conda.anaconda.org'</code>
<code>CONDA_HOMEPAGE_URL = 'https://conda.io'</code>
<code>ERROR_UPLOAD_URL = 'https://conda.io/conda-post/unexpected-error'</code>
<code>DEFAULTS_CHANNEL_NAME = 'defaults'</code>
<code>RECOGNIZED_URL_SCHEMES = ('http', 'https', 'ftp', 's3', 'file')</code>
<code>DEFAULT_CHANNELS_UNIX = ('https://repo.anaconda.com/pkgs/main',</code> <code>'https://repo.anaconda.com/pkgs/r')</code>
<code>DEFAULT_CHANNELS_WIN = ('https://repo.anaconda.com/pkgs/main',</code> <code>'https://repo.anaconda.com/pkgs/r',...</code>
<code>DEFAULT_CUSTOM_CHANNELS</code>
<code>DEFAULT_CHANNELS</code>
<code>ROOT_ENV_NAME = 'base'</code>
<code>ROOT_NO_RM = ('python', 'pycosat', 'ruamel.yaml', 'conda', 'openssl', 'requests')</code>
<code>DEFAULT_AGGRESSIVE_UPDATE_PACKAGES = ('ca-certificates', 'certifi', 'openssl')</code>
<code>COMPATIBLE_SHELLS = ('bash', 'cmd.exe', 'fish', 'tcsh', 'xonsh', 'zsh', 'powershell')</code>
<code>MAX_CHANNEL_PRIORITY = 10000</code>
<code>CONDA_PACKAGE_EXTENSION_V1 = '.tar.bz2'</code>
<code>CONDA_PACKAGE_EXTENSION_V2 = '.conda'</code>
<code>CONDA_PACKAGE_EXTENSIONS = ()</code>
<code>CONDA_TARBALL_EXTENSION</code>
<code>CONDA_TEMP_EXTENSION = '.c~'</code>
<code>CONDA_TEMP_EXTENSIONS = ()</code>

```

CONDA_LOGS_DIR = '.logs'
UNKNOWN_CHANNEL = '<unknown>'
REPODATA_FN = 'repodata.json'
NOTICES_FN = 'notices.json'
NOTICES_CACHE_FN = 'notices.cache'
NOTICES_CACHE_SUBDIR = 'notices'
NOTICES_DECORATOR_DISPLAY_INTERVAL = 86400
DRY_RUN_PREFIX = 'Dry run action:'
PREFIX_NAME_DISALLOWED_CHARS

class SafetyChecks
    Bases: enum.Enum

    Generic enumeration.

    Derive from this class to define new enumerations.

    disabled = 'disabled'

    warn = 'warn'

    enabled = 'enabled'

    __str__()
        Return str(self).

class PathConflict
    Bases: enum.Enum

    Generic enumeration.

    Derive from this class to define new enumerations.

    clobber = 'clobber'

    warn = 'warn'

    prevent = 'prevent'

    __str__()
        Return str(self).

class DepsModifier
    Bases: enum.Enum

    Flags to enable alternate handling of dependencies.

    NOT_SET = 'not_set'

    NO_DEPS = 'no_deps'

    ONLY_DEPS = 'only_deps'

    __str__()
        Return str(self).

class UpdateModifier
    Bases: enum.Enum

    Generic enumeration.

```

Derive from this class to define new enumerations.

```
SPECS_SATISFIED_SKIP_SOLVE = 'specs_satisfied_skip_solve'
```

```
FREEZE_INSTALLED = 'freeze_installed'
```

```
UPDATE_DEPS = 'update_deps'
```

```
UPDATE_SPECS = 'update_specs'
```

```
UPDATE_ALL = 'update_all'
```

```
__str__()
```

Return str(self).

```
class ChannelPriorityMeta
```

Bases: `enum.EnumMeta`

Metaclass for Enum

```
__call__(value, *args, **kwargs)
```

Either returns an existing member, or creates a new enum class.

This method is used both when an enum class is given a value to match to an enumeration member (i.e. `Color(3)`) and for the functional API (i.e. `Color = Enum('Color', names='RED GREEN BLUE')`).

When used for the functional API:

value will be the name of the new class.

names should be either a string of white-space/comma delimited names (values will start at *start*), or an iterator/mapping of name, value pairs.

module should be set to the module this class is being created in; if it is not set, an attempt to find that module will be made, but if it fails the class will not be picklable.

qualname should be set to the actual location this class can be found at in its module; by default it is set to the global scope. If this is not correct, unpickling will fail in some circumstances.

type, if set, will be mixed in as the first base class.

```
class ValueEnum
```

Bases: `enum.Enum`

Subclass of enum that returns the value of the enum as its str representation

```
__str__()
```

Return str(self).

```
class ChannelPriority
```

Bases: `six.with_metaclass(ChannelPriorityMeta, ValueEnum)`

```
__name__ = 'ChannelPriority'
```

```
STRICT = 'strict'
```

```
FLEXIBLE = 'flexible'
```

```
DISABLED = 'disabled'
```

```
class SatSolverChoice
```

Bases: `ValueEnum`

Subclass of enum that returns the value of the enum as its str representation

```
PYCOSAT = 'pycosat'
```

```
PYCRYPTOSAT = 'pycryptosat'
```

```

    PYSAT = 'pysat'
class NoticeLevel
    Bases: ValueEnum
    Subclass of enum that returns the value of the enum as its str representation
    CRITICAL = 'critical'
    WARNING = 'warning'
    INFO = 'info'
PACKAGE_CACHE_MAGIC_FILE = 'urls.txt'
PREFIX_MAGIC_FILE
PREFIX_STATE_FILE
PACKAGE_ENV_VARS_DIR
CONDA_ENV_VARS_UNSET_VAR = '***unset***'
NAMESPACES_MAP
NAMESPACE_PACKAGE_NAMES
NAMESPACES
NO_PLUGINS = False

```

context

Conda's global configuration object.

The context aggregates all configuration files, environment variables, and command line arguments into one global stateful object to be used across all of conda.

Classes

Context

ContextStackObject

ContextStack

Functions

mockable_context_envs_dirs(root_writable,

root_prefix, ...)

channel_alias_validation(value)

default_python_default()

continues on next page

Table 73 – continued from previous page

<code>default_python_validation(value)</code>	
<code>ssl_verify_validation(value)</code>	
<code>reset_context([search_path, argparse_args])</code>	
<code>fresh_context([env, search_path, argparse_args])</code>	
<code>stack_context(pushing[, search_path, arg- parse_args])</code>	
<code>stack_context_default(pushing[, argparse_args])</code>	
<code>replace_context([pushing, search_path, arg- parse_args])</code>	
<code>replace_context_default([pushing, arg- parse_args])</code>	
<code>_get_cpu_info()</code>	
<code>env_name(prefix)</code>	
<code>locate_prefix_by_name(name[, envs_dirs])</code>	Find the location of a prefix given a conda env name. If the location does not exist, an
<code>validate_prefix_name(→ str)</code>	Run various validations to make sure prefix_name is valid
<code>determine_target_prefix(ctx[, args])</code>	Get the prefix to operate in. The prefix may not yet exist.
<code>_first_writable_envs_dir()</code>	
<code>get_prefix(ctx, args[, search])</code>	

Attributes

<code>_platform_map</code>
<code>non_x86_machines</code>
<code>_arch_names</code>
<code>user_rc_path</code>
<code>sys_rc_path</code>
<code>context_stack</code>
<code>conda_tests_ctxt_mgmt_def_pol</code>
<code>context</code>
<code>_platform_map</code>

```

non_x86_machines
_arch_names
user_rc_path
sys_rc_path
mockable_context_envs_dirs(root_writable, root_prefix, _envs_dirs)
channel_alias_validation(value)
default_python_default()
default_python_validation(value)
ssl_verify_validation(value)
class Context(search_path=None, argparse_args=None, **kwargs)
    Bases: conda.common.configuration.Configuration
    property experimental_solver
    property plugin_manager
        This is the preferred way of accessing the PluginManager object for this application and is located here
        to avoid problems with cyclical imports elsewhere in the code.
    property conda_build_local_paths
    property conda_build_local_urls
    property croot
        This is where source caches and work folders live
    property local_build_root
    property conda_build
    property arch_name
    property conda_private
    property platform
    property default_threads: int | None
    property repodata_threads: int | None
    property fetch_threads: int | None
    property verify_threads: int | None
    property execute_threads
    property subdir
    property subdirs
    property bits
    property root_dir: os.PathLike
    property root_writable
    property envs_dirs
    property pkgs_dirs
    property default_prefix

```

property active_prefix

property shlvl

property aggressive_update_packages

property target_prefix

property conda_prefix

property conda_exe

property av_data_dir

Where critical artifact verification data (e.g., various public keys) can be found.

property signing_metadata_url_base

Base URL for artifact verification signing metadata (*.root.json, key_mgr.json).

property conda_exe_vars_dict

The vars can refer to each other if necessary since the dict is ordered. None means unset it.

property migrated_channel_aliases

property prefix_specified

property channels

property config_files

property use_only_tar_bz2

property binstar_upload

property verbosity

property category_map

add_pip_as_python_dependency

allow_conda_downgrades

allow_cycles

allow_softlinks

auto_update_conda

auto_activate_base

auto_stack

notify_outdated_conda

clobber

change_ps1

env_prompt

create_default_packages

default_python

download_only

enable_private_envs

force_32bit

non_admin_enabled

pip_interop_enabled
_default_threads
_repodata_threads
_fetch_threads
_verify_threads
_execute_threads
_aggressive_update_packages
safety_checks
extra_safety_checks
_signing_metadata_url_base
path_conflict
pinned_packages
disallowed_packages
rollback_enabled
track_features
use_index_cache
separate_format_cache
_root_prefix
_envs_dirs
_pkgs_dirs
_subdir
_subdirs
local_repodata_ttl
ssl_verify
client_ssl_cert
client_ssl_cert_key
proxy_servers
remote_connect_timeout_secs
remote_read_timeout_secs
remote_max_retries
remote_backoff_factor
add_anaconda_token
allow_non_channel_urls
_channel_alias
channel_priority
_channels

channel_settings
_custom_channels
_custom_multichannels
_default_channels
_migrated_channel_aliases
migrated_custom_channels
override_channels_enabled
show_channel_urls
use_local
allowlist_channels
restore_free_channel
repodata_fns
_use_only_tar_bz2
always_softlink
always_copy
always_yes
debug
dev
dry_run
error_upload_url
force
json
offline
quiet
ignore_pinned
report_errors
shortcuts
number_channel_notices
_verbosity
experimental
deps_modifier
update_modifier
sat_solver
solver_ignore_timestamps
solver
force_remove

```

force_reinstall
target_prefix_override
unsatisfiable_hints
unsatisfiable_hints_check_depth
bld_path
anaconda_upload
_croot
_conda_build
no_plugins
post_build_validation()
known_subdirs()
trash_dir()
root_prefix()
channel_alias()
default_channels()
custom_multichannels()
custom_channels()
user_agent()
_override(key, value)
    TODO: This might be broken in some ways. Unsure what happens if the old value is a property and gets
    set to a new value. Or if the new value overrides the validation logic on the underlying ParameterLoader
    instance.

    Investigate and implement in a safer way.
requests_version()
python_implementation_name_version()
platform_system_release()
os_distribution_name_version()
libc_family_version()
cpu_flags()
cuda_version() → str | None
    Retrieves the current cuda version.
get_descriptions()
description_map()
reset_context(search_path=SEARCH_PATH, argparse_args=None)
fresh_context(env=None, search_path=SEARCH_PATH, argparse_args=None, **kwargs)
class ContextStackObject(search_path=SEARCH_PATH, argparse_args=None)

    set_value(search_path=SEARCH_PATH, argparse_args=None)

```

apply()

class ContextStack

push(*search_path*, *argparse_args*)

apply()

pop()

replace(*search_path*, *argparse_args*)

context_stack

stack_context(*pushing*, *search_path*=*SEARCH_PATH*, *argparse_args*=*None*)

stack_context_default(*pushing*, *argparse_args*=*None*)

replace_context(*pushing*=*None*, *search_path*=*SEARCH_PATH*, *argparse_args*=*None*)

replace_context_default(*pushing*=*None*, *argparse_args*=*None*)

conda_tests_ctxt_mgmt_def_pol

_get_cpu_info()

env_name(*prefix*)

locate_prefix_by_name(*name*, *envs_dirs*=*None*)

Find the location of a prefix given a conda env name. If the location does not exist, an error is raised.

validate_prefix_name(*prefix_name*: *str*, *ctx*: [Context](#), *allow_base*=*True*) → *str*

Run various validations to make sure *prefix_name* is valid

determine_target_prefix(*ctx*, *args*=*None*)

Get the prefix to operate in. The prefix may not yet exist.

Parameters

- **ctx** -- the context of conda
- **args** -- the argparse args from the command line

Returns: the prefix Raises: `CondaEnvironmentNotFoundError` if the prefix is invalid

_first_writable_envs_dir()

get_prefix(*ctx*, *args*, *search*=*True*)

context

exceptions

Base exceptions.

cli

common

Common utilities for conda command line tools.

Functions

confirm([message, choices, default, dry_run])

confirm_yn([message, default, dry_run])

ensure_name_or_prefix(args, command)

is_active_prefix(→ bool)

Determines whether the args we pass in are pointing to the active prefix.

arg2spec(arg[, json, update])

specs_from_args(args[, json])

strip_comment(line)

spec_from_line(line)

specs_from_url(url[, json])

names_in_specs(names, specs)

disp_features(features)

stdout_json(d)

stdout_json_success([success])

print_envs_list(known_conda_prefixes[, output])

check_non_admin()

validate_prefix(prefix)

Verifies the prefix is a valid conda environment.

Attributes

spec_pat

confirm(message='Proceed', choices=('yes', 'no'), default='yes', dry_run=NULL)

confirm_yn(message='Proceed', default='yes', dry_run=NULL)

ensure_name_or_prefix(args, command)

is_active_prefix(*prefix: str*) → bool

Determines whether the args we pass in are pointing to the active prefix. Can be used a validation step to make sure operations are not being performed on the active prefix.

arg2spec(*arg, json=False, update=False*)

specs_from_args(*args, json=False*)

spec_pat

strip_comment(*line*)

spec_from_line(*line*)

specs_from_url(*url, json=False*)

names_in_specs(*names, specs*)

disp_features(*features*)

stdout_json(*d*)

stdout_json_success(*success=True, **kwargs*)

print_envs_list(*known_conda_prefixes, output=True*)

check_non_admin()

validate_prefix(*prefix*)

Verifies the prefix is a valid conda environment.

Raises

- ***EnvironmentLocationNotFound*** -- Non-existent path or not a directory.
- ***DirectoryNotACondaEnvironmentError*** -- Directory is not a conda environment.

Returns Valid prefix.

Return type *str*

conda_argparse

Conda command line interface parsers.

Classes

<i>ArgumentParser</i>	Object for parsing command line strings into Python objects.
<i>_GreedySubParsersAction</i>	A custom subparser action to conditionally act as a greedy consumer.
<i>NullCountAction</i>	Information about how to convert command line strings to Python objects.
<i>ExtendConstAction</i>	Information about how to convert command line strings to Python objects.

Functions

<i>generate_pre_parser</i> (→ ArgumentParser)	
<i>generate_parser</i> (→ ArgumentParser)	
<i>do_call</i> (args, parser)	Serves as the primary entry point for commands referred to in this file and for
<i>find_built_in_commands</i> (parser)	
<i>_exec</i> (executable_args, env_vars)	
<i>_exec_win</i> (executable_args, env_vars)	
<i>_exec_unix</i> (executable_args, env_vars)	
<i>configure_parser_plugins</i> (→ None)	For each of the provided plugin-based subcommands, we'll create
<i>configure_parser_clean</i> (sub_parsers)	
<i>configure_parser_info</i> (sub_parsers)	
<i>configure_parser_config</i> (sub_parsers)	
<i>configure_parser_create</i> (sub_parsers)	
<i>configure_parser_init</i> (sub_parsers)	
<i>configure_parser_install</i> (sub_parsers)	
<i>configure_parser_list</i> (sub_parsers)	
<i>configure_parser_compare</i> (sub_parsers)	
<i>configure_parser_package</i> (sub_parsers)	
<i>configure_parser_remove</i> (sub_parsers, aliases)	
<i>configure_parser_run</i> (sub_parsers)	
<i>configure_parser_search</i> (sub_parsers)	
<i>configure_parser_update</i> (sub_parsers, aliases)	
<i>configure_parser_notices</i> (sub_parsers[, name])	
<i>configure_parser_rename</i> (→ None)	
<i>add_parser_create_install_update</i> (p[, pre-fix_required])	

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Table 78 – continued from previous page

<code>add_parser_pscheck(p)</code>	
<code>add_parser_show_channel_urls(p)</code>	
<code>add_parser_help(p)</code>	So we can use consistent capitalization and periods in the help. You must
<code>add_parser_prefix(p[, prefix_required])</code>	
<code>add_parser_json(p)</code>	
<code>add_output_and_prompt_options(p)</code>	
<code>add_parser_channels(p)</code>	
<code>add_parser_solver_mode(p)</code>	
<code>add_parser_update_modifiers(solver_mode_options)</code>	
<code>add_parser_prune(p)</code>	
<code>add_parser_solver(p)</code>	Add a command-line flag for alternative solver backends.
<code>add_parser_networking(p)</code>	
<code>add_parser_package_install_options(p)</code>	
<code>add_parser_known(p)</code>	
<code>add_parser_default_packages(p)</code>	

Attributes

<code>on_win</code>
<code>user_rc_path</code>
<code>escaped_user_rc_path</code>
<code>escaped_sys_rc_path</code>
<code>BUILTIN_COMMANDS</code>
<code>NOTICES_HELP</code>
<code>NOTICES_DESCRIPTION</code>

on_win

user_rc_path

`escaped_user_rc_path`

`escaped_sys_rc_path`

`BUILTIN_COMMANDS`

`generate_pre_parser(**kwargs) → ArgumentParser`

`generate_parser(**kwargs) → ArgumentParser`

`do_call(args: argparse.Namespace, parser: ArgumentParser)`

Serves as the primary entry point for commands referred to in this file and for all registered plugin subcommands.

`find_builtin_commands(parser)`

`class ArgumentParser(*args, add_help=True, **kwargs)`

Bases: `argparse.ArgumentParser`

Object for parsing command line strings into Python objects.

Keyword Arguments

- **(default** *(- usage -- A usage message)* `-- os.path.basename(sys.argv[0])`)
- **(default** *-- auto-generated from arguments*)
- **does** *(- description -- A description of what the program)* `--`
- **descriptions** *(- epilog -- Text following the argument)* `--`
- **one** *(- parents -- Parsers whose arguments should be copied into this)* `--`
- **messages** *(- formatter_class -- HelpFormatter class for printing help)* `--`
- **arguments** *(- argument_default -- The default value for all)* `--`
- **containing** *(- fromfile_prefix_chars -- Characters that prefix files)* `-- additional arguments`
- **arguments** `--`
- **conflicts** *(- conflict_handler -- String indicating how to handle)* `--`
- **option** *(- add_help -- Add a -h/-help)* `--`
- **unambiguously** *(- allow_abbrev -- Allow long options to be abbreviated)* `--`
- **with** *(- exit_on_error -- Determines whether or not ArgumentParser exits)* `-- error info when an error occurs`

`_check_value(action, value)`

`parse_args(*args, override_args=None, **kwargs)`

`class _GreedySubParsersAction(option_strings, prog, parser_class, dest=SUPPRESS, required=False, help=None, metavar=None)`

Bases: `argparse._SubParsersAction`

A custom subparser action to conditionally act as a greedy consumer.

This is a workaround since `argparse.REMAINDER` does not work as expected, see <https://github.com/python/cpython/issues/61252>.

`__call__(parser, namespace, values, option_string=None)`

`_get_subactions()`

Sort actions for subcommands to appear alphabetically in help blurb.

```
_exec(executable_args, env_vars)
```

```
_exec_win(executable_args, env_vars)
```

```
_exec_unix(executable_args, env_vars)
```

```
class NullCountAction(option_strings, dest, default=None, required=False, help=None)
```

```
    Bases: argparse._CountAction
```

Information about how to convert command line strings to Python objects.

Action objects are used by an ArgumentParser to represent the information needed to parse a single argument from one or more strings from the command line. The keyword arguments to the Action constructor are also all attributes of Action instances.

Keyword Arguments

- **which** (- *option_strings* -- *A list of command-line option strings*) -- should be associated with this action.
- **object** (- *dest* -- *The name of the attribute to hold the created*) --
- **be** (- *nargs* -- *The number of command-line arguments that should*) -- consumed. By default, one argument will be consumed and a single value will be produced. Other values include:
 - N (an integer) consumes N arguments (and produces a list)
 - '?' consumes zero or one arguments
 - '*' consumes zero or more arguments (and produces a list)
 - '+' consumes one or more arguments (and produces a list)Note that the difference between the default and nargs=1 is that with the default, a single value will be produced, while with nargs=1, a list containing a single value will be produced.
- **the** (- *metavar* -- *The name to be used for the option's argument with*) -- option uses an action that takes no values.
- **specified.** (- *default* -- *The value to be produced if the option is not*) --
- **and** (- *type* -- *A callable that accepts a single string argument,*) -- returns the converted value. The standard Python types str, int, float, and complex are useful examples of such callables. If None, str is used.
- **None,** (- *choices* -- *A container of values that should be allowed. If not*) -- after a command-line argument has been converted to the appropriate type, an exception will be raised if it is not a member of this collection.
- **the** -- command line. This is only meaningful for optional command-line arguments.
- **argument.** (- *help* -- *The help string describing the*) --
- **the** -- help string. If None, the 'dest' value will be used as the name.

```
static _ensure_value(namespace, name, value)
```

```
__call__(parser, namespace, values, option_string=None)
```

```
class ExtendConstAction(option_strings, dest, const, default=None, type=None, choices=None,  
                        required=False, help=None, metavar=None)
```

```
    Bases: argparse.Action
```

Information about how to convert command line strings to Python objects.

Action objects are used by an `ArgumentParser` to represent the information needed to parse a single argument from one or more strings from the command line. The keyword arguments to the Action constructor are also all attributes of Action instances.

Keyword Arguments

- **which** *(- option_strings -- A list of command-line option strings) --* should be associated with this action.
- **object** *(- dest -- The name of the attribute to hold the created) --*
- **be** *(- nargs -- The number of command-line arguments that should) --* consumed. By default, one argument will be consumed and a single value will be produced. Other values include:
 - N (an integer) consumes N arguments (and produces a list)
 - '?' consumes zero or one arguments
 - '*' consumes zero or more arguments (and produces a list)
 - '+' consumes one or more arguments (and produces a list)
- Note that the difference between the default and `nargs=1` is that with the default, a single value will be produced, while with `nargs=1`, a list containing a single value will be produced.
- **the** *(- metavar -- The name to be used for the option's argument with) --* option uses an action that takes no values.
- **specified.** *(- default -- The value to be produced if the option is not) --*
- **and** *(- type -- A callable that accepts a single string argument,) --* returns the converted value. The standard Python types `str`, `int`, `float`, and `complex` are useful examples of such callables. If `None`, `str` is used.
- **None,** *(- choices -- A container of values that should be allowed. If not) --* after a command-line argument has been converted to the appropriate type, an exception will be raised if it is not a member of this collection.
- **the** -- command line. This is only meaningful for optional command-line arguments.
- **argument.** *(- help -- The help string describing the) --*
- **the** -- help string. If `None`, the 'dest' value will be used as the name.

`__call__(parser, namespace, values, option_string=None)`

`configure_parser_plugins(sub_parsers) → None`

For each of the provided plugin-based subcommands, we'll create a new subparser for an improved help printout and calling the `configure_parser()` with the newly created subcommand specific argument parser.

`configure_parser_clean(sub_parsers)`

`configure_parser_info(sub_parsers)`

`configure_parser_config(sub_parsers)`

`configure_parser_create(sub_parsers)`

`configure_parser_init(sub_parsers)`

`configure_parser_install(sub_parsers)`

`configure_parser_list(sub_parsers)`

`configure_parser_compare(sub_parsers)`

```
configure_parser_package(sub_parsers)
configure_parser_remove(sub_parsers, aliases)
configure_parser_run(sub_parsers)
configure_parser_search(sub_parsers)
configure_parser_update(sub_parsers, aliases)
NOTICES_HELP = 'Retrieve latest channel notifications.'
NOTICES_DESCRIPTION
configure_parser_notices(sub_parsers, name='notices')
configure_parser_rename(sub_parsers) → None
add_parser_create_install_update(p, prefix_required=False)
add_parser_pscheck(p)
add_parser_show_channel_urls(p)
add_parser_help(p)
    So we can use consistent capitalization and periods in the help. You must use the add_help=False argument to
    ArgumentParser or add_parser to use this. Add this first to be consistent with the default argparse output.
add_parser_prefix(p, prefix_required=False)
add_parser_json(p)
add_output_and_prompt_options(p)
add_parser_channels(p)
add_parser_solver_mode(p)
add_parser_update_modifiers(solver_mode_options)
add_parser_prune(p)
add_parser_solver(p)
    Add a command-line flag for alternative solver backends.
    See context.solver for more info.
add_parser_networking(p)
add_parser_package_install_options(p)
add_parser_known(p)
add_parser_default_packages(p)
```

`find_commands`

Utilities for finding executables and *conda*-* commands.

Functions

find_executable(executable[, include_others])

find_commands([include_others])

find_executable(executable, include_others=True)

find_commands(include_others=True)

install

Conda package installation logic.

Core logic for *conda [create|install|update|remove]* commands.

See *conda.cli.main_create*, *conda.cli.main_install*, *conda.cli.main_update*, and *conda.cli.main_remove* for the entry points into this module.

Functions

check_prefix(prefix[, json])

clone(src_arg, dst_prefix[, json, quiet, index_args])

print_activate(env_name_or_prefix)

get_revision(arg[, json])

install(args, parser[, command]) Logic for *conda install*, *conda update*, and *conda create*.

handle_txn(unlink_link_transaction, prefix, args, newenv)

Attributes

stderrlog

stderrlog

check_prefix(prefix, json=False)

clone(src_arg, dst_prefix, json=False, quiet=False, index_args=None)

print_activate(env_name_or_prefix)

get_revision(arg, json=False)

install(args, parser, command='install')

Logic for *conda install*, *conda update*, and *conda create*.

handle_txn(*unlink_link_transaction, prefix, args, newenv, remove_op=False*)

main

Entry point for all conda subcommands.

Functions

<i>init_loggers</i> ([context])	
<i>generate_parser</i> (*args, **kwargs)	Some code paths import this function directly from this module instead
<i>main_subshell</i> (*args[, post_parse_hook])	Entrypoint for the "subshell" invocation of CLI interface. E.g. <i>conda create</i> .
<i>main_sourced</i> (shell, *args, **kwargs)	Entrypoint for the "sourced" invocation of CLI interface. E.g. <i>conda activate</i> .
<i>main</i> (*args, **kwargs)	

init_loggers(*context=None*)

generate_parser(*args, **kwargs)

Some code paths import this function directly from this module instead of from `conda_argparse`. We add the forwarder for backwards compatibility.

main_subshell(*args, *post_parse_hook=None*, **kwargs)

Entrypoint for the "subshell" invocation of CLI interface. E.g. *conda create*.

main_sourced(*shell*, *args, **kwargs)

Entrypoint for the "sourced" invocation of CLI interface. E.g. *conda activate*.

main(*args, **kwargs)

main_clean

CLI implementation for *conda clean*.

Removes cached package tarballs, index files, package metadata, temporary files, and log files.

Functions

<i>_get_size</i> (→ int)
<i>_get_pkgs_dirs</i> (→ dict[str, tuple[str]])
<i>_get_total_size</i> (→ int)
<i>_rm_rf</i> (→ None)

continues on next page

Table 84 – continued from previous page

<code>find_tarballs(→ dict[str, Any])</code>
<code>find_pkgs(→ dict[str, Any])</code>
<code>rm_pkgs(→ None)</code>
<code>find_index_cache(→ list[str])</code>
<code>find_pkgs_dirs(→ list[str])</code>
<code>find_tempfiles(→ list[str])</code>
<code>find_logfiles(→ list[str])</code>
<code>rm_items(→ None)</code>
<code>_execute(args, parser)</code>
<code>execute(args, parser)</code>

Attributes

<code>_EXTS</code>

```

EXTS = ()
_get_size(*parts: str, warnings: list[str] | None) → int
_get_pkgs_dirs(pkg_sizes: dict[str, dict[str, int]]) → dict[str, tuple[str]]
_get_total_size(pkg_sizes: dict[str, dict[str, int]]) → int
_rm_rf(*parts: str, verbose: bool, verbosity: bool) → None
find_tarballs() → dict[str, Any]
find_pkgs() → dict[str, Any]
rm_pkgs(pkgs_dirs: dict[str, tuple[str]], warnings: list[str], total_size: int, pkg_sizes: dict[str, dict[str, int]], *,
        verbose: bool, verbosity: bool, dry_run: bool, name: str) → None
find_index_cache() → list[str]
find_pkgs_dirs() → list[str]
find_tempfiles(paths: Iterable[str]) → list[str]
find_logfiles() → list[str]
rm_items(items: list[str], *, verbose: bool, verbosity: bool, dry_run: bool, name: str) → None
_execute(args, parser)
execute(args, parser)

```

main_compare

CLI implementation for *conda compare*.

Compare the packages in an environment with the packages listed in an environment file.

Functions

get_packages(prefix)

_get_name_tuple(pkg)

_to_str(pkg)

compare_packages(active_pkgs, specification_pkgs)

execute(args, parser)

get_packages(*prefix*)**_get_name_tuple**(*pkg*)**_to_str**(*pkg*)**compare_packages**(*active_pkgs*, *specification_pkgs*)**execute**(*args*, *parser*)**main_config**

CLI implementation for *conda config*.

Allows for programmatically interacting with conda's configuration files (e.g., *~/.condarc*).

Functions

execute(args, parser)

format_dict(d)

parameter_description_builder(name)

describe_all_parameters()

print_config_item(key, value)

execute_config(args, parser)

execute(*args*, *parser*)

```

format_dict(d)
parameter_description_builder(name)
describe_all_parameters()
print_config_item(key, value)
execute_config(args, parser)

```

main_create

CLI implementation for *conda create*.

Creates new conda environments with the specified packages.

Functions

```
execute(args, parser)
```

```
execute(args, parser)
```

main_info

CLI implementation for *conda info*.

Display information about current conda installation.

Functions

```
get_user_site()
```

```
dump_record(pkg)
```

```
pretty_package(prec)
```

```
print_package_info(packages)
```

```
get_info_dict([system])
```

```
get_env_vars_str(info_dict)
```

```
get_main_info_str(info_dict)
```

```
execute(args, parser)
```

Attributes

IGNORE_FIELDS

SKIP_FIELDS

get_user_site()

IGNORE_FIELDS

SKIP_FIELDS

dump_record(*pkg*)

pretty_package(*prec*)

print_package_info(*packages*)

get_info_dict(*system=False*)

get_env_vars_str(*info_dict*)

get_main_info_str(*info_dict*)

execute(*args, parser*)

main_init

CLI implementation for *conda init*.

Prepares the user's profile for running conda, and sets up the conda shell interface.

Functions

execute(*args, parser*)

execute(*args, parser*)

main_install

CLI implementation for *conda install*.

Installs the specified packages into an existing environment.

Functions

`execute(args, parser)`

execute(*args, parser*)

main_list

CLI implementation for *conda list*.

Lists all packages installed into an environment.

Functions

`print_export_header(subdir)`

`get_packages(installed, regex)`

`list_packages(prefix[, regex, format, reverse, ...])`

`print_packages(prefix[, regex, format, reverse, ...])`

`print_explicit(prefix[, add_md5])`

`execute(args, parser)`

print_export_header(*subdir*)

get_packages(*installed, regex*)

list_packages(*prefix, regex=None, format='human', reverse=False, show_channel_urls=None*)

print_packages(*prefix, regex=None, format='human', reverse=False, piplist=False, json=False, show_channel_urls=None*)

print_explicit(*prefix, add_md5=False*)

execute(*args, parser*)

main_notices

CLI implementation for *conda notices*.

Manually retrieves channel notifications, caches them and displays them.

Functions

<code>execute(args, _)</code>	Command that retrieves channel notifications, caches them and displays them.
-------------------------------	--

execute(args: *argparse.Namespace*, _: *argparse.ArgumentParser*)
Command that retrieves channel notifications, caches them and displays them.

main_package

CLI implementation for *conda package*.

Provides some low-level tools for creating conda packages.

Functions

<code>remove(prefix, files)</code>	Remove files for a given prefix.
------------------------------------	----------------------------------

<code>execute(args, parser)</code>	
------------------------------------	--

<code>get_installed_version(prefix, name)</code>	
--	--

<code>create_info(name, version, build_number, requires_py)</code>	
--	--

<code>fix_shebang(tmp_dir, path)</code>	
---	--

<code>_add_info_dir(t, tmp_dir, files, has_prefix, info)</code>	
---	--

<code>create_conda_pkg(prefix, files, info, tar_path[, ...])</code>	Create a conda package and return a list of warnings.
---	---

<code>make_tarbz2(prefix[, name, version, build_number, files])</code>	
--	--

<code>which_package(path)</code>	Return the package containing the path.
----------------------------------	---

<code>which_prefix(path)</code>	Return the prefix for the provided path.
---------------------------------	--

Attributes

<code>shebang_pat</code>

remove(prefix, files)
Remove files for a given prefix.

execute(args, parser)

get_installed_version(prefix, name)

create_info(name, version, build_number, requires_py)

shebang_pat

fix_shebang(tmp_dir, path)

_add_info_dir(*t, tmp_dir, files, has_prefix, info*)

create_conda_pkg(*prefix, files, info, tar_path, update_info=None*)

Create a conda package and return a list of warnings.

make_tarbz2(*prefix, name='unknown', version='0.0', build_number=0, files=None*)

which_package(*path*)

Return the package containing the path.

Provided the path of a (presumably) conda installed file, iterate over the conda packages the file came from. Usually the iteration yields only one package.

which_prefix(*path*)

Return the prefix for the provided path.

Provided the path of a (presumably) conda installed file, return the environment prefix in which the file is located.

main_pip

PEP 621 compatible entry point used when *conda init* has not updated the user shell profile.

Functions

pip_installed_post_parse_hook(*args, p*)

main(**args*, ***kwargs*)

pip_installed_post_parse_hook(*args, p*)

main(**args*, ***kwargs*)

main_remove

CLI implementation for *conda remove*.

Removes the specified packages from an existing environment.

Functions

execute(*args, parser*)

execute(*args, parser*)

main_rename

CLI implementation for *conda rename*.

Renames an existing environment by cloning it and then removing the original environment.

Functions

<code>validate_src(→ str)</code>	Validate that we are receiving at least one value for --name or --prefix
<code>validate_destination(→ str)</code>	Ensure that our destination does not exist
<code>execute(args, _)</code>	Executes the command for renaming an existing environment.

validate_src(name: *str* | *None*, prefix: *str* | *None*) → *str*

Validate that we are receiving at least one value for --name or --prefix and ensure that the "base" environment is not being renamed

validate_destination(dest: *str*, force: *bool* = *False*) → *str*

Ensure that our destination does not exist

execute(args, _)

Executes the command for renaming an existing environment.

main_run

CLI implementation for *conda run*.

Runs the provided command within the specified environment.

Functions

<code>execute(args, parser)</code>

execute(args, parser)

main_search

CLI implementation for *conda search*.

Query channels for packages matching the provided package spec.

Functions

execute(args, parser)

pretty_record(record)

execute(args, parser)

pretty_record(record)

main_update

CLI implementation for *conda update*.

Updates the specified packages in an existing environment.

Functions

execute(args, parser)

execute(args, parser)

python_api

Wrapper for running conda CLI commands as a Python API.

Classes

Commands

Functions

<i>run_command</i> (command, *arguments, **kwargs)	Runs a conda command in-process with a given set of command-line interface arguments.
--	---

Attributes

STRING

STDOUT

`class Commands`

```
CLEAN = 'clean'
CONFIG = 'config'
CREATE = 'create'
INFO = 'info'
INSTALL = 'install'
LIST = 'list'
REMOVE = 'remove'
SEARCH = 'search'
UPDATE = 'update'
RUN = 'run'
NOTICES = 'notices'
```

`STRING`

`STDOUT`

`run_command(command, *arguments, **kwargs)`

Runs a conda command in-process with a given set of command-line interface arguments.

Differences from the command-line interface: Always uses `--yes` flag, thus does not ask for confirmation.

Parameters

- **command** -- one of the Commands.
- ***arguments** -- instructions you would normally pass to the conda command on the command line see below for examples. Be very careful to delimit arguments exactly as you want them to be delivered. No 'combine then split at spaces' or other information destroying processing gets performed on the arguments.
- ****kwargs** -- special instructions for programmatic overrides

Keyword Arguments

- **use_exception_handler** -- defaults to False. False will let the code calling `run_command` handle all exceptions. True won't raise when an exception has occurred, and instead give a non-zero return code
- **search_path** -- an optional non-standard search path for configuration information that overrides the default `SEARCH_PATH`
- **stdout** -- Define capture behavior for stream `sys.stdout`. Defaults to `STRING`. `STRING` captures as a string. `None` leaves stream untouched. Otherwise redirect to file-like object `stdout`.

- **stderr** -- Define capture behavior for stream `sys.stderr`. Defaults to `STRING`. `STRING` captures as a string. `None` leaves stream untouched. `STDOUT` redirects to stdout target and returns `None` as stderr value. Otherwise redirect to file-like object stderr.

Returns a tuple of stdout, stderr, and return_code. stdout, stderr are either strings, `None` or the corresponding file-like function argument.

Examples

```
>>> run_command(Commands.CREATE, "-n", "newenv", "python=3", "flask",
    use_exception_handler=True)
>>> run_command(Commands.CREATE, "-n", "newenv", "python=3", "flask")
>>> run_command(Commands.CREATE, ["-n", "newenv", "python=3", "flask"], search_
    path=())
```

Functions

`main(*args, **kwargs)`

main(*args, **kwargs)

common

Code in `conda.common` is not conda-specific. Technically, it sits *aside* the application stack and not *within* the stack. It is able to stand independently on its own. The *only* allowed imports of conda code in `conda.common` modules are imports of other `conda.common` modules and imports from `conda._vendor`.

If objects are needed from other parts of conda, they should be passed directly as arguments to functions and methods.

_logic

Classes

<code>_ClauseList</code>	Storage for the CNF clauses, represented as a list of tuples of ints.
<code>_ClauseArray</code>	Storage for the CNF clauses, represented as a flat int array.
<code>_SatSolver</code>	Simple wrapper to call a SAT solver given a <code>_ClauseList/_ClauseArray</code> instance.
<code>_PycoSatSolver</code>	Simple wrapper to call a SAT solver given a <code>_ClauseList/_ClauseArray</code> instance.
<code>_PyCryptoSatSolver</code>	Simple wrapper to call a SAT solver given a <code>_ClauseList/_ClauseArray</code> instance.
<code>_PySatSolver</code>	Simple wrapper to call a SAT solver given a <code>_ClauseList/_ClauseArray</code> instance.

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Table 107 – continued from previous page

*Clauses***Attributes***TRUE**FALSE**_sat_solver_str_to_cls**_sat_solver_cls_to_str***TRUE****FALSE****class _ClauseList**

Storage for the CNF clauses, represented as a list of tuples of ints.

get_clause_count()

Return number of stored clauses.

save_state()Get state information to be able to revert temporary additions of supplementary clauses. *_ClauseList*: state is simply the number of clauses.**restore_state(saved_state)**Restore state saved via *save_state*. Removes clauses that were added after the state has been saved.**as_list()**

Return clauses as a list of tuples of ints.

as_array()

Return clauses as a flat int array, each clause being terminated by 0.

class _ClauseArray

Storage for the CNF clauses, represented as a flat int array. Each clause is terminated by int(0).

extend(clauses)**append(clause)****get_clause_count()**Return number of stored clauses. This is an $O(n)$ operation since we don't store the number of clauses explicitly due to performance reasons (Python interpreter overhead in *self.append*).**save_state()**Get state information to be able to revert temporary additions of supplementary clauses. *_ClauseArray*: state is the length of the int array, NOT number of clauses.**restore_state(saved_state)**Restore state saved via *save_state*. Removes clauses that were added after the state has been saved.**as_list()**

Return clauses as a list of tuples of ints.

```

as_array()
    Return clauses as a flat int array, each clause being terminated by 0.

class _SatSolver(**run_kwargs)
    Simple wrapper to call a SAT solver given a _ClauseList/_ClauseArray instance.

get_clause_count()

as_list()

save_state()

restore_state(saved_state)

run(m, **kwargs)

abstract setup(m, **kwargs)
    Create a solver instance, add the clauses to it, and return it.

abstract invoke(solver)
    Start the actual SAT solving and return the calculated solution.

abstract process_solution(sat_solution)
    Process the solution returned by self.invoke. Returns a list of satisfied variables or None if no solution is
    found.

class _PycoSatSolver(**run_kwargs)
    Bases: \_SatSolver

    Simple wrapper to call a SAT solver given a _ClauseList/_ClauseArray instance.

setup(m, limit=0, **kwargs)
    Create a solver instance, add the clauses to it, and return it.

invoke(iter_sol)
    Start the actual SAT solving and return the calculated solution.

process_solution(sat_solution)
    Process the solution returned by self.invoke. Returns a list of satisfied variables or None if no solution is
    found.

class _PyCryptoSatSolver(**run_kwargs)
    Bases: \_SatSolver

    Simple wrapper to call a SAT solver given a _ClauseList/_ClauseArray instance.

setup(m, threads=1, **kwargs)
    Create a solver instance, add the clauses to it, and return it.

invoke(solver)
    Start the actual SAT solving and return the calculated solution.

process_solution(solution)
    Process the solution returned by self.invoke. Returns a list of satisfied variables or None if no solution is
    found.

class _PySatSolver(**run_kwargs)
    Bases: \_SatSolver

    Simple wrapper to call a SAT solver given a _ClauseList/_ClauseArray instance.

setup(m, **kwargs)
    Create a solver instance, add the clauses to it, and return it.

```

invoke(*solver*)

Start the actual SAT solving and return the calculated solution.

process_solution(*sat_solution*)

Process the solution returned by self.invoke. Returns a list of satisfied variables or None if no solution is found.

_sat_solver_str_to_cls

_sat_solver_cls_to_str

class Clauses(*m=0, sat_solver_str=_sat_solver_cls_to_str[_PycoSatSolver]*)

get_clause_count()

as_list()

new_var()

assign(*vals*)

Combine(*args, polarity*)

Eval(*func, args, polarity*)

Prevent(*func, *args*)

Require(*func, *args*)

Not(*x, polarity=None, add_new_clauses=False*)

And(*f, g, polarity, add_new_clauses=False*)

Or(*f, g, polarity, add_new_clauses=False*)

Xor(*f, g, polarity, add_new_clauses=False*)

ITE(*c, t, f, polarity, add_new_clauses=False*)

All(*iter, polarity=None*)

Any(*iter, polarity*)

AtMostOne_NSQ(*vals, polarity*)

AtMostOne_BDD(*vals, polarity=None*)

ExactlyOne_NSQ(*vals, polarity*)

ExactlyOne_BDD(*vals, polarity*)

LB_Preprocess(*lits, coeffs*)

BDD(*lits, coeffs, nterms, lo, hi, polarity*)

LinearBound(*lits, coeffs, lo, hi, preprocess, polarity*)

_run_sat(*m, limit=0*)

sat(*additional=None, includeIf=False, limit=0*)

Calculate a SAT solution for the current clause set.

Returned is the list of those solutions. When the clauses are unsatisfiable, an empty list is returned.

minimize(*lits, coeffs, bestsol=None, trymax=False*)

Minimize the objective function given by (coeff, integer) pairs in zip(coeffs, lits). The actual minimization is multiobjective: first, we minimize the largest active coefficient value, then we minimize the sum.

_os**linux****Functions**

<i>linux_get_libc_version()</i>	If on linux, returns (libc_family, version), otherwise (None, None).
---------------------------------	--

linux_get_libc_version()

If on linux, returns (libc_family, version), otherwise (None, None).

unix**Functions***get_free_space_on_unix*(dir_name)*is_admin_on_unix*()**get_free_space_on_unix**(dir_name)**is_admin_on_unix**()**windows****Classes**

<i>SW</i>	Enum where members are also (and must be) ints
<i>ERROR</i>	Enum where members are also (and must be) ints

Functions*get_free_space_on_windows*(dir_name)*is_admin_on_windows*()

<i>_wait_and_close_handle</i> (process_handle)	Waits until spawned process finishes and closes the handle for it.
--	--

<i>run_as_admin</i> (args[, wait])	Run command line argument list (<i>args</i>) with elevated privileges.
------------------------------------	--

Attributes

PHANDLE

PHANDLE

class SW

Bases: `enum.IntEnum`

Enum where members are also (and must be) ints

HIDE = 0

MAXIMIZE = 3

MINIMIZE = 6

RESTORE = 9

SHOW = 5

SHOWDEFAULT = 10

SHOWMAXIMIZED = 3

SHOWMINIMIZED = 2

SHOWMINNOACTIVE = 7

SHOWNA = 8

SHOWNOACTIVATE = 4

SHOWNORMAL = 1

class ERROR

Bases: `enum.IntEnum`

Enum where members are also (and must be) ints

ZERO = 0

FILE_NOT_FOUND = 2

PATH_NOT_FOUND = 3

BAD_FORMAT = 11

ACCESS_DENIED = 5

ASSOC_INCOMPLETE = 27

DDE_BUSY = 30

DDE_FAIL = 29

DDE_TIMEOUT = 28

DLL_NOT_FOUND = 32

NO_ASSOC = 31

OOM = 8

SHARE = 26

`get_free_space_on_windows(dir_name)`

is_admin_on_windows()

_wait_and_close_handle(*process_handle*)

Waits until spawned process finishes and closes the handle for it.

run_as_admin(*args*, *wait=True*)

Run command line argument list (*args*) with elevated privileges.

If *wait* is True, the process will block until completion.

Notes

- no stdin / stdout / stderr pipe support
- does not automatically quote arguments (i.e. for paths that may contain spaces)

See: - <http://stackoverflow.com/a/19719292/1170370> on 20160407 MCS. - [msdn.microsoft.com/en-us/library/windows/desktop/bb762153\(v=vs.85\).aspx](https://msdn.microsoft.com/en-us/library/windows/desktop/bb762153(v=vs.85).aspx) - https://github.com/ContinuumIO/menuinst/blob/master/menuinst/windows/win_elevate.py - <https://github.com/saltstack/salt-windows-install/blob/master/deps/salt/python/App/Lib/site-packages/win32/Demos/pipes/runproc.py> # NOQA - https://github.com/twonds/twisted/blob/master/twisted/internet/_dumbwin32proc.py - <https://stackoverflow.com/a/19982092/2127762> - <https://www.codeproject.com/Articles/19165/Vista-UAC-The-Definitive-Guide> - <https://github.com/JustAMan/pyWinClobber/blob/master/win32elevate.py>

on_win

compat

Functions

encode_for_env_var(\rightarrow str) Environment names and values need to be string.

encode_environment(env)

encode_arguments(arguments)

isiterable(obj)

open(file[, mode, buffering, encoding, errors, ...])

six_with_metaclass(meta, *bases) Create a base class with a metaclass.

ensure_binary(value)

ensure_text_type(\rightarrow str)

ensure_unicode(value)

ensure_fs_path_encoding(value)

ensure_utf8_encoding(value)

Attributes

on_win

on_mac

on_linux

FILESYSTEM_ENCODING

ENCODE_ENVIRONMENT

ENCODE_ARGS

NoneType

primitive_types

on_win**on_mac****on_linux****FILESYSTEM_ENCODING****ENCODE_ENVIRONMENT = True****ENCODE_ARGS = False****encode_for_env_var**(*value*) → *str*

Environment names and values need to be string.

encode_environment(*env*)**encode_arguments**(*arguments*)**isiterable**(*obj*)**open**(*file*, *mode*='r', *buffering*=-1, *encoding*=None, *errors*=None, *newline*=None, *closefd*=True)**six_with_metaclass**(*meta*, **bases*)

Create a base class with a metaclass.

NoneType**primitive_types = ()****ensure_binary**(*value*)**ensure_text_type**(*value*) → *str***ensure_unicode**(*value*)**ensure_fs_path_encoding**(*value*)**ensure_utf8_encoding**(*value*)

configuration

A generalized application configuration utility.

Features include:

- lazy eval
- merges configuration files
- parameter type validation, with custom validation
- parameter aliases

Easily extensible to other source formats, e.g. json and ini

Classes

<i>ParameterFlag</i>	Generic enumeration.
<i>RawParameter</i>	
<i>EnvRawParameter</i>	
<i>ArgParseRawParameter</i>	
<i>YamlRawParameter</i>	
<i>DefaultValueRawParameter</i>	Wraps a default value as a RawParameter, for usage in ParameterLoader.
<i>LoadedParameter</i>	
<i>PrimitiveLoadedParameter</i>	LoadedParameter type that holds a single python primitive value.
<i>MapLoadedParameter</i>	LoadedParameter type that holds a map (i.e. dict) of LoadedParameters.
<i>SequenceLoadedParameter</i>	LoadedParameter type that holds a sequence (i.e. list) of LoadedParameters.
<i>ObjectLoadedParameter</i>	LoadedParameter type that holds a mapping (i.e. object) of LoadedParameters.
<i>ConfigurationObject</i>	Dummy class to mark whether a Python object has config parameters within.
<i>Parameter</i>	
<i>PrimitiveParameter</i>	Parameter type for a Configuration class that holds a single python primitive value.
<i>MapParameter</i>	Parameter type for a Configuration class that holds a map (i.e. dict) of Parameters.
<i>SequenceParameter</i>	Parameter type for a Configuration class that holds a sequence (i.e. list) of Parameters.
<i>ObjectParameter</i>	Parameter type for a Configuration class that holds an object with Parameter fields.
<i>ParameterLoader</i>	ParameterLoader class contains the top level logic needed to load a parameter from start to

continues on next page

Table 116 – continued from previous page

<i>ConfigurationType</i>	metaclass for Configuration
<i>Configuration</i>	

Functions

<i>pretty_list</i> (iterable[, padding])	
<i>pretty_map</i> (dictionary[, padding])	
<i>expand_environment_variables</i> (unexpanded)	
<i>raise_errors</i> (errors)	
<i>load_file_configs</i> (→ dict[pathlib.Path, dict])	
<i>custom_expandvars</i> (→ str)	Expand variables in a string.

Attributes

<i>EMPTY_MAP</i>
<i>CONDARC_FILENAMES</i>
<i>YAML_EXTENSIONS</i>
<i>_RE_CUSTOM_EXPANDVARS</i>

EMPTY_MAP

pretty_list(iterable, padding='')

pretty_map(dictionary, padding='')

expand_environment_variables(unexpanded)

exception ConfigurationError(message, caused_by=None, **kwargs)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception ConfigurationLoadError(path, message_addition="", **kwargs)

Bases: [ConfigurationError](#)

Common base class for all non-exit exceptions.

exception ValidationError(parameter_name, parameter_value, source, msg=None, **kwargs)

Bases: [ConfigurationError](#)

Common base class for all non-exit exceptions.

exception MultipleKeysError(*source, keys, preferred_key*)

Bases: [ValidationError](#)

Common base class for all non-exit exceptions.

exception InvalidTypeError(*parameter_name, parameter_value, source, wrong_type, valid_types, msg=None*)

Bases: [ValidationError](#)

Common base class for all non-exit exceptions.

exception CustomValidationError(*parameter_name, parameter_value, source, custom_message*)

Bases: [ValidationError](#)

Common base class for all non-exit exceptions.

exception MultiValidationError(*errors, *args, **kwargs*)

Bases: [conda.CondaMultiError](#), [ConfigurationError](#)

Common base class for all non-exit exceptions.

raise_errors(*errors*)

class ParameterFlag

Bases: [enum.Enum](#)

Generic enumeration.

Derive from this class to define new enumerations.

final = 'final'

top = 'top'

bottom = 'bottom'

__str__()

Return str(self).

classmethod from_name(*name*)

classmethod from_value(*value*)

classmethod from_string(*string*)

class RawParameter(*source, key, raw_value*)

__repr__()

Return repr(self).

abstract value(*parameter_obj*)

abstract keyflag()

abstract valueflags(*parameter_obj*)

classmethod make_raw_parameters(*source, from_map*)

class EnvRawParameter(*source, key, raw_value*)

Bases: [RawParameter](#)

property __important_split_value

source = 'envvars'

value(*parameter_obj*)

keyflag()

```
    valueflags(parameter_obj)
    classmethod make_raw_parameters(appname)
class ArgParseRawParameter(source, key, raw_value)
    Bases: RawParameter
    source = 'cmd_line'
    value(parameter_obj)
    keyflag()
    valueflags(parameter_obj)
    classmethod make_raw_parameters(args_from_argparse)
class YamlRawParameter(source, key, raw_value, key_comment)
    Bases: RawParameter
    value(parameter_obj)
    keyflag()
    valueflags(parameter_obj)
    static _get_yaml_key_comment(commented_dict, key)
    classmethod _get_yaml_list_comments(value)
    static _get_yaml_list_comment_item(item)
    static _get_yaml_map_comments(value)
    classmethod make_raw_parameters(source, from_map)
    classmethod make_raw_parameters_from_file(filepath)
class DefaultValueRawParameter(source, key, raw_value)
    Bases: RawParameter
    Wraps a default value as a RawParameter, for usage in ParameterLoader.
    value(parameter_obj)
    keyflag()
    valueflags(parameter_obj)
load_file_configs(search_path: Iterable[Path | str], **kwargs) → dict[pathlib.Path, dict]
class LoadedParameter(name, value, key_flag, value_flags, validation=None)

    _type
    _element_type
    __eq__(other)
        Return self==value.
    __hash__()
        Return hash(self).
    collect_errors(instance, typed_value, source='<<merged>>')
        Validate a LoadedParameter typed value.

    Parameters
```

- **instance** ([Configuration](#)) -- the instance object used to create the LoadedParameter.
- **typed_value** (*Any*) -- typed value to validate.
- **source** (*str*) -- string description for the source of the typed_value.

expand()

Recursively expands any environment values in the Loaded Parameter.

Returns: LoadedParameter

abstract merge(matches)

Recursively merges matches into one LoadedParameter.

Parameters **matches** (*List<LoadedParameter>*) -- list of matches of this parameter.

Returns: LoadedParameter

typify(source)

Recursively types a LoadedParameter.

Parameters **source** (*str*) -- string describing the source of the LoadedParameter.

Returns: a primitive, sequence, or map representing the typed value.

static _typify_data_structure(value, source, type_hint=None)**static _match_key_is_important(loaded_parameter)****static _first_important_matches(matches)****class PrimitiveLoadedParameter(name, element_type, value, key_flag, value_flags, validation=None)**

Bases: [LoadedParameter](#)

LoadedParameter type that holds a single python primitive value.

The python primitive types are str, int, float, complex, bool, and NoneType. In addition, python 2 has long and unicode types.

__eq__(other)

Return self==value.

__hash__()

Return hash(self).

merge(matches)

Recursively merges matches into one LoadedParameter.

Parameters **matches** (*List<LoadedParameter>*) -- list of matches of this parameter.

Returns: LoadedParameter

class MapLoadedParameter(name, value, element_type, key_flag, value_flags, validation=None)

Bases: [LoadedParameter](#)

LoadedParameter type that holds a map (i.e. dict) of LoadedParameters.

_type**collect_errors(instance, typed_value, source='<<merged>>')**

Validate a LoadedParameter typed value.

Parameters

- **instance** ([Configuration](#)) -- the instance object used to create the LoadedParameter.
- **typed_value** (*Any*) -- typed value to validate.

- **source** (*str*) -- string description for the source of the typed_value.

merge(*parameters: Sequence[MapLoadedParameter]*) → *MapLoadedParameter*
Recursively merges matches into one LoadedParameter.

Parameters matches (*List<LoadedParameter>*) -- list of matches of this parameter.

Returns: LoadedParameter

class SequenceLoadedParameter(*name, value, element_type, key_flag, value_flags, validation=None*)
Bases: *LoadedParameter*

LoadedParameter type that holds a sequence (i.e. list) of LoadedParameters.

_type

collect_errors(*instance, typed_value, source='<<merged>>'*)
Validate a LoadedParameter typed value.

Parameters

- **instance** (*Configuration*) -- the instance object used to create the LoadedParameter.
- **typed_value** (*Any*) -- typed value to validate.
- **source** (*str*) -- string description for the source of the typed_value.

merge(*matches*)
Recursively merges matches into one LoadedParameter.

Parameters matches (*List<LoadedParameter>*) -- list of matches of this parameter.

Returns: LoadedParameter

class ObjectLoadedParameter(*name, value, element_type, key_flag, value_flags, validation=None*)
Bases: *LoadedParameter*

LoadedParameter type that holds a mapping (i.e. object) of LoadedParameters.

_type

collect_errors(*instance, typed_value, source='<<merged>>'*)
Validate a LoadedParameter typed value.

Parameters

- **instance** (*Configuration*) -- the instance object used to create the LoadedParameter.
- **typed_value** (*Any*) -- typed value to validate.
- **source** (*str*) -- string description for the source of the typed_value.

merge(*parameters: Sequence[ObjectLoadedParameter]*) → *ObjectLoadedParameter*
Recursively merges matches into one LoadedParameter.

Parameters matches (*List<LoadedParameter>*) -- list of matches of this parameter.

Returns: LoadedParameter

class ConfigurationObject

Dummy class to mark whether a Python object has config parameters within.

class Parameter(*default, validation=None*)

property default

Returns a DefaultValueRawParameter that wraps the actual default value.

_type

_element_type

get_all_matches(*name, names, instance*)

Finds all matches of a Parameter in a Configuration instance

Parameters

- **name** (*str*) -- canonical name of the parameter to search for
- **names** (*tuple(str)*) -- alternative aliases of the parameter
- **instance** (*Configuration*) -- instance of the configuration to search within

Returns (List(*RawParameter*)): matches of the parameter found in the configuration.

abstract load(*name, match*)

Loads a Parameter with the value in a RawParameter.

Parameters

- **name** (*str*) -- name of the parameter to pass through
- **match** (*RawParameter*) -- the value of the RawParameter match

Returns a LoadedParameter

typify(*name, source, value*)

class PrimitiveParameter(*default, element_type=None, validation=None*)

Bases: *Parameter*

Parameter type for a Configuration class that holds a single python primitive value.

The python primitive types are str, int, float, complex, bool, and NoneType. In addition, python 2 has long and unicode types.

load(*name, match*)

Loads a Parameter with the value in a RawParameter.

Parameters

- **name** (*str*) -- name of the parameter to pass through
- **match** (*RawParameter*) -- the value of the RawParameter match

Returns a LoadedParameter

class MapParameter(*element_type, default=frozendict(), validation=None*)

Bases: *Parameter*

Parameter type for a Configuration class that holds a map (i.e. dict) of Parameters.

_type

get_all_matches(*name, names, instance*)

Finds all matches of a Parameter in a Configuration instance

Parameters

- **name** (*str*) -- canonical name of the parameter to search for
- **names** (*tuple(str)*) -- alternative aliases of the parameter
- **instance** (*Configuration*) -- instance of the configuration to search within

Returns (List(*RawParameter*)): matches of the parameter found in the configuration.

load(*name*, *match*)

Loads a Parameter with the value in a RawParameter.

Parameters

- **name** (*str*) -- name of the parameter to pass through
- **match** (*RawParameter*) -- the value of the RawParameter match

Returns a LoadedParameter

class SequenceParameter(*element_type*, *default*=(), *validation*=None, *string_delimiter*=',')

Bases: *Parameter*

Parameter type for a Configuration class that holds a sequence (i.e. list) of Parameters.

_type

get_all_matches(*name*, *names*, *instance*)

Finds all matches of a Parameter in a Configuration instance

Parameters

- **name** (*str*) -- canonical name of the parameter to search for
- **names** (*tuple*(*str*)) -- alternative aliases of the parameter
- **instance** (*Configuration*) -- instance of the configuration to search within

Returns (List(*RawParameter*)): matches of the parameter found in the configuration.

load(*name*, *match*)

Loads a Parameter with the value in a RawParameter.

Parameters

- **name** (*str*) -- name of the parameter to pass through
- **match** (*RawParameter*) -- the value of the RawParameter match

Returns a LoadedParameter

class ObjectParameter(*element_type*, *default*=*ConfigurationObject*(), *validation*=None)

Bases: *Parameter*

Parameter type for a Configuration class that holds an object with Parameter fields.

_type

get_all_matches(*name*, *names*, *instance*)

Finds all matches of a Parameter in a Configuration instance

Parameters

- **name** (*str*) -- canonical name of the parameter to search for
- **names** (*tuple*(*str*)) -- alternative aliases of the parameter
- **instance** (*Configuration*) -- instance of the configuration to search within

Returns (List(*RawParameter*)): matches of the parameter found in the configuration.

load(*name*, *match*)

Loads a Parameter with the value in a RawParameter.

Parameters

- **name** (*str*) -- name of the parameter to pass through

- **match** ([RawParameter](#)) -- the value of the RawParameter match

Returns a LoadedParameter

class [ParameterLoader](#)(*parameter_type*, *aliases=()*, *expandvars=False*)

ParameterLoader class contains the top level logic needed to load a parameter from start to finish.

property [name](#)

property [names](#)

_set_name(*name*)

__get__(*instance*, *instance_type*)

_raw_parameters_from_single_source(*raw_parameters*)

static [raw_parameters_from_single_source](#)(*name*, *names*, *raw_parameters*)

class [ConfigurationType](#)(*name*, *bases*, *attr*)

Bases: [type](#)

metaclass for Configuration

CONDARC_FILENAMES = ('.condarc', 'condarc')

YAML_EXTENSIONS = ('.yaml', '.yml')

_RE_CUSTOM_EXPANDVARS

custom_expandvars(*template: str*, *mapping: collections.abc.Mapping[str, Any] = {}*, */*, ***kwargs*) → [str](#)

Expand variables in a string.

Inspired by *string.Template* and modified to mirror *os.path.expandvars* functionality allowing custom variables without mutating *os.environ*.

Expands POSIX and Windows CMD environment variables as follows:

- \$VARIABLE → value of VARIABLE
- \${VARIABLE} → value of VARIABLE
- %VARIABLE% → value of VARIABLE

Invalid substitutions are left as-is:

- \$MISSING → \$MISSING
- \${MISSING} → \${MISSING}
- %MISSING% → %MISSING%
- \$\$ → \$\$
- %% → %%
- \$ → \$
- % → %

class [Configuration](#)(*search_path=()*, *app_name=None*, *argparse_args=None*, ***kwargs*)

static [_expand_search_path](#)(*search_path: Iterable[Path | str]*, ***kwargs*) → [Iterable\[pathlib.Path\]](#)

classmethod [_load_search_path](#)(*search_path: Iterable[pathlib.Path]*) → [Iterable\[tuple\[pathlib.Path, dict\]\]](#)

_set_search_path(*search_path: Iterable[Path | str]*, ***kwargs*)

```
_set_env_vars(app_name=None)
_set_argparse_args(argparse_args)
_set_raw_data(raw_data: collections.abc.Mapping[Hashable, dict])
_reset_cache()
register_reset_callback(callback)
check_source(source)
validate_all()
static _collect_validation_error(func, *args, **kwargs)
validate_configuration()
post_build_validation()
collect_all()
describe_parameter(parameter_name)
list_parameters()
typify_parameter(parameter_name, value, source)
abstract get_descriptions()
```

constants

Common constants.

NULL

cuda

Detect cuda version.

Functions

`cuda_detect()`

cuda_detect()

decorators

Common decorators.

Functions

<code>env_override(envvar_name[, vert_empty_to_none])</code>	con-	Override the return value of the decorated function with an environment variable.
--	------	---

env_override(*envvar_name*, *convert_empty_to_none=False*)
Override the return value of the decorated function with an environment variable.

If *convert_empty_to_none* is true, if the value of the environment variable is the empty string, a None value will be returned.

disk

Common disk utilities.

Functions

<code>temporary_content_in_file(content[, suffix])</code>

temporary_content_in_file(*content*, *suffix=""*)

io

Common I/O utilities.

Classes

<code>DeltaSecondsFormatter</code>	Logging formatter with additional attributes for run time logging.
<code>ContextDecorator</code>	Base class for a context manager class (implementing <code>__enter__()</code> and <code>__exit__()</code>) that also
<code>SwallowBrokenPipe</code>	Base class for a context manager class (implementing <code>__enter__()</code> and <code>__exit__()</code>) that also
<code>CaptureTarget</code>	Constants used for contextmanager captured.
<code>Spinner</code>	

param message A message to prefix the spinner with. The string ' ' is automatically appended.

continues on next page

Table 122 – continued from previous page

<i>ProgressBar</i>	
<i>DummyExecutor</i>	This is an abstract base class for concrete asynchronous executors.
<i>ThreadLimitedThreadPoolExecutor</i>	This is an abstract base class for concrete asynchronous executors.
<i>time_recorder</i>	Base class for a context manager class (implementing <code>__enter__()</code> and <code>__exit__()</code>) that also

Functions

<i>dashlist</i> (iterable[, indent])	
<i>env_vars</i> ([var_map, callback, stack_callback])	
<i>env_var</i> (name, value[, callback, stack_callback])	
<i>env_unmodified</i> ([callback])	
<i>captured</i> ([stdout, stderr])	Capture outputs of sys.stdout and sys.stderr.
<i>argv</i> (args_list)	
<i>_logger_lock</i> ()	
<i>disable_logger</i> (logger_name)	
<i>stderr_log_level</i> (level[, logger_name])	
<i>attach_stderr_handler</i> ([level, logger_name, propagate, ...])	
<i>timeout</i> (timeout_secs, func, *args[, default_return])	Enforce a maximum time for a callable to complete.
<i>get_instrumentation_record_file</i> ()	
<i>print_instrumentation_data</i> ()	

Attributes

<i>_FORMATTER</i>
<i>swallow_broken_pipe</i>
<i>as_completed</i>

class **DeltaSecondsFormatter**(*fmt=None, datefmt=None*)
 Bases: `logging.Formatter`
 Logging formatter with additional attributes for run time logging.

``delta_secs``

Elapsed seconds since last log/format call (or creation of logger).

``relative_created_secs``

Like *relativeCreated*, time relative to the initialization of the *logging* module but conveniently scaled to seconds as a *float* value.

format(record)

Format the specified record as text.

The record's attribute dictionary is used as the operand to a string formatting operation which yields the returned string. Before formatting the dictionary, a couple of preparatory steps are carried out. The message attribute of the record is computed using `LogRecord.getMessage()`. If the formatting string uses the time (as determined by a call to `usesTime()`), `formatTime()` is called to format the event time. If there is exception information, it is formatted using `formatException()` and appended to the message.

_FORMATTER

dashlist(iterable, indent=2)

class ContextDecorator

Base class for a context manager class (implementing `__enter__()` and `__exit__()`) that also makes it a decorator.

`__call__(f)`

class SwallowBrokenPipe

Bases: *ContextDecorator*

Base class for a context manager class (implementing `__enter__()` and `__exit__()`) that also makes it a decorator.

`__enter__()`

`__exit__(exc_type, exc_val, exc_tb)`

swallow_broken_pipe

class CaptureTarget

Bases: `enum.Enum`

Constants used for contextmanager captured.

Used similarly like the constants PIPE, STDOUT for `stdlib's subprocess.Popen`.

STRING

STDOUT

env_vars(var_map=None, callback=None, stack_callback=None)

env_var(name, value, callback=None, stack_callback=None)

env_unmodified(callback=None)

captured(stdout=CaptureTarget.STRING, stderr=CaptureTarget.STRING)

Capture outputs of `sys.stdout` and `sys.stderr`.

If `stdout` is **STRING**, capture `sys.stdout` as a string, if `stdout` is `None`, do not capture `sys.stdout`, leaving it untouched, otherwise redirect `sys.stdout` to the file-like object given by `stdout`.

Behave correspondingly for `stderr` with the exception that if `stderr` is **STDOUT**, redirect `sys.stderr` to `stdout` target and set `stderr` attribute of yielded object to `None`.

Parameters

- **stdout** -- capture target for sys.stdout, one of STRING, None, or file-like object
- **stderr** -- capture target for sys.stderr, one of STRING, STDOUT, None, or file-like object

Yields *CapturedText* --

has attributes **stdout**, **stderr** which are either strings, None or the corresponding file-like function argument.

argv(*args_list*)

_logger_lock()

disable_logger(*logger_name*)

stderr_log_level(*level*, *logger_name*=None)

attach_stderr_handler(*level*=WARN, *logger_name*=None, *propagate*=False, *formatter*=None)

timeout(*timeout_secs*, *func*, **args*, *default_return*=None, ***kwargs*)

Enforce a maximum time for a callable to complete. Not yet implemented on Windows.

class Spinner(*message*, *enabled*=True, *json*=False, *fail_message*='failed\n')

Parameters

- **message** (*str*) -- A message to prefix the spinner with. The string ': ' is automatically appended.
- **enabled** (*bool*) -- If False, usage is a no-op.
- **json** (*bool*) -- If True, will not output non-json to stdout.

spinner_cycle

start()

stop()

_start_spinning()

__enter__()

__exit__(*exc_type*, *exc_val*, *exc_tb*)

class ProgressBar(*description*, *enabled*=True, *json*=False, *position*=None, *leave*=True)

classmethod get_lock()

update_to(*fraction*)

finish()

refresh()

Force refresh i.e. once 100% has been reached

close()

static _tqdm(**args*, ***kwargs*)

Deferred import so it doesn't hit the *conda activate* paths.

class DummyExecutor

Bases: `concurrent.futures.Executor`

This is an abstract base class for concrete asynchronous executors.

submit(*fn*, **args*, ***kwargs*)

Submits a callable to be executed with the given arguments.

Schedules the callable to be executed as `fn(*args, **kwargs)` and returns a Future instance representing the execution of the callable.

Returns A Future representing the given call.

map(*func*, **iterables*)

Returns an iterator equivalent to `map(fn, iter)`.

Parameters

- **fn** -- A callable that will take as many arguments as there are passed iterables.
- **timeout** -- The maximum number of seconds to wait. If None, then there is no limit on the wait time.
- **chunksize** -- The size of the chunks the iterable will be broken into before being passed to a child process. This argument is only used by `ProcessPoolExecutor`; it is ignored by `ThreadPoolExecutor`.

Returns `map(func, *iterables)` but the calls may be evaluated out-of-order.

Return type An iterator equivalent to

Raises

- **TimeoutError** -- If the entire result iterator could not be generated before the given timeout.
- **Exception** -- If `fn(*args)` raises for any values.

shutdown(*wait=True*)

Clean-up the resources associated with the Executor.

It is safe to call this method several times. Otherwise, no other methods can be called after this one.

Parameters

- **wait** -- If True then shutdown will not return until all running futures have finished executing and the resources used by the executor have been reclaimed.
- **cancel_futures** -- If True then shutdown will cancel all pending futures. Futures that are completed or running will not be cancelled.

class ThreadLimitedThreadPoolExecutor(*max_workers=10*)

Bases: `concurrent.futures.ThreadPoolExecutor`

This is an abstract base class for concrete asynchronous executors.

submit(*fn*, **args*, ***kwargs*)

This is an exact reimplement of the `submit()` method on the parent class, except with an added `try/except` around `self._adjust_thread_count()`. So long as there is at least one living thread, this thread pool will not throw an exception if threads cannot be expanded to `max_workers`.

In the implementation, we use "protected" attributes from `concurrent.futures` (`_base` and `_WorkItem`). Consider vendoring the whole `concurrent.futures` library as an alternative to these protected imports.

<https://github.com/agronholm/pythonfutures/blob/3.2.0/concurrent/futures/thread.py#L121-L131> #
NOQA <https://github.com/python/cpython/blob/v3.6.4/Lib/concurrent/futures/thread.py#L114-L124>

as_completed

get_instrumentation_record_file()

```
class time_recorder(entry_name=None, module_name=None)
```

Bases: [ContextDecorator](#)

Base class for a context manager class (implementing `__enter__()` and `__exit__()`) that also makes it a decorator.

```
record_file
```

```
start_time
```

```
total_call_num
```

```
total_run_time
```

```
_set_entry_name(f)
```

```
__call__(f)
```

```
__enter__()
```

```
__exit__(exc_type, exc_val, exc_tb)
```

```
classmethod log_totals()
```

```
_ensure_dir()
```

```
print_instrumentation_data()
```

iterators

Replacements for parts of the `toolz` library.

Functions

<code>groupby_to_dict</code> (keyfunc, sequence)	A <i>toolz</i> -style <i>groupby</i> implementation.
<code>unique</code> (\rightarrow Generator[Any, None, None])	A <i>toolz</i> inspired <i>unique</i> implementation.

`groupby_to_dict`(*keyfunc*, *sequence*)

A *toolz*-style *groupby* implementation.

Returns a dictionary of { key: [group] } instead of iterators.

`unique`(*sequence*: Sequence[Any]) \rightarrow Generator[Any, None, None]

A *toolz* inspired *unique* implementation.

Returns a generator of unique elements in the sequence

logic

The basic idea to nest logical expressions is instead of trying to denest things via distribution, we add new variables. So if we have some logical expression `expr`, we replace it with `x` and add `expr <-> x` to the clauses, where `x` is a new variable, and `expr <-> x` is recursively evaluated in the same way, so that the final clauses are ORs of atoms.

To use this, create a new `Clauses` object with the max var, for instance, if you already have `[[1, 2, -3]]`, you would use `C = Clause(3)`. All functions return a new literal, which represents that function, or `True` or `False` if the expression can be resolved fully. They may also add new clauses to `C.clauses`, which will then be delivered to the SAT solver.

All functions take atoms as arguments (an atom is an integer, representing a literal or a negated literal, or boolean constants True or False; that is, it is the callers' responsibility to do the conversion of expressions recursively. This is done because we do not have data structures representing the various logical classes, only atoms.

The polarity argument can be set to True or False if you know that the literal being used will only be used in the positive or the negative, respectively (e.g., you will only use x , not $-x$). This will generate fewer clauses. It is probably best if you do not take advantage of this directly, but rather through the Require and Prevent functions.

Classes

Clauses

Functions

<i>minimal_unsatisfiable_subset</i> (clauses, sat, explicit_specs)	Given a set of clauses, find a minimal unsatisfiable subset (an
--	---

Attributes

TRUE

FALSE

PycoSatSolver

PyCryptoSatSolver

PySatSolver

TRUE

FALSE

PycoSatSolver = 'pysosat'

PyCryptoSatSolver = 'pyscryptosat'

PySatSolver = 'pysat'

class Clauses(*m=0, sat_solver=PycoSatSolver*)

 property m

 property unsat

 get_clause_count()

 as_list()

 _check_variable(*variable*)

_check_literal(*literal*)
add_clause(*clause*)
add_clauses(*clauses*)
name_var(*m*, *name*)
new_var(*name=None*)
from_name(*name*)
from_index(*m*)
_assign(*vals*, *name=None*)
_convert(*x*)
_eval(*func*, *args*, *no_literal_args*, *polarity*, *name*)
Prevent(*what*, **args*)
Require(*what*, **args*)
Not(*x*, *polarity=None*, *name=None*)
And(*f*, *g*, *polarity=None*, *name=None*)
Or(*f*, *g*, *polarity=None*, *name=None*)
Xor(*f*, *g*, *polarity=None*, *name=None*)
ITE(*c*, *t*, *f*, *polarity=None*, *name=None*)
 If *c* Then *t* Else *f*.

 In this function, if any of *c*, *t*, or *f* are True and False the resulting expression is resolved.

All(*iter*, *polarity=None*, *name=None*)
Any(*vals*, *polarity=None*, *name=None*)
AtMostOne_NSQ(*vals*, *polarity=None*, *name=None*)
AtMostOne_BDD(*vals*, *polarity=None*, *name=None*)
AtMostOne(*vals*, *polarity=None*, *name=None*)
ExactlyOne_NSQ(*vals*, *polarity=None*, *name=None*)
ExactlyOne_BDD(*vals*, *polarity=None*, *name=None*)
ExactlyOne(*vals*, *polarity=None*, *name=None*)
LinearBound(*equation*, *lo*, *hi*, *preprocess=True*, *polarity=None*, *name=None*)
sat(*additional=None*, *includeIf=False*, *names=False*, *limit=0*)
 Calculate a SAT solution for the current clause set.

 Returned is the list of those solutions. When the clauses are unsatisfiable, an empty list is returned.

itersolve(*constraints=None*, *m=None*)
minimize(*objective*, *bestsol=None*, *trymax=False*)

minimal_unsatisfiable_subset(*clauses*, *sat*, *explicit_specs*)
 Given a set of clauses, find a minimal unsatisfiable subset (an unsatisfiable core)

A set is a minimal unsatisfiable subset if no proper subset is unsatisfiable. A set of clauses may have many minimal unsatisfiable subsets of different sizes.

sat should be a function that takes a tuple of clauses and returns True if the clauses are satisfiable and False if they are not. The algorithm will work with any order-reversing function (reversing the order of subset and the order False < True), that is, any function where $(A \leq B) \text{ iff } (\text{sat}(B) \leq \text{sat}(A))$, where $A \leq B$ means A is a subset of B and False < True).

path

Common path utilities.

Functions

is_path(value)

expand(path)

paths_equal(path1, path2)

Examples

url_to_path(url)

Convert a [file://](#) URL to a path.

tokenized_startswith(test_iterable,
startswith_iterable)

get_all_directories(→ list[tuple[str]])

get_leaf_directories(→ Sequence[str])

explode_directories(→ set[str])

pyc_path(py_path, python_major_minor_version)

This must not return backslashes on Windows as that will break

missing_pyc_files(python_major_minor_version,
files)

parse_entry_point_def(ep_definition)

get_python_short_path([python_version])

get_python_site_packages_short_path(python_version)

get_major_minor_version(string[, with_dot])

get_bin_directory_short_path()

win_path_ok(path)

win_path_double_escape(path)

win_path_backout(path)

continues on next page

Table 129 – continued from previous page

<code>ensure_pad(name[, pad])</code>	
Examples	
<code>is_private_env_name(env_name)</code>	
Examples	
<code>is_private_env_path(env_path)</code>	
Examples	
<code>right_pad_os_sep(path)</code>	
<code>split_filename(path_or_url)</code>	
<code>get_python_noarch_target_path(source_short_path, ...)</code>	
<code>win_path_to_unix(path[, root_prefix])</code>	
<code>which(executable)</code>	Backwards-compatibility wrapper. Use <i>shutil.which</i> directly if possible.
<code>strip_pkg_extension(path)</code>	
Examples	
<code>is_package_file(path)</code>	
Examples	

Attributes

<code>PATH_MATCH_REGEX</code>
<code>KNOWN_EXTENSIONS</code>
<code>_VERSION_REGEX</code>

```
PATH_MATCH_REGEX = '\\.\/|\\.\\.\\.|~|\/|[a-zA-Z]:[\/\\\\\\]|\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|\/'
```

```
KNOWN_EXTENSIONS = ('.conda', '.tar.bz2', '.json', '.jlap', '.json.zst')
```

```
is_path(value)
```

```
expand(path)
```

```
paths_equal(path1, path2)
```

Examples

```
>>> paths_equal('/a/b/c', '/a/b/c/d/..')
True
```

url_to_path(*url*)

Convert a `file://` URL to a path.

Relative file URLs (i.e. `file:relative/path`) are not supported.

tokenized_startswith(*test_iterable*, *startswith_iterable*)

get_all_directories(*files: Iterable[str]*) → `list[tuple[str]]`

get_leaf_directories(*files: Iterable[str]*) → `Sequence[str]`

explode_directories(*child_directories: Iterable[tuple[str, Ellipsis]]*) → `set[str]`

pyc_path(*py_path*, *python_major_minor_version*)

This must not return backslashes on Windows as that will break tests and leads to an eventual need to make `url_to_path` return backslashes too and that may end up changing files on disc or to the result of comparisons with the contents of them.

missing_pyc_files(*python_major_minor_version*, *files*)

parse_entry_point_def(*ep_definition*)

get_python_short_path(*python_version=None*)

get_python_site_packages_short_path(*python_version*)

_VERSION_REGEX

get_major_minor_version(*string*, *with_dot=True*)

get_bin_directory_short_path()

win_path_ok(*path*)

win_path_double_escape(*path*)

win_path_backout(*path*)

ensure_pad(*name*, *pad='_'*)

Examples

```
>>> ensure_pad('conda')
'_conda_'
>>> ensure_pad('_conda')
'__conda_'
>>> ensure_pad('')
''
```

is_private_env_name(*env_name*)

Examples

```
>>> is_private_env_name("_conda")
False
>>> is_private_env_name("_conda_")
True
```

is_private_env_path(*env_path*)

Examples

```
>>> is_private_env_path('/some/path/to/envs/_conda_')
True
>>> is_private_env_path('/not/an/envs_dir/_conda_')
False
```

right_pad_os_sep(*path*)

split_filename(*path_or_url*)

get_python_noarch_target_path(*source_short_path*, *target_site_packages_short_path*)

win_path_to_unix(*path*, *root_prefix=""*)

which(*executable*)

Backwards-compatibility wrapper. Use *shutil.which* directly if possible.

strip_pkg_extension(*path*: *str*)

Examples

```
>>> strip_pkg_extension("/path/_license-1.1-py27_1.tar.bz2")
('/path/_license-1.1-py27_1', '.tar.bz2')
>>> strip_pkg_extension("/path/_license-1.1-py27_1.conda")
('/path/_license-1.1-py27_1', '.conda')
>>> strip_pkg_extension("/path/_license-1.1-py27_1")
('/path/_license-1.1-py27_1', None)
```

is_package_file(*path*)

Examples

```
>>> is_package_file("/path/_license-1.1-py27_1.tar.bz2")
True
>>> is_package_file("/path/_license-1.1-py27_1.conda")
True
>>> is_package_file("/path/_license-1.1-py27_1")
False
```

pkg_formats**python**

Common Python package format utilities.

Classes

<i>PythonDistribution</i>	Base object describing a python distribution based on path to anchor file.
<i>PythonInstalledDistribution</i>	Python distribution installed via distutils.
<i>PythonEggInfoDistribution</i>	Python distribution installed via setuptools.
<i>PythonEggLinkDistribution</i>	Python distribution installed via setuptools.
<i>PythonDistributionMetadata</i>	Object representing the metadata of a Python Distribution given by anchor
<i>Evaluator</i>	This class is used to evaluate marker expressions.

Functions

<i>norm_package_name</i> (name)	
<i>pypi_name_to_conda_name</i> (pypi_name)	
<i>norm_package_version</i> (version)	Normalize a version by removing extra spaces and parentheses.
<i>split_spec</i> (spec, sep)	Split a spec by separator and return stripped start and end parts.
<i>parse_specification</i> (spec)	Parse a requirement from a python distribution metadata and return a
<i>get_site_packages_anchor_files</i> (site_packages_path, ...)	Get all the anchor files for the site packages directory.
<i>get_dist_file_from_egg_link</i> (egg_link_file, prefix_path)	Return the egg info file path following an egg link.
<i>parse_marker</i> (marker_string)	Parse marker string and return a dictionary containing a marker expression.
<i>_is_literal</i> (o)	
<i>get_default_marker_context</i> ()	Return the default context dictionary to use when parsing markers.
<i>interpret</i> (marker[, execution_context])	Interpret a marker and return a result depending on environment.

Attributes

PYPI_TO_CONDA

PYPI_CONDA_DEPS

PARTIAL_PYPI_SPEC_PATTERN

PY_FILE_RE

PySpec

IDENTIFIER

VERSION_IDENTIFIER

COMPARE_OP

MARKER_OP

OR

AND

NON_SPACE

STRING_CHUNK

DEFAULT_MARKER_CONTEXT

evaluator

PYPI_TO_CONDA**PYPI_CONDA_DEPS****PARTIAL_PYPI_SPEC_PATTERN****PY_FILE_RE****PySpec****exception MetadataWarning**Bases: [Warning](#)

Base class for warning categories.

class PythonDistribution(*anchor_full_path, python_version*)

Base object describing a python distribution based on path to anchor file.

property name**property norm_name**


```

property conda_name
property version
MANIFEST_FILES = ()
REQUIRES_FILES = ()
MANDATORY_FILES = ()
ENTRY_POINTS_FILES = ('entry_points.txt',)
static init(prefix_path, anchor_file, python_version)
_check_files()
    Check the existence of mandatory files for a given distribution.
_check_path_data(path, checksum, size)
    Normalizes record data content and format.
static _parse_requires_file_data(data, global_section='__global__')
static _parse_entries_file_data(data)
_load_requires_provides_file()
manifest_full_path()
get_paths()
    Read the list of installed paths from record or source file.

```

Example

```

[(u'skdata/_init_.py', u'sha256=47DEQpj8HBSa-_TImW-5JCeuQeRkm5NMpJWZG3hSuFU', 0),
 (u'skdata/diabetes.py', None, None), ...

]

get_dist_requirements()
get_python_requirements()
get_external_requirements()
get_extra_provides()
get_conda_dependencies()
    Process metadata fields providing dependency information.
    This includes normalizing fields, and evaluating environment markers.
abstract get_optional_dependencies()
get_entry_points()
class PythonInstalledDistribution(prefix_path, anchor_file, python_version)
    Bases: PythonDistribution
    Python distribution installed via distutils.

```

Notes

- <https://www.python.org/dev/peps/pep-0376/>

```
MANIFEST_FILES = ('RECORD',)
REQUIRES_FILES = ()
MANDATORY_FILES = ('METADATA',)
ENTRY_POINTS_FILES = ()
is_manageable = True
```

class `PythonEggInfoDistribution`(*anchor_full_path*, *python_version*, *sp_reference*)

Bases: `PythonDistribution`

Python distribution installed via setuptools.

Notes

- <http://peak.telecommunity.com/DevCenter/EggFormats>

```
property is_manageable
MANIFEST_FILES = ('installed-files.txt', 'SOURCES', 'SOURCES.txt')
REQUIRES_FILES = ('requires.txt', 'depends.txt')
MANDATORY_FILES = ()
ENTRY_POINTS_FILES = ('entry_points.txt',)
```

class `PythonEggLinkDistribution`(*prefix_path*, *anchor_file*, *python_version*)

Bases: `PythonEggInfoDistribution`

Python distribution installed via setuptools.

Notes

- <http://peak.telecommunity.com/DevCenter/EggFormats>

```
is_manageable = False
```

class `PythonDistributionMetadata`(*path*)

Object representing the metadata of a Python Distribution given by anchor file (or directory) path.

This metadata is extracted from a single file. Python distributions might create additional files that complement this metadata information, but that is handled at the python distribution level.

Notes

- <https://packaging.python.org/specifications/core-metadata/>
- Metadata 2.1: <https://www.python.org/dev/peps/pep-0566/>
- Metadata 2.0: <https://www.python.org/dev/peps/pep-0426/> (Withdrawn)
- Metadata 1.2: <https://www.python.org/dev/peps/pep-0345/>
- Metadata 1.1: <https://www.python.org/dev/peps/pep-0314/>
- Metadata 1.0: <https://www.python.org/dev/peps/pep-0241/>

property name

property version

FILE_NAMES = ('METADATA', 'PKG-INFO')

SINGLE_USE_KEYS

MULTIPLE_USE_KEYS

static `_process_path(path, metadata_filenames)`

Find metadata file inside dist-info folder, or check direct file.

classmethod `_message_to_dict(message)`

Convert the RFC-822 headers data into a dictionary.

message is an email.parser.Message instance.

The canonical method to transform metadata fields into such a data structure is as follows:

- The original key-value format should be read with email.parser.HeaderParser
- All transformed keys should be reduced to lower case. Hyphens should be replaced with underscores, but otherwise should retain all other characters
- The transformed value for any field marked with "(Multiple-use") should be a single list containing all the original values for the given key
- The Keywords field should be converted to a list by splitting the original value on whitespace characters
- The message body, if present, should be set to the value of the description key.
- The result should be stored as a string-keyed dictionary.

classmethod `_read_metadata(fpath)`

Read the original format which is stored as RFC-822 headers.

_get_multiple_data(keys)

Helper method to get multiple data values by keys.

Keys is an iterable including the preferred key in order, to include values of key that might have been replaced (deprecated), for example keys can be ['requires_dist', 'requires'], where the key 'requires' is deprecated and replaced by 'requires_dist'.

get_dist_requirements()

Changed in version 2.1: The field format specification was relaxed to accept the syntax used by popular publishing tools.

Each entry contains a string naming some other distutils project required by this distribution.

The format of a requirement string contains from one to four parts:

- A project name, in the same format as the Name: field. The only mandatory part.

- A comma-separated list of ‘extra’ names. These are defined by the required project, referring to specific features which may need extra dependencies.
- A version specifier. Tools parsing the format should accept optional parentheses around this, but tools generating it should not use parentheses.
- An environment marker after a semicolon. This means that the requirement is only needed in the specified conditions.

This field may be followed by an environment marker after a semicolon.

Example

```
frozenset(['pkginfo', 'PasteDeploy', 'zope.interface (>3.5.0)', 'pywin32 >1.0; sys_platform == "win32"'])
```

Return 'Requires' if 'Requires-Dist' is empty.

get_python_requirements()

New in version 1.2.

This field specifies the Python version(s) that the distribution is guaranteed to be compatible with. Installation tools may look at this when picking which version of a project to install.

The value must be in the format specified in Version specifiers.

This field may be followed by an environment marker after a semicolon.

Example

```
frozenset(['>=3', '>2.6,!<3.0.*,!<3.1.*', '~<2.6', '>=3; sys_platform == "win32"'])
```

get_external_requirements()

Changed in version 2.1: The field format specification was relaxed to accept the syntax used by popular publishing tools.

Each entry contains a string describing some dependency in the system that the distribution is to be used. This field is intended to serve as a hint to downstream project maintainers, and has no semantics which are meaningful to the distutils distribution.

The format of a requirement string is a name of an external dependency, optionally followed by a version declaration within parentheses.

This field may be followed by an environment marker after a semicolon.

Because they refer to non-Python software releases, version numbers for this field are not required to conform to the format specified in PEP 440: they should correspond to the version scheme used by the external dependency.

Notice that there's is no particular rule on the strings to be used!

Example

```
frozenset(['C', 'libpng (>=1.5)', 'make; sys_platform != "win32"])
```

get_extra_provides()

New in version 2.1.

A string containing the name of an optional feature. Must be a valid Python identifier. May be used to make a dependency conditional on whether the optional feature has been requested.

Example

```
frozenset(['pdf', 'doc', 'test'])
```

get_dist_provides()

New in version 1.2.

Changed in version 2.1: The field format specification was relaxed to accept the syntax used by popular publishing tools.

Each entry contains a string naming a Distutils project which is contained within this distribution. This field must include the project identified in the Name field, followed by the version : Name (Version).

A distribution may provide additional names, e.g. to indicate that multiple projects have been bundled together. For instance, source distributions of the ZODB project have historically included the transaction project, which is now available as a separate distribution. Installing such a source distribution satisfies requirements for both ZODB and transaction.

A distribution may also provide a “virtual” project name, which does not correspond to any separately-distributed project: such a name might be used to indicate an abstract capability which could be supplied by one of multiple projects. E.g., multiple projects might supply RDBMS bindings for use by a given ORM: each project might declare that it provides ORM-bindings, allowing other projects to depend only on having at most one of them installed.

A version declaration may be supplied and must follow the rules described in Version specifiers. The distribution’s version number will be implied if none is specified.

This field may be followed by an environment marker after a semicolon.

Return *Provides* in case *Provides-Dist* is empty.

get_dist_obsolete()

New in version 1.2.

Changed in version 2.1: The field format specification was relaxed to accept the syntax used by popular publishing tools.

Each entry contains a string describing a distutils project’s distribution which this distribution renders obsolete, meaning that the two projects should not be installed at the same time.

Version declarations can be supplied. Version numbers must be in the format specified in Version specifiers [1].

The most common use of this field will be in case a project name changes, e.g. Gorgon 2.3 gets subsumed into Torqued Python 1.0. When you install Torqued Python, the Gorgon distribution should be removed.

This field may be followed by an environment marker after a semicolon.

Return *Obsoletes* in case *Obsoletes-Dist* is empty.

Example

```
frozenset(['Gorgon', 'OtherProject (<3.0) ; python_version == '2.7'])
```

Notes

- [1] <https://packaging.python.org/specifications/version-specifiers/>

get_classifiers()

Classifiers are described in PEP 301, and the Python Package Index publishes a dynamic list of currently defined classifiers.

This field may be followed by an environment marker after a semicolon.

Example

```
frozenset(['Development Status :: 4 - Beta', 'Environment :: Console (Text Based) ; os_name ==  
"posix"])
```

norm_package_name(*name*)

pypi_name_to_conda_name(*pypi_name*)

norm_package_version(*version*)

Normalize a version by removing extra spaces and parentheses.

split_spec(*spec*, *sep*)

Split a spec by separator and return stripped start and end parts.

parse_specification(*spec*)

Parse a requirement from a python distribution metadata and return a namedtuple with name, extras, constraints, marker and url components.

This method does not enforce strict specifications but extracts the information which is assumed to be *correct*. As such no errors are raised.

Example

```
PySpec(name='requests', extras=['security'], constraints='>=3.3.0', marker='foo >= 2.7 or bar == 1', url='')
```

get_site_packages_anchor_files(*site_packages_path*, *site_packages_dir*)

Get all the anchor files for the site packages directory.

get_dist_file_from_egg_link(*egg_link_file*, *prefix_path*)

Return the egg info file path following an egg link.

parse_marker(*marker_string*)

Parse marker string and return a dictionary containing a marker expression.

The dictionary will contain keys "op", "lhs" and "rhs" for non-terminals in the expression grammar, or strings. A string contained in quotes is to be interpreted as a literal string, and a string not contained in quotes is a variable (such as `os_name`).

IDENTIFIER

VERSION_IDENTIFIER

COMPARE_OP

MARKER_OP**OR****AND****NON_SPACE****STRING_CHUNK****_is_literal(*o*)****class Evaluator**

This class is used to evaluate marker expressions.

operations**evaluate(*expr*, *context*)**Evaluate a marker expression returned by the `parse_requirement()` function in the specified context.**get_default_marker_context()**

Return the default context dictionary to use when parsing markers.

DEFAULT_MARKER_CONTEXT**evaluator****interpret(*marker*, *execution_context*=None)**

Interpret a marker and return a result depending on environment.

Parameters

- **marker** (*str*) -- The marker to interpret.
- **execution_context** (*mapping*) -- The context used for name lookup.

serialize

YAML and JSON serialization and deserialization functions.

Functions

`_yaml_round_trip()`

`_yaml_safe()`

`yaml_round_trip_load(string)`

`yaml_safe_load(string)`**Examples**

`yaml_round_trip_dump(object[, stream])` Dump object to string or stream.

`yaml_safe_dump(object[, stream])` Dump object to string or stream.

`json_load(string)`

continues on next page

Table 134 – continued from previous page

`json_dump(object)`

`_yaml_round_trip()``_yaml_safe()``yaml_round_trip_load(string)``yaml_safe_load(string)`

Examples

```
>>> yaml_safe_load("key: value")
{'key': 'value'}
```

`yaml_round_trip_dump(object, stream=None)`

Dump object to string or stream.

`yaml_safe_dump(object, stream=None)`

Dump object to string or stream.

`json_load(string)``json_dump(object)`

signals

Intercept signals and handle them gracefully.

Functions

`get_signal_name(signum)`

Examples

`signal_handler(handler)`

Attributes

`INTERRUPT_SIGNALS`

`INTERRUPT_SIGNALS = ('SIGABRT', 'SIGINT', 'SIGTERM', 'SIGQUIT', 'SIGBREAK')``get_signal_name(signum)`

Examples

```
>>> from signal import SIGINT
>>> get_signal_name(SIGINT)
'SIGINT'
```

signal_handler(*handler*)

toposort

Topological sorting implementation.

Functions

<code>_toposort(data)</code>	Dependencies are expressed as a dictionary whose keys are items
<code>pop_key(data)</code>	Pop an item from the graph that has the fewest dependencies in the case of a tie
<code>_safe_toposort(data)</code>	Dependencies are expressed as a dictionary whose keys are items
<code>toposort(data[, safe])</code>	

_toposort(*data*)

Dependencies are expressed as a dictionary whose keys are items and whose values are a set of dependent items. Output is a list of sets in topological order. The first set consists of items with no dependences, each subsequent set consists of items that depend upon items in the preceding sets.

pop_key(*data*)

Pop an item from the graph that has the fewest dependencies in the case of a tie The winners will be sorted alphabetically

_safe_toposort(*data*)

Dependencies are expressed as a dictionary whose keys are items and whose values are a set of dependent items. Output is a list of sets in topological order. The first set consists of items with no dependencies, each subsequent set consists of items that depend upon items in the preceding sets.

toposort(*data*, *safe=True*)

url

Common URL utilities.

Classes

<i>Url</i>	Object used to represent a Url. The string representation of this object is a url string.
------------	---

Functions

<i>hex_octal_to_int</i> (ho)	
<i>percent_decode</i> (path)	
<i>path_to_url</i> (path)	
<i>urlparse</i> (→ Url)	
<i>url_to_s3_info</i> (url)	Convert an s3 url to a tuple of bucket and key.
<i>is_url</i> (url)	

Examples

<i>is_ipv4_address</i> (string_ip)

Examples

<i>is_ipv6_address</i> (string_ip)

Examples

<i>is_ip_address</i> (string_ip)

Examples

<i>join</i> (*args)
<i>has_scheme</i> (value)
<i>strip_scheme</i> (url)

Examples

<i>mask_anaconda_token</i> (url)
<i>split_anaconda_token</i> (url)

Examples

continues on next page

Table 139 – continued from previous page

`split_platform(known_subdirs, url)`

Examples

`_split_platform_re(known_subdirs)`

`has_platform(url, known_subdirs)`

`split_scheme_auth_token(url)`

Examples

`split_conda_url_easy_parts(known_subdirs, url)`

`get_proxy_username_and_pass(scheme)`

<code>add_username_and_password(→ str)</code>	Inserts <i>username</i> and <i>password</i> into provided <i>url</i>
---	--

<code>maybe_add_auth(→ str)</code>	Add auth if the url doesn't currently have it.
------------------------------------	--

<code>maybe_unquote(url)</code>	
---------------------------------	--

<code>remove_auth(→ str)</code>	Remove embedded authentication from URL.
---------------------------------	--

<code>escape_channel_url(channel)</code>	
--	--

Attributes

<code>file_scheme</code>	<code>def url_to_path(url):</code>
--------------------------	------------------------------------

<code>url_attrs</code>	
------------------------	--

<code>join_url</code>	
-----------------------	--

hex_octal_to_int(*ho*)

percent_decode(*path*)

file_scheme = 'file:/'

```
def url_to_path(url): assert url.startswith(file_scheme), "{ } is not a file-scheme URL".format(url)
decoded = percent_decode(url[len(file_scheme):]) if decoded.startswith('/') and decoded[2] == ':':
```

```
    # A Windows path. decoded.replace('/', '')
```

```
    return decoded
```

path_to_url(*path*)

url_attrs = ('scheme', 'path', 'query', 'fragment', 'username', 'password', 'hostname', 'port')

class **Url**

Bases: `namedtuple('Url', url_attrs)`

Object used to represent a Url. The string representation of this object is a url string.

This object was inspired by the `urllib3` implementation as it gives you a way to construct URLs from various parts. The motivation behind this object was making something that is interoperable with built the `urllib.parse.urlparse` function and has more features than the built-in `ParseResult` object.

property `auth`

property `netloc`

__str__()
Return `str(self)`.

as_dict() → `dict`
Provide a public interface for namedtuple's `_asdict`

replace(***kwargs*) → *Url*
Provide a public interface for namedtuple's `_replace`

classmethod `from_parse_result`(*parse_result*: `urllib.parse.ParseResult`) → *Url*

urlparse(*url*: *str*) → *Url*

url_to_s3_info(*url*)
Convert an s3 url to a tuple of bucket and key.

Examples

```
>>> url_to_s3_info("s3://bucket-name.bucket/here/is/the/key")
('bucket-name.bucket', '/here/is/the/key')
```

is_url(*url*)

Examples

```
>>> is_url(None)
False
>>> is_url("s3://some/bucket")
True
```

is_ipv4_address(*string_ip*)

Examples

```
>>> [is_ipv4_address(ip) for ip in ('8.8.8.8', '192.168.10.10', '255.255.255.255')]
[True, True, True]
>>> [is_ipv4_address(ip) for ip in ('8.8.8', '192.168.10.10.20', '256.255.255.255',
↪ '::1')]
[False, False, False, False]
```

is_ipv6_address(*string_ip*)

Examples

```
>> [is_ipv6_address(ip) for ip in ('::1', '2001:db8:85a3::370:7334', '1234:*7+1234')] [True, True, True] >>
[is_ipv6_address(ip) for ip in ('192.168.10.10', '1234:*8+1234')] [False, False]
```

is_ip_address(*string_ip*)

Examples

```
>> is_ip_address('192.168.10.10') True >> is_ip_address('::1') True >> is_ip_address('www.google.com') False
```

join(**args*)

join_url

has_scheme(*value*)

strip_scheme(*url*)

Examples

```
>>> strip_scheme("https://www.conda.io")
'www.conda.io'
>>> strip_scheme("s3://some.bucket/plus/a/path.ext")
'some.bucket/plus/a/path.ext'
```

mask_anaconda_token(*url*)

split_anaconda_token(*url*)

Examples

```
>>> split_anaconda_token("https://1.2.3.4/t/tk-123-456/path")
(u'https://1.2.3.4/path', u'tk-123-456')
>>> split_anaconda_token("https://1.2.3.4/t//path")
(u'https://1.2.3.4/path', u'')
>>> split_anaconda_token("https://some.domain/api/t/tk-123-456/path")
(u'https://some.domain/api/path', u'tk-123-456')
>>> split_anaconda_token("https://1.2.3.4/conda/t/tk-123-456/path")
(u'https://1.2.3.4/conda/path', u'tk-123-456')
>>> split_anaconda_token("https://1.2.3.4/path")
(u'https://1.2.3.4/path', None)
>>> split_anaconda_token("https://10.2.3.4:8080/conda/t/tk-123-45")
(u'https://10.2.3.4:8080/conda', u'tk-123-45')
```

split_platform(*known_subdirs*, *url*)

Examples

```
>>> from conda.base.constants import KNOWN_SUBDIRS
>>> split_platform(KNOWN_SUBDIRS, "https://1.2.3.4/t/tk-123/linux-ppc64le/path")
(u'https://1.2.3.4/t/tk-123/path', u'linux-ppc64le')
```

`_split_platform_re(known_subdirs)`

`has_platform(url, known_subdirs)`

`split_scheme_auth_token(url)`

Examples

```
>>> split_scheme_auth_token("https://u:p@conda.io/t/x1029384756/more/path")
('conda.io/more/path', 'https', 'u:p', 'x1029384756')
>>> split_scheme_auth_token(None)
(None, None, None, None)
```

`split_conda_url_easy_parts(known_subdirs, url)`

`get_proxy_username_and_pass(scheme)`

`add_username_and_password(url: str, username: str, password: str) → str`
Inserts *username* and *password* into provided *url*

```
>>> add_username_and_password('https://anaconda.org', 'TestUser', 'Password')
'https://TestUser:Password@anaconda.org'
```

`maybe_add_auth(url: str, auth: str, force=False) → str`
Add auth if the url doesn't currently have it.

By default, does not replace auth if it already exists. Setting *force* to True overrides this behavior.

Examples

```
>>> maybe_add_auth("https://www.conda.io", "user:passwd")
'https://user:passwd@www.conda.io'
>>> maybe_add_auth("https://www.conda.io", "")
'https://www.conda.io'
```

`maybe_unquote(url)`

`remove_auth(url: str) → str`
Remove embedded authentication from URL.

`escape_channel_url(channel)`

core

Code in `conda.core` is the core logic. It is strictly forbidden from having side effects. No printing to stdout or stderr, no disk manipulation, no http requests. All side effects should be implemented through `conda.gateways`. Objects defined in `conda.models` should be heavily preferred for `conda.core` function/method arguments and return values.

Conda modules importable from `conda.core` are

- `conda._vendor`
- `conda.common`
- `conda.core`
- `conda.models`
- `conda.gateways`

Conda modules strictly off limits for import within `conda.core` are

- `conda.api`
- `conda.cli`
- `conda.client`

envs_manager

Tools for managing conda environments.

Functions

`get_user_environments_txt_file([userhome])`

`register_env(location)`

`unregister_env(location)`

`list_all_known_prefixes()`

`query_all_prefixes(spec)`

*`_clean_environments_txt(environments_txt_file[,
...])`*

*`_rewrite_environments_txt(environments_txt_file,
prefixes)`*

`get_user_environments_txt_file(userhome='~')`

`register_env(location)`

`unregister_env(location)`

`list_all_known_prefixes()`

`query_all_prefixes(spec)`

`_clean_environments_txt(environments_txt_file, remove_location=None)`

`_rewrite_environments_txt`(*environments_txt_file*, *prefixes*)

index

Tools for fetching the current index.

Functions

`check_whitelist`(*channel_urls*)

`check_allowlist`(*channel_urls*)

`get_index`(*channel_urls*, *prepend*, *platform*, ...) Return the index of packages available on the channels

`fetch_index`(*channel_urls*[, *use_cache*, *index*, *repo-*
data_fn])

`dist_str_in_index`(*index*, *dist_str*)

`_supplement_index_with_prefix`(*index*, *prefix*)

`_supplement_index_with_cache`(*index*)

`_make_virtual_package`(*name*[, *version*,
build_string])

`_supplement_index_with_features`(*index*[, *fea-*
tures])

`_supplement_index_with_system`(*index*) Loads and populates virtual package records from conda
plugins

`get_archspec_name`()

`calculate_channel_urls`(*channel_urls*, *prepend*,
...)

`get_reduced_index`(*prefix*, *channels*, *subdirs*, *specs*,
...)

Attributes

`LAST_CHANNEL_URLS`

`check_whitelist`(*channel_urls*)

`check_allowlist`(*channel_urls*)

`LAST_CHANNEL_URLS` = []

`get_index`(*channel_urls*=(), *prepend*=True, *platform*=None, *use_local*=False, *use_cache*=False, *unknown*=None,
 prefix=None, *repodata_fn*=context.repodata_fns[- 1])

Return the index of packages available on the channels

If *prepend*=False, only the channels passed in as arguments are used. If *platform*=None, then the current platform is used. If *prefix* is supplied, then the packages installed in that prefix are added.


```

fetch_index(channel_urls, use_cache=False, index=None, repodata_fn=context.repodata_fns[- 1])
dist_str_in_index(index, dist_str)
_supplement_index_with_prefix(index, prefix)
_supplement_index_with_cache(index)
_make_virtual_package(name, version=None, build_string=None)
_supplement_index_with_features(index, features=())
_supplement_index_with_system(index)
    Loads and populates virtual package records from conda plugins and adds them to the provided index, unless
    there is a naming conflict.
get_archspec_name()
calculate_channel_urls(channel_urls=(), prepend=True, platform=None, use_local=False)
get_reduced_index(prefix, channels, subdirs, specs, repodata_fn)

```

initialize

Backend logic for *conda init*.

Sections in this module are

1. top-level functions
2. plan creators
3. plan runners
4. individual operations
5. helper functions

The top-level functions compose and execute full plans.

A plan is created by composing various individual operations. The plan data structure is a list of dicts, where each dict represents an individual operation. The dict contains two keys--*function* and *kwargs*--where *function* is the name of the individual operation function within this module.

Each individual operation must

- a) return a *Result* (i.e. `NEEDS_SUDO`, `MODIFIED`, or `NO_CHANGE`)
- b) have no side effects if `context.dry_run` is `True`
- c) be verbose and descriptive about the changes being made or proposed is `context.verbosity >= 1`

The plan runner functions take the plan (list of dicts) as an argument, and then coordinate the execution of each individual operation. The docstring for *run_plan_elevated()* has details on how that strategy is implemented.

Classes

Result

Functions

install(conda_prefix)

initialize(conda_prefix, shells, for_user,
for_system, ...)

initialize_dev(shell[, dev_env_prefix,
conda_source_root])

_initialize_dev_bash(prefix, env_vars, un-
set_env_vars)

_initialize_dev_cmdexe(prefix, env_vars, un-
set_env_vars)

make_install_plan(conda_prefix)

make_initialize_plan(conda_prefix, shells, Creates a plan for initializing conda in shells.
for_user, ...)

run_plan(plan)

run_plan_elevated(plan) The strategy of this function differs between unix and
Windows. Both strategies use a

run_plan_from_stdin()

run_plan_from_temp_file(temp_path)

print_plan_results(plan[, stream])

make_entry_point(target_path, conda_prefix, mod-
ule, func)

make_entry_point_exe(target_path, conda_prefix)

install_anaconda_prompt(target_path,
conda_prefix, reverse)

_install_file(target_path, file_content)

install_conda_sh(target_path, conda_prefix)

install_Scripts_activate_bat(target_path,
conda_prefix)

install_activate_bat(target_path, conda_prefix)

install_deactivate_bat(target_path,
conda_prefix)

install_activate(target_path, conda_prefix)

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Table 145 – continued from previous page

<i>install_deactivate</i> (target_path, conda_prefix)
<i>install_condabin_conda_bat</i> (target_path, conda_prefix)
<i>install_library_bin_conda_bat</i> (target_path, conda_prefix)
<i>install_condabin_conda_activate_bat</i> (target_path, ...)
<i>install_condabin_rename_tmp_bat</i> (target_path, conda_prefix)
<i>install_condabin_conda_auto_activate_bat</i> (target_path, ...)
<i>install_condabin_hook_bat</i> (target_path, conda_prefix)
<i>install_conda_fish</i> (target_path, conda_prefix)
<i>install_conda_psm1</i> (target_path, conda_prefix)
<i>install_conda_hook_psi</i> (target_path, conda_prefix)
<i>install_conda_xsh</i> (target_path, conda_prefix)
<i>install_conda_csh</i> (target_path, conda_prefix)
<i>_config_fish_content</i> (conda_prefix)
<i>init_fish_user</i> (target_path, conda_prefix, reverse)
<i>_config_xonsh_content</i> (conda_prefix)
<i>init_xonsh_user</i> (target_path, conda_prefix, reverse)
<i>_bashrc_content</i> (conda_prefix, shell)
<i>init_sh_user</i> (target_path, conda_prefix, shell[, re- verse])
<i>init_sh_system</i> (target_path, conda_prefix[, reverse])
<i>_read_windows_registry</i> (target_path)
<i>_write_windows_registry</i> (target_path, value_value, ...)
<i>init_cmd_exe_registry</i> (target_path, conda_prefix[, reverse])
<i>init_long_path</i> (target_path)
<i>_powershell_profile_content</i> (conda_prefix)
<i>init_powershell_user</i> (target_path, conda_prefix, reverse)

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Table 145 – continued from previous page

<code>remove_conda_in_sp_dir(target_path)</code>
<code>make_conda_egg_link(target_path, conda_source_root)</code>
<code>modify_easy_install_ptb(target_path, conda_source_root)</code>
<code>make_dev_egg_info_file(target_path)</code>
<code>make_diff(old, new)</code>
<code>_get_python_info(prefix)</code>

Attributes

<code>CONDA_INITIALIZE_RE_BLOCK</code>
<code>CONDA_INITIALIZE_PS_RE_BLOCK</code>
<code>temp_path</code>

```
CONDA_INITIALIZE_RE_BLOCK = '^# >>> conda initialize >>>(?:\\n|\\r\\n)([\\s\\S]*?)# <<<
conda initialize <<<(?:\\n|\\r\\n)?'
```

```
CONDA_INITIALIZE_PS_RE_BLOCK = '^#region conda
initialize(?:\\n|\\r\\n)([\\s\\S]*?)#endregion(?:\\n|\\r\\n)?'
```

```
class Result
```

```
    NEEDS_SUDO = 'needs sudo'
```

```
    MODIFIED = 'modified'
```

```
    NO_CHANGE = 'no change'
```

```
install(conda_prefix)
```

```
initialize(conda_prefix, shells, for_user, for_system, anaconda_prompt, reverse=False)
```

```
initialize_dev(shell, dev_env_prefix=None, conda_source_root=None)
```

```
_initialize_dev_bash(prefix, env_vars, unset_env_vars)
```

```
_initialize_dev_cmdexe(prefix, env_vars, unset_env_vars)
```

```
make_install_plan(conda_prefix)
```

```
make_initialize_plan(conda_prefix, shells, for_user, for_system, anaconda_prompt, reverse=False)
```

Creates a plan for initializing conda in shells.

Bash: On Linux, when opening the terminal, `.bashrc` is sourced (because it is an interactive shell). On macOS on the other hand, the `.bash_profile` gets sourced by default when executing it in Terminal.app. Some other programs do the same on macOS so that's why we're initializing conda in `.bash_profile`. On Windows, there are multiple ways to open bash depending on how it was installed. Git Bash, Cygwin, and MSYS2 all use `.bash_profile` by default.

PowerShell: There's several places PowerShell can store its path, depending on if it's Windows PowerShell, PowerShell Core on Windows, or PowerShell Core on macOS/Linux. The easiest way to resolve it is to just ask different possible installations of PowerShell where their profiles are.

run_plan(plan)

run_plan_elevated(plan)

The strategy of this function differs between unix and Windows. Both strategies use a subprocess call, where the subprocess is run with elevated privileges. The executable invoked with the subprocess is *python -m conda.core.initialize*, so see the *if __name__ == "__main__"* at the bottom of this module.

For unix platforms, we convert the plan list to json, and then call this module with *sudo python -m conda.core.initialize* while piping the plan json to stdin. We collect json from stdout for the results of the plan execution with elevated privileges.

For Windows, we create a temporary file that holds the json content of the plan. The subprocess reads the content of the file, modifies the content of the file with updated execution status, and then closes the file. This process then reads the content of that file for the individual operation execution results, and then deletes the file.

run_plan_from_stdin()

run_plan_from_temp_file(temp_path)

print_plan_results(plan, stream=None)

make_entry_point(target_path, conda_prefix, module, func)

make_entry_point_exe(target_path, conda_prefix)

install_anaconda_prompt(target_path, conda_prefix, reverse)

_install_file(target_path, file_content)

install_conda_sh(target_path, conda_prefix)

install_Scripts_activate_bat(target_path, conda_prefix)

install_activate_bat(target_path, conda_prefix)

install_deactivate_bat(target_path, conda_prefix)

install_activate(target_path, conda_prefix)

install_deactivate(target_path, conda_prefix)

install_condabin_conda_bat(target_path, conda_prefix)

install_library_bin_conda_bat(target_path, conda_prefix)

install_condabin_conda_activate_bat(target_path, conda_prefix)

install_condabin_rename_tmp_bat(target_path, conda_prefix)

install_condabin_conda_auto_activate_bat(target_path, conda_prefix)

install_condabin_hook_bat(target_path, conda_prefix)

install_conda_fish(target_path, conda_prefix)

install_conda_psm1(target_path, conda_prefix)

install_conda_hook_ps1(target_path, conda_prefix)

install_conda_xsh(target_path, conda_prefix)

install_conda_csh(target_path, conda_prefix)

_config_fish_content(conda_prefix)

```
init_fish_user(target_path, conda_prefix, reverse)
_config_xonsh_content(conda_prefix)
init_xonsh_user(target_path, conda_prefix, reverse)
_bashrc_content(conda_prefix, shell)
init_sh_user(target_path, conda_prefix, shell, reverse=False)
init_sh_system(target_path, conda_prefix, reverse=False)
_read_windows_registry(target_path)
_write_windows_registry(target_path, value_value, value_type)
init_cmd_exe_registry(target_path, conda_prefix, reverse=False)
init_long_path(target_path)
_powershell_profile_content(conda_prefix)
init_powershell_user(target_path, conda_prefix, reverse)
remove_conda_in_sp_dir(target_path)
make_conda_egg_link(target_path, conda_source_root)
modify_easy_install_pth(target_path, conda_source_root)
make_dev_egg_info_file(target_path)
make_diff(old, new)
_get_python_info(prefix)
temp_path
```

link

Package installation implemented as a series of link/unlink transactions.

Classes

PrefixSetup

ActionGroup

PrefixActionGroup

ChangeReport

UnlinkLinkTransaction

Functions

determine_link_type(*extracted_package_dir*,
target_prefix)

make_unlink_actions(*transaction_context*, ...)

match_specs_to_dists(*packages_info_to_link*,
specs)

run_script(→ bool)

Call the post-link (or pre-unlink) script, returning True
on success,

messages(*prefix*)

determine_link_type(*extracted_package_dir*, *target_prefix*)

make_unlink_actions(*transaction_context*, *target_prefix*, *prefix_record*)

match_specs_to_dists(*packages_info_to_link*, *specs*)

class PrefixSetup

Bases: `NamedTuple`

target_prefix: `str`

unlink_precs: `Iterable[conda.models.records.PackageRecord]`

link_precs: `Iterable[conda.models.records.PackageRecord]`

remove_specs: `Iterable[conda.resolve.MatchSpec]`

update_specs: `Iterable[conda.resolve.MatchSpec]`

neutered_specs: `Iterable[conda.resolve.MatchSpec]`

class ActionGroup

Bases: `NamedTuple`

type: `str`

pkg_data: `PackageInfo | None`

actions: `Iterable[conda.core.path_actions._Action]`

target_prefix: `str`

class PrefixActionGroup

Bases: `NamedTuple`

remove_menu_action_groups: `Iterable[ActionGroup]`

unlink_action_groups: `Iterable[ActionGroup]`

unregister_action_groups: `Iterable[ActionGroup]`

link_action_groups: `Iterable[ActionGroup]`

register_action_groups: `Iterable[ActionGroup]`

compile_action_groups: `Iterable[ActionGroup]`

make_menu_action_groups: `Iterable[ActionGroup]`

entry_point_action_groups: `Iterable[ActionGroup]`

```
    prefix_record_groups: Iterable[ActionGroup]

class ChangeReport
    Bases: NamedTuple

    prefix: str

    specs_to_remove: Iterable[conda.resolve.MatchSpec]
    specs_to_add: Iterable[conda.resolve.MatchSpec]
    removed_precs: Iterable[conda.models.records.PackageRecord]
    new_precs: Iterable[conda.models.records.PackageRecord]
    updated_precs: Iterable[conda.models.records.PackageRecord]
    downgraded_precs: Iterable[conda.models.records.PackageRecord]
    superseded_precs: Iterable[conda.models.records.PackageRecord]
    fetch_precs: Iterable[conda.models.records.PackageRecord]

class UnlinkLinkTransaction(*setups)

    property nothing_to_do
    download_and_extract()
    prepare()
    verify()
    _verify_pre_link_message(all_link_groups)
    execute()
    _get_pfe()

    classmethod _prepare(transaction_context, target_prefix, unlink_precs, link_precs, remove_specs,
                          update_specs, neutered_specs)

    static _verify_individual_level(prefix_action_group)
    static _verify_prefix_level(target_prefix_AND_prefix_action_group_tuple)
    static _verify_transaction_level(prefix_setups)
    _verify(prefix_setups, prefix_action_groups)
    _execute(all_action_groups)

    static _execute_actions(axngroup)
    static _execute_post_link_actions(axngroup)
    static _reverse_actions(axngroup, reverse_from_idx=- 1)
    static _get_python_version(target_prefix, pcrecs_to_unlink, packages_info_to_link)
    static _make_link_actions(transaction_context, package_info, target_prefix, requested_link_type,
                              requested_spec)

    static _make_entry_point_actions(transaction_context, package_info, target_prefix,
                                     requested_link_type, requested_spec, link_action_groups)

    static _make_compile_actions(transaction_context, package_info, target_prefix, requested_link_type,
                                 requested_spec, link_action_groups)
```



```

    _make_legacy_action_groups()
    print_transaction_summary()
    _change_report_str(change_report)
    static _calculate_change_report(prefix, unlink_precs, link_precs, download_urls, specs_to_remove,
                                    specs_to_add)
run_script(prefix: str, prec, action: str = 'post-link', env_prefix: str = None, activate: bool = False) → bool
    Call the post-link (or pre-unlink) script, returning True on success, False on failure.
messages(prefix)
```

package_cache

Backport of conda.core.package_cache_data for conda-build.

ProgressiveFetchExtract

package_cache_data

Tools for managing the package cache (previously downloaded packages).

Classes

<i>PackageCacheType</i>	This metaclass does basic caching of PackageCache instance objects.
<i>PackageCacheData</i>	
<i>UrlsData</i>	
<i>ProgressiveFetchExtract</i>	

Functions

<i>do_cache_action</i> (prec, cache_action, progress_bar[, ...])	This function gets called from <i>ProgressiveFetchExtract.execute</i> .
<i>do_extract_action</i> (prec, extract_action, progress_bar)	This function gets called after <i>do_cache_action</i> completes.
<i>do_cleanup</i> (actions)	
<i>do_reverse</i> (actions)	
<i>done_callback</i> (future, actions, progress_bar, exceptions)	
<i>rm_fetched</i> (dist)	Checks to see if the requested package is in the cache; and if so, it removes both

continues on next page

Table 150 – continued from previous page

download(url, dst_path[, session, md5sum, urlstxt, ...])

Attributes

FileNotFoundError

THREADSAFE_EXTRACT

EXTRACT_THREADS

FileNotFoundError

THREADSAFE_EXTRACT = False**EXTRACT_THREADS****class PackageCacheType**Bases: *type*

This metaclass does basic caching of PackageCache instance objects.

__call__(pkgs_dir)

Call self as a function.

class PackageCacheData(pkgs_dir)**property** _package_cache_records**property** is_writable**_cache_****insert**(package_cache_record)**load**()**reload**()**get**(package_ref, default=NULL)**remove**(package_ref, default=NULL)**query**(package_ref_or_match_spec)**iter_records**()**classmethod** query_all(package_ref_or_match_spec, pkgs_dirs=None)**classmethod** first_writable(pkgs_dirs=None)**classmethod** writable_caches(pkgs_dirs=None)**classmethod** read_only_caches(pkgs_dirs=None)**classmethod** all_caches_writable_first(pkgs_dirs=None)**classmethod** get_all_extracted_entries()**classmethod** get_entry_to_link(package_ref)

```

    classmethod tarball_file_in_cache(tarball_path, md5sum=None, exclude_caches=())
    classmethod clear()
    tarball_file_in_this_cache(tarball_path, md5sum=None)
    _check_writable()
    static _clean_tarball_path_and_get_md5sum(tarball_path, md5sum=None)
    _scan_for_dist_no_channel(dist_str)
    itervalues()
    values()
    __repr__()
        Return repr(self).
    _make_single_record(package_filename)
    static _dedupe_pkgs_dir_contents(pkgs_dir_contents)
class UrlsData(pkgs_dir)

    __contains__(url)
    __iter__()
    add_url(url)
    get_url(package_path)
class ProgressiveFetchExtract(link_prefs)

    property cache_actions
    property extract_actions
    static make_actions_for_record(pref_or_spec)
    prepare()
    execute()
        Run each action in self.paired_actions. Each action in cache_actions runs before its corresponding ex-
        tract_actions.
    static _progress_bar(prec_or_spec, position=None, leave=False)
    __hash__()
        Return hash(self).
    __eq__(other)
        Return self==value.
do_cache_action(prec, cache_action, progress_bar, download_total=1.0)
    This function gets called from ProgressiveFetchExtract.execute.
do_extract_action(prec, extract_action, progress_bar)
    This function gets called after do_cache_action completes.
do_cleanup(actions)
do_reverse(actions)

```

done_callback(*future*: *concurrent.futures.Future*, *actions*: *tuple*[*CacheUrlAction* | *ExtractPackageAction*, *Ellipsis*], *progress_bar*: *conda.common.io.ProgressBar*, *exceptions*: *list*[*Exception*], *finish*: *bool* = *False*)

rm_fetched(*dist*)

Checks to see if the requested package is in the cache; and if so, it removes both the package itself and its extracted contents.

download(*url*, *dst_path*, *session*=*None*, *md5sum*=*None*, *urlstxt*=*False*, *retries*=3)

path_actions

Atomic actions that make up a package installation or removal transaction.

Classes

<i>_Action</i>	
<i>PathAction</i>	
<i>MultiPathAction</i>	
<i>PrefixPathAction</i>	
<i>CreateInPrefixPathAction</i>	
<i>LinkPathAction</i>	
<i>PrefixReplaceLinkAction</i>	
<i>MakeMenuAction</i>	
<i>CreateNonadminAction</i>	
<i>CompileMultiPycAction</i>	
<i>AggregateCompileMultiPycAction</i>	Bunch up all of our compile actions, so that they all get carried out at once.
<i>CreatePythonEntryPointAction</i>	
<i>CreatePrefixRecordAction</i>	
<i>UpdateHistoryAction</i>	
<i>RegisterEnvironmentLocationAction</i>	
<i>RemoveFromPrefixPathAction</i>	
<i>UnlinkPathAction</i>	

continues on next page

Table 152 – continued from previous page

RemoveMenuAction

RemoveLinkedPackageRecordAction

UnregisterEnvironmentLocationAction

CacheUrlAction

ExtractPackageAction

Attributes

FileNotFoundError

REPR_IGNORE_KWARGS

FileNotFoundError

`REPR_IGNORE_KWARGS = ('transaction_context', 'package_info', 'hold_path')``class _Action` `property verified` `_verified = False` `abstract verify()` `abstract execute()` `abstract reverse()` `abstract cleanup()` `__repr__()` `Return repr(self).``class PathAction` `Bases: _Action` `abstract property target_full_path``class MultiPathAction` `Bases: _Action` `abstract property target_full_paths``class PrefixPathAction(transaction_context, target_prefix, target_short_path)` `Bases: PathAction` `property target_short_paths` `property target_full_path`

```
class CreateInPrefixPathAction(transaction_context, package_info, source_prefix, source_short_path,
                               target_prefix, target_short_path)
    Bases: PrefixPathAction
    property source_full_path
    verify()
    cleanup()

class LinkPathAction(transaction_context, package_info, extracted_package_dir, source_short_path,
                     target_prefix, target_short_path, link_type, source_path_data)
    Bases: CreateInPrefixPathAction
    classmethod create_file_link_actions(transaction_context, package_info, target_prefix,
                                         requested_link_type)
    classmethod create_directory_actions(transaction_context, package_info, target_prefix,
                                         requested_link_type, file_link_actions)
    classmethod create_python_entry_point_windows_exe_action(transaction_context, package_info,
                                                              target_prefix, requested_link_type,
                                                              entry_point_def)

    verify()
    execute()
    reverse()

class PrefixReplaceLinkAction(transaction_context, package_info, extracted_package_dir,
                              source_short_path, target_prefix, target_short_path, link_type,
                              prefix_placeholder, file_mode, source_path_data)
    Bases: LinkPathAction
    verify()
    execute()

class MakeMenuAction(transaction_context, package_info, target_prefix, target_short_path)
    Bases: CreateInPrefixPathAction
    classmethod create_actions(transaction_context, package_info, target_prefix, requested_link_type)
    execute()
    reverse()

class CreateNonadminAction(transaction_context, package_info, target_prefix)
    Bases: CreateInPrefixPathAction
    classmethod create_actions(transaction_context, package_info, target_prefix, requested_link_type)
    execute()
    reverse()

class CompileMultiPycAction(transaction_context, package_info, target_prefix, source_short_paths,
                             target_short_paths)
    Bases: MultiPathAction
    property target_full_paths
    property source_full_paths
```

```

    classmethod create_actions(transaction_context, package_info, target_prefix, requested_link_type,
                               file_link_actions)

    verify()

    cleanup()

    execute()

    reverse()

class AggregateCompileMultiPycAction(*individuals, **kw)
    Bases: CompileMultiPycAction

    Bunch up all of our compile actions, so that they all get carried out at once. This avoids clobbering and is faster
    when we have several individual packages requiring compilation.

class CreatePythonEntryPointAction(transaction_context, package_info, target_prefix, target_short_path,
                                   module, func)
    Bases: CreateInPrefixPathAction

    classmethod create_actions(transaction_context, package_info, target_prefix, requested_link_type)

    execute()

    reverse()

class CreatePrefixRecordAction(transaction_context, package_info, target_prefix, target_short_path,
                               requested_link_type, requested_spec, all_link_path_actions)
    Bases: CreateInPrefixPathAction

    classmethod create_actions(transaction_context, package_info, target_prefix, requested_link_type,
                               requested_spec, all_link_path_actions)

    execute()

    reverse()

class UpdateHistoryAction(transaction_context, target_prefix, target_short_path, remove_specs, update_specs,
                           neutered_specs)
    Bases: CreateInPrefixPathAction

    classmethod create_actions(transaction_context, target_prefix, remove_specs, update_specs,
                               neutered_specs)

    execute()

    reverse()

    cleanup()

class RegisterEnvironmentLocationAction(transaction_context, target_prefix)
    Bases: PathAction

    abstract property target_full_path

    verify()

    execute()

    reverse()

    cleanup()

class RemoveFromPrefixPathAction(transaction_context, linked_package_data, target_prefix,
                                  target_short_path)
    Bases: PrefixPathAction

```

```
    verify()

class UnlinkPathAction(transaction_context, linked_package_data, target_prefix, target_short_path,
                        link_type=LinkType.hardlink)
    Bases: RemoveFromPrefixPathAction
    execute()
    reverse()
    cleanup()

class RemoveMenuAction(transaction_context, linked_package_data, target_prefix, target_short_path)
    Bases: RemoveFromPrefixPathAction
    classmethod create_actions(transaction_context, linked_package_data, target_prefix)
    execute()
    reverse()
    cleanup()

class RemoveLinkedPackageRecordAction(transaction_context, linked_package_data, target_prefix,
                                       target_short_path)
    Bases: UnlinkPathAction
    execute()
    reverse()

class UnregisterEnvironmentLocationAction(transaction_context, target_prefix)
    Bases: PathAction
    abstract property target_full_path
    verify()
    execute()
    reverse()
    cleanup()

class CacheUrlAction(url, target_pkgs_dir, target_package_basename, sha256=None, size=None, md5=None)
    Bases: PathAction
    property target_full_path
    verify()
    execute(progress_update_callback=None)
    _execute_local(source_path, target_package_cache, progress_update_callback=None)
    _execute_channel(target_package_cache, progress_update_callback=None)
    reverse()
    cleanup()
    __str__()
        Return str(self).

class ExtractPackageAction(source_full_path, target_pkgs_dir, target_extracted_dirname, record_or_spec,
                           sha256, size, md5)
    Bases: PathAction
```



```

property target_full_path
verify()
execute(progress_update_callback=None)
reverse()
cleanup()
__str__()
    Return str(self).

```

portability

Tools for cross-OS portability.

Functions

<code>update_prefix(path, new_prefix[, placeholder, mode, ...])</code>	
<code>replace_prefix(→ bytes)</code>	Replaces <i>placeholder</i> text with the <i>new_prefix</i> provided. The <i>mode</i> provided can
<code>binary_replace(→ bytes)</code>	Perform a binary replacement of <i>data</i> , where the placeholder <i>search</i> is
<code>has_pyzzzer_entry_point(data)</code>	
<code>replace_pyzzzer_entry_point_shebang(all_data, ...)</code>	Code adapted from pyzzzer. This is meant to deal with entry point exe's created by distlib,
<code>replace_long_shebang(mode, data)</code>	
<code>generate_shebang_for_entry_point(executable[, ...])</code>	This function can be used to generate a shebang line for Python entry points.

Attributes

<code>SHEBANG_REGEX</code>	
<code>MAX_SHEBANG_LENGTH</code>	
<code>POPULAR_ENCODINGS</code>	

```
SHEBANG_REGEX = b'^(!(?:[ ]*)(/?:\\\\\\\\ |[^ \\n\\r\\t]*)*)(.*)$'
```

```
MAX_SHEBANG_LENGTH
```

```
POPULAR_ENCODINGS = ('utf-8', 'utf-16-le', 'utf-16-be', 'utf-32-le', 'utf-32-be')
```

```
exception _PaddingError
```

```
    Bases: Exception
```

```
    Common base class for all non-exit exceptions.
```

update_prefix(*path*, *new_prefix*, *placeholder*=PREFIX_PLACEHOLDER, *mode*=FileMode.text, *subdir*=context.subdir)

replace_prefix(*mode*: conda.models.enums.FileMode, *data*: bytes, *placeholder*: str, *new_prefix*: str) → bytes
Replaces *placeholder* text with the *new_prefix* provided. The *mode* provided can either be text or binary.

We use the *POPULAR_ENCODINGS* module level constant defined above to make several passes at replacing the placeholder. We do this to account for as many encodings as possible. If this causes any performance problems in the future, it could potentially be removed (i.e. just using the most popular "utf-8" encoding").

More information/discussion available here: <https://github.com/conda/conda/pull/9946>

binary_replace(*data*: bytes, *search*: bytes, *replacement*: bytes, *encoding*: str = 'utf-8') → bytes
Perform a binary replacement of *data*, where the placeholder *search* is replaced with *replacement* and the remaining string is padded with null characters. All input arguments are expected to be bytes objects.

Parameters

- **data** -- The bytes object that will be searched and replaced
- **search** -- The bytes object to find
- **replacement** -- The bytes object that will replace *search*
- **encoding** (*str*) -- The encoding of the expected string in the binary.

has_pyzzzer_entry_point(*data*)

replace_pyzzzer_entry_point_shebang(*all_data*, *placeholder*, *new_prefix*)

Code adapted from pyzzzer. This is meant to deal with entry point exe's created by distlib, which consist of a launcher, then a shebang, then a zip archive of the entry point code to run. We need to change the shebang. https://bitbucket.org/vinay.sajip/pyzzzer/src/5d5740cb04308f067d5844a56f91e7a27efccc/pyzzzer/__init__.py?at=default&fileviewer=file-view-default#__init__.py-112 # NOQA

replace_long_shebang(*mode*, *data*)

generate_shebang_for_entry_point(*executable*, *with_usr_bin_env*=False)

This function can be used to generate a shebang line for Python entry points.

Use cases: - At install/link time, to generate the *noarch*: *python* entry points. - conda init uses it to create its own entry point during conda-build

prefix_data

Tools for managing the packages installed within an environment.

Classes

PrefixDataType

Basic caching of PrefixData instance objects.

PrefixData

Functions

<code>get_conda_anchor_files_and_records(...)</code>	Return the anchor files for the conda records of python packages.
<code>get_python_version_for_prefix(prefix)</code>	
<code>delete_prefix_from_linked_data(path)</code>	Here, path may be a complete prefix or a dist inside a prefix

class PrefixDataType

Bases: `type`

Basic caching of PrefixData instance objects.

`__call__`(*prefix_path*, *pip_interop_enabled=None*)
Call self as a function.

class PrefixData(*prefix_path*, *pip_interop_enabled=None*)

property `_prefix_records`

property `is_writable`

property `_python_pkg_record`

Return the prefix record for the package python.

`_cache_`

`load()`

`reload()`

`_get_json_fn(prefix_record)`

`insert(prefix_record)`

`remove(package_name)`

`get(package_name, default=NULL)`

`iter_records()`

`iter_records_sorted()`

`all_subdir_urls()`

`query(package_ref_or_match_spec)`

`_load_single_record(prefix_record_json_path)`

`_has_python()`

`_load_site_packages()`

Load non-conda-installed python packages in the site-packages of the prefix.

Python packages not handled by conda are installed via other means, like using pip or using python setup.py develop for local development.

Packages found that are not handled by conda are converted into a prefix record and handled in memory.

Packages clobbering conda packages (i.e. the conda-meta record) are removed from the in memory representation.

```
_get_environment_state_file()
```

```
_write_environment_state_file(state)
```

```
get_environment_env_vars()
```

```
set_environment_env_vars(env_vars)
```

```
unset_environment_env_vars(env_vars)
```

```
get_conda_anchor_files_and_records(site_packages_short_path, python_records)
```

Return the anchor files for the conda records of python packages.

```
get_python_version_for_prefix(prefix)
```

```
delete_prefix_from_linked_data(path)
```

Here, path may be a complete prefix or a dist inside a prefix

solve

The classic solver implementation.

Classes

Solver

A high-level API to conda's solving logic. Three public methods are provided to access a

SolverStateContainer

Functions

_get_solver_class(*[key]*)

Load the correct solver backend.

get_pinned_specs(*prefix*)

Find pinned specs from file and return a tuple of Match-Spec.

diff_for_unlink_link_precs(*prefix*, *final_precs*[,
...])

```
_get_solver_class(key=None)
```

Load the correct solver backend.

See `context.solver` for more details.

```
class Solver(prefix, channels, subdirs=(), specs_to_add=(), specs_to_remove=(), repodata_fn=REPODATA_FN,  
            command=NULL)
```

A high-level API to conda's solving logic. Three public methods are provided to access a solution in various forms.

- *solve_final_state*()
- *solve_for_diff*()
- *solve_for_transaction*()

solve_for_transaction(*update_modifier=NULL, deps_modifier=NULL, prune=NULL, ignore_pinned=NULL, force_remove=NULL, force_reinstall=NULL, should_retry_solve=False*)

Gives an `UnlinkLinkTransaction` instance that can be used to execute the solution on an environment.

Parameters

- **deps_modifier** (`DepsModifier`) -- See `solve_final_state()`.
- **prune** (`bool`) -- See `solve_final_state()`.
- **ignore_pinned** (`bool`) -- See `solve_final_state()`.
- **force_remove** (`bool`) -- See `solve_final_state()`.
- **force_reinstall** (`bool`) -- See `solve_for_diff()`.
- **should_retry_solve** (`bool`) -- See `solve_final_state()`.

Returns

Return type `UnlinkLinkTransaction`

solve_for_diff(*update_modifier=NULL, deps_modifier=NULL, prune=NULL, ignore_pinned=NULL, force_remove=NULL, force_reinstall=NULL, should_retry_solve=False*)

Gives the package references to remove from an environment, followed by the package references to add to an environment.

Parameters

- **deps_modifier** (`DepsModifier`) -- See `solve_final_state()`.
- **prune** (`bool`) -- See `solve_final_state()`.
- **ignore_pinned** (`bool`) -- See `solve_final_state()`.
- **force_remove** (`bool`) -- See `solve_final_state()`.
- **force_reinstall** (`bool`) --

For requested `specs_to_add` that are already satisfied in the environment, instructs the solver to remove the package and spec from the environment, and then add it back--possibly with the exact package instance modified, depending on the spec exactness.

- **should_retry_solve** (`bool`) -- See `solve_final_state()`.

Returns A two-tuple of `PackageRef` sequences. The first is the group of packages to remove from the environment, in sorted dependency order from leaves to roots. The second is the group of packages to add to the environment, in sorted dependency order from roots to leaves.

Return type `tuple[PackageRef], tuple[PackageRef]`

solve_final_state(*update_modifier=NULL, deps_modifier=NULL, prune=NULL, ignore_pinned=NULL, force_remove=NULL, should_retry_solve=False*)

Gives the final, solved state of the environment.

Parameters

- **update_modifier** (`UpdateModifier`) -- An optional flag directing how updates are handled regarding packages already existing in the environment.
- **deps_modifier** (`DepsModifier`) -- An optional flag indicating special solver handling for dependencies. The default solver behavior is to be as conservative as possible with dependency updates (in the case the dependency already exists in the environment), while

still ensuring all dependencies are satisfied. Options include * NO_DEPS * ONLY_DEPS * UPDATE_DEPS * UPDATE_DEPS_ONLY_DEPS * FREEZE_INSTALLED

- **prune** (*bool*) -- If True, the solution will not contain packages that were previously brought into the environment as dependencies but are no longer required as dependencies and are not user-requested.
- **ignore_pinned** (*bool*) -- If True, the solution will ignore pinned package configuration for the prefix.
- **force_remove** (*bool*) -- Forces removal of a package without removing packages that depend on it.
- **should_retry_solve** (*bool*) -- Indicates whether this solve will be retried. This allows us to control whether to call `find_conflicts` (slow) in `ssc.r.solve`

Returns In sorted dependency order from roots to leaves, the package references for the solved state of the environment.

Return type `tuple[PackageRef]`

`determine_constraining_specs(spec, solution_precs)`

`get_request_package_in_solution(solution_precs, specs_map)`

`get_constrained_packages(pre_packages, post_packages, index_keys)`

`_collect_all_metadata(ssc)`

`_remove_specs(ssc)`

`_find_inconsistent_packages(ssc)`

`_package_has_updates(ssc, spec, installed_pool)`

`_should_freeze(ssc, target_prec, conflict_specs, explicit_pool, installed_pool)`

`_add_specs(ssc)`

`_run_sat(ssc)`

`_post_sat_handling(ssc)`

`_notify_conda_outdated(link_precs)`

`_prepare(prepared_specs)`

`class SolverStateContainer(prefix, update_modifier, deps_modifier, prune, ignore_pinned, force_remove, should_retry_solve)`

`prefix_data()`

`specs_from_history_map()`

`track_features_specs()`

`pinned_specs()`

`set_repository_metadata(index, r)`

`working_state_reset()`

`get_pinned_specs(prefix)`

Find pinned specs from file and return a tuple of MatchSpec.

`diff_for_unlink_link_precs(prefix, final_precs, specs_to_add=(), force_reinstall=NULL)`

subdir_data

Tools for managing a subdir's repodata.json.

Classes

SubdirDataType

PackageRecordList

Lazily convert dicts to PackageRecord.

SubdirData

Functions

read_mod_and_etag(path)

get_cache_control_max_age(cache_control_value)

make_feature_record(feature_name)

fetch_repodata_remote_request(url, etag, mod_stamp[, ...])
param etag cached etag header

Attributes

REPODATA_PICKLE_VERSION

MAX_REPODATA_VERSION

REPODATA_HEADER_RE

REPODATA_PICKLE_VERSION = 30

MAX_REPODATA_VERSION = 1

REPODATA_HEADER_RE = b'((_etag|_mod|_cache_control)":[]?("(.*?[^\\]\\")"[,}\\s]'

class SubdirDataType

Bases: `type`

__call__(channel, repodata_fn=REPODATA_FN)

Call self as a function.

class PackageRecordList(initlist=None)

Bases: `collections.UserList`

Lazily convert dicts to PackageRecord.

__getitem__(i)

```
class SubdirData(channel, repodata_fn=REPODATA_FN, RepoInterface=CondaRepoInterface)

    property _repo: conda.gateways.repodata.RepoInterface
        Changes as we mutate self.repodata_fn.

    property repo_cache: conda.gateways.repodata.RepodataCache

    property repo_fetch: conda.gateways.repodata.RepodataFetch
        Object to get repodata. Not cached since self.repodata_fn is mutable.

        Replaces fetch_repodata_remote_request, self._repo, self.repo_cache.

    property cache_path_base

    property url_w_repodata_fn

    property cache_path_json

    property cache_path_state
        Out-of-band etag and other state needed by the RepoInterface.

    property cache_path_pickle

    _cache_

    classmethod clear_cached_local_channel_data(exclude_file=True)

    static query_all(package_ref_or_match_spec, channels=None, subdirs=None,
                    repodata_fn=REPODATA_FN)

    query(package_ref_or_match_spec)

    reload()

    load()

    iter_records()

    _iter_records_by_name(name)

    _load_state()
        Cache headers and additional data needed to keep track of the cache are stored separately, instead of the
        previous "added to repodata.json" arrangement.

    _save_state(state: conda.gateways.repodata.RepodataState)

    _load()
        Try to load repodata. If e.g. we are downloading current_repodata.json, fall back to repodata.json when
        the former is unavailable.

    _pickle_me()

    _read_local_repodata(state: conda.gateways.repodata.RepodataState)

    _pickle_valid_checks(pickled_state, mod, etag)
        Throw away the pickle if these don't all match.

    _read_pickled(state: conda.gateways.repodata.RepodataState)

    _process_raw_repodata_str(raw_repodata_str, state: RepodataState | None = None)
        State contains information that was previously in-band in raw_repodata_str.

    _process_raw_repodata(repodata: dict, state: RepodataState | None = None)

read_mod_and_etag(path)

get_cache_control_max_age(cache_control_value: str)
```


`make_feature_record(feature_name)`

`fetch_repodata_remote_request(url, etag, mod_stamp, repodata_fn=REPODATA_FN)`

Parameters

- **etag** -- cached etag header
- **mod_stamp** -- cached last-modified header

deprecations

Tools to aid in deprecating code.

Classes

DeprecationHandler

Attributes

deprecated

exception `DeprecatedError`

Bases: `RuntimeError`

Unspecified run-time error.

class `DeprecationHandler(version: Version | str)`

_version: `packaging.version.Version`

__call__(*deprecate_in: str, remove_in: str, *, addendum: str | None = None, stack: int = 0*) → `Callable[[Callable, Callable]]`

Deprecation decorator for functions, methods, & classes.

Parameters

- **deprecate_in** -- Version in which code will be marked as deprecated.
- **remove_in** -- Version in which code is expected to be removed.
- **addendum** -- Optional additional messaging. Useful to indicate what to do instead.
- **stack** -- Optional stacklevel increment.

argument(*deprecate_in: str, remove_in: str, argument: str, *, rename: str | None = None, addendum: str | None = None, stack: int = 0*) → `Callable[[Callable, Callable]]`

Deprecation decorator for keyword arguments.

Parameters

- **deprecate_in** -- Version in which code will be marked as deprecated.

- **remove_in** -- Version in which code is expected to be removed.
- **argument** -- The argument to deprecate.
- **rename** -- Optional new argument name.
- **addendum** -- Optional additional messaging. Useful to indicate what to do instead.
- **stack** -- Optional stacklevel increment.

action(*deprecate_in*: *str*, *remove_in*: *str*, *action*: *argparse.Action*, *, *addendum*: *str* | *None* = *None*, *stack*: *int* = 0)

module(*deprecate_in*: *str*, *remove_in*: *str*, *, *addendum*: *str* | *None* = *None*, *stack*: *int* = 0) → *None*
Deprecation function for modules.

Parameters

- **deprecate_in** -- Version in which code will be marked as deprecated.
- **remove_in** -- Version in which code is expected to be removed.
- **addendum** -- Optional additional messaging. Useful to indicate what to do instead.
- **stack** -- Optional stacklevel increment.

constant(*deprecate_in*: *str*, *remove_in*: *str*, *constant*: *str*, *value*: *Any*, *, *addendum*: *str* | *None* = *None*, *stack*: *int* = 0) → *None*

Deprecation function for module constant/global.

Parameters

- **deprecate_in** -- Version in which code will be marked as deprecated.
- **remove_in** -- Version in which code is expected to be removed.
- **constant** --
- **value** --
- **addendum** -- Optional additional messaging. Useful to indicate what to do instead.
- **stack** -- Optional stacklevel increment.

topic(*deprecate_in*: *str*, *remove_in*: *str*, *, *topic*: *str*, *addendum*: *str* | *None* = *None*, *stack*: *int* = 0) → *None*
Deprecation function for a topic.

Parameters

- **deprecate_in** -- Version in which code will be marked as deprecated.
- **remove_in** -- Version in which code is expected to be removed.
- **topic** -- The topic being deprecated.
- **addendum** -- Optional additional messaging. Useful to indicate what to do instead.
- **stack** -- Optional stacklevel increment.

_get_module(*stack*: *int*) → *tuple*[*types.ModuleType*, *str*]
Detect the module from which we are being called.

Parameters **stack** -- The stacklevel increment.

Returns The module and module name.

_generate_message(*deprecate_in*: *str*, *remove_in*: *str*, *prefix*: *str*, *addendum*: *str*) → *tuple*[*type*[*Warning*] | *None*, *str*]

Deprecation decorator for functions, methods, & classes.

Parameters

- **deprecate_in** -- Version in which code will be marked as deprecated.
- **remove_in** -- Version in which code is expected to be removed.
- **prefix** -- The message prefix, usually the function name.
- **addendum** -- Additional messaging. Useful to indicate what to do instead.

Returns The warning category (if applicable) and the message.

deprecated

exception_handler

Error handling and error reporting.

Classes

ExceptionHandler

Functions

conda_exception_handler(func, *args, **kwargs)

class ExceptionHandler

```

property http_timeout
property user_agent
property error_upload_url
property _isatty
__call__(func, *args, **kwargs)
write_out(*content)
handle_exception(exc_val, exc_tb)
handle_application_exception(exc_val, exc_tb)
_print_conda_exception(exc_val, exc_tb)
handle_unexpected_exception(exc_val, exc_tb)
handle_reportable_application_exception(exc_val, exc_tb)
get_error_report(exc_val, exc_tb)
print_unexpected_error_report(error_report)
print_expected_error_report(error_report)

```

`_upload(error_report) → None`
Determine whether or not to upload the error report.

`_ask_upload()`

`_execute_upload(error_report)`

`_post_upload(do_upload)`

`conda_exception_handler(func, *args, **kwargs)`

exceptions

Conda exceptions.

Functions

`maybe_raise(error, context)`

`print_conda_exception(exc_val[, exc_tb])`

`_format_exc([exc_val, exc_tb])`

exception `ResolvePackageNotFound(bad_deps)`

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `LockError(message)`

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `ArgumentError(message, **kwargs)`

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

return_code = 2

exception `Help(message, caused_by=None, **kwargs)`

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `ActivateHelp`

Bases: `Help`

Common base class for all non-exit exceptions.

exception `DeactivateHelp`

Bases: `Help`

Common base class for all non-exit exceptions.

exception `GenericHelp(command)`

Bases: `Help`

Common base class for all non-exit exceptions.

exception `CondaSignalInterrupt`(*signum*)

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `TooManyArgumentsError`(*expected*, *received*, *offending_arguments*, *optional_message*="", *args)

Bases: `ArgumentError`

Common base class for all non-exit exceptions.

exception `ClobberError`(*message*, *path_conflict*, **kwargs)

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

`__repr__()`

Return repr(self).

exception `BasicClobberError`(*source_path*, *target_path*, *context*)

Bases: `ClobberError`

Common base class for all non-exit exceptions.

exception `KnownPackageClobberError`(*target_path*, *colliding_dist_being_linked*, *colliding_linked_dist*, *context*)

Bases: `ClobberError`

Common base class for all non-exit exceptions.

exception `UnknownPackageClobberError`(*target_path*, *colliding_dist_being_linked*, *context*)

Bases: `ClobberError`

Common base class for all non-exit exceptions.

exception `SharedLinkPathClobberError`(*target_path*, *incompatible_package_dists*, *context*)

Bases: `ClobberError`

Common base class for all non-exit exceptions.

exception `CommandNotFoundError`(*command*)

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `PathNotFoundError`(*path*)

Bases: `conda.CondaError`, `OSError`

Common base class for all non-exit exceptions.

exception `DirectoryNotFoundError`(*path*)

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `EnvironmentLocationNotFound`(*location*)

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `EnvironmentNameNotFound`(*environment_name*)

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception NoBaseEnvironmentErrorBases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception DirectoryNotACondaEnvironmentError(*target_directory*)Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception CondaEnvironmentError(*message*, **args*)Bases: [conda.CondaError](#), [OSError](#)

Common base class for all non-exit exceptions.

exception DryRunExitBases: [conda.CondaExitZero](#)

Common base class for all non-exit exceptions.

exception CondaSystemExit(**args*)Bases: [conda.CondaExitZero](#), [SystemExit](#)

Common base class for all non-exit exceptions.

exception PaddingError(*dist*, *placeholder*, *placeholder_length*)Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception LinkError(*message*)Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception CondaOSError(*message*, ***kwargs*)Bases: [conda.CondaError](#), [OSError](#)

Common base class for all non-exit exceptions.

exception ProxyErrorBases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception CondaIOError(*message*, **args*)Bases: [conda.CondaError](#), [OSError](#)

Common base class for all non-exit exceptions.

exception CondaFileIOError(*filepath*, *message*, **args*)Bases: [CondaIOError](#)

Common base class for all non-exit exceptions.

exception CondaKeyError(*key*, *message*, **args*)Bases: [conda.CondaError](#), [KeyError](#)

Common base class for all non-exit exceptions.

exception ChannelError(*message*, *caused_by*=None, ***kwargs*)Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception ChannelNotAllowed(*channel*)

Bases: [ChannelError](#)

Common base class for all non-exit exceptions.

exception UnavailableInvalidChannel(*channel, status_code, response: requests.models.Response | None = None*)

Bases: [ChannelError](#)

Common base class for all non-exit exceptions.

status_code: `str | int`

exception OperationNotAllowed(*message*)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception CondaImportError(*message*)

Bases: [conda.CondaError](#), [ImportError](#)

Common base class for all non-exit exceptions.

exception ParseError(*message*)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception CouldntParseError(*reason*)

Bases: [ParseError](#)

Common base class for all non-exit exceptions.

exception ChecksumMismatchError(*url, target_full_path, checksum_type, expected_checksum, actual_checksum*)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception PackageNotInstalledError(*prefix, package_name*)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception CondaHTTPError(*message, url, status_code, reason, elapsed_time, response=None, caused_by=None*)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception CondaSSLError(*message, caused_by=None, **kwargs*)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception AuthenticationError(*message, caused_by=None, **kwargs*)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception PackagesNotFoundError(*packages, channel_urls=()*)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception UnsatisfiableError(*bad_deps*, *chains=True*, *strict=False*)

Bases: [conda.CondaError](#)

An exception to report unsatisfiable dependencies.

Parameters

- **bad_deps** -- a list of tuples of objects (likely MatchSpecs).
- **chains** -- (optional) if True, the tuples are interpreted as chains of dependencies, from top level to bottom. If False, the tuples are interpreted as simple lists of conflicting specs.

Returns Raises an exception with a formatted message detailing the unsatisfiable specifications.

_format_chain_str(*bad_deps*)

exception RemoveError(*message*)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception DisallowedPackageError(*package_ref*, ***kwargs*)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception SpecsConfigurationConflictError(*requested_specs*, *pinned_specs*, *prefix*)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception CondaIndexError(*message*)

Bases: [conda.CondaError](#), [IndexError](#)

Common base class for all non-exit exceptions.

exception CondaValueError(*message*, **args*, ***kwargs*)

Bases: [conda.CondaError](#), [ValueError](#)

Common base class for all non-exit exceptions.

exception CyclicalDependencyError(*packages_with_cycles*, ***kwargs*)

Bases: [conda.CondaError](#), [ValueError](#)

Common base class for all non-exit exceptions.

exception CorruptedEnvironmentError(*environment_location*, *corrupted_file*, ***kwargs*)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception CondaHistoryError(*message*)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception CondaUpgradeError(*message*)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception CondaVerificationError(*message*)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception `SafetyError`(*message*)

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `CondaMemoryError`(*caused_by*, ***kwargs*)

Bases: `conda.CondaError`, `MemoryError`

Common base class for all non-exit exceptions.

exception `NotWritableError`(*path*, *errno*, ***kwargs*)

Bases: `conda.CondaError`, `OSError`

Common base class for all non-exit exceptions.

exception `NoWritableEnvsDirError`(*envs_dirs*, ***kwargs*)

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `NoWritablePkgsDirError`(*pkgs_dirs*, ***kwargs*)

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `EnvironmentNotWritableError`(*environment_location*, ***kwargs*)

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `CondaDependencyError`(*message*)

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `BinaryPrefixReplacementError`(*path*, *placeholder*, *new_prefix*, *original_data_length*,
new_data_length)

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `InvalidSpec`(*message*, ***kwargs*)

Bases: `conda.CondaError`, `ValueError`

Common base class for all non-exit exceptions.

exception `InvalidVersionSpec`(*invalid_spec*, *details*)

Bases: `InvalidSpec`

Common base class for all non-exit exceptions.

exception `InvalidMatchSpec`(*invalid_spec*, *details*)

Bases: `InvalidSpec`

Common base class for all non-exit exceptions.

exception `EncodingError`(*caused_by*, ***kwargs*)

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `NoSpaceLeftError`(*caused_by*, ***kwargs*)

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `CondaEnvException(message, *args, **kwargs)`

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `EnvironmentFileNotFound(filename, *args, **kwargs)`

Bases: `CondaEnvException`

Common base class for all non-exit exceptions.

exception `EnvironmentFileExtensionNotValid(filename, *args, **kwargs)`

Bases: `CondaEnvException`

Common base class for all non-exit exceptions.

exception `EnvironmentFileEmpty(filename, *args, **kwargs)`

Bases: `CondaEnvException`

Common base class for all non-exit exceptions.

exception `EnvironmentFileNotDownloaded(username, packagename, *args, **kwargs)`

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `SpecNotFound(msg, *args, **kwargs)`

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

exception `PluginError(message, caused_by=None, **kwargs)`

Bases: `conda.CondaError`

Common base class for all non-exit exceptions.

maybe_raise(*error*, *context*)

print_conda_exception(*exc_val*, *exc_tb=None*)

_format_exc(*exc_val=None*, *exc_tb=None*)

exports

Backported exports for conda-build.

Classes

Completer

InstalledPackages

memoized

Decorator. Caches a function's return value each time it is called.

Functions

`handle_proxy_407(x, y)`

`iteritems(d, **kw)`

`rm_rf(path[, max_retries, trash])`

`hash_file(_)`

`verify(_)`

`display_actions(actions, index[,
show_channel_urls, ...])`

`get_index([channel_urls, prepend, platform, ...])`

`fetch_index(channel_urls[, use_cache, index])`

`package_cache()`

`symlink_conda(prefix, root_dir[, shell])`

`_symlink_conda_hlp(prefix, root_dir, where, sym-
link_fn)`

<code>win_conda_bat_redirect(src, dst, shell)</code>	Special function for Windows XP where the <i>CreateSym- bolicLink</i>
--	---

<code>linked_data(prefix[, ignore_channels])</code>	Return a dictionary of the linked packages in prefix.
---	---

<code>linked(prefix[, ignore_channels])</code>	Return the Dists of linked packages in prefix.
--	--

<code>is_linked(prefix, dist)</code>	Return the install metadata for a linked package in a pre- fix, or None
--------------------------------------	--

`download(url, dst_path[, session, md5sum, urlstxt, ...])`

Attributes

`non_x86_linux_machines`

`get_default_urls`

`arch_name`

`binstar_upload`

`bits`

`default_prefix`

`default_python`

continues on next page

Table 170 – continued from previous page

<i>envs_dirs</i>
<i>pkgs_dirs</i>
<i>platform</i>
<i>root_dir</i>
<i>root_writable</i>
<i>subdir</i>
<i>conda_build</i>
<i>get_rc_urls</i>
<i>get_local_urls</i>
<i>load_condarc</i>
<i>PaddingError</i>
<i>LinkError</i>
<i>CondaOSError</i>
<i>IndexRecord</i>
<i>PY3</i>
<i>string_types</i>
<i>text_type</i>
<i>KEYS</i>
<i>KEYS_DIR</i>

handle_proxy_407(*x*, *y*)
non_x86_linux_machines
get_default_urls
arch_name
binstar_upload
bits
default_prefix
default_python
envs_dirs

```

pkgs_dirs
platform
root_dir
root_writable
subdir
conda_build
get_rc_urls
get_local_urls
load_condarc
PaddingError
LinkError
CondaOSError
IndexRecord
PY3 = True
string_types
text_type
iteritems(d, **kw)
class Completer

    get_items()
    __contains__(item)
    __iter__()
class InstalledPackages
class memoized(func)
    Decorator. Caches a function's return value each time it is called. If called later with the same arguments, the
    cached value is returned (not reevaluated).

    __call__(*args, **kw)
rm_rf(path, max_retries=5, trash=True)
KEYS
KEYS_DIR
hash_file(_)
verify(_)
display_actions(actions, index, show_channel_urls=None, specs_to_remove=(), specs_to_add=())
get_index(channel_urls=(), prepend=True, platform=None, use_local=False, use_cache=False, unknown=None,
          prefix=None)
fetch_index(channel_urls, use_cache=False, index=None)
package_cache()

```

symlink_conda(*prefix, root_dir, shell=None*)

_symlink_conda_hlp(*prefix, root_dir, where, symlink_fn*)

win_conda_bat_redirect(*src, dst, shell*)

Special function for Windows XP where the *CreateSymbolicLink* function is not available.

Simply creates a *.bat* file at *dst* which calls *src* together with all command line arguments.

Works of course only with callable files, e.g. *.bat* or *.exe* files.

linked_data(*prefix, ignore_channels=False*)

Return a dictionary of the linked packages in prefix.

linked(*prefix, ignore_channels=False*)

Return the Dists of linked packages in prefix.

is_linked(*prefix, dist*)

Return the install metadata for a linked package in a prefix, or None if the package is not linked in the prefix.

download(*url, dst_path, session=None, md5sum=None, urlstxt=False, retries=3, sha256=None, size=None*)

gateways

Gateways isolate interaction of conda code with the outside world. Disk manipulation, database interaction, and remote requests should all be through various gateways. Functions and methods in `conda.gateways` must use `conda.models` for arguments and return values.

Conda modules importable from `conda.gateways` are

- `conda._vendor`
- `conda.common`
- `conda.models`
- `conda.gateways`

Conda modules off limits for import within `conda.gateways` are

- `conda.api`
- `conda.cli`
- `conda.client`
- `conda.core`

Conda modules strictly prohibited from importing `conda.gateways` are

- `conda.api`
- `conda.cli`
- `conda.client`

anaconda_client

Anaconda-client (binstar) token management for CondaSession.

Classes

EnvAppDirs

Functions

replace_first_api_with_conda(url)

_get_binstar_token_directory()

read_binstar_tokens()

set_binstar_token(url, token)

remove_binstar_token(url)

replace_first_api_with_conda(*url*)

class EnvAppDirs(*appname, appauthor, root_path*)

property user_data_dir

property site_data_dir

property user_cache_dir

property user_log_dir

_get_binstar_token_directory()

read_binstar_tokens()

set_binstar_token(*url, token*)

remove_binstar_token(*url*)

connection

adapters

ftp

Defines FTP transport adapter for CondaSession (requests.Session).

Taken from requests-ftp (https://github.com/Lukasa/requests-ftp/blob/master/requests_ftp/ftp.py).

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Classes

<i>FTPAdapter</i>	A Requests Transport Adapter that handles FTP urls.
-------------------	---

Functions

<i>_new_makepasv</i> (self)	
<i>data_callback_factory</i> (variable)	Returns a callback suitable for use by the FTP library. This callback
<i>build_text_response</i> (request, data, code)	Build a response for textual data.
<i>build_binary_response</i> (request, data, code)	Build a response for data whose encoding is unknown.
<i>build_response</i> (request, data, code, encoding)	Builds a response object from the data returned by ftplib, using the
<i>parse_multipart_files</i> (request)	Given a prepared request, return a file-like object containing the
<i>get_status_code_from_code_response</i> (code)	Handle complicated code response, even multi-lines.

Attributes

<i>_old_makepasv</i>

_old_makepasv

_new_makepasv(self)

class FTPAdapter

Bases: conda.gateways.connection.BaseAdapter

A Requests Transport Adapter that handles FTP urls.

send(request, **kwargs)

Sends a PreparedRequest object over FTP. Returns a response object.

close()

Dispose of any internal state.

list(path, request)

Executes the FTP LIST command on the given path.

retr(path, request)

Executes the FTP RETR command on the given path.

stor(*path, request*)

Executes the FTP STOR command on the given path.

nlst(*path, request*)

Executes the FTP NLST command on the given path.

get_username_password_from_header(*request*)

Given a PreparedRequest object, reverse the process of adding HTTP Basic auth to obtain the username and password. Allows the FTP adapter to piggyback on the basic auth notation without changing the control flow.

get_host_and_path_from_url(*request*)

Given a PreparedRequest object, split the URL in such a manner as to determine the host and the path. This is a separate method to wrap some of urlparse's craziness.

data_callback_factory(*variable*)

Returns a callback suitable for use by the FTP library. This callback will repeatedly save data into the variable provided to this function. This variable should be a file-like structure.

build_text_response(*request, data, code*)

Build a response for textual data.

build_binary_response(*request, data, code*)

Build a response for data whose encoding is unknown.

build_response(*request, data, code, encoding*)

Builds a response object from the data returned by ftplib, using the specified encoding.

parse_multipart_files(*request*)

Given a prepared request, return a file-like object containing the original data. This is pretty hacky.

get_status_code_from_code_response(*code*)

Handle complicated code response, even multi-lines.

We get the status code in two ways: - extracting the code from the last valid line in the response - getting it from the 3 first digits in the code After a comparison between the two values, we can safely set the code or raise a warning. .. rubric:: Examples

- `get_status_code_from_code_response('200 Welcome') == 200`
- `multi_line_code = '226-File successfully transferredn226 0.000 seconds'`
`get_status_code_from_code_response(multi_line_code) == 226`
- `multi_line_with_code_conflicts = '200-File successfully transferredn226 0.000 seconds'`
`get_status_code_from_code_response(multi_line_with_code_conflicts) == 226`

For more detail see RFC 959, page 36, on multi-line responses: <https://www.ietf.org/rfc/rfc959.txt> "Thus the format for multi-line replies is that the first line

will begin with the exact required reply code, followed immediately by a Hyphen, "-" (also known as Minus), followed by text. The last line will begin with the same code, followed immediately by Space <SP>, optionally some text, and the Telnet end-of-line code."

localfs

Defines local filesystem transport adapter for CondaSession (requests.Session).

Classes

LocalFSAdapter

The Base Transport Adapter

class LocalFSAdapter

Bases: `conda.gateways.connection.BaseAdapter`

The Base Transport Adapter

send(*request*, *stream=None*, *timeout=None*, *verify=None*, *cert=None*, *proxies=None*)

Sends PreparedRequest object. Returns Response object.

Parameters

- **request** -- The PreparedRequest being sent.
- **stream** -- (optional) Whether to stream the request content.
- **timeout** (*float* or *tuple*) -- (optional) How long to wait for the server to send data before giving up, as a float, or a (connect timeout, read timeout) tuple.
- **verify** -- (optional) Either a boolean, in which case it controls whether we verify the server's TLS certificate, or a string, in which case it must be a path to a CA bundle to use
- **cert** -- (optional) Any user-provided SSL certificate to be trusted.
- **proxies** -- (optional) The proxies dictionary to apply to the request.

close()

Cleans up adapter specific items.

s3

Defines S3 transport adapter for CondaSession (requests.Session).

Classes

S3Adapter

The Base Transport Adapter

Attributes

have_boto3

stderrlog

have_boto3 = True

stderrlog**class S3Adapter**Bases: `conda.gateways.connection.BaseAdapter`

The Base Transport Adapter

send(*request*, *stream=None*, *timeout=None*, *verify=None*, *cert=None*, *proxies=None*)

Sends PreparedRequest object. Returns Response object.

Parameters

- **request** -- The PreparedRequest being sent.
- **stream** -- (optional) Whether to stream the request content.
- **timeout** (*float* or *tuple*) -- (optional) How long to wait for the server to send data before giving up, as a float, or a (connect timeout, read timeout) tuple.
- **verify** -- (optional) Either a boolean, in which case it controls whether we verify the server's TLS certificate, or a string, in which case it must be a path to a CA bundle to use
- **cert** -- (optional) Any user-provided SSL certificate to be trusted.
- **proxies** -- (optional) The proxies dictionary to apply to the request.

close()

Cleans up adapter specific items.

_send_boto3(*boto3*, *resp*, *request*)**_send_boto**(*boto*, *resp*, *request*)**_write_tempfile**(*writer_callable*)**download**

Download logic for conda indices and packages.

Classes*TmpDownload*

Context manager to handle downloads to a tempfile.

Functions*disable_ssl_verify_warning()**download*(*url*, *target_full_path*[, *md5*, *sha256*, *size*, ...])*download_text*(*url*)**disable_ssl_verify_warning()****download**(*url*, *target_full_path*, *md5=None*, *sha256=None*, *size=None*, *progress_update_callback=None*)**download_text**(*url*)

```
class TmpDownload(url, verbose=True)
    Context manager to handle downloads to a tempfile.

    __enter__()
    __exit__(exc_type, exc_value, traceback)
```

session

Requests session configured with all accepted scheme adapters.

Classes

<i>EnforceUnusedAdapter</i>	The Base Transport Adapter
<i>CondaSessionType</i>	Takes advice from https://github.com/requests/requests/issues/1871#issuecomment-33327847
<i>CondaSession</i>	A Requests session.
<i>CondaHttpAuth</i>	Base class that all auth implementations derive from

Attributes

<i>RETRIES</i>
<i>CONDA_SESSION_SCHEMES</i>

RETRIES = 3

CONDA_SESSION_SCHEMES

```
class EnforceUnusedAdapter
    Bases: conda.gateways.connection.BaseAdapter
    The Base Transport Adapter

    send(request, *args, **kwargs)
        Sends PreparedRequest object. Returns Response object.
```

Parameters

- **request** -- The PreparedRequest being sent.
- **stream** -- (optional) Whether to stream the request content.
- **timeout** (*float* or *tuple*) -- (optional) How long to wait for the server to send data before giving up, as a float, or a (connect timeout, read timeout) tuple.
- **verify** -- (optional) Either a boolean, in which case it controls whether we verify the server's TLS certificate, or a string, in which case it must be a path to a CA bundle to use
- **cert** -- (optional) Any user-provided SSL certificate to be trusted.
- **proxies** -- (optional) The proxies dictionary to apply to the request.

```
abstract close()
    Cleans up adapter specific items.
```

class CondaSessionTypeBases: `type`

Takes advice from <https://github.com/requests/requests/issues/1871#issuecomment-33327847> and creates one Session instance per thread.

__call__()

Call self as a function.

class CondaSessionBases: `conda.gateways.connection.Session`

A Requests session.

Provides cookie persistence, connection-pooling, and configuration.

Basic Usage:

```
>>> import requests
>>> s = requests.Session()
>>> s.get('https://httpbin.org/get')
<Response [200]>
```

Or as a context manager:

```
>>> with requests.Session() as s:
...     s.get('https://httpbin.org/get')
<Response [200]>
```

class CondaHttpAuthBases: `conda.gateways.connection.AuthBase`

Base class that all auth implementations derive from

__call__(request)**static _apply_basic_auth(request)****static add_binstar_token(url)****static handle_407(response, **kwargs)**

Prompts the user for the proxy username and password and modifies the proxy in the session object to include it.

This method is modeled after

- `requests.auth.HTTPDigestAuth.handle_401()`
- `requests.auth.HTTPProxyAuth`
- the previous `conda.fetch.handle_proxy_407()`

It both adds 'username:password' to the proxy URL, as well as adding a 'Proxy-Authorization' header. If any of this is incorrect, please file an issue.

disk

create

Disk utility functions for creating new files or directories.

Classes

<i>TemporaryDirectory</i>	Create and return a temporary directory. This has the same
<i>ProgressFileWrapper</i>	

Functions

<i>write_as_json_to_file</i> (file_path, obj)	
<i>create_python_entry_point</i> (target_full_path, ...)	
<i>create_application_entry_point</i> (source_full_path, ...)	
<i>extract_tarball</i> (tarball_full_path[, ...])	
<i>make_menu</i> (prefix, file_path[, remove])	Create cross-platform menu items (e.g. Windows Start Menu)
<i>create_hard_link_or_copy</i> (src, dst)	
<i>_is_unix_executable_using_ORIGIN</i> (path)	
<i>_do_softlink</i> (src, dst)	
<i>create_fake_executable_softlink</i> (src, dst)	
<i>copy</i> (src, dst)	
<i>_do_copy</i> (src, dst)	
<i>create_link</i> (src, dst[, link_type, force])	
<i>compile_multiple_pyc</i> (python_exe_full_path, ...)	
<i>create_package_cache_directory</i> (pkgs_dir)	
<i>create_envs_directory</i> (envs_dir)	

Attributes

stdoutlog

mkdir_p

python_entry_point_template

application_entry_point_template

class TemporaryDirectory(*suffix="", prefix='tmp', dir=None*)

Create and return a temporary directory. This has the same behavior as mkdtemp but can be used as a context manager. For .. rubric:: Example

with TemporaryDirectory() as tmpdir: ...

Upon exiting the context, the directory and everything contained in it are removed.

name

_closed = False

__repr__()

Return repr(self).

__enter__()

cleanup(*_warn=False, _warnings=_warnings*)

__exit__(*exc, value, tb*)

__del__()

stdoutlog

mkdir_p

python_entry_point_template

application_entry_point_template

write_as_json_to_file(*file_path, obj*)

create_python_entry_point(*target_full_path, python_full_path, module, func*)

create_application_entry_point(*source_full_path, target_full_path, python_full_path*)

class ProgressFileWrapper(*fileobj, progress_update_callback*)

__getattr__(*name*)

__setattr__(*name, value*)

Implement setattr(self, name, value).

read(*size=-1*)

progress_update()

extract_tarball(*tarball_full_path, destination_directory=None, progress_update_callback=None*)

make_menu(*prefix, file_path, remove=False*)

Create cross-platform menu items (e.g. Windows Start Menu)

Passes all menu config files `%PREFIX%/Menu/*.json` to `menuinst.install`. `remove=True` will remove the menu items.

create_hard_link_or_copy(*src, dst*)

_is_unix_executable_using_ORIGIN(*path*)

_do_softlink(*src, dst*)

create_fake_executable_softlink(*src, dst*)

copy(*src, dst*)

_do_copy(*src, dst*)

create_link(*src, dst, link_type=LinkType.hardlink, force=False*)

compile_multiple_pyc(*python_exe_full_path, py_full_paths, pyc_full_paths, prefix, py_ver*)

create_package_cache_directory(*pkgs_dir*)

create_envs_directory(*envs_dir*)

delete

Disk utility functions for deleting files and folders.

Functions

<code>rmtree(path, *args, **kwargs)</code>			
<code>unlink_or_rename_to_trash(path)</code>			If files are in use, especially on windows, we can't remove them.
<code>remove_empty_parent_paths(path)</code>			
<code>rm_rf(path[,</code>	<code>max_retries,</code>	<code>trash,</code>	Completely delete path
<code>clean_empty_parents])</code>			
<code>delete_trash(prefix)</code>			
<code>backoff_rmdir(dirpath[, max_tries])</code>			
<code>path_is_clean(path)</code>			Sometimes we can't completely remove a path because files are considered in use

rmtree(*path, *args, **kwargs*)

unlink_or_rename_to_trash(*path*)

If files are in use, especially on windows, we can't remove them. The fallback path is to rename them (but keep their folder the same), which maintains the file handle validity. See comments at: <https://serverfault.com/a/503769>

remove_empty_parent_paths(*path*)

rm_rf(*path*, *max_retries*=5, *trash*=True, *clean_empty_parents*=False, *args, **kw)

Completely delete path *max_retries* is the number of times to retry on failure. The default is 5. This only applies to deleting a directory. If removing path fails and *trash* is True, files will be moved to the trash directory.

delete_trash(*prefix*)

backoff_rmdir(*dirpath*, *max_tries*=MAX_TRIES)

path_is_clean(*path*)

Sometimes we can't completely remove a path because files are considered in use by python (hardlinking confusion). For our tests, it is sufficient that either the folder doesn't exist, or nothing but temporary file copies are left.

link

Disk utility functions for symlinking files and folders.

Portions of the code within this module are taken from <https://github.com/jaraco/jaraco.windows> which is MIT licensed by Jason R. Coombs.

<https://github.com/jaraco/skeleton/issues/1#issuecomment-285448440>

lchmod

link

islink

permissions

Disk utility functions for modifying file and directory permissions.

Functions

make_writable(*path*)

make_read_only(*path*)

recursive_make_writable(*path*[, *max_tries*])

make_executable(*path*)

is_executable(*path*)

make_writable(*path*)

make_read_only(*path*)

recursive_make_writable(*path*, *max_tries*=MAX_TRIES)

make_executable(*path*)

is_executable(*path*)

read

Disk utility functions for reading and processing file contents.

Functions

<code>yield_lines(path)</code>	Generator function for lines in file. Empty generator if path does not exist.
<code>_digest_path(→ str)</code>	
<code>compute_sum(→ str)</code>	
<code>compute_md5sum(→ str)</code>	
<code>compute_sha256sum(→ str)</code>	
<code>read_package_info(record, package_cache_record)</code>	
<code>read_index_json(extracted_package_directory)</code>	
<code>read_index_json_from_tarball(package_tarball_full_path)</code>	
<code>read_repodata_json(extracted_package_directory)</code>	
<code>read_icondata(extracted_package_directory)</code>	
<code>read_package_metadata(extracted_package_directory)</code>	
<code>read_paths_json(extracted_package_directory)</code>	
<code>read_has_prefix(path)</code>	Reads <i>has_prefix</i> file and return dict mapping filepaths to tuples(placeholder, FileMode).
<code>read_no_link(info_dir)</code>	
<code>read_soft_links(extracted_package_directory, files)</code>	
<code>read_python_record(prefix_path, anchor_file, ...)</code>	Convert a python package defined by an anchor file (Metadata information)

Attributes

`listdir`

listdir

`yield_lines(path)`

Generator function for lines in file. Empty generator if path does not exist.

Parameters `path` (*str*) -- path to file

Returns each line in file, not starting with '#'

Return type iterator

`_digest_path(algo: Literal[md5, sha256], path: str | os.PathLike) → str`

`compute_sum(path: str | os.PathLike, algo: Literal[md5, sha256]) → str`

`compute_md5sum(path: str | os.PathLike) → str`

`compute_sha256sum(path: str | os.PathLike) → str`

`read_package_info(record, package_cache_record)`

`read_index_json(extracted_package_directory)`

`read_index_json_from_tarball(package_tarball_full_path)`

`read_repodata_json(extracted_package_directory)`

`read_icondata(extracted_package_directory)`

`read_package_metadata(extracted_package_directory)`

`read_paths_json(extracted_package_directory)`

`read_has_prefix(path)`

Reads `has_prefix` file and return dict mapping filepaths to tuples(placeholder, FileMode).

A line in `has_prefix` contains one of:

- filepath
- placeholder mode filepath

Mode values are one of:

- text
- binary

`read_no_link(info_dir)`

`read_soft_links(extracted_package_directory, files)`

`read_python_record(prefix_path, anchor_file, python_version)`

Convert a python package defined by an anchor file (Metadata information) into a conda prefix record object.

test

Disk utility functions testing path properties (e.g., writable, hardlinks, softlinks, etc.).

Functions

`file_path_is_writable(path)`

`hardlink_supported(source_file, dest_dir)`

`softlink_supported(source_file, dest_dir)`

continues on next page

Table 190 – continued from previous page

`is_conda_environment(prefix)`

`file_path_is_writable(path)``hardlink_supported(source_file, dest_dir)``softlink_supported(source_file, dest_dir)``is_conda_environment(prefix)`

update

Disk utility functions for modifying existing files or directories.

Functions

`update_file_in_place_as_binary(file_full_path,`
`callback)`

`rename(source_path, destination_path[, force])`

<code>rename_context(source[, destination, dry_run])</code>	Used for removing a directory when there are dependent actions (i.e. you need to ensure
---	---

`backoff_rename(source_path, destination_path[, force])``touch(path[, mkdir, sudo_safe])`

Attributes

`SHEBANG_REGEX`

SHEBANG_REGEX

exception CancelOperation

Bases: `Exception`

Common base class for all non-exit exceptions.

`update_file_in_place_as_binary(file_full_path, callback)``rename(source_path, destination_path, force=False)``rename_context(source: str, destination: str | None = None, dry_run: bool = False)`

Used for removing a directory when there are dependent actions (i.e. you need to ensure other actions succeed before removing it).

Example

```
with rename_context(directory): # Do dependent actions here

backoff_rename(source_path, destination_path, force=False)

touch(path, mkdir=False, sudo_safe=False)
```

Functions

<code>exp_backoff_fn(fn, *args, **kwargs)</code>	Mostly for retrying file operations that fail on Windows due to virus scanners
<code>mkdir_p(path)</code>	
<code>mkdir_p_sudo_safe(path)</code>	

Attributes

<code>on_win</code>	
<code>MAX_TRIES</code>	

```
on_win
MAX_TRIES = 7
exp_backoff_fn(fn, *args, **kwargs)
    Mostly for retrying file operations that fail on Windows due to virus scanners
mkdir_p(path)
mkdir_p_sudo_safe(path)
```

logging

Configure logging for conda.

Classes

<code>TokenURLFilter</code>	Filter instances are used to perform arbitrary filtering of LogRecords.
<code>StdStreamHandler</code>	Log StreamHandler that always writes to the current sys stream.

Functions

`initialize_logging()`

`initialize_std_loggers()`

`initialize_root_logger([level])`

`set_conda_log_level([level])`

`set_all_logger_level([level])`

`set_file_logging([logger_name, level, path])`

`set_verbosity(verbosity_level)`

`trace(self, message, *args, **kwargs)`

Attributes

`TRACE`

`VERBOSITY_LEVELS`

`TRACE = 5``VERBOSITY_LEVELS = ()``class TokenURLFilter(name="")``Bases: logging.Filter`

Filter instances are used to perform arbitrary filtering of LogRecords.

Loggers and Handlers can optionally use Filter instances to filter records as desired. The base filter class only allows events which are below a certain point in the logger hierarchy. For example, a filter initialized with "A.B" will allow events logged by loggers "A.B", "A.B.C", "A.B.C.D", "A.B.D" etc. but not "A.BB", "B.A.B" etc. If initialized with the empty string, all events are passed.

`TOKEN_URL_PATTERN``TOKEN_REPLACE``filter(record)`

Since Python 2's getMessage() is incapable of handling any strings that are not unicode when it interpolates the message with the arguments, we fix that here by doing it ourselves.

At the same time we replace tokens in the arguments which was not happening until now.

`class StdStreamHandler(sys_stream)``Bases: logging.StreamHandler`

Log StreamHandler that always writes to the current sys stream.

```
terminator = '\n'
```

```
__getattr__(attr)
```

```
emit(record)
```

Emit a record.

If a formatter is specified, it is used to format the record. The record is then written to the stream with a trailing newline. If exception information is present, it is formatted using `traceback.print_exception` and appended to the stream. If the stream has an 'encoding' attribute, it is used to determine how to do the output to the stream.

```
initialize_logging()
```

```
initialize_std_loggers()
```

```
initialize_root_logger(level=ERROR)
```

```
set_conda_log_level(level=WARN)
```

```
set_all_logger_level(level=DEBUG)
```

```
set_file_logging(logger_name=None, level=DEBUG, path=None)
```

```
set_verbosity(verbosity_level)
```

```
trace(self, message, *args, **kwargs)
```

repodata

Repodata interface.

jlap

Incremental repodata feature based on .jlap patch files.

core

JLAP reader.

Classes

JLAP

A more or less complete user-defined wrapper around list objects.

Functions

<code>keyed_hash(data, key)</code>	Keyed hash.
<code>line_and_pos(→ Iterator[tuple[int, bytes]])</code>	param lines iterator over input split by 'n', with 'n' removed.

Attributes

<code>DIGEST_SIZE</code>
<code>DEFAULT_IV</code>

`DIGEST_SIZE = 32`

`DEFAULT_IV`

keyed_hash(data: *bytes*, key: *bytes*)
Keyed hash.

line_and_pos(lines: *Iterable[bytes]*, pos=0) → Iterator[tuple[int, bytes]]

Parameters

- **lines** -- iterator over input split by 'n', with 'n' removed.
- **pos** -- initial position

class `JLAP`(initlist=None)

Bases: `collections.UserList`

A more or less complete user-defined wrapper around list objects.

property `body`

All lines except the first, and last two.

property `penultimate`

Next-to-last line. Should contain the footer.

property `last`

Last line. Should contain the trailing checksum.

classmethod `from_lines`(lines: *Iterable[bytes]*, iv: *bytes*, pos=0, verify=True)

Parameters

- **lines** -- iterator over input split by b'n', with b'n' removed
- **pos** -- initial position
- **iv** -- initialization vector (first line of .jlap stream, hex decoded). Ignored if pos==0.
- **verify** -- assert last line equals computed checksum of previous line. Useful for writing new .jlap files if False.

Raises `ValueError` -- if trailing and computed checksums do not match

Returns list of (offset, line, checksum)

classmethod `from_path(path: Path | str, verify=True)`

add(*line: str*)

Add line to buffer, following checksum rules.

Buffer must not be empty.

(Remember to pop trailing checksum and possibly trailing metadata line, if appending to a complete jlap file)

Less efficient than creating a new buffer from many lines and our last iv, and extending.

Returns self

terminate()

Add trailing checksum to buffer.

Returns self

write(*path: pathlib.Path*)

Write buffer to path.

fetch

JLAP consumer.

Classes

HashWriter

Base class for raw binary I/O.

Functions

hash()

Ordinary hash.

process_jlap_response(response[, pos, iv])

fetch_jlap(url[, pos, etag, iv, ignore_etag, session])

request_jlap(url[, pos, etag, ignore_etag, session])

Return the part of the remote .jlap file we are interested in.

format_hash(hash)

Abbreviate hash for formatting.

find_patches(patches, have, want)

apply_patches(data, apply)

withext(url, ext)

timeme(message)

build_headers(json_path, state)

Caching headers for a path and state.

continues on next page

Table 202 – continued from previous page

<code>download_and_hash</code> (hasher, url, json_path, session, state)	Download url if it doesn't exist, passing bytes through hasher.update().
<code>request_url_jlap_state</code> (→ dict None)	

Attributes

<code>DIGEST_SIZE</code>
<code>JLAP_KEY</code>
<code>HEADERS</code>
<code>NOMINAL_HASH</code>
<code>ON_DISK_HASH</code>
<code>LATEST</code>
<code>JLAP_UNAVAILABLE</code>
<code>ZSTD_UNAVAILABLE</code>
<code>STORE_HEADERS</code>

`DIGEST_SIZE = 32`

`JLAP_KEY = 'jlap'`

`HEADERS = 'headers'`

`NOMINAL_HASH = 'blake2_256_nominal'`

`ON_DISK_HASH = 'blake2_256'`

`LATEST = 'latest'`

`JLAP_UNAVAILABLE = 'jlap_unavailable'`

`ZSTD_UNAVAILABLE = 'zstd_unavailable'`

`STORE_HEADERS`

`hash()`

Ordinary hash.

exception `Jlap304NotModified`

Bases: `Exception`

Common base class for all non-exit exceptions.

exception `JlapSkipZst`

Bases: `Exception`

Common base class for all non-exit exceptions.

exception JlapPatchNotFoundBases: `LookupError`

Base class for lookup errors.

process_jlap_response(*response*: `conda.gateways.connection.Response`, *pos*=0, *iv*=b'')**fetch_jlap**(*url*, *pos*=0, *etag*=None, *iv*=b'', *ignore_etag*=True, *session*=None)**request_jlap**(*url*, *pos*=0, *etag*=None, *ignore_etag*=True, *session*: `Session` | `None` = None)

Return the part of the remote .jlap file we are interested in.

format_hash(*hash*)

Abbreviate hash for formatting.

find_patches(*patches*, *have*, *want*)**apply_patches**(*data*, *apply*)**withext**(*url*, *ext*)**timeme**(*message*)**build_headers**(*json_path*: `pathlib.Path`, *state*: `conda.gateways.repodata.RepodataState`)

Caching headers for a path and state.

class HashWriter(*backing*, *hasher*)Bases: `io.RawIOBase`

Base class for raw binary I/O.

write(*b*: `bytes`)**close**()

Flush and close the IO object.

This method has no effect if the file is already closed.

download_and_hash(*hasher*, *url*, *json_path*, *session*: `conda.gateways.connection.Session`, *state*: `RepodataState` | `None`, *is_zst*=False, *dest_path*: `pathlib.Path` | `None` = None)

Download url if it doesn't exist, passing bytes through hasher.update().

json_path: Path of old cached data (ignore etag if not exists). *dest_path*: Path to write new data.**request_url_jlap_state**(*url*, *state*: `conda.gateways.repodata.RepodataState`, *full_download*=False, *, *session*: `conda.gateways.connection.Session`, *cache*: `conda.gateways.repodata.RepodataCache`, *temp_path*: `pathlib.Path`) → `dict` | `None`**interface**

JLAP interface for repodata.

Classes

<i>JlapRepoInterface</i>	Helper class that provides a standard way to create an ABC using
--------------------------	--

class JlapRepoInterface(url: *str*, repodata_fn: *str* | *None*, *, cache_path_json: *str* | *Path*, cache_path_state: *str* | *Path*, cache: *conda.gateways.repodata.RepodataCache*, **kwargs)

Bases: *conda.gateways.repodata.RepoInterface*

Helper class that provides a standard way to create an ABC using inheritance.

repodata(state: *dict* | *RepodataState*) → *str* | *None*

Fetch newest repodata if necessary.

Always writes to *cache_path_json*.

repodata_parsed(state: *dict* | *RepodataState*) → *dict* | *None*

JLAP has to parse the JSON anyway.

Use this to avoid a redundant parse when repodata is updated.

When repodata is not updated, it doesn't matter whether this function or the caller reads from a file.

lock

Record locking to manage potential repodata / repodata metadata file contention between conda processes. Try to acquire a lock on a single byte in the metadata file; modify both files; then release the lock.

Functions

<i>_lock_noop</i> (fd)	When locking is not available.
<i>_lock_impl</i> (fd)	
<i>lock</i> (fd)	

Attributes

<i>LOCK_BYTE</i>
<i>LOCK_ATTEMPTS</i>
<i>LOCK_SLEEP</i>

LOCK_BYTE = 21

LOCK_ATTEMPTS = 10

LOCK_SLEEP = 1

`_lock_noop(fd)`
 When locking is not available.

`_lock_impl(fd)`

`lock(fd)`

Classes

<i>PackageCacheData</i>	
<i>Channel</i>	Channel:
<i>CondaSession</i>	A Requests session.
<i>RepoInterface</i>	Helper class that provides a standard way to create an ABC using
<i>CondaRepoInterface</i>	Provides an interface for retrieving repodata data from channels.
<i>RepodataState</i>	Load/save info file that accompanies cached <i>repodata.json</i> .
<i>RepodataCache</i>	Handle caching for a single repodata.json + repodata.info.json
<i>RepodataFetch</i>	Combine RepodataCache and RepoInterface to provide <code>subdir_data.SubdirData()</code>

Functions

<i>stringify(obj[, content_max_len])</i>	
<i>maybe_unquote(url)</i>	
<i>makedirs_p_sudo_safe(path)</i>	
<i>lock(fd)</i>	
<i>get_repo_interface(→ type[RepoInterface])</i>	
<i>_add_http_value_to_dict(resp, http_key, d, dict_key)</i>	
<i>conda_http_errors(url, repodata_fn)</i>	Use in a with: statement to translate requests exceptions to conda ones.
<i>_md5_not_for_security(data)</i>	
<i>cache_fn_url(url[, repodata_fn])</i>	
<i>get_cache_control_max_age(cache_control_value)</i>	
<i>create_cache_dir()</i>	

Attributes

`CONDA_HOMEPAGE_URL`

`REPODATA_FN`

`context`

`join_url`

`deprecated`

`stderrlog`

`CHECK_ALTERNATE_FORMAT_INTERVAL`

`LAST_MODIFIED_KEY`

`ETAG_KEY`

`CACHE_CONTROL_KEY`

`URL_KEY`

`CACHE_STATE_SUFFIX`

exception `CondaError`(*message*, *caused_by=None*, ***kwargs*)

Bases: `Exception`

Common base class for all non-exit exceptions.

return_code = 1

reportable = False

__repr__()

Return repr(self).

__str__()

Return str(self).

dump_map()

stringify(*obj*, *content_max_len=0*)

`CONDA_HOMEPAGE_URL` = 'https://conda.io'

`REPODATA_FN` = 'repodata.json'

`context`

`join_url`

`maybe_unquote`(*url*)

class `PackageCacheData`(*pkgs_dir*)

```

property _package_cache_records
property is_writable
_cache_
insert(package_cache_record)
load()
reload()
get(package_ref, default=NULL)
remove(package_ref, default=NULL)
query(package_ref_or_match_spec)
iter_records()
classmethod query_all(package_ref_or_match_spec, pkgs_dirs=None)
classmethod first_writable(pkgs_dirs=None)
classmethod writable_caches(pkgs_dirs=None)
classmethod read_only_caches(pkgs_dirs=None)
classmethod all_caches_writable_first(pkgs_dirs=None)
classmethod get_all_extracted_entries()
classmethod get_entry_to_link(package_ref)
classmethod tarball_file_in_cache(tarball_path, md5sum=None, exclude_caches=())
classmethod clear()
tarball_file_in_this_cache(tarball_path, md5sum=None)
_check_writable()
static _clean_tarball_path_and_get_md5sum(tarball_path, md5sum=None)
_scan_for_dist_no_channel(dist_str)
intervalues()
values()
__repr__()
    Return repr(self).
_make_single_record(package_filename)
static _dedupe_pkgs_dir_contents(pkgs_dir_contents)
deprecated
exception CondaDependencyError(message)
    Bases: conda.CondaError
    Common base class for all non-exit exceptions.
exception CondaHTTPError(message, url, status_code, reason, elapsed_time, response=None, caused_by=None)
    Bases: conda.CondaError
    Common base class for all non-exit exceptions.

```

exception CondaSSLError(*message*, *caused_by*=None, ***kwargs*)

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception NotWritableError(*path*, *errno*, ***kwargs*)

Bases: [conda.CondaError](#), [OSError](#)

Common base class for all non-exit exceptions.

exception ProxyError

Bases: [conda.CondaError](#)

Common base class for all non-exit exceptions.

exception UnavailableInvalidChannel(*channel*, *status_code*, *response*: *requests.models.Response* | *None* = *None*)

Bases: [ChannelError](#)

Common base class for all non-exit exceptions.

status_code: [str](#) | [int](#)

class Channel(*scheme*=None, *auth*=None, *location*=None, *token*=None, *name*=None, *platform*=None, *package_filename*=None)

Channel: *scheme* <> *auth* <> *location* <> *token* <> *channel* <> *subchannel* <> *platform* <> *package_filename*

Package Spec: *channel* <> *subchannel* <> *namespace* <> *package_name*

property channel_location

property channel_name

property subdir

property canonical_name

property base_url

property base_urls

property subdir_url

property url_channel_wtf

cache

static _reset_state()

static from_url(url)

static from_channel_name(channel_name)

static from_value(value)

static make_simple_channel(channel_alias, channel_url, name=None)

urls(with_credentials=False, subdirs=None)

url(with_credentials=False)

__str__()

Return str(self).

__repr__()

Return repr(self).


```

__eq__(other)
    Return self==value.

__hash__()
    Return hash(self).

__nonzero__()

__bool__()

__json__()

dump()

```

class CondaSession

Bases: `conda.gateways.connection.Session`

A Requests session.

Provides cookie persistence, connection-pooling, and configuration.

Basic Usage:

```

>>> import requests
>>> s = requests.Session()
>>> s.get('https://httpbin.org/get')
<Response [200]>

```

Or as a context manager:

```

>>> with requests.Session() as s:
...     s.get('https://httpbin.org/get')
<Response [200]>

```

`makedirs_p_sudo_safe(path)`

`lock(fd)`

`stderrlog`

`CHECK_ALTERNATE_FORMAT_INTERVAL`

`LAST_MODIFIED_KEY = 'mod'`

`ETAG_KEY = 'etag'`

`CACHE_CONTROL_KEY = 'cache_control'`

`URL_KEY = 'url'`

`CACHE_STATE_SUFFIX = '.info.json'`

exception RepodataIsEmpty(*channel, status_code, response: requests.models.Response | None = None*)

Bases: `conda.exceptions.UnavailableInvalidChannel`

Subclass used to determine when empty repodata should be cached, e.g. for a channel that doesn't provide `current_repodata.json`

exception RepodataOnDisk

Bases: `Exception`

Indicate that `RepoInterface.repodata()` successfully wrote repodata to disk, instead of returning a string.

class RepoInterfaceBases: `abc.ABC`

Helper class that provides a standard way to create an ABC using inheritance.

repodata(*state: dict*) → *str*

Given a mutable state dictionary with information about the cache, return repodata.json (or current_repodata.json) as a str. This function also updates state, which is expected to be saved by the caller.

exception Response304ContentUnchangedBases: `Exception`

Common base class for all non-exit exceptions.

get_repo_interface() → *type*[`RepoInterface`]**class CondaRepoInterface**(*url: str, repodata_fn: str | None, **kwargs*)Bases: `RepoInterface`

Provides an interface for retrieving repodata data from channels.

_url: *str***_repodata_fn**: *str***repodata**(*state: RepodataState*) → *str | None*

Given a mutable state dictionary with information about the cache, return repodata.json (or current_repodata.json) as a str. This function also updates state, which is expected to be saved by the caller.

_add_http_value_to_dict(*resp, http_key, d, dict_key*)**conda_http_errors**(*url, repodata_fn*)

Use in a with: statement to translate requests exceptions to conda ones.

class RepodataState(*cache_path_json: Path | str = "", cache_path_state: Path | str = "", repodata_fn="", dict=None*)Bases: `collections.UserDict`Load/save info file that accompanies cached *repodata.json*.**property mod**: *str*

Last-Modified header or ""

property etag: *str*

Etag header or ""

property cache_control: *str*

Cache-Control header or ""

_aliased**_strings****load**()

Cache headers and additional data needed to keep track of the cache are stored separately, instead of the previous "added to repodata.json" arrangement.

save()Must be called after writing *cache_path_json*, since mtime is in another file.**has_format**(*format: str*) → *tuple*[*bool*, *datetime.datetime* | *None*]**set_has_format**(*format: str, value: bool*)**clear_has_format**(*format: str*)

Remove 'has_{format}' instead of setting to False.

```

should_check_format(format: str) → bool
    Return True if named format should be attempted.

__setitem__(key: str, item: Any) → None

__missing__(key: str)

class RepodataCache(base, repodata_fn)
    Handle caching for a single repodata.json + repodata.info.json (<hex-string>*.json inside dir)

    Avoid race conditions while loading, saving repodata.json and cache state.

    property cache_path_json

    property cache_path_state
        Out-of-band etag and other state needed by the RepoInterface.

    load(*, state_only=False) → str

    load_state()
        Update self.state without reading repodata.json.

        Return self.state.

    save(data: str)
        Write data to <repodata>.json cache path, synchronize state.

    replace(temp_path: pathlib.Path)
        Rename path onto <repodata>.json path, synchronize state.

        Relies on path's mtime not changing on move. temp_path should be adjacent to self.cache_path_json to be
        on the same filesystem.

    refresh(refresh_ns=0)
        Update access time in cache info file to indicate a HTTP 304 Not Modified response.

    stale()
        Compare state refresh_ns against cache control header and context.local_repodata_ttl.

    timeout()
        Return number of seconds until cache times out (<= 0 if already timed out).

class RepodataFetch(cache_path_base: pathlib.Path, channel: conda.models.channel.Channel, repodata_fn:
    str, *, repo_interface_cls)
    Combine RepodataCache and RepoInterface to provide subdir_data.SubdirData() with what it needs.

    Provide a variety of formats since some RepoInterface have to json.loads(...) anyway, and some clients
    don't need the Python data structure at all.

    property url_w_repodata_fn

    property cache_path_json

    property cache_path_state
        Out-of-band etag and other state needed by the RepoInterface.

    property repo_cache: RepodataCache

    property _repo: RepoInterface
        Changes as we mutate self.repodata_fn.

    cache_path_base: pathlib.Path

    channel: conda.models.channel.Channel

    repodata_fn: str

```

url_w_subdir: `str`

url_w_credentials: `str`

repo_interface_cls: `Any`

fetch_latest_parsed() → `tuple[dict, RepodataState]`

Retrieve parsed latest or latest-cached repodata as a dict; update cache.

Returns (repodata contents, state including cache headers)

fetch_latest_path() → `tuple[pathlib.Path, RepodataState]`

Retrieve latest or latest-cached repodata; update cache.

Returns (pathlib.Path to uncompressed repodata contents, RepodataState)

fetch_latest() → `tuple[dict | str, RepodataState]`

Return up-to-date repodata and cache information. Fetch repodata from remote if cache has expired; return cached data if cache has not expired; return stale cached data or dummy data if in offline mode.

read_cache() → `tuple[str, RepodataState]`

Read repodata from disk, without trying to fetch a fresh version.

_md5_not_for_security(data)

cache_fn_url(url, repodata_fn=REPODATA_FN)

get_cache_control_max_age(cache_control_value: str)

create_cache_dir()

subprocess

Helper functions for subprocess.

Functions

_format_output(command_str, cwd, rc, stdout, stderr)

any_subprocess(args, prefix[, env, cwd])

subprocess_call(command[, env, path, stdin, ...])

This utility function should be preferred for all conda subprocessing.

_subprocess_clean_env(env[, clean_python, clean_conda])

subprocess_call_with_clean_env(command[, path, stdin, ...])

Attributes

Response

Response

_format_output(*command_str*, *cwd*, *rc*, *stdout*, *stderr*)

any_subprocess(*args*, *prefix*, *env=None*, *cwd=None*)

subprocess_call(*command*, *env=None*, *path=None*, *stdin=None*, *raise_on_error=True*, *capture_output=True*)

This utility function should be preferred for all conda subprocessing. It handles multiple tricky details.

_subprocess_clean_env(*env*, *clean_python=True*, *clean_conda=True*)

subprocess_call_with_clean_env(*command*, *path=None*, *stdin=None*, *raise_on_error=True*,
clean_python=True, *clean_conda=True*)

history

Tools interfacing with conda's history file.

Classes

History

Functions

write_head(fo)

is_diff(content)

pretty_diff(diff)

pretty_content(content)

Attributes

h

exception `CondaHistoryWarning`

Bases: `Warning`

Base class for warning categories.

write_head(*fo*)

is_diff(*content*)

pretty_diff(*diff*)

pretty_content(*content*)

class `History`(*prefix*)

`com_pat`

`spec_pat`

`conda_v_pat`

`__enter__`()

`__exit__`(*exc_type*, *exc_value*, *traceback*)

`init_log_file`()

`file_is_empty`()

`update`() → `None`

Update the history file (creating a new one if necessary).

`parse`() → `list[tuple[str, set[str], list[str]]]`

Parse the history file.

Return a list of tuples(datetime strings, set of distributions/diffs, comments).

static `_parse_old_format_specs_string`(*specs_string*)

Parse specifications string that use conda<4.5 syntax.

Examples

- "param >=1.5.1,<2.0"
- "python>=3.5.1,jupyter >=1.0.0,<2.0,matplotlib >=1.5.1,<2.0"

classmethod `_parse_comment_line`(*line*)

Parse comment lines in the history file.

These lines can be of command type or action type.

Examples

- "# cmd: /scratch/mc3/bin/conda install -c conda-forge param>=1.5.1,<2.0"
- "# install specs: python>=3.5.1,jupyter >=1.0.0,<2.0,matplotlib >=1.5.1,<2.0"

get_user_requests()

Return a list of user requested items.

Each item is a dict with the following keys: 'date': the date and time running the command 'cmd': a list of argv of the actual command which was run 'action': install/remove/update 'specs': the specs being used

get_requested_specs_map()

construct_states()

Return a list of tuples(datetime strings, set of distributions).

get_state(rev=-1)

Return the state, i.e. the set of distributions, for a given revision.

Defaults to latest (which is the same as the current state when the log file is up-to-date).

Returns a list of dist_strs.

print_log()

object_log()

write_changes(last_state, current_state)

write_specs(remove_specs=(), update_specs=(), neutered_specs=())

h

instructions

Define the instruction set (constants) for conda operations.

Functions

PREFIX_CMD(state, prefix)

PRINT_CMD(state, arg)

FETCH_CMD(state, package_cache_entry)

EXTRACT_CMD(state, arg)

PROGRESSIVEFETCHEXTRACT_CMD(state, ...)

UNLINKLINKTRANSACTION_CMD(state, arg)

check_files_in_package(source_dir, files)

Attributes

CHECK_FETCH

FETCH

CHECK_EXTRACT

EXTRACT

RM_EXTRACTED

RM_FETCHED

PREFIX

PRINT

PROGRESS

SYMLINK_CONDA

UNLINK

LINK

UNLINKLINKTRANSACTION

PROGRESSIVEFETCHEXTRACT

PROGRESS_COMMANDS

ACTION_CODES

commands

OP_ORDER

```
CHECK_FETCH = 'CHECK_FETCH'
FETCH = 'FETCH'
CHECK_EXTRACT = 'CHECK_EXTRACT'
EXTRACT = 'EXTRACT'
RM_EXTRACTED = 'RM_EXTRACTED'
RM_FETCHED = 'RM_FETCHED'
PREFIX = 'PREFIX'
PRINT = 'PRINT'
PROGRESS = 'PROGRESS'
```



```

SYMLINK_CONDA = 'SYMLINK_CONDA'
UNLINK = 'UNLINK'
LINK = 'LINK'
UNLINKLINKTRANSACTION = 'UNLINKLINKTRANSACTION'
PROGRESSIVEFETCHEXTRACT = 'PROGRESSIVEFETCHEXTRACT'
PROGRESS_COMMANDS
ACTION_CODES = ()
PREFIX_CMD(state, prefix)
PRINT_CMD(state, arg)
FETCH_CMD(state, package_cache_entry)
EXTRACT_CMD(state, arg)
PROGRESSIVEFETCHEXTRACT_CMD(state, progressive_fetch_extract)
UNLINKLINKTRANSACTION_CMD(state, arg)
check_files_in_package(source_dir, files)
commands
OP_ORDER = ()

```

lock

Tools for working with locks

A lock is just an empty directory. We use directories because this lets us use the race condition-proof `os.makedirs`.

For now, there is one global lock for all of conda, because some things happen globally (such as downloading packages).

We don't raise an error if the lock is named with the current PID

Classes

<i>FileLock</i>	Lock a path (file or directory) with the lock file sitting <i>beside</i> path.
<i>DirectoryLock</i>	Lock a directory with the lock file sitting <i>within</i> the directory being locked.

Functions

<i>touch</i> (file_name[, times])	Touch function like touch in Unix shell
-----------------------------------	---

Attributes

`LOCK_EXTENSION`

`LOCKSTR`

`stdoutlog`

`Locked`

```
LOCK_EXTENSION = 'conda_lock'
```

```
LOCKSTR = Multiline-String
```

```
"""
LOCKERROR: It looks like conda is already doing something.
The lock {0} was found. Wait for it to finish before continuing.
If you are sure that conda is not running, remove it and try again.
You can also use: $ conda clean --lock
"""
```

stdoutlog

```
touch(file_name, times=None)
```

Touch function like touch in Unix shell :param file_name: the name of file :param times: the access and modified time .. rubric:: Examples

```
touch("hello_world.py")
```

```
class FileLock(path_to_lock, retries=10)
```

Lock a path (file or directory) with the lock file sitting *beside* path.

Parameters

- **path_to_lock** -- the path to be locked
- **retries** -- max number of retries

```
__enter__()
```

```
__exit__(exc_type, exc_value, traceback)
```

```
class DirectoryLock(directory_path, retries=10)
```

Bases: [FileLock](#)

Lock a directory with the lock file sitting *within* the directory being locked.

Useful when, for example, locking the root prefix at /conda, and / is not writable.

Parameters

- **directory_path** -- the path to be locked
- **retries** -- max number of retries

Locked

misc

Miscellaneous utility functions.

Functions

<code>conda_installed_files(prefix[, exclude_self_build])</code>	ex-	Return the set of files which have been installed (using conda) into
<code>explicit(specs, prefix[, verbose, force_extract, ...])</code>		
<code>rel_path(prefix, path[, windows_forward_slashes])</code>		
<code>walk_prefix(prefix[, ignore_predefined_files, ...])</code>		Return the set of all files in a given prefix directory.
<code>untracked(prefix[, exclude_self_build])</code>		Return (the set) of all untracked files for a given prefix.
<code>touch_nonadmin(prefix)</code>		Creates \$PREFIX/.nonadmin if sys.prefix/.nonadmin exists (on Windows).
<code>clone_env(prefix1, prefix2[, verbose, quiet, index_args])</code>		Clone existing prefix1 into new prefix2.

Attributes

<code>url_pat</code>

conda_installed_files(*prefix*, *exclude_self_build*=False)

Return the set of files which have been installed (using conda) into a given prefix.

url_pat

explicit(*specs*, *prefix*, *verbose*=False, *force_extract*=True, *index_args*=None, *index*=None)

rel_path(*prefix*, *path*, *windows_forward_slashes*=True)

walk_prefix(*prefix*, *ignore_predefined_files*=True, *windows_forward_slashes*=True)

Return the set of all files in a given prefix directory.

untracked(*prefix*, *exclude_self_build*=False)

Return (the set) of all untracked files for a given prefix.

touch_nonadmin(*prefix*)

Creates \$PREFIX/.nonadmin if sys.prefix/.nonadmin exists (on Windows).

clone_env(*prefix1*, *prefix2*, *verbose*=True, *quiet*=False, *index_args*=None)

Clone existing prefix1 into new prefix2.

models

Models are data transfer objects or "light-weight" domain objects with no appreciable logic other than their own validation. Models are used to pass data between layers of the stack. In many ways they are similar to ORM objects. Unlike ORM objects, they are NOT themselves allowed to load data from a remote resource. Thought of another way, they cannot import from `conda.gateways`, but rather `conda.gateways` imports from `conda.models` as appropriate to create model objects from remote resources.

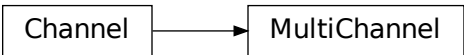
Conda modules importable from `conda.models` are

- `conda._vendor`
- `conda.common`
- `conda.models`

channel

Defines `Channel` and `MultiChannel` objects and other channel-related functions.

Object inheritance:



Classes

<i>ChannelType</i>	This metaclass does basic caching and enables static constructor method usage with a
<i>Channel</i>	Channel:
<i>MultiChannel</i>	Channel:

Functions

<i>tokenized_startswith</i> (test_iterable, startswith_iterable)
<i>tokenized_conda_url_startswith</i> (test_url, startswith_url)
<i>_get_channel_for_name</i> (channel_name)
<i>_read_channel_configuration</i> (scheme, host, port, path)
<i>parse_conda_channel_url</i> (url)

continues on next page

Table 223 – continued from previous page

<code>get_conda_build_local_url()</code>	
<code>prioritize_channels(channels[, with_credentials, subdirs])</code>	
<code>all_channel_urls(channels[, subdirs, with_credentials])</code>	
<code>offline_keep(url)</code>	
<code>get_channel_objs(ctx)</code>	Return current channels as Channel objects

class ChannelTypeBases: `type`

This metaclass does basic caching and enables static constructor method usage with a single arg.

`__call__(*args, **kwargs)`

Call self as a function.

class Channel(*scheme=None, auth=None, location=None, token=None, name=None, platform=None, package_filename=None*)

Channel: *scheme* <> *auth* <> *location* <> *token* <> *channel* <> *subchannel* <> *platform* <> *package_filename*Package Spec: *channel* <> *subchannel* <> *namespace* <> *package_name***property** `channel_location`**property** `channel_name`**property** `subdir`**property** `canonical_name`**property** `base_url`**property** `base_urls`**property** `subdir_url`**property** `url_channel_wtf``_cache_`**static** `_reset_state()`**static** `from_url(url)`**static** `from_channel_name(channel_name)`**static** `from_value(value)`**static** `make_simple_channel(channel_alias, channel_url, name=None)`**urls**(*with_credentials=False, subdirs=None*)**url**(*with_credentials=False*)`__str__()`Return `str(self)`.`__repr__()`Return `repr(self)`.`__eq__(other)`Return `self==value`.

```
__hash__()
    Return hash(self).

__nonzero__()

__bool__()

__json__()

dump()

class MultiChannel(name, channels, platform=None)
    Bases: Channel

    Channel: scheme <> auth <> location <> token <> channel <> subchannel <> platform <> package_filename
    Package Spec: channel <> subchannel <> namespace <> package_name

    property channel_location
    property canonical_name
    property base_url
    property base_urls
    urls(with_credentials=False, subdirs=None)
    url(with_credentials=False)
    dump()

tokenized_startswith(test_iterable, startswith_iterable)
tokenized_conda_url_startswith(test_url, startswith_url)
_get_channel_for_name(channel_name)
_read_channel_configuration(scheme, host, port, path)
parse_conda_channel_url(url)
get_conda_build_local_url()
prioritize_channels(channels, with_credentials=True, subdirs=None)
all_channel_urls(channels, subdirs=None, with_credentials=True)
offline_keep(url)
get_channel_objs(ctx: conda.base.context.Context)
    Return current channels as Channel objects

dist
```

(Legacy) Low-level implementation of a Channel.

Classes

DistDetails

DistType

Dist

Functions

strip_extension(original_dist)

split_extension(original_dist)

dist_str_to_quad(dist_str)

Attributes

IndexRecord

class **DistDetails**Bases: `NamedTuple`**name:** `str`**version:** `str`**build_string:** `str`**build_number:** `str`**dist_name:** `str`**fmt:** `str`**IndexRecord****class** **DistType**(name, bases, attr)Bases: `conda.auxlib.entity.EntityType`**__call__**(*args, **kwargs)

Call self as a function.

strip_extension(original_dist)**split_extension**(original_dist)**class** **Dist**(channel, dist_name=None, name=None, version=None, build_string=None, build_number=None, base_url=None, platform=None, fmt='tar.bz2')Bases: `conda.auxlib.entity.Entity`**property** full_name

```
property build
property subdir
property pair
property quad
property is_feature_package
property is_channel
property fn
_cache_
_lazy_validate = True
channel
dist_name
name
fmt
version
build_string
build_number
base_url
platform
to_package_ref()
__str__()
    Return str(self).
to_filename(extension=None)
to_matchspec()
to_match_spec()
classmethod from_string(string, channel_override=NULL)
static parse_dist_name(string)
classmethod from_url(url)
to_url()
__key__()
__lt__(other)
    Return self<value.
__gt__(other)
    Return self>value.
__le__(other)
    Return self<=value.
__ge__(other)
    Return self>=value.
```



```

__hash__()
    Return hash(self).

__eq__(other)
    Return self==value.

__ne__(other)
    Return self!=value.

split(sep=None, maxsplit=- 1)
rsplit(sep=None, maxsplit=- 1)
startswith(match)
__contains__(item)
dist_str_to_quad(dist_str)

```

enums

Collection of enums used throughout conda.

Classes

<i>Arch</i>	Generic enumeration.
<i>Platform</i>	Generic enumeration.
<i>FileMode</i>	Generic enumeration.
<i>LinkType</i>	Generic enumeration.
<i>PathType</i>	Refers to if the file in question is hard linked or soft linked. Originally designed to be used
<i>LeasedPathType</i>	Generic enumeration.
<i>PackageType</i>	Generic enumeration.
<i>NoarchType</i>	Generic enumeration.

class Arch

Bases: `enum.Enum`

Generic enumeration.

Derive from this class to define new enumerations.

```

x86 = 'x86'
x86_64 = 'x86_64'
arm64 = 'arm64'
armv6l = 'armv6l'
armv7l = 'armv7l'
aarch64 = 'aarch64'
ppc64 = 'ppc64'
ppc64le = 'ppc64le'
riscv64 = 'riscv64'

```

```
s390x = 's390x'
z = 'z'
classmethod from_sys()
__json__()
```

class Platform

Bases: `enum.Enum`

Generic enumeration.

Derive from this class to define new enumerations.

```
freebsd = 'freebsd'
linux = 'linux'
win = 'win32'
openbsd = 'openbsd5'
osx = 'darwin'
zos = 'zos'
classmethod from_sys()
__json__()
```

class FileMode

Bases: `enum.Enum`

Generic enumeration.

Derive from this class to define new enumerations.

```
text = 'text'
binary = 'binary'
__str__()
    Return str(self).
```

class LinkType

Bases: `enum.Enum`

Generic enumeration.

Derive from this class to define new enumerations.

```
hardlink = 1
softlink = 2
copy = 3
directory = 4
__int__()
__str__()
    Return str(self).
__json__()
```

class PathTypeBases: `enum.Enum`

Refers to if the file in question is hard linked or soft linked. Originally designed to be used in paths.json

`hardlink = 'hardlink'``softlink = 'softlink'``directory = 'directory'``linked_package_record = 'linked_package_record'``pyc_file = 'pyc_file'``unix_python_entry_point = 'unix_python_entry_point'``windows_python_entry_point_script = 'windows_python_entry_point_script'``windows_python_entry_point_exe = 'windows_python_entry_point_exe'``basic_types()``__str__()`

Return str(self).

`__json__()`**class LeasedPathType**Bases: `enum.Enum`

Generic enumeration.

Derive from this class to define new enumerations.

`application_entry_point = 'application_entry_point'``application_entry_point_windows_exe = 'application_entry_point_windows_exe'``application_softlink = 'application_softlink'``__str__()`

Return str(self).

`__json__()`**class PackageType**Bases: `enum.Enum`

Generic enumeration.

Derive from this class to define new enumerations.

`NOARCH_GENERIC = 'noarch_generic'``NOARCH_PYTHON = 'noarch_python'``VIRTUAL_PRIVATE_ENV = 'virtual_private_env'``VIRTUAL_PYTHON_WHEEL = 'virtual_python_wheel'``VIRTUAL_PYTHON_EGG_MANAGEABLE = 'virtual_python_egg_manageable'``VIRTUAL_PYTHON_EGG_UNMANAGEABLE = 'virtual_python_egg_unmanageable'``VIRTUAL_PYTHON_EGG_LINK = 'virtual_python_egg_link'``VIRTUAL_SYSTEM = 'virtual_system'``static conda_package_types()`

```
    static unmanageable_package_types()

class NoarchType
    Bases: enum.Enum

    Generic enumeration.

    Derive from this class to define new enumerations.

    generic = 'generic'
    python = 'python'
    static coerce(val)
```

[leased_path_entry](#)

Implements object describing a symbolic link from the base environment to a private environment.

Since private environments are an unrealized feature of conda and has been deprecated this data model no longer serves a purpose and has also been deprecated.

Classes

LeasedPathEntry	<code>_path</code> : short path for the leased path, using forward slashes
---------------------------------	--

```
class LeasedPathEntry(**kwargs)
    Bases: conda.auxlib.entity.Entity

    _path: short path for the leased path, using forward slashes
    target_path: the full path to the executable in the private env
    target_prefix: the full path to the private environment
    leased_path: the full path for the lease in the root prefix
    package_name: the package holding the lease
    leased_path_type: application_entry_point

    _path
    target_path
    target_prefix
    leased_path
    package_name
    leased_path_type
```

[match_spec](#)

Implements the query language for conda packages (a.k.a, MatchSpec).

The MatchSpec is the conda package specification (e.g. `conda==23.3`, `python<3.7`, `cryptography * *_0`) and is used to communicate the desired packages to install.

Classes

<i>MatchSpecType</i>	
<i>MatchSpec</i>	The query language for conda packages.
<i>MatchInterface</i>	
<i>_StrMatchMixin</i>	
<i>ExactStrMatch</i>	
<i>ExactLowerStrMatch</i>	
<i>GlobStrMatch</i>	
<i>GlobLowerStrMatch</i>	
<i>SplitStrMatch</i>	
<i>FeatureMatch</i>	
<i>ChannelMatch</i>	
<i>CaseInsensitiveStrMatch</i>	

Functions

<i>_parse_version_plus_build</i> (v_plus_b)	This should reliably pull the build string out of a version + build string combo.
<i>_parse_legacy_dist</i> (dist_str)	

Examples

<i>_parse_channel</i> (channel_val)
<i>_parse_spec_str</i> (spec_str)

Attributes

<i>_PARSE_CACHE</i>
<i>_implementors</i>

class MatchSpecType
 Bases: `type`

```
__call__(spec_arg=None, **kwargs)
    Call self as a function.
```

```
class MatchSpec(optional=False, target=None, **kwargs)
```

The query language for conda packages.

Any of the fields that comprise a `PackageRecord` can be used to compose a `MatchSpec`.

`MatchSpec` can be composed with keyword arguments, where keys are any of the attributes of `PackageRecord`. Values for keyword arguments are the exact values the attribute should match against. Many fields can also be matched against non-exact values--by including wildcard `*` and `>/<` ranges--where supported. Any non-specified field is the equivalent of a full wildcard match.

`MatchSpec` can also be composed using a single positional argument, with optional keyword arguments. Keyword arguments also override any conflicting information provided in the positional argument. The positional argument can be either an existing `MatchSpec` instance or a string. Conda has historically had several string representations for equivalent `MatchSpec`'s. This `:class:`MatchSpec` should accept any existing valid spec string, and correctly compose a `MatchSpec` instance.

A series of rules are now followed for creating the canonical string representation of a `MatchSpec` instance. The canonical string representation can generically be represented by

```
(channel(/subdir):(namespace):)name(version(build))[key1=value1,key2=value2]
```

where `()` indicate optional fields. The rules for constructing a canonical string representation are:

1. *name* (i.e. "package name") is required, but its value can be `'*'`. Its position is always outside the key-value brackets.
2. If *version* is an exact version, it goes outside the key-value brackets and is prepended by `==`. If *version* is a "fuzzy" value (e.g. `1.11.*`), it goes outside the key-value brackets with the `.*` left off and is prepended by `=`. Otherwise *version* is included inside key-value brackets.
3. If *version* is an exact version, and *build* is an exact value, *build* goes outside key-value brackets prepended by a `=`. Otherwise, *build* goes inside key-value brackets. *build_string* is an alias for *build*.
4. The *namespace* position is being held for a future conda feature.
5. If *channel* is included and is an exact value, a `::` separator is used between *channel* and *name*. *channel* can either be a canonical channel name or a channel url. In the canonical string representation, the canonical channel name will always be used.
6. If *channel* is an exact value and *subdir* is an exact value, *subdir* is appended to *channel* with a `/` separator. Otherwise, *subdir* is included in the key-value brackets.
7. Key-value brackets can be delimited by comma, space, or comma+space. Value can optionally be wrapped in single or double quotes, but must be wrapped if *value* contains a comma, space, or equal sign. The canonical format uses comma delimiters and single quotes.
8. When constructing a `MatchSpec` instance from a string, any key-value pair given inside the key-value brackets overrides any matching parameter given outside the brackets.

When `MatchSpec` attribute values are simple strings, they are interpreted using the following conventions:

- If the string begins with `^` and ends with `$`, it is converted to a regex.
- If the string contains an asterisk (`*`), it is transformed from a glob to a regex.
- Otherwise, an exact match to the string is sought.

Examples

```
>>> str(MatchSpec(name='foo', build='py2*', channel='conda-forge'))
'conda-forge::foo[build=py2*]'
>>> str(MatchSpec('foo 1.0 py27_0'))
'foo==1.0=py27_0'
>>> str(MatchSpec('foo=1.0=py27_0'))
'foo==1.0=py27_0'
>>> str(MatchSpec('conda-forge::foo[version=1.0.*]'))
'conda-forge::foo=1.0'
>>> str(MatchSpec('conda-forge/linux-64::foo>=1.0'))
'conda-forge/linux-64::foo[version='>=1.0']'
>>> str(MatchSpec('*linux-64::foo>=1.0'))
'foo[subdir=linux-64,version='>=1.0']'
```

To fully-specify a package with a full, exact spec, the fields

- channel
- subdir
- name
- version
- build

must be given as exact values. In the future, the namespace field will be added to this list. Alternatively, an exact spec is given by `*[md5=12345678901234567890123456789012]` or `*[sha256=f453db4ffe2271ec492a2913af4e61d4a6c118201f07de757df0eff769b65d2e]`.

property is_name_only_spec

property optional

property target

property original_spec_str

property name

property strictness

property spec

property version

property fn

```
FIELD_NAMES = ('channel', 'subdir', 'name', 'version', 'build', 'build_number',
               'track_features', 'features', ...)
```

FIELD_NAMES_SET

_MATCHER_CACHE

classmethod from_dist_str(*dist_str*)

get_exact_value(*field_name*)

get_raw_value(*field_name*)

get(*field_name*, default=None)

dist_str()

match(*rec*)

Accepts an *IndexRecord* or a dict, and matches can pull from any field in that record. Returns True for a match, and False for no match.

_match_individual(*record, field_name, match_component*)

_is_simple()

_is_single()

_to_filename_do_not_use()

__repr__()

Return repr(self).

__str__()

Return str(self).

__json__()

conda_build_form()

__eq__(*other*)

Return self==value.

__hash__()

Return hash(self).

_hash_key()

__contains__(*field*)

_build_components(***kwargs*)

static _make_component(*field_name, value*)

classmethod merge(*match_specs, union=False*)

classmethod union(*match_specs*)

_merge(*other, union=False*)

_parse_version_plus_build(*v_plus_b*)

This should reliably pull the build string out of a version + build string combo. .. rubric:: Examples

```
>>> _parse_version_plus_build("=1.2.3 0")
('=1.2.3', '0')
>>> _parse_version_plus_build("1.2.3=0")
('1.2.3', '0')
>>> _parse_version_plus_build(">=1.0 , < 2.0 py34_0")
('>=1.0,<2.0', 'py34_0')
>>> _parse_version_plus_build(">=1.0 , < 2.0 =py34_0")
('>=1.0,<2.0', 'py34_0')
>>> _parse_version_plus_build("=1.2.3 ")
('=1.2.3', None)
>>> _parse_version_plus_build(">1.8,<2|==1.7")
('>1.8,<2|==1.7', None)
>>> _parse_version_plus_build("* openblas_0")
('*', 'openblas_0')
>>> _parse_version_plus_build("* *")
('*', '*')
```


`_parse_legacy_dist(dist_str)`

Examples

```
>>> _parse_legacy_dist("_license-1.1-py27_1.tar.bz2")
('_license', '1.1', 'py27_1')
>>> _parse_legacy_dist("_license-1.1-py27_1")
('_license', '1.1', 'py27_1')
```

`_parse_channel(channel_val)`

`_PARSE_CACHE`

`_parse_spec_str(spec_str)`

`class MatchInterface(value)`

property raw_value

abstract property exact_value

If the match value is an exact specification, returns the value. Otherwise returns None.

abstract match(other)

matches(value)

merge(other)

union(other)

`class _StrMatchMixin`

property exact_value

__str__()

Return str(self).

__repr__()

Return repr(self).

__eq__(other)

Return self==value.

__hash__()

Return hash(self).

`class ExactStrMatch(value)`

Bases: `_StrMatchMixin`, `MatchInterface`

__slots__ = ('_raw_value',)

match(other)

`class ExactLowerStrMatch(value)`

Bases: `ExactStrMatch`

match(other)

`class GlobStrMatch(value)`

Bases: `_StrMatchMixin`, `MatchInterface`

property exact_value

If the match value is an exact specification, returns the value. Otherwise returns None.

property matches_all

__slots__ = ('_raw_value', '_re_match')

match(*other*)

class GlobLowerStrMatch(*value*)

Bases: [GlobStrMatch](#)

class SplitStrMatch(*value*)

Bases: [MatchInterface](#)

property exact_value

If the match value is an exact specification, returns the value. Otherwise returns None.

__slots__ = ('_raw_value',)

_convert(*value*)

match(*other*)

__repr__()

Return repr(self).

__str__()

Return str(self).

__eq__(*other*)

Return self==value.

__hash__()

Return hash(self).

class FeatureMatch(*value*)

Bases: [MatchInterface](#)

property exact_value

If the match value is an exact specification, returns the value. Otherwise returns None.

__slots__ = ('_raw_value',)

_convert(*value*)

match(*other*)

__repr__()

Return repr(self).

__str__()

Return str(self).

__eq__(*other*)

Return self==value.

__hash__()

Return hash(self).

class ChannelMatch(*value*)

Bases: [GlobStrMatch](#)

match(*other*)

```
__str__()
    Return str(self).
```

```
__repr__()
    Return repr(self).
```

```
class CaseInsensitiveStrMatch(value)
```

```
    Bases: GlobLowerStrMatch
```

```
    match(other)
```

```
_implementors
```

```
package_info
```

(Legacy) Low-level implementation of a PackageRecord.

Classes

<i>NoarchField</i>	Fields are doing something very similar to boxing and unboxing
<i>Noarch</i>	
<i>PreferredEnv</i>	
<i>PackageMetadata</i>	
<i>PackageInfo</i>	

```
class NoarchField(enum_class, default=NULL, required=True, validation=None, in_dump=True,
                  default_in_dump=True, nullable=False, immutable=False, aliases=())
```

```
    Bases: conda.auxlib.entity.EnumField
```

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, `dump` in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --
- **dump** (*boolean, optional*) --

```
    box(instance, instance_type, val)
```

```
class Noarch(**kwargs)
```

```
    Bases: conda.auxlib.entity.Entity
```

```
    type
```

```
    entry_points
class PreferredEnv(**kwargs)
    Bases: conda.auxlib.entity.Entity
    name
    executable_paths
    softlink_paths
class PackageMetadata(**kwargs)
    Bases: conda.auxlib.entity.Entity
    package_metadata_version
    noarch
    preferred_env
class PackageInfo(**kwargs)
    Bases: conda.auxlib.entity.ImmutableEntity
    property name
    property version
    property build
    property build_number
    extracted_package_dir
    package_tarball_full_path
    channel
    repodata_record
    url
    icondata
    package_metadata
    paths_data
    dist_str()
```

`prefix_graph`

Implements directed graphs to sort and manipulate packages within a prefix.

Object inheritance:



Classes

<i>PrefixGraph</i>	A directed graph structure used for sorting packages (prefix_records) in prefixes and
<i>GeneralGraph</i>	Compared with PrefixGraph, this class takes in more than one record of a given name,

class `PrefixGraph(records, specs=())`

A directed graph structure used for sorting packages (prefix_records) in prefixes and manipulating packages within prefixes (e.g. removing and pruning).

The terminology used for edge direction is "parents" and "children" rather than "successors" and "predecessors". The parent nodes of a record are those records in the graph that match the record's "depends" field. E.g. NodeA depends on NodeB, then NodeA is a child of NodeB, and NodeB is a parent of NodeA. Nodes can have zero parents, or more than two parents.

Most public methods mutate the graph.

property records

remove_spec(spec)

Remove all matching nodes, and any associated child nodes.

Parameters `spec` (`MatchSpec`) --

Returns The removed nodes.

Return type `tuple[PrefixRecord]`

remove_youngest_descendant_nodes_with_specs()

A specialized method used to determine only dependencies of requested specs.

Returns The removed nodes.

Return type `tuple[PrefixRecord]`

prune()

Prune back all packages until all child nodes are anchored by a spec.

Returns The pruned nodes.

Return type `tuple[PrefixRecord]`

get_node_by_name(name)

all_descendants(node)

all_ancestors(node)

_remove_node(node)

Removes this node and all edges referencing it.

_toposort()

classmethod `_toposort_raise_on_cycles(graph)`

classmethod `_topo_sort_handle_cycles(graph)`

static `_toposort_pop_key(graph)`

Pop an item from the graph that has the fewest parents. In the case of a tie, use the node with the alphabetically-first package name.

static `_toposort_prepare_graph(graph)`

```
class GeneralGraph(records, specs=())
```

Bases: *PrefixGraph*

Compared with *PrefixGraph*, this class takes in more than one record of a given name, and operates on that graph from the higher view across any matching dependencies. It is not a *Prefix* thing, but more like a "graph of all possible candidates" thing, and is used for unsatisfiability analysis

```
breadth_first_search_by_name(root_spec, target_spec)
```

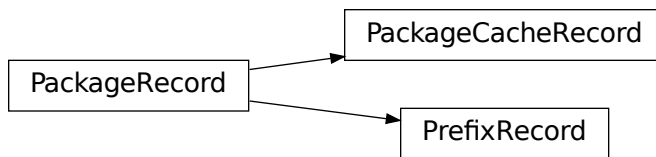
Return shorted path from *root_spec* to *spec_name*

records

Implements the data model for conda packages.

A *PackageRecord* is the record of a package present in a channel. A *PackageCache* is the record of a downloaded and cached package. A *PrefixRecord* is the record of a package installed into a conda environment.

Object inheritance:



Classes

<i>LinkTypeField</i>	Fields are doing something very similar to boxing and unboxing
<i>NoarchField</i>	Fields are doing something very similar to boxing and unboxing
<i>TimestampField</i>	Fields are doing something very similar to boxing and unboxing
<i>Link</i>	
<i>_FeaturesField</i>	Fields are doing something very similar to boxing and unboxing
<i>ChannelField</i>	Fields are doing something very similar to boxing and unboxing
<i>SubdirField</i>	Fields are doing something very similar to boxing and unboxing
<i>FilenameField</i>	Fields are doing something very similar to boxing and unboxing
<i>PackageTypeField</i>	Fields are doing something very similar to boxing and unboxing

continues on next page

Table 234 – continued from previous page

<i>PathData</i>	
<i>PathDataV1</i>	
<i>PathsData</i>	
<i>PackageRecord</i>	
<i>Md5Field</i>	Fields are doing something very similar to boxing and unboxing
<i>PackageCacheRecord</i>	
<i>PrefixRecord</i>	

Attributes*EMPTY_LINK*

class LinkTypeField(*enum_class*, *default=NULL*, *required=True*, *validation=None*, *in_dump=True*, *default_in_dump=True*, *nullable=False*, *immutable=False*, *aliases=()*)

Bases: *conda.auxlib.entity.EnumField*

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, dump in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --
- **dump** (*boolean, optional*) --

box(*instance, instance_type, val*)

class NoarchField(*enum_class*, *default=NULL*, *required=True*, *validation=None*, *in_dump=True*, *default_in_dump=True*, *nullable=False*, *immutable=False*, *aliases=()*)

Bases: *conda.auxlib.entity.EnumField*

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, dump in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.

- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --
- **dump** (*boolean, optional*) --

box(*instance, instance_type, val*)

class **TimestampField**

Bases: [conda.auxlib.entity.NumberField](#)

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, `dump` in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --
- **dump** (*boolean, optional*) --

static **_make_seconds**(*val*)

static **_make_milliseconds**(*val*)

box(*instance, instance_type, val*)

dump(*instance, instance_type, val*)

__get__(*instance, instance_type*)

class **Link**(***kwargs*)

Bases: [conda.auxlib.entity.DictSafeMixin](#), [conda.auxlib.entity.Entity](#)

source

type

EMPTY_LINK

class **_FeaturesField**(***kwargs*)

Bases: [conda.auxlib.entity.ListField](#)

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, `dump` in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --
- **dump** (*boolean, optional*) --

box(*instance, instance_type, val*)

`dump(instance, instance_type, val)`

class ChannelField(*aliases=()*)

Bases: `conda.auxlib.entity.ComposableField`

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, `dump` in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --
- **dump** (*boolean, optional*) --

`dump(instance, instance_type, val)`

`__get__(instance, instance_type)`

class SubdirField

Bases: `conda.auxlib.entity.StringField`

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, `dump` in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --
- **dump** (*boolean, optional*) --

`__get__(instance, instance_type)`

class FilenameField(*aliases=()*)

Bases: `conda.auxlib.entity.StringField`

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, `dump` in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --
- **dump** (*boolean, optional*) --

`__get__(instance, instance_type)`

class `PackageTypeField`

Bases: `conda.auxlib.entity.EnumField`

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, dump in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --
- **dump** (*boolean, optional*) --

`__get__(instance, instance_type)`

class `PathData(**kwargs)`

Bases: `conda.auxlib.entity.Entity`

property `path`

`_path`

property `prefix_placeholder`

property `file_mode`

property `no_link`

property `path_type`

class `PathDataV1(**kwargs)`

Bases: `PathData`

property `sha256`

property `size_in_bytes`

property `inode_paths`

property `sha256_in_prefix`

class `PathsData(**kwargs)`

Bases: `conda.auxlib.entity.Entity`

property `paths_version`

property `paths`

class `PackageRecord(**kwargs)`

Bases: `conda.auxlib.entity.DictSafeMixin`, `conda.auxlib.entity.Entity`

property `schannel`

property `_pkey`

property `is_unmanageable`

property `combined_depends`

property `namekey`

```
name
version
build
build_number
channel
subdir
fn
md5
legacy_bz2_md5
legacy_bz2_size
url
sha256
metadata_signature_status
arch
platform
depends
constrains
track_features
features
noarch
preferred_env
license
license_family
package_type
timestamp
date
size
__hash__()
    Return hash(self).
__eq__(other)
    Return self==value.
dist_str()
dist_fields_dump()
__str__()
    Return str(self).
to_match_spec()
to_simple_match_spec()
```

`record_id()`

class `Md5Field`

Bases: `conda.auxlib.entity.StringField`

Fields are doing something very similar to boxing and unboxing of c#/java primitives. `__set__` should take a "primitive" or "raw" value and create a "boxed" or "programmatically usable" value of it. While `__get__` should return the boxed value, `dump` in turn should unbox the value into a primitive or raw value.

Parameters

- **types** (*primitive literal or type or sequence of types*) --
- **default** (*any, callable, optional*) -- If default is callable, it's guaranteed to return a valid value at the time of Entity creation.
- **required** (*boolean, optional*) --
- **validation** (*callable, optional*) --
- **dump** (*boolean, optional*) --

`__get__` (*instance, instance_type*)

class `PackageCacheRecord(**kwargs)`

Bases: `PackageRecord`

`property is_fetched`

`property is_extracted`

`property tarball_basename`

`package_tarball_full_path`

`extracted_package_dir`

`md5`

`_calculate_md5sum()`

class `PrefixRecord(**kwargs)`

Bases: `PackageRecord`

`package_tarball_full_path`

`extracted_package_dir`

`files`

`paths_data`

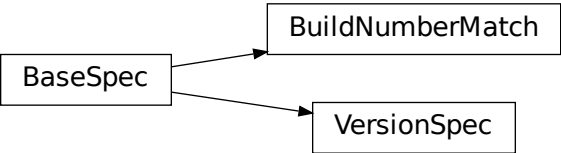
`link`

`requested_spec`

`auth`

version

Implements the version spec with parsing and comparison logic.
Object inheritance:



Classes

<i>SingleStrArgCachingType</i>	
<i>VersionOrder</i>	Implement an order relation between version strings.
<i>BaseSpec</i>	
<i>VersionSpec</i>	
<i>BuildNumberMatch</i>	

Functions

<i>normalized_version</i> (\rightarrow VersionOrder)	Parse a version string and return VersionOrder object.
<i>ver_eval</i> (vtest, spec)	
<i>treeify</i> (spec_str)	

Examples

<i>untreeify</i> (spec[, _inand, depth])
--

Examples

<i>compatible_release_operator</i> (x, y)

Attributes

`version_check_re`

`version_split_re`

`version_cache`

`VSPEC_TOKENS`

`version_relation_re`

`regex_split_re`

`OPERATOR_MAP`

`OPERATOR_START`

`VersionMatch`

normalized_version(version: *str*) → *VersionOrder*

Parse a version string and return VersionOrder object.

ver_eval(vtest, spec)

version_check_re

version_split_re

version_cache

class SingleStrArgCachingType

Bases: `type`

__call__(arg)

Call self as a function.

class VersionOrder(vstr)

Implement an order relation between version strings.

Version strings can contain the usual alphanumeric characters (A-Za-z0-9), separated into components by dots and underscores. Empty segments (i.e. two consecutive dots, a leading/trailing underscore) are not permitted. An optional epoch number - an integer followed by '!' - can proceed the actual version string (this is useful to indicate a change in the versioning scheme itself). Version comparison is case-insensitive.

Conda supports six types of version strings: * Release versions contain only integers, e.g. '1.0', '2.3.5'. * Pre-release versions use additional letters such as 'a' or 'rc',

for example '1.0a1', '1.2.beta3', '2.3.5rc3'.

- Development versions are indicated by the string 'dev', for example '1.0dev42', '2.3.5.dev12'.
- Post-release versions are indicated by the string 'post', for example '1.0post1', '2.3.5.post2'.

- Tagged versions have a suffix that specifies a particular property of interest, e.g. '1.1.parallel'. Tags can be added to any of the preceding four types. As far as sorting is concerned, tags are treated like strings in pre-release versions.
- An optional local version string separated by '+' can be appended to the main (upstream) version string. It is only considered in comparisons when the main versions are equal, but otherwise handled in exactly the same manner.

To obtain a predictable version ordering, it is crucial to keep the version number scheme of a given package consistent over time. Specifically, * version strings should always have the same number of components

(except for an optional tag suffix or local version string),

- letters/strings indicating non-release versions should always occur at the same position.

Before comparison, version strings are parsed as follows: * They are first split into epoch, version number, and local version

number at '!' and '+' respectively. If there is no '!', the epoch is set to 0. If there is no '+', the local version is empty.

- The version part is then split into components at '.' and '_'.
- Each component is split again into runs of numerals and non-numerals
- Subcomponents containing only numerals are converted to integers.
- Strings are converted to lower case, with special treatment for 'dev' and 'post'.
- When a component starts with a letter, the fillvalue 0 is inserted to keep numbers and strings in phase, resulting in '1.1.a1' == '1.1.0a1'.
- The same is repeated for the local version part.

Examples

1.2g.beta15.rc => [[0], [1], [2, 'g'], [0, 'beta', 15], [0, 'rc']] 1!2.15.1_ALPHA => [[1], [2], [15], [1, '_alpha']]

The resulting lists are compared lexicographically, where the following rules are applied to each pair of corresponding subcomponents: * integers are compared numerically * strings are compared lexicographically, case-insensitive * strings are smaller than integers, except * 'dev' versions are smaller than all corresponding versions of other types * 'post' versions are greater than all corresponding versions of other types * if a subcomponent has no correspondent, the missing correspondent is

treated as integer 0 to ensure '1.1' == '1.1.0'.

The resulting order is:

0.4

< 0.4.0 < 0.4.1.rc

== 0.4.1.RC # case-insensitive comparison < 0.4.1 < 0.5a1 < 0.5b3 < 0.5C1 # case-insensitive comparison < 0.5 < 0.9.6 < 0.960923 < 1.0 < 1.1dev1 # special case 'dev' < **1.1_** # appended underscore is special case for openssl-like versions < 1.1a1 < 1.1.0dev1 # special case 'dev'

== 1.1.dev1 # 0 is inserted before string < 1.1.a1 < 1.1.0rc1 < 1.1.0

== 1.1 < 1.1.0post1 # special case 'post'

== 1.1.post1 # 0 is inserted before string < 1.1post1 # special case 'post' < 1996.07.12 < 1!0.4.1 # epoch increased < 1!3.1.1.6 < 2!0.4.1 # epoch increased again

Some packages (most notably openssl) have incompatible version conventions. In particular, openssl interprets letters as version counters rather than pre-release identifiers. For openssl, the relation

1.0.1 < 1.0.1a => False # should be true for openssl

holds, whereas conda packages use the opposite ordering. You can work-around this problem by appending an underscore to plain version numbers:

1.0.1_ < 1.0.1a => True # ensure correct ordering for openssl

cache

__str__()

Return str(self).

__repr__()

Return repr(self).

_eq(t1, t2)

__eq__(other)

Return self==value.

startswith(other)

__ne__(other)

Return self!=value.

__lt__(other)

Return self<value.

__gt__(other)

Return self>value.

__le__(other)

Return self<=value.

__ge__(other)

Return self>=value.

VSPEC_TOKENS = '\\s*\\^[^\$]*[\$]|\\s*[()|,|][^()|,|]+'

treeify(spec_str)

Examples

```
>>> treeify("1.2.3")
'1.2.3'
>>> treeify("1.2.3,>4.5.6")
(' ', '1.2.3', '>4.5.6')
>>> treeify("1.2.3,4.5.6|<=7.8.9")
(' | ', (' ', '1.2.3', '4.5.6'), '<=7.8.9')
>>> treeify("(1.2.3|4.5.6),<=7.8.9")
(' ', (' | ', '1.2.3', '4.5.6'), '<=7.8.9')
>>> treeify("((1.5|((1.6|1.7), 1.8), 1.9 |2.0))|2.1")
(' | ', '1.5', (' ', (' | ', '1.6', '1.7'), '1.8', '1.9'), '2.0', '2.1')
```

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```
>>> treeify("1.5|(1.6|1.7),1.8,1.9|2.0|2.1")
('|', '1.5', ('', ('|', '1.6', '1.7'), '1.8', '1.9'), '2.0', '2.1')
```

untreeify(spec, _inand=False, depth=0)

Examples

```
>>> untreeify('1.2.3')
'1.2.3'
>>> untreeify(('|', '1.2.3', '>4.5.6'))
'1.2.3,>4.5.6'
>>> untreeify(('|', ('|', '1.2.3', '4.5.6'), '<=7.8.9'))
'(1.2.3,4.5.6)|<=7.8.9'
>>> untreeify(('|', ('|', '1.2.3', '4.5.6'), '<=7.8.9'))
'(1.2.3|4.5.6),<=7.8.9'
>>> untreeify(('|', '1.5', ('|', ('|', '1.6', '1.7'), '1.8', '1.9'), '2.0', '2.1'))
'1.5|((1.6|1.7),1.8,1.9)|2.0|2.1'
```

compatible_release_operator(x, y)

version_relation_re

regex_split_re

OPERATOR_MAP

OPERATOR_START

class BaseSpec(spec_str, matcher, is_exact)

property spec

property raw_value

property exact_value

is_exact()

__eq__(other)

Return self==value.

__ne__(other)

Return self!=value.

__hash__()

Return hash(self).

__str__()

Return str(self).

__repr__()

Return repr(self).

abstract merge(other)

regex_match(spec_str)

operator_match(spec_str)

```
    any_match(spec_str)
    all_match(spec_str)
    exact_match(spec_str)
    always_true_match(spec_str)
class VersionSpec(vspec)
    Bases: BaseSpec
    _cache_
    get_matcher(vspec)
    merge(other)
    union(other)
VersionMatch
class BuildNumberMatch(vspec)
    Bases: BaseSpec
    property exact_value: int | None
    _cache_
    get_matcher(vspec)
    merge(other)
    union(other)
    __str__()
        Return str(self).
    __repr__()
        Return repr(self).
```

notices

cache

Handles all caching logic including:

- Retrieving from cache
- Saving to cache
- Determining whether not certain items have expired and need to be refreshed

Functions

<code>cached_response(func)</code>	
<hr/>	
<code>is_notice_response_cache_expired(→ bool)</code>	This checks the contents of the cache response to see if it is expired.
<hr/>	
<code>get_notices_cache_dir(→ pathlib.Path)</code>	Returns the location of the notices cache directory as a Path object

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Table 239 – continued from previous page

<code>get_notices_cache_file()</code> (\rightarrow <code>pathlib.Path</code>)	Returns the location of the notices cache file as a Path object
<code>get_notice_response_from_cache(...)</code>	Retrieves a notice response object from cache if it exists.
<code>write_notice_response_to_cache()</code> (\rightarrow <code>None</code>)	Writes our notice data to our local cache location.
<code>mark_channel_notices_as_viewed()</code> (\rightarrow <code>None</code>)	Insert channel notice into our database marking it as read.
<code>get_viewed_channel_notice_ids()</code> (\rightarrow <code>set[str]</code>)	Return the ids of the channel notices which have already been seen.

Attributes

`logger`

logger

`cached_response(func)`

`is_notice_response_cache_expired(channel_notice_response: conda.notices.types.ChannelNoticeResponse)`
 \rightarrow `bool`

This checks the contents of the cache response to see if it is expired.

If for whatever reason we encounter an exception while parsing the individual messages, we assume an invalid cache and return true.

`get_notices_cache_dir()` \rightarrow `pathlib.Path`

Returns the location of the notices cache directory as a Path object

`get_notices_cache_file()` \rightarrow `pathlib.Path`

Returns the location of the notices cache file as a Path object

`get_notice_response_from_cache(url: str, name: str, cache_dir: pathlib.Path)` \rightarrow `ChannelNoticeResponse | None`

Retrieves a notice response object from cache if it exists.

`write_notice_response_to_cache(channel_notice_response: conda.notices.types.ChannelNoticeResponse, cache_dir: pathlib.Path)` \rightarrow `None`

Writes our notice data to our local cache location.

`mark_channel_notices_as_viewed(cache_file: pathlib.Path, channel_notices: Sequence[conda.notices.types.ChannelNotice])` \rightarrow `None`

Insert channel notice into our database marking it as read.

`get_viewed_channel_notice_ids(cache_file: pathlib.Path, channel_notices: Sequence[conda.notices.types.ChannelNotice])` \rightarrow `set[str]`

Return the ids of the channel notices which have already been seen.

core

Core conda notices logic.

Functions

<code>retrieve_notices(...)</code>	Function used for retrieving notices. This is called by the "notices" decorator as well
<code>display_notices(→ None)</code>	Prints the channel notices to std out.
<code>notices(func)</code>	Wrapper for "execute" entry points for subcommands.
<code>get_channel_name_and_urls(→ list[tuple[ChannelUrl, ...])</code>	Return a sequence of Channel URL and name tuples.
<code>flatten_notice_responses(...)</code>	
<code>filter_notices(...)</code>	Perform filtering actions for the provided sequence of ChannelNotice objects.
<code>is_channel_notices_enabled(→ bool)</code>	Determines whether channel notices are enabled and therefore displayed when
<code>is_channel_notices_cache_expired(→ bool)</code>	Checks to see if the notices cache file we use to keep track of

Attributes

<code>ChannelName</code>
<code>ChannelUrl</code>
<code>logger</code>

ChannelName

ChannelUrl

logger

retrieve_notices(*limit: int | None = None, always_show_viewed: bool = True, silent: bool = False*) → *conda.notices.types.ChannelNoticeResultSet*

Function used for retrieving notices. This is called by the "notices" decorator as well as the sub-command "notices"

Parameters

- **limit** -- Limit the number of notices to show (defaults to None).
- **always_show_viewed** -- Whether all notices should be shown, not only the unread ones (defaults to True).
- **silent** -- Whether to use a spinner when fetching and caching notices.

display_notices(*channel_notice_set: conda.notices.types.ChannelNoticeResultSet*) → *None*

Prints the channel notices to std out.

notices(func)

Wrapper for "execute" entry points for subcommands.

If channel notices need to be fetched, we do that first and then run the command normally. We then display these notices at the very end of the command output so that the user is more likely to see them.

This ordering was specifically done to address the following bug report:

- <https://github.com/conda/conda/issues/11847>

Parameters **func** -- Function to be decorated

get_channel_name_and_urls(channels: Sequence[Channel | MultiChannel]) → list[tuple[ChannelUrl, ChannelName]]

Return a sequence of Channel URL and name tuples.

This function handles both Channel and MultiChannel object types.

flatten_notice_responses(channel_notice_responses: Sequence[conda.notices.types.ChannelNoticeResponse]) → Sequence[conda.notices.types.ChannelNotice]

filter_notices(channel_notices: Sequence[conda.notices.types.ChannelNotice], limit: int | None = None, exclude: set[str] | None = None) → Sequence[conda.notices.types.ChannelNotice]

Perform filtering actions for the provided sequence of ChannelNotice objects.

is_channel_notices_enabled(ctx: conda.base.context.Context) → bool

Determines whether channel notices are enabled and therefore displayed when invoking the *notices* command decorator.

This only happens when:

- offline is False
- number_channel_notices is greater than 0

Parameters **ctx** -- The conda context object

is_channel_notices_cache_expired() → bool

Checks to see if the notices cache file we use to keep track of displayed notices is expired. This involves checking the mtime attribute of the file. Anything older than what is specified as the NOTICES_DECORATOR_DISPLAY_INTERVAL is considered expired.

fetch

Notices network fetch logic.

Functions

<code>get_notice_responses(...)</code>	Provided a list of channel notification url/name tuples, return a sequence of
<code>get_channel_notice_response(→ ChannelNoticeResponse None)</code>	Return a channel response object. We use this to wrap the response with

Attributes

logger

logger

get_notice_responses(*url_and_names*: Sequence[tuple[str, str]], *silent*: bool = False, *max_workers*: int = 10)
→ Sequence[conda.notices.types.ChannelNoticeResponse]

Provided a list of channel notification url/name tuples, return a sequence of ChannelNoticeResponse objects.

Parameters

- **url_and_names** -- channel url and the channel name
- **silent** -- turn off "loading animation" (defaults to False)
- **max_workers** -- increase worker number in thread executor (defaults to 10)

Returns Sequence[ChannelNoticeResponse]

get_channel_notice_response(*url*: str, *name*: str) → ChannelNoticeResponse | None

Return a channel response object. We use this to wrap the response with additional channel information to use. If the response was invalid we suppress/log and error message.

types

Implements all conda.notices types.

Classes

<i>ChannelNotice</i>	Represents an individual channel notice.
<i>ChannelNoticeResultSet</i>	Represents a list of a channel notices, plus some accompanying
<i>ChannelNoticeResponse</i>	

class ChannelNotice

Bases: NamedTuple

Represents an individual channel notice.

id: str | None

channel_name: str | None

message: str | None

level: conda.base.constants.NoticeLevel

created_at: datetime | None

expired_at: datetime | None

interval: int | None

class ChannelNoticeResultSet

Bases: NamedTuple

Represents a list of a channel notices, plus some accompanying metadata such as *viewed_channel_notices*.**channel_notices:** Sequence[[ChannelNotice](#)]**total_number_channel_notices:** int**viewed_channel_notices:** int**class ChannelNoticeResponse**

Bases: NamedTuple

property notices: Sequence[[ChannelNotice](#)]**url:** str**name:** str**json_data:** dict | None**static _parse_notice_level**(level: str | None) → [conda.base.constants.NoticeLevel](#)

We use this to validate notice levels and provide reasonable defaults if any are invalid.

static _parse_iso_timestamp(iso_timestamp: str | None) → datetime | None

Parse ISO timestamp and fail over to a default value of none.

classmethod get_cache_key(url: str, cache_dir: [pathlib.Path](#)) → [pathlib.Path](#)

Returns where this channel response will be cached by hashing the URL.

views

Handles all display/view logic.

Functions

<i>print_notices</i> (channel_notices)	Accepts a list of channel notice responses and prints a display.
<i>print_notice_message</i> (→ None)	Prints a single channel notice.
<i>print_more_notices_message</i> (→ None)	Conditionally shows a message informing users how many more message there are.

print_notices(channel_notices: Sequence[[conda.notices.types.ChannelNotice](#)])

Accepts a list of channel notice responses and prints a display.

Parameters **channel_notices** -- A sequence of ChannelNotice objects.**print_notice_message**(notice: [conda.notices.types.ChannelNotice](#), indent: str = ' ') → None

Prints a single channel notice.

print_more_notices_message(total_notices: int, displayed_notices: int, viewed_notices: int) → None

Conditionally shows a message informing users how many more message there are.

Functions

<code>notices(func)</code>	Wrapper for "execute" entry points for subcommands.
----------------------------	---

notices(*func*)

Wrapper for "execute" entry points for subcommands.

If channel notices need to be fetched, we do that first and then run the command normally. We then display these notices at the very end of the command output so that the user is more likely to see them.

This ordering was specifically done to address the following bug report:

- <https://github.com/conda/conda/issues/11847>

Parameters **func** -- Function to be decorated

plan

Handle the planning of installs and their execution.

Note: conda.install uses canonical package names in its interface functions, whereas conda.resolve uses package filenames, as those are used as index keys. We try to keep fixes to this "impedance mismatch" local to this module.

Functions

<code>print_dists(dists_extras)</code>
--

<code>display_actions(actions,</code>	<code>index[,</code>
<code>show_channel_urls, ...)</code>	
<code>add_unlink(actions, dist)</code>	

<code>add_defaults_to_specs(r, linked, specs[, update,</code>	
<code>prefix])</code>	
<code>_get_best_prec_match(precs)</code>	

<code>revert_actions(prefix[, revision, index])</code>
--

<code>execute_actions(actions, index[, verbose])</code>

<code>_plan_from_actions(actions, index)</code>

<code>_inject_UNLINKLINKTRANSACTION(plan, index, pre-</code>	
<code>fix, ...)</code>	
<code>_handle_menuinst(unlink_dists, link_dists)</code>	

<code>install_actions(prefix, index, specs[, force, ...])</code>
--

<code>get_blank_actions(prefix)</code>
--

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Table 248 – continued from previous page

<code>execute_plan</code> (old_plan[, index, verbose])	Deprecated: This should <i>conda.instructions.execute_instructions</i> instead.
<code>execute_instructions</code> (plan[, index, verbose, _commands])	Execute the instructions in the plan
<code>_update_old_plan</code> (old_plan)	Update an old plan object to work with

`print_dists`(dists_extras)

`display_actions`(actions, index, show_channel_urls=None, specs_to_remove=(), specs_to_add=())

`add_unlink`(actions, dist)

`add_defaults_to_specs`(r, linked, specs, update=False, prefix=None)

`_get_best_prec_match`(prec)

`revert_actions`(prefix, revision=-1, index=None)

`execute_actions`(actions, index, verbose=False)

`_plan_from_actions`(actions, index)

`_inject_UNLINKLINKTRANSACTION`(plan, index, prefix, axn, specs)

`_handle_menuinst`(unlink_dists, link_dists)

`install_actions`(prefix, index, specs, force=False, only_names=None, always_copy=False, pinned=True, update_deps=True, prune=False, channel_priority_map=None, is_update=False, minimal_hint=False)

`get_blank_actions`(prefix)

`execute_plan`(old_plan, index=None, verbose=False)

Deprecated: This should *conda.instructions.execute_instructions* instead.

`execute_instructions`(plan, index=None, verbose=False, _commands=None)

Execute the instructions in the plan

Parameters

- **plan** -- A list of (instruction, arg) tuples
- **index** -- The meta-data index
- **verbose** -- verbose output
- **_commands** -- (For testing only) dict mapping an instruction to executable if None

then the default commands will be used

`_update_old_plan`(old_plan)

Update an old plan object to work with *conda.instructions.execute_instructions*

plugins

In this module, you will find everything relevant to conda's plugin system. It contains all of the code that plugin authors will use to write plugins, as well as conda's internal implementations of plugins.

Modules relevant for plugin authors

- `conda.plugins.hookspec`: all available hook specifications are listed here, including examples of how to use them
- `conda.plugins.types`: important types to use when defining plugin hooks

Modules relevant for internal development

- `conda.plugins.manager`: includes our custom subclass of pluggy's `PluginManager` class

Modules with internal plugin implementations

- `conda.plugins.solvers`: implementation of the "classic" solver
- `conda.plugins.subcommands.doctor`: conda doctor subcommand
- `conda.plugins.virtual_packages`: registers virtual packages in conda

hookspec

Pluggy hook specifications ("hookspecs") to register conda plugins.

Each hookspec defined in `CondaSpecs` contains an example of how to use it.

Classes

<code>CondaSpecs</code>	The conda plugin hookspecs, to be used by developers.
-------------------------	---

Attributes

<code>spec_name</code>	Name used for organizing conda hook specifications
<code>_hookspec</code>	The conda plugin hook specifications, to be used by developers
<code>hookimpl</code>	Decorator used to mark plugin hook implementations

spec_name = 'conda'

Name used for organizing conda hook specifications

_hookspec

The conda plugin hook specifications, to be used by developers

hookimpl

Decorator used to mark plugin hook implementations

class CondaSpecs

The conda plugin hookspecs, to be used by developers.

conda_solvers() → `collections.abc.Iterable[conda.plugins.types.CondaSolver]`

Register solvers in conda.

Example:

```
import logging

from conda import plugins
from conda.core import solve

log = logging.getLogger(__name__)

class VerboseSolver(solve.Solver):
    def solve_final_state(self, *args, **kwargs):
        log.info("My verbose solver!")
        return super().solve_final_state(*args, **kwargs)

@plugins.hookimpl
def conda_solvers():
    yield plugins.CondaSolver(
        name="verbose-classic",
        backend=VerboseSolver,
    )
```

Returns An iterable of solver entries.

conda_subcommands() → `collections.abc.Iterable[conda.plugins.types.CondaSubcommand]`

Register external subcommands in conda.

Example:

```
from conda import plugins

def example_command(args):
    print("This is an example command!")

@plugins.hookimpl
def conda_subcommands():
    yield plugins.CondaSubcommand(
        name="example",
        summary="example command",
        action=example_command,
    )
```

Returns An iterable of subcommand entries.

conda_virtual_packages() → `collections.abc.Iterable[conda.plugins.types.CondaVirtualPackage]`

Register virtual packages in Conda.

Example:

```
from conda import plugins

@plugins.hookimpl
def conda_virtual_packages():
    yield plugins.CondaVirtualPackage(
        name="my_custom_os",
        version="1.2.3",
        build="x86_64",
    )
```

Returns An iterable of virtual package entries.

conda_pre_commands() → collections.abc.Iterable[conda.plugins.types.CondaPreCommand]
Register pre-command functions in conda.

Example:

```
from conda import plugins

def example_pre_command(command):
    print("pre-command action")

@plugins.hookimpl
def conda_pre_commands():
    yield CondaPreCommand(
        name="example-pre-command",
        action=example_pre_command,
        run_for={"install", "create"},
    )
```

conda_post_commands() → collections.abc.Iterable[conda.plugins.types.CondaPostCommand]
Register post-command functions in conda.

Example:

```
from conda import plugins

def example_post_command(command):
    print("post-command action")

@plugins.hookimpl
def conda_post_commands():
    yield CondaPostCommand(
        name="example-post-command",
        action=example_post_command,
        run_for={"install", "create"},
    )
```

manager

This module contains a subclass implementation of pluggy's `PluginManager`.

Additionally, it contains a function we use to construct the `PluginManager` object and register all plugins during conda's startup process.

Classes

<code>CondaPluginManager</code>	The conda plugin manager to implement behavior additional to pluggy's default plugin manager.
---------------------------------	---

Functions

<code>get_plugin_manager()</code> → <code>CondaPluginManager</code>	Get a cached version of the <code>CondaPluginManager</code> instance,
---	---

class `CondaPluginManager`(*project_name*: `str` | `None` = `None`, **args*, ***kwargs*)

Bases: `pluggy.PluginManager`

The conda plugin manager to implement behavior additional to pluggy's default plugin manager.

get_cached_solver_backend

get_canonical_name(*plugin*: `object`) → `str`

Return canonical name for a plugin object. Note that a plugin may be registered under a different name which was specified by the caller of `register(plugin, name)`. To obtain the name of an registered plugin use `get_name(plugin)` instead.

load_plugins(**plugins*) → `int`

Load the provided list of plugins and fail gracefully on error. The provided list of plugins can either be classes or modules with `hookimpl`.

load_entrypoints(*group*: `str`, *name*: `str` | `None` = `None`) → `int`

Load modules from querying the specified setuptools group.

Parameters

- **group** (`str`) -- Entry point group to load plugins.
- **name** (`str`) -- If given, loads only plugins with the given name.

Return type

Returns The number of plugins loaded by this call.

get_hook_results(*name*: `str`) → `list`

Return results of the plugin hooks with the given name and raise an error if there is a conflict.

get_solver_backend(*name*: `str` | `None` = `None`) → `type[conda.core.solve.Solver]`

Get the solver backend with the given name (or fall back to the name provided in the context).

See `context.solver` for more details.

Please use the cached version of this method called `get_cached_solver_backend()` for high-throughput code paths which is set up as a instance-specific LRU cache.

invoke_pre_commands(*command: str*) → *None*

Invokes `CondaPreCommand.action` functions registered with `conda_pre_commands`.

Parameters **command** -- name of the command that is currently being invoked

invoke_post_commands(*command: str*) → *None*

Invokes `CondaPostCommand.action` functions registered with `conda_post_commands`.

Parameters **command** -- name of the command that is currently being invoked

disable_external_plugins() → *None*

Disables all currently registered plugins except built-in conda plugins

get_subcommands() → *dict[str, conda.plugins.types.CondaSubcommand]*

get_plugin_manager() → *CondaPluginManager*

Get a cached version of the *CondaPluginManager* instance, with the built-in and entrypoints provided by the plugins loaded.

solvers

Register the classic conda solver.

Functions

conda_solvers()

The classic solver as shipped by default in conda.

conda_solvers()

The classic solver as shipped by default in conda.

subcommands

doctor

Provide 'conda doctor' environment check feature.

cli

CLI implementation for *conda doctor*.

Functions

get_prefix(→ *str*)

configure_parser(*parser*)

execute(→ *None*)

Run conda doctor subcommand.

conda_subcommands()

get_prefix(args: *argparse.Namespace*) → str

configure_parser(parser: *conda.cli.conda_argparse.ArgumentParser*)

execute(args: *argparse.Namespace*) → None

Run conda doctor subcommand.

conda_subcommands()

health_checks

Backend logic implementation for *conda doctor*.

Functions

<i>display_report_heading</i> (→ None)	Displays our report heading.
<i>find_packages_with_missing_files</i> (→ dict[str, list[str]])	Finds packages listed in conda-meta which have missing files.
<i>find_altered_packages</i> (→ dict[str, list[str]])	Finds altered packages
<i>display_health_checks</i> (→ None)	Prints health report.

Attributes

<i>logger</i>
<i>OK_MARK</i>

logger

OK_MARK = ''

display_report_heading(prefix: *str*) → None

Displays our report heading.

find_packages_with_missing_files(prefix: *str* | *Path*) → dict[str, list[str]]

Finds packages listed in conda-meta which have missing files.

find_altered_packages(prefix: *str* | *Path*) → dict[str, list[str]]

Finds altered packages

display_health_checks(prefix: *str*, verbose: *bool* = False) → None

Prints health report.

plugins

types

Definition of specific return types for use when defining a conda plugin hook.

Each type corresponds to the plugin hook for which it is used.

Classes

<i>CondaSubcommand</i>	Return type to use when defining a conda subcommand plugin hook.
<i>CondaVirtualPackage</i>	Return type to use when defining a conda virtual package plugin hook.
<i>CondaSolver</i>	Return type to use when defining a conda solver plugin hook.
<i>CondaPreCommand</i>	Return type to use when defining a conda pre-command plugin hook.
<i>CondaPostCommand</i>	Return type to use when defining a conda post-command plugin hook.

class CondaSubcommand

Return type to use when defining a conda subcommand plugin hook.

For details on how this is used, see [conda_subcommands\(\)](#).

Parameters

- **name** -- Subcommand name (e.g., conda my-subcommand-name).
- **summary** -- Subcommand summary, will be shown in conda --help.
- **action** -- Callable that will be run when the subcommand is invoked.
- **configure_parser** -- Callable that will be run when the subcommand parser is initialized.

name: `str`

summary: `str`

action: `Callable[[Namespace | tuple[str]], int | None]`

configure_parser: `Callable[[ArgumentParser], None] | None`

class CondaVirtualPackage

Bases: `NamedTuple`

Return type to use when defining a conda virtual package plugin hook.

For details on how this is used, see [conda_virtual_packages\(\)](#).

Parameters

- **name** -- Virtual package name (e.g., my_custom_os).
- **version** -- Virtual package version (e.g., 1.2.3).
- **build** -- Virtual package build string (e.g., x86_64).

name: `str`

version: `str | None`

build: `str | None`

class CondaSolver

Bases: NamedTuple

Return type to use when defining a conda solver plugin hook.

For details on how this is used, see [conda_solvers\(\)](#).**Parameters**

- **name** -- Solver name (e.g., custom-solver).
- **backend** -- Type that will be instantiated as the solver backend.

name: `str`**backend:** `type[conda.core.solve.Solver]`**class CondaPreCommand**

Bases: NamedTuple

Return type to use when defining a conda pre-command plugin hook.

For details on how this is used, see [conda_pre_commands\(\)](#).**Parameters**

- **name** -- Pre-command name (e.g., custom_plugin_pre_commands).
- **action** -- Callable which contains the code to be run.
- **run_for** -- Represents the command(s) this will be run on (e.g. install or create).

name: `str`**action:** `Callable[[str], None]`**run_for:** `set[str]`**class CondaPostCommand**

Bases: NamedTuple

Return type to use when defining a conda post-command plugin hook.

For details on how this is used, see [conda_post_commands\(\)](#).**Parameters**

- **name** -- Post-command name (e.g., custom_plugin_post_commands).
- **action** -- Callable which contains the code to be run.
- **run_for** -- Represents the command(s) this will be run on (e.g. install or create).

name: `str`**action:** `Callable[[str], None]`**run_for:** `set[str]`

virtual_packages

archspec

Detect archspec name.

Functions

conda_virtual_packages()

conda_virtual_packages()

cuda

Detect CUDA version.

Functions

<i>cuda_version()</i>	Attempt to detect the version of CUDA present in the operating system.
<i>cached_cuda_version()</i>	A cached version of the cuda detection system.
<i>conda_virtual_packages()</i>	
<i>_cuda_driver_version_detector_target(queue)</i>	Attempt to detect the version of CUDA present in the operating system in a

cuda_version()

Attempt to detect the version of CUDA present in the operating system.

On Windows and Linux, the CUDA library is installed by the NVIDIA driver package, and is typically found in the standard library path, rather than with the CUDA SDK (which is optional for running CUDA apps).

On macOS, the CUDA library is only installed with the CUDA SDK, and might not be in the library path.

Returns: version string (e.g., '9.2') or None if CUDA is not found.

cached_cuda_version()

A cached version of the cuda detection system.

conda_virtual_packages()

_cuda_driver_version_detector_target(queue)

Attempt to detect the version of CUDA present in the operating system in a subprocess.

On Windows and Linux, the CUDA library is installed by the NVIDIA driver package, and is typically found in the standard library path, rather than with the CUDA SDK (which is optional for running CUDA apps).

On macOS, the CUDA library is only installed with the CUDA SDK, and might not be in the library path.

Returns: version string (e.g., '9.2') or None if CUDA is not found. The result is put in the queue rather than a return value.

freebsd

Detect whether this is FeeBSD.

Functions

conda_virtual_packages()

conda_virtual_packages()

linux

Detect whether this is Linux.

Functions

conda_virtual_packages()

conda_virtual_packages()

osx

Detect whether this is macOS.

Functions

conda_virtual_packages()

conda_virtual_packages()

windows

Detect whether this is Windows.

Functions

conda_virtual_packages()

conda_virtual_packages()**plugins**

Classes

<i>CondaPostCommand</i>	Return type to use when defining a conda post-command plugin hook.
<i>CondaPreCommand</i>	Return type to use when defining a conda pre-command plugin hook.
<i>CondaSolver</i>	Return type to use when defining a conda solver plugin hook.
<i>CondaSubcommand</i>	Return type to use when defining a conda subcommand plugin hook.
<i>CondaVirtualPackage</i>	Return type to use when defining a conda virtual package plugin hook.

Attributes

<i>hookimpl</i>	Decorator used to mark plugin hook implementations
-----------------	--

hookimpl

Decorator used to mark plugin hook implementations

class CondaPostCommand

Bases: NamedTuple

Return type to use when defining a conda post-command plugin hook.

For details on how this is used, see [*conda_post_commands\(\)*](#).

Parameters

- **name** -- Post-command name (e.g., `custom_plugin_post_commands`).
- **action** -- Callable which contains the code to be run.
- **run_for** -- Represents the command(s) this will be run on (e.g. `install` or `create`).

name: `str`**action:** `Callable[[str], None]`**run_for:** `set[str]`

class CondaPreCommand

Bases: NamedTuple

Return type to use when defining a conda pre-command plugin hook.

For details on how this is used, see [conda_pre_commands\(\)](#).

Parameters

- **name** -- Pre-command name (e.g., custom_plugin_pre_commands).
- **action** -- Callable which contains the code to be run.
- **run_for** -- Represents the command(s) this will be run on (e.g. install or create).

name: `str`

action: `Callable[[str], None]`

run_for: `set[str]`

class CondaSolver

Bases: `NamedTuple`

Return type to use when defining a conda solver plugin hook.

For details on how this is used, see [conda_solvers\(\)](#).

Parameters

- **name** -- Solver name (e.g., custom-solver).
- **backend** -- Type that will be instantiated as the solver backend.

name: `str`

backend: `type[conda.core.solve.Solver]`

class CondaSubcommand

Return type to use when defining a conda subcommand plugin hook.

For details on how this is used, see [conda_subcommands\(\)](#).

Parameters

- **name** -- Subcommand name (e.g., conda my-subcommand-name).
- **summary** -- Subcommand summary, will be shown in conda --help.
- **action** -- Callable that will be run when the subcommand is invoked.
- **configure_parser** -- Callable that will be run when the subcommand parser is initialized.

name: `str`

summary: `str`

action: `Callable[[Namespace | tuple[str]], int | None]`

configure_parser: `Callable[[ArgumentParser], None] | None`

class CondaVirtualPackage

Bases: `NamedTuple`

Return type to use when defining a conda virtual package plugin hook.

For details on how this is used, see [conda_virtual_packages\(\)](#).

Parameters

- **name** -- Virtual package name (e.g., my_custom_os).
- **version** -- Virtual package version (e.g., 1.2.3).
- **version** -- Virtual package build string (e.g., x86_64).

```
name: str
version: str | None
build: str | None
```

resolve

Low-level SAT solver wrapper/interface for the classic solver.

See `conda.core.solver.Solver` for the high-level API.

Classes

Resolve

Functions

_get_sat_solver_cls([sat_solver_choice])

exactness_and_number_of_deps(resolve_obj, ms) Sorting key to emphasize packages that have more strict

Attributes

stdoutlog

Unsatisfiable

ResolvePackageNotFound

_sat_solvers

stdoutlog

Unsatisfiable

ResolvePackageNotFound

_sat_solvers

_get_sat_solver_cls(sat_solver_choice=*SatSolverChoice.PYCOSAT*)

exactness_and_number_of_deps(resolve_obj, ms)

Sorting key to emphasize packages that have more strict requirements. More strict means the reduced index can be reduced more, so we want to consider these more constrained deps earlier in reducing the index.

class Resolve(index, processed=False, channels=())

__hash__()

Return hash(self).

default_filter(*features=None, filter=None*)

valid(*spec_or_prec, filter, optional=True*)

Tests if a package, MatchSpec, or a list of both has satisfiable dependencies, assuming cyclic dependencies are always valid.

Parameters

- **spec_or_prec** -- a package record, a MatchSpec, or an iterable of these.
- **filter** -- a dictionary of (fkey, valid) pairs, used to consider a subset of dependencies, and to eliminate repeated searches.
- **optional** -- if True (default), do not enforce optional specifications when considering validity. If False, enforce them.

Returns True if the full set of dependencies can be satisfied; False otherwise. If filter is supplied and update is True, it will be updated with the search results.

valid2(*spec_or_prec, filter_out, optional=True*)

invalid_chains(*spec, filter, optional=True*)

Constructs a set of 'dependency chains' for invalid specs.

A dependency chain is a tuple of MatchSpec objects, starting with the requested spec, proceeding down the dependency tree, ending at a specification that cannot be satisfied.

Parameters

- **spec** -- a package key or MatchSpec
- **filter** -- a dictionary of (prec, valid) pairs to be used when testing for package validity.

Returns A tuple of tuples, empty if the MatchSpec is valid.

verify_specs(*specs*)

Perform a quick verification that specs and dependencies are reasonable.

Parameters **specs** -- An iterable of strings or MatchSpec objects to be tested.

Returns Nothing, but if there is a conflict, an error is thrown.

Note that this does not attempt to resolve circular dependencies.

_classify_bad_deps(*bad_deps, specs_to_add, history_specs, strict_channel_priority*)

find_matches_with_strict(*ms, strict_channel_priority*)

find_conflicts(*specs, specs_to_add=None, history_specs=None*)

breadth_first_search_for_dep_graph(*root_spec, target_name, dep_graph, num_targets=1*)

Return shorted path from root_spec to target_name

build_graph_of_deps(*spec*)

build_conflict_map(*specs, specs_to_add=None, history_specs=None*)

Perform a deeper analysis on conflicting specifications, by attempting to find the common dependencies that might be the cause of conflicts.

Parameters

- **specs** -- An iterable of strings or MatchSpec objects to be tested.
- **conflict.** (*It is assumed that the specs*) --

Returns A list of lists of bad deps

Return type bad_deps

Strategy: If we're here, we know that the specs conflict. This could be because: - One spec conflicts with another; e.g.

`['numpy 1.5*', 'numpy >=1.6']`

- **One spec conflicts with a dependency of another; e.g.** `['numpy 1.5*', 'scipy 0.12.0b1']`
- **Each spec depends on *the same package* but in a different way; e.g.,** `['A', 'B']` where A depends on numpy 1.5, and B on numpy 1.6.

Technically, all three of these cases can be boiled down to the last one if we treat the spec itself as one of the "dependencies". There might be more complex reasons for a conflict, but this code only considers the ones above.

The purpose of this code, then, is to identify packages (like numpy above) that all of the specs depend on *but in different ways*. We then identify the dependency chains that lead to those packages.

`_get_strict_channel(package_name)`

`_broader(ms, specs_by_name)`

Prevent introduction of matchspecs that broaden our selection of choices.

`_get_package_pool(specs)`

`get_reduced_index(explicit_specs, sort_by_exactness=True, exit_on_conflict=False)`

`match_any(mss, prec)`

`find_matches(spec: conda.models.match_spec.MatchSpec) → tuple[conda.models.records.PackageRecord]`

`ms_depends(prec: conda.models.records.PackageRecord) → list[conda.models.match_spec.MatchSpec]`

`version_key(prec, vtype=None)`

`static _make_channel_priorities(channels)`

`get_pkgs(ms, emptyok=False)`

`static to_sat_name(val)`

`static to_feature_metric_id(prec_dist_str, feat)`

`push_MatchSpec(C, spec)`

`gen_clauses()`

`generate_spec_constraints(C, specs)`

`generate_feature_count(C)`

`generate_update_count(C, specs)`

`generate_feature_metric(C)`

`generate_removal_count(C, specs)`

`generate_install_count(C, specs)`

`generate_package_count(C, missing)`

`generate_version_metrics(C, specs, include0=False)`


```

dependency_sort(must_have: dict[str, conda.models.records.PackageRecord]) →
    list[conda.models.records.PackageRecord]

environment_is_consistent(installed)

get_conflicting_specs(specs, explicit_specs)

bad_installed(installed, new_specs)

restore_bad(pkgs, preserve)

install_specs(specs, installed, update_deps=True)

install(specs, installed=None, update_deps=True, returnall=False)

remove_specs(specs, installed)

remove(specs, installed)

solve(specs: list, returnall: bool = False, _remove=False, specs_to_add=None, history_specs=None,
    should_retry_solve=False) → list[conda.models.records.PackageRecord]

```

testing

cases

Extends unittest.TestCase to include select pytest fixtures.

Classes

BaseTestCase

A class whose instances are single test cases.

class BaseTestCase(*methodName*='runTest')

Bases: `unittest.TestCase`

A class whose instances are single test cases.

By default, the test code itself should be placed in a method named 'runTest'.

If the fixture may be used for many test cases, create as many test methods as are needed. When instantiating such a TestCase subclass, specify in the constructor arguments the name of the test method that the instance is to execute.

Test authors should subclass TestCase for their own tests. Construction and deconstruction of the test's environment ('fixture') can be implemented by overriding the 'setUp' and 'tearDown' methods respectively.

If it is necessary to override the `__init__` method, the base class `__init__` method must always be called. It is important that subclasses should not change the signature of their `__init__` method, since instances of the classes are instantiated automatically by parts of the framework in order to be run.

When subclassing TestCase, you can set these attributes: * `failureException`: determines which exception will be raised when

the instance's assertion methods fail; test methods raising this exception will be deemed to have 'failed' rather than 'errored'.

- **longMessage**: determines whether long messages (including repr of objects used in assert methods) will be printed on failure in *addition* to any explicit message passed.

- **maxDiff**: sets the maximum length of a diff in failure messages by assert methods using difflib. It is looked up as an instance attribute so can be configured by individual tests if required.

```
fixture_names = ('tmpdir',)
auto_injector_fixture(request)
```

fixtures

Collection of pytest fixtures used in conda tests.

Functions

<code>suppress_resource_warning()</code>	Suppress <i>Unclosed Socket Warning</i>
<code>tmpdir(tmpdir, request)</code>	
<code>clear_subdir_cache()</code>	
<code>disable_channel_notices()</code>	Fixture that will set "context.number_channel_notices" to 0 and then set
<code>reset_conda_context()</code>	Resets the context object after each test function is run.
<code>temp_package_cache(tmp_path_factory)</code>	Used to isolate package or index cache from other tests.

suppress_resource_warning()

Suppress *Unclosed Socket Warning*

It seems urllib3 keeps a socket open to avoid costly recreation costs.

xref: <https://github.com/kennethreitz/requests/issues/1882>

tmpdir(tmpdir, request)

clear_subdir_cache()

disable_channel_notices()

Fixture that will set "context.number_channel_notices" to 0 and then set it back to its original value.

This is also a good example of how to override values in the context object.

reset_conda_context()

Resets the context object after each test function is run.

temp_package_cache(tmp_path_factory)

Used to isolate package or index cache from other tests.

gateways

fixtures

Collection of pytest fixtures used in conda.gateways tests.

Functions

<code>minio_s3_server(xprocess, tmp_path)</code>	Mock a local S3 server using <i>minio</i>
--	---

Attributes

<code>MINIO_EXE</code>

<code>minio_s3_server(xprocess, tmp_path)</code>	Mock a local S3 server using <i>minio</i>
--	---

MINIO_EXE

minio_s3_server(*xprocess*, *tmp_path*)

Mock a local S3 server using *minio*

This requires: - pytest-xprocess: runs the background process - minio: the executable must be in PATH

Note, the given S3 server will be EMPTY! The test function needs to populate it. You can use `conda.testing.helpers.populate_s3_server` for that.

minio_s3_server

helpers

Collection of helper functions used in conda tests.

Functions

<code>strip_expected(stderr)</code>

<code>raises(exception, func[, string])</code>
--

<code>captured([disallow_stderr])</code>
--

<code>capture_json_with_argv(command[, disallow_stderr, ...])</code>
--

<code>set_active_prefix(→ None)</code>
--

<code>assert_equals(a, b[, output])</code>
--

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Table 273 – continued from previous page

<code>assert_not_in(a, b[, output])</code>	
<code>assert_in(a, b[, output])</code>	
<code>run_inprocess_conda_command(command[, disallow_stderr])</code>	
<code>add_subdir(dist_string)</code>	
<code>add_subdir_to_iter(iterable)</code>	
<code>tmpdir()</code>	
<code>supplement_index_with_repodata(index, repodata, ...)</code>	
<code>add_feature_records_legacy(index)</code>	
<code>_export_subdir_data_to_repodata(subdir_data, index)</code>	This function is only temporary and meant to patch wrong / undesirable
<code>_sync_channel_to_disk(channel, subdir_data, index)</code>	This function is only temporary and meant to patch wrong / undesirable
<code>_alias_canonical_channel_name_cache_to_file_path(name)</code>	This function is only temporary and meant to patch wrong / undesirable
<code>_patch_for_local_exports(name, subdir_data, channel, index)</code>	This function is only temporary and meant to patch wrong / undesirable
<code>get_index_r_1([subdir])</code>	
<code>get_index_r_2([subdir])</code>	
<code>get_index_r_4([subdir])</code>	
<code>get_index_r_5([subdir])</code>	
<code>get_index_must_unfreeze([subdir])</code>	
<code>get_index_cuda([subdir])</code>	
<code>record([name, version, depends, build, build_number, ...])</code>	
<code>get_solver(tmpdir[, specs_to_add, specs_to_remove, ...])</code>	
<code>get_solver_2(tmpdir[, specs_to_add, specs_to_remove, ...])</code>	
<code>get_solver_4(tmpdir[, specs_to_add, specs_to_remove, ...])</code>	
<code>get_solver_5(tmpdir[, specs_to_add, specs_to_remove, ...])</code>	
<code>get_solver_aggregate_1(tmpdir[, specs_to_add, ...])</code>	
<code>get_solver_aggregate_2(tmpdir[, specs_to_add, ...])</code>	

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Table 273 – continued from previous page

`get_solver_must_unfreeze(tmpdir[, specs_to_add,`
`...])`

`get_solver_cuda(tmpdir[, specs_to_add, ...])`

`convert_to_dist_str(solution)`

`solver_class()`

Attributes

`TEST_DATA_DIR`

`CHANNEL_DIR`

`EXPORTED_CHANNELS_DIR`

`expected_error_prefix`

TEST_DATA_DIR
CHANNEL_DIR
EXPORTED_CHANNELS_DIR
expected_error_prefix = 'Using Anaconda Cloud api site <https://api.anaconda.org>'

strip_expected(*stderr*)

raises(*exception*, *func*, *string=None*)

captured(*disallow_stderr=True*)

capture_json_with_argv(*command*, *disallow_stderr=True*, *ignore_stderr=False*, ***kwargs*)

set_active_prefix(*prefix: str*) → *None*
assert_equals(*a*, *b*, *output=""*)

assert_not_in(*a*, *b*, *output=""*)

assert_in(*a*, *b*, *output=""*)

run_inprocess_conda_command(*command*, *disallow_stderr: bool = True*)

add_subdir(*dist_string*)

add_subdir_to_iter(*iterable*)

tmpdir()

supplement_index_with_repodata(*index*, *repodata*, *channel*, *priority*)

add_feature_records_legacy(*index*)

_export_subdir_data_to_repodata(*subdir_data*, *index*)

This function is only temporary and meant to patch wrong / undesirable testing behaviour. It should end up being replaced with the new class-based, backend-agnostic solver tests.

`_sync_channel_to_disk(channel, subdir_data, index)`

This function is only temporary and meant to patch wrong / undesirable testing behaviour. It should end up being replaced with the new class-based, backend-agnostic solver tests.

`_alias_canonical_channel_name_cache_to_file_prefix(name, subdir_data=None)`

This function is only temporary and meant to patch wrong / undesirable testing behaviour. It should end up being replaced with the new class-based, backend-agnostic solver tests.

`_patch_for_local_exports(name, subdir_data, channel, index)`

This function is only temporary and meant to patch wrong / undesirable testing behaviour. It should end up being replaced with the new class-based, backend-agnostic solver tests.

`get_index_r_1(subdir=context.subdir)`

`get_index_r_2(subdir=context.subdir)`

`get_index_r_4(subdir=context.subdir)`

`get_index_r_5(subdir=context.subdir)`

`get_index_must_unfreeze(subdir=context.subdir)`

`get_index_cuda(subdir=context.subdir)`

`record(name='a', version='1.0', depends=None, build='0', build_number=0, timestamp=0, channel=None, **kwargs)`

`get_solver(tmpdir, specs_to_add=(), specs_to_remove=(), prefix_records=(), history_specs=())`

`get_solver_2(tmpdir, specs_to_add=(), specs_to_remove=(), prefix_records=(), history_specs=())`

`get_solver_4(tmpdir, specs_to_add=(), specs_to_remove=(), prefix_records=(), history_specs=())`

`get_solver_5(tmpdir, specs_to_add=(), specs_to_remove=(), prefix_records=(), history_specs=())`

`get_solver_aggregate_1(tmpdir, specs_to_add=(), specs_to_remove=(), prefix_records=(), history_specs=())`

`get_solver_aggregate_2(tmpdir, specs_to_add=(), specs_to_remove=(), prefix_records=(), history_specs=())`

`get_solver_must_unfreeze(tmpdir, specs_to_add=(), specs_to_remove=(), prefix_records=(), history_specs=())`

`get_solver_cuda(tmpdir, specs_to_add=(), specs_to_remove=(), prefix_records=(), history_specs=())`

`convert_to_dist_str(solution)`

`solver_class()`

integration

These helpers were originally defined in `tests/test_create.py`, but were refactored here so downstream projects can benefit from them too.

Classes

Commands

Functions

escape_for_winpath(p)

running_a_python_capable_of_unicode_subprocessing()

set_tmpdir(tmpdir)

_get_temp_prefix([name, use_restricted_unicode])

make_temp_prefix([name, use_restricted_unicode, ...]) When the env. you are creating will be used to install Python 2.7 on Windows

FORCE_temp_prefix([name, use_restricted_unicode])

temp_chdir(target_dir)

*run_command(command, prefix, *arguments, **kwargs)*

*make_temp_env(*packages, **kwargs)*

make_temp_package_cache()

make_temp_channel(packages)

create_temp_location()

tempdir()

reload_config(prefix)

package_is_installed(prefix, spec)

_package_is_installed(prefix, spec)

get_conda_list_tuple(prefix, package_name)

get_shortcut_dir()

Attributes

TEST_LOG_LEVEL

PYTHON_BINARY

BIN_DIRECTORY

UNICODE_CHARACTERS

UNICODE_CHARACTERS_RESTRICTED

which_or_where

cp_or_copy

env_or_set

SPACER_CHARACTER

tmpdir_in_use

TEST_LOG_LEVEL**PYTHON_BINARY****BIN_DIRECTORY****UNICODE_CHARACTERS** = 'ōáêñßôç'**UNICODE_CHARACTERS_RESTRICTED** = 'abcdef'**which_or_where****cp_or_copy****env_or_set****SPACER_CHARACTER** = ' '**escape_for_winpath**(*p*)**running_a_python_capable_of_unicode_subprocessing**()**tmpdir_in_use****set_tmpdir**(*tmpdir*)**_get_temp_prefix**(*name=None, use_restricted_unicode=False*)**make_temp_prefix**(*name=None, use_restricted_unicode=False, _temp_prefix=None*)

When the env. you are creating will be used to install Python 2.7 on Windows only a restricted amount of Unicode will work, and probably only those chars in your current codepage, so the characters in UNICODE_CHARACTERS_RESTRICTED should probably be randomly generated from that instead. The problem here is that the current codepage needs to be able to handle 'sys.prefix' otherwise ntpath will fall over.

FORCE_temp_prefix(*name=None, use_restricted_unicode=False*)


```
class Commands
```

```
    COMPARE = 'compare'
    CONFIG = 'config'
    CLEAN = 'clean'
    CREATE = 'create'
    INFO = 'info'
    INSTALL = 'install'
    LIST = 'list'
    REMOVE = 'remove'
    SEARCH = 'search'
    UPDATE = 'update'
    RUN = 'run'
```

```
temp_chdir(target_dir)
```

```
run_command(command, prefix, *arguments, **kwargs)
```

```
make_temp_env(*packages, **kwargs)
```

```
make_temp_package_cache()
```

```
make_temp_channel(packages)
```

```
create_temp_location()
```

```
tempdir()
```

```
reload_config(prefix)
```

```
package_is_installed(prefix, spec)
```

```
_package_is_installed(prefix, spec)
```

```
get_conda_list_tuple(prefix, package_name)
```

```
get_shortcut_dir()
```

notices

fixtures

Collection of pytest fixtures used in conda.notices tests.

Functions

<code>notices_cache_dir(tmpdir)</code>	Fixture that creates the notices cache dir while also mocking
<code>notices_mock_http_session_get()</code>	
<code>conda_notices_args_n_parser()</code>	

notices_cache_dir(tmpdir)

Fixture that creates the notices cache dir while also mocking out a call to user_cache_dir.

notices_mock_http_session_get()

conda_notices_args_n_parser()

helpers

Collection of helper functions used in conda.notices tests.

Classes

<code>DummyArgs</code>	Dummy object that sets all kwargs as object properties.
<code>MockResponse</code>	

Functions

<code>get_test_notices(→ dict)</code>	
<code>add_resp_to_mock(→ None)</code>	Adds any number of MockResponse to MagicMock object as side_effects
<code>create_notice_cache_files(→ None)</code>	Creates the cache files that we use in tests
<code>offset_cache_file_mtime(→ None)</code>	Allows for offsetting the mtime of the notices cache file. This is often
<code>notices_decorator_assert_message_in_stdout(capsys, ...)</code>	Plants a run of notices decorator where we expect to see the messages
<code>get_notice_cache_filenames(→ tuple[str])</code>	Returns the filenames of the cache files that will be searched for

Attributes

DEFAULT_NOTICE_MESG

DEFAULT_NOTICE_MESG = 'Here is an example message that will be displayed to users'

get_test_notices(*messages: Sequence[str], level: str | None = 'info', created_at: datetime.datetime | None = None, expired_at: datetime.datetime | None = None*) → dict

add_resp_to_mock(*mock_session: unittest.mock.MagicMock, status_code: int, messages_json: dict, raise_exc: bool = False*) → None

Adds any number of MockResponse to MagicMock object as side_effects

create_notice_cache_files(*cache_dir: pathlib.Path, cache_files: Sequence[str], messages_json_seq: Sequence[dict]*) → None

Creates the cache files that we use in tests

offset_cache_file_mtime(*mtime_offset*) → None

Allows for offsetting the mtime of the notices cache file. This is often used to mock an older creation time the cache file.

class DummyArgs(***kwargs*)

Dummy object that sets all kwargs as object properties.

notices_decorator_assert_message_in_stdout(*captured, messages: Sequence[str], dummy_mesg: str | None = None, not_in: bool = False*)

Tests a run of notices decorator where we expect to see the messages print to stdout.

class MockResponse(*status_code, json_data, raise_exc=False*)

json()

get_notice_cache_filenames(*ctx: conda.base.context.Context*) → tuple[str]

Returns the filenames of the cache files that will be searched for

solver_helpers

Helpers for testing the solver.

Classes

SimpleEnvironment

Helper environment object.

SolverTests

Tests for *conda.core.solve.Solver* implementations.

Functions

<code>index_packages(num)</code>	Get the index data of the <code>helpers.get_index_r_*</code> helpers.
<code>package_string(record)</code>	
<code>package_string_set(packages)</code>	Transforms package container in package string set.
<code>package_dict(packages)</code>	Transforms package container into a dictionary.
<code>empty_prefix()</code>	
<code>temp_simple_env(→ SimpleEnvironment)</code>	

index_packages(*num*)

Get the index data of the `helpers.get_index_r_*` helpers.

package_string(*record*)

package_string_set(*packages*)

Transforms package container in package string set.

package_dict(*packages*)

Transforms package container into a dictionary.

class SimpleEnvironment(*path, solver_class, subdirs=context.subdirs*)

Helper environment object.

property _channel_packages

Helper that unfolds the `repo_packages` into a dictionary.

REPO_DATA_KEYS = ('build', 'build_number', 'depends', 'license', 'md5', 'name', 'sha256', 'size', 'subdir', ...)

solver(*add, remove*)

Writes `repo_packages` to the disk and creates a solver instance.

solver_transaction(*add=(), remove=(), as_specs=False*)

install(**specs, as_specs=False*)

remove(**specs, as_specs=False*)

_package_data(*record*)

Turn record into data, to be written in the JSON environment/repo files.

_write_installed_packages()

_write_repo_packages(*channel_name, packages*)

Write packages to the channel path.

empty_prefix()

temp_simple_env(*solver_class=Solver*) → *SimpleEnvironment*

class SolverTests

Tests for `conda.core.solve.Solver` implementations.

abstract property solver_class: `type[conda.core.solve.Solver]`

Class under test.

property tests_to_skip

```

skip_tests(request)
env()
find_package_in_list(packages, **kwargs)
find_package(**kwargs)
assert_unsatisfiable(exc_info, entries)
    Helper to assert that a conda.exceptions.UnsatisfiableError instance as a the specified set of unsatisfiable specifications.
test_empty(env)
test_iopro_mkl(env)
test_iopro_nomkl(env)
test_mkl(env)
test_accelerate(env)
test_scipy_mkl(env)
test_anaconda_nomkl(env)
test_pseudo_boolean(env)
test_unsat_from_r1(env)
test_unsat_simple(env)
test_get_dists(env)
test_unsat_shortest_chain_1(env)
test_unsat_shortest_chain_2(env)
test_unsat_shortest_chain_3(env)
test_unsat_shortest_chain_4(env)
test_unsat_chain(env)
test_unsat_any_two_not_three(env)
test_unsat_expand_single(env)
test_unsat_missing_dep(env)
test_nonexistent(env)
test_timestamps_and_deps(env)
test_nonexistent_deps(env)
test_install_package_with_feature(env)
test_unintentional_feature_downgrade(env)
test_circular_dependencies(env)
test_irrational_version(env)
test_no_features(env)
test_channel_priority_1(monkeypatch, env)
test_unsat_channel_priority(monkeypatch, env)
test_remove(env)

```

```
test_surplus_features_1(env)
test_surplus_features_2(env)
test_get_reduced_index_broadening_with_unsatisfiable_early_dep(env)
test_get_reduced_index_broadening_preferred_solution(env)
test_arch_preferred_over_noarch_when_otherwise_equal(env)
test_noarch_preferred_over_arch_when_version_greater(env)
test_noarch_preferred_over_arch_when_version_greater_dep(env)
test_noarch_preferred_over_arch_when_build_greater(env)
test_noarch_preferred_over_arch_when_build_greater_dep(env)
```

Classes

CondaCLIFixture

PathFactoryFixture

TmpEnvFixture

Functions

reset_context([search_path, argparse_args])

init_loggers([context])

encode_for_env_var(→ str) Environment names and values need to be string.

conda_ensure_sys_python_is_base_env_python()

conda_move_to_front_of_PATH()

conda_check_versions_aligned()

conda_cli(→ CondaCLIFixture) Fixture returning CondaCLIFixture instance.

path_factory(→ PathFactoryFixture) Fixture returning PathFactoryFixture instance.

tmp_env(→ TmpEnvFixture) Fixture returning TmpEnvFixture instance.

Attributes

context

on_win

deprecated

context

reset_context(*search_path*=SEARCH_PATH, *argparse_args*=None)

init_loggers(*context*=None)

on_win

deprecated

encode_for_env_var(*value*) → str

Environment names and values need to be string.

conda_ensure_sys_python_is_base_env_python()

conda_move_to_front_of_PATH()

conda_check_versions_aligned()

class CondaCLIFixture

capsys: `pytest.CaptureFixture`

__call__(**argv*: str) → tuple[str, str, int]

Test conda CLI. Mimic what is done in *conda.cli.main.main*.

conda ... == conda_cli(...)

Parameters *argv* -- Arguments to parse

Returns Command results

Return type tuple[stdout, stdout, exitcode]

conda_cli(*capsys*: `pytest.CaptureFixture`) → *CondaCLIFixture*

Fixture returning CondaCLIFixture instance.

class PathFactoryFixture

tmp_path: `pathlib.Path`

__call__(*name*: str | None = None, *prefix*: str | None = None, *suffix*: str | None = None) → `pathlib.Path`

Unique, non-existent path factory.

Extends pytest's *tmp_path* fixture with a new unique, non-existent path for usage in cases where we need a temporary path that doesn't exist yet.

Parameters

- **name** -- Path name to append to *tmp_path*

- **prefix** -- Prefix to prepend to unique name generated
- **suffix** -- Suffix to append to unique name generated

Returns A new unique path

path_factory(*tmp_path*: *pathlib.Path*) → *PathFactoryFixture*

Fixture returning PathFactoryFixture instance.

class *TmpEnvFixture*

path_factory: *PathFactoryFixture*

conda_cli: *CondaCLIFixture*

__call__(**packages*: *str*, *prefix*: *str* | *os.PathLike* | *None* = *None*) → *Iterator[pathlib.Path]*

Generate a conda environment with the provided packages.

Parameters

- **packages** -- The packages to install into environment
- **prefix** -- The prefix at which to install the conda environment

Returns The conda environment's prefix

tmp_env(*path_factory*: *PathFactoryFixture*, *conda_cli*: *CondaCLIFixture*) → *TmpEnvFixture*

Fixture returning TmpEnvFixture instance.

trust

constants

Context trust constants.

You could argue that the signatures being here is not necessary; indeed, we are not necessarily going to be able to check them *properly* (based on some prior expectations) as the user, since this is the beginning of trust bootstrapping, the first/backup version of the root of trust metadata. Still, the signatures here are useful for diagnostic purposes, and, more important, to allow self-consistency checks: that helps us avoid breaking the chain of trust if someone accidentally lists the wrong keys down the line. (: The discrepancy can be detected when loading the root data, and we can decline to cache incorrect trust metadata that would make further root updates impossible.

INITIAL_TRUST_ROOT

KEY_MGR_FILE = 'key_mgr.json'

signature_verification

Interface between conda-content-trust and conda.

Classes

_SignatureVerification

Attributes

signature_verification

exception **SignatureError**

Bases: **Exception**

Common base class for all non-exit exceptions.

class **_SignatureVerification**

property **enabled**
property **trusted_root**
property **key_mgr**
property **session**
_fetch_channel_signing_data(*signing_data_url, filename, etag=None, mod_stamp=None*)
__call__(*info, fn, signatures*)

signature_verification

utils

Utility functions.

Functions

<i>path_identity</i> (path)	Used as a dummy path converter where no conversion necessary
<i>unix_path_to_win</i> (path[, root_prefix])	Convert a path or :-separated string of paths into a Windows representation
<i>win_path_to_cygwin</i> (path)	
<i>cygwin_path_to_win</i> (path)	
<i>translate_stream</i> (stream, translator)	
<i>human_bytes</i> (n)	Return the number of bytes n in more human readable form.

continues on next page

Table 289 – continued from previous page

<code>md5_file(→ str)</code>	
<code>hashsum_file(→ str)</code>	
<code>sys_prefix_unfollowed()</code>	Since conda is installed into non-root environments as a symlink only
<code>quote_for_shell(*arguments)</code>	Properly quote arguments for command line passing.
<code>massage_arguments(arguments[, errors])</code>	
<code>wrap_subprocess_call(root_prefix, prefix, dev_mode, ...)</code>	
<code>get_comspec()</code>	Returns COMSPEC from envvars.
<code>ensure_dir_exists(func)</code>	Ensures that the directory exists for functions returning
<code>safe_open(*args, **kwargs)</code>	Allows us to open files while catching any exceptions

Attributes

<code>unix_shell_base</code>
<code>msys2_shell_base</code>
<code>shells</code>
<code>_RE_UNSAFE</code>

`path_identity(path)`

Used as a dummy path converter where no conversion necessary

`unix_path_to_win(path, root_prefix="")`

Convert a path or :-separated string of paths into a Windows representation

Does not add cygdrive. If you need that, set root_prefix to "/cygdrive"

`win_path_to_cygwin(path)`

`cygwin_path_to_win(path)`

`translate_stream(stream, translator)`

`human_bytes(n)`

Return the number of bytes n in more human readable form.

Examples

```
>>> human_bytes(42)
'42 B'
>>> human_bytes(1042)
'1 KB'
>>> human_bytes(10004242)
'9.5 MB'
>>> human_bytes(100000004242)
'93.13 GB'
```

unix_shell_base

msys2_shell_base

shells

md5_file(*path*: *str* | *PathLike*) → *str*

hashsum_file(*path*: *str* | *PathLike*, *mode*: *Literal*[*md5*, *sha256*] = *'md5'*) → *str*

sys_prefix_unfollowed()

Since conda is installed into non-root environments as a symlink only and because `sys.prefix` follows symlinks, this function can be used to get the 'unfollowed' `sys.prefix`.

This value is usually the same as the prefix of the environment into which conda has been symlinked. An example of when this is necessary is when conda looks for external sub-commands in `find_commands.py`

quote_for_shell(**arguments*)

Properly quote arguments for command line passing.

For POSIX uses `shlex.join`, for Windows uses a custom implementation to properly escape metacharacters.

Parameters *arguments* (*list of str*) -- Arguments to quote.

Returns Quoted arguments.

Return type *str*

_RE_UNSAFE

massage_arguments(*arguments*, *errors*=*'assert'*)

wrap_subprocess_call(*root_prefix*, *prefix*, *dev_mode*, *debug_wrapper_scripts*, *arguments*,
use_system_tmp_path=*False*)

get_comspec()

Returns COMSPEC from envvars.

Ensures COMSPEC envvar is set to `cmd.exe`, if not attempt to find it.

Raises **KeyError** -- COMSPEC is undefined and cannot be found.

Returns COMSPEC value.

Return type *str*

ensure_dir_exists(*func*)

Ensures that the directory exists for functions returning a `Path` object containing a directory

safe_open(**args*, ***kwargs*)

Allows us to open files while catching any exceptions and raise them as `CondaErrors` instead.

We do this to provide a more informative/actionable error output.

Functions

`conda_signal_handler(signum, frame)`

Attributes

`__name__`

`__author__`

`__email__`

`__license__`

`__copyright__`

`__summary__`

`__url__`

`CONDA_PACKAGE_ROOT`

```
__name__ = 'conda'
__author__ = 'Anaconda, Inc.'
__email__ = 'conda@continuum.io'
__license__ = 'BSD-3-Clause'
__copyright__ = 'Copyright (c) 2012, Anaconda, Inc.'
__summary__
__url__ = 'https://github.com/conda/conda'
CONDA_PACKAGE_ROOT
exception CondaError(message, caused_by=None, **kwargs)
    Bases: Exception
    Common base class for all non-exit exceptions.
    return_code = 1
    reportable = False
    __repr__()
        Return repr(self).
    __str__()
        Return str(self).
    dump_map()
```

exception `CondaMultiError(errors)`

Bases: `CondaError`

Common base class for all non-exit exceptions.

`__repr__()`

Return repr(self).

`__str__()`

Return str(self).

`dump_map()`

`contains(exception_class)`

exception `CondaExitZero(message, caused_by=None, **kwargs)`

Bases: `CondaError`

Common base class for all non-exit exceptions.

`return_code = 0`

`conda_signal_handler(signum, frame)`

5.10.2 conda_env

`__main__`

Conda-env as a module entry point.

`cli`

`common`

Common utilities for conda-env command line tools.

Functions

`stdout_json(d)`

`get_prefix(args[, search])`

`find_prefix_name(name)`

`print_result(args, prefix, result)`

<code>get_filename(filename)</code>	Expand filename if local path or return the url
-------------------------------------	---

Attributes

base_env_name

```
base_env_name = 'base'
stdout_json(d)
get_prefix(args, search=True)
find_prefix_name(name)
print_result(args, prefix, result)
get_filename(filename)
    Expand filename if local path or return the url
```

main

Entry point for all conda-env subcommands.

Functions

show_help_on_empty_command()

create_parser()

do_call(*arguments*, *parser*)

main()

```
show_help_on_empty_command()
create_parser()
do_call(arguments, parser)
main()
```

main_config

CLI implementation for *conda-env config*.

Allows for programmatically interacting with conda-env's configuration files (e.g., *~/condarc*).

Functions

`configure_parser(sub_parsers)`

`execute(args, parser)`

Attributes

`config_description`

`config_example`

config_description = Multiline-String

```
"""
Configure a conda environment
"""
```

config_example = Multiline-String

```
"""
examples:
    conda env config vars list
    conda env config --append channels conda-forge
"""
```

configure_parser(sub_parsers)

execute(args, parser)

main_create

CLI implementation for *conda-env create*.

Creates new conda environments with the specified packages.

Functions

`configure_parser(sub_parsers)`

`execute(args, parser)`

Attributes

description

example

description = Multiline-String

```
"""
Create an environment based on an environment definition file.

If using an environment.yml file (the default), you can name the
environment in the first line of the file with 'name: envname' or
you can specify the environment name in the CLI command using the
-n/--name argument. The name specified in the CLI will override
the name specified in the environment.yml file.

Unless you are in the directory containing the environment definition
file, use -f to specify the file path of the environment definition
file you want to use.
"""
```

example = Multiline-String

```
"""
examples:
    conda env create
    conda env create -n envname
    conda env create folder/envname
    conda env create -f /path/to/environment.yml
    conda env create -f /path/to/requirements.txt -n envname
    conda env create -f /path/to/requirements.txt -p /home/user/envname
"""
```

configure_parser(*sub_parsers*)

execute(*args*, *parser*)

main_export

CLI implementation for *conda-env export*.

Dumps specified environment package specifications to the screen.

Functions

`configure_parser(sub_parsers)`

`execute(args, parser)`

Attributes

`description`

`example`

description = Multiline-String

```
"""
Export a given environment
"""
```

example = Multiline-String

```
"""
examples:
    conda env export
    conda env export --file SOME_FILE
"""
```

configure_parser(sub_parsers)

execute(args, parser)

main_list

CLI implementation for *conda-env list*.

Lists available conda environments.

Functions

configure_parser(sub_parsers)

execute(args, parser)

Attributes

description

example

description = Multiline-String

```
"""
List the Conda environments
"""
```

example = Multiline-String

```
"""
examples:
    conda env list
    conda env list --json
"""
```

configure_parser(sub_parsers)

execute(args, parser)

main_remove

CLI implementation for *conda-env remove*.

Removes the specified conda environment.

Functions

configure_parser(sub_parsers)

execute(args, parser)

Attributes

_help

_description

_example

_help = 'Remove an environment'**_description****_example** = Multiline-String

```

"""
Examples:

    conda env remove --name FOO
    conda env remove -n FOO
"""

```

configure_parser(*sub_parsers*)**execute**(*args*, *parser*)

main_update

CLI implementation for *conda-env update*.

Updates the conda environments with the specified packages.

Functions

configure_parser(*sub_parsers*)

execute(*args*, *parser*)

Attributes

description

example

description = Multiline-String

```
"""
Update the current environment based on environment file
"""
```

example = Multiline-String

```
"""
examples:
    conda env update
    conda env update -n=foo
    conda env update -f=/path/to/environment.yml
    conda env update --name=foo --file=environment.yml
    conda env update vader/deathstar
"""
```

configure_parser(sub_parsers)

execute(args, parser)

main_vars

CLI implementation for *conda-env config vars*.

Allows for configuring conda-env's vars.

Functions

configure_parser(sub_parsers)

execute_list(args, parser)

execute_set(args, parser)

execute_unset(args, parser)

Attributes

var_description

var_example

list_description

list_example

set_description

continues on next page

Table 309 – continued from previous page

`set_example`

`unset_description`

`unset_example`

var_description = Multiline-String

```

"""
Interact with environment variables associated with Conda environments
"""

```

var_example = Multiline-String

```

"""
examples:
    conda env config vars list -n my_env
    conda env config vars set MY_VAR=something OTHER_THING=ohhhhya
    conda env config vars unset MY_VAR
"""

```

list_description = Multiline-String

```

"""
List environment variables for a conda environment
"""

```

list_example = Multiline-String

```

"""
examples:
    conda env config vars list -n my_env
"""

```

set_description = Multiline-String

```

"""
Set environment variables for a conda environment
"""

```

set_example = Multiline-String

```

"""
example:
    conda env config vars set MY_VAR=weeee
"""

```

unset_description = Multiline-String

```

"""
Unset environment variables for a conda environment
"""

```

unset_example = Multiline-String

```
"""
example:
    conda env config vars unset MY_VAR
"""
```

configure_parser(sub_parsers)

execute_list(args, parser)

execute_set(args, parser)

execute_unset(args, parser)

env

Environment object describing the conda environment.yaml file.

Classes

<i>Dependencies</i>	dict() -> new empty dictionary
<i>Environment</i>	

Functions

<i>validate_keys</i> (data, kwargs)	Check for unknown keys, remove them and print a warning.
<i>load_from_directory</i> (directory)	Load and return an <code>Environment</code> from a given directory
<i>from_environment</i> (name, prefix[, no_builds, ...])	Get environment object from prefix
<i>from_yaml</i> (yamlstr, **kwargs)	Load and return a <code>Environment</code> from a given yaml string
<i>_expand_channels</i> (data)	Expands environment variables for the channels found in the yaml data
<i>from_file</i> (filename)	

Attributes

<i>VALID_KEYS</i>

VALID_KEYS = ('name', 'dependencies', 'prefix', 'channels', 'variables')

validate_keys(data, kwargs)

Check for unknown keys, remove them and print a warning.

load_from_directory(*directory*)

Load and return an `Environment` from a given directory

from_environment(*name, prefix, no_builds=False, ignore_channels=False, from_history=False*)

Get environment object from prefix

Parameters

- **name** -- The name of environment
- **prefix** -- The path of prefix
- **no_builds** -- Whether has build requirement
- **ignore_channels** -- whether ignore_channels
- **from_history** -- Whether environment file should be based on explicit specs in history

Returns: `Environment` object

from_yaml(*yamlstr, **kwargs*)

Load and return a `Environment` from a given yaml string

_expand_channels(*data*)

Expands environment variables for the channels found in the yaml data

from_file(*filename*)

class Dependencies(*raw, *args, **kwargs*)

Bases: `dict`

`dict()` -> new empty dictionary `dict(mapping)` -> new dictionary initialized from a mapping object's

(key, value) pairs

dict(iterable) -> new dictionary initialized as if via: `d = { } for k, v in iterable:`

`d[k] = v`

dict(kwargs)** -> new dictionary initialized with the name=value pairs in the keyword argument list. For example: `dict(one=1, two=2)`

parse()

add(*package_name*)

class Environment(*name=None, filename=None, channels=None, dependencies=None, prefix=None, variables=None*)

add_channels(*channels*)

remove_channels()

to_dict(*stream=None*)

to_yaml(*stream=None*)

save()

installers

base

Dynamic installer loading.

Functions

get_installer(name)

Attributes

ENTRY_POINT

ENTRY_POINT = 'conda_env.installers'

exception InvalidInstaller(name)

Bases: *Exception*

Common base class for all non-exit exceptions.

get_installer(name)

conda

Conda-flavored installer.

Functions

solve(prefix, specs, args, env, * , **kwargs)

dry_run(specs, args, env, *_ , **kwargs)

install(prefix, specs, args, env, *_ , **kwargs)

solve(prefix, specs, args, env, * , **kwargs)

dry_run(specs, args, env, *_ , **kwargs)

install(prefix, specs, args, env, *_ , **kwargs)

pip

Pip-flavored installer.

Functions

<code>_pip_install_via_requirements(prefix, specs, args, *_ , ...)</code>	Installs the pip dependencies in specs using a temporary pip requirements file.
---	---

<code>install(*args, **kwargs)</code>	
---------------------------------------	--

`_pip_install_via_requirements(prefix, specs, args, *_ , **kwargs)`
 Installs the pip dependencies in specs using a temporary pip requirements file.

Parameters

- **prefix** (*string*) -- The path to the python and pip executables.
- **specs** (*iterable of strings*) -- Each element should be a valid pip dependency. See:
https://pip.pypa.io/en/stable/user_guide/#requirements-files
https://pip.pypa.io/en/stable/reference/pip_install/#requirements-file-format

`install(*args, **kwargs)`

pip_util

Functions related to core conda functionality that relates to pip

NOTE: This modules used to in conda, as conda/pip.py

Classes

<code>PipPackage</code>	<code>dict()</code> -> new empty dictionary
-------------------------	---

Functions

<code>pip_subprocess(args, prefix, cwd)</code>	
--	--

<code>get_pip_installed_packages(stdout)</code>	Return the list of pip packages installed based on the command output
---	---

<code>get_pip_version(prefix)</code>	
--------------------------------------	--

<code>installed(prefix[, output])</code>	
--	--

<code>_canonicalize_name(name)</code>	
---------------------------------------	--

<code>add_pip_installed(prefix, installed_pkgs[, json, output])</code>	
--	--

Attributes

`_canonicalize_regex`

pip_subprocess(*args, prefix, cwd*)

get_pip_installed_packages(*stdout*)

Return the list of pip packages installed based on the command output

get_pip_version(*prefix*)

class PipPackage

Bases: `dict`

`dict()` -> new empty dictionary `dict(mapping)` -> new dictionary initialized from a mapping object's

(key, value) pairs

dict(iterable) -> new dictionary initialized as if via: `d = { }` for k, v in iterable:

`d[k] = v`

dict(kwargs)** -> new dictionary initialized with the name=value pairs in the keyword argument list. For example: `dict(one=1, two=2)`

__str__()

Return `str(self)`.

installed(*prefix, output=True*)

_canonicalize_regex

_canonicalize_name(*name*)

add_pip_installed(*prefix, installed_pkgs, json=None, output=True*)

specs

binstar

Define binstar spec.

Classes

`BinstarSpec`

`spec = BinstarSpec('darth/deathstar')`

Attributes

ENVIRONMENT_TYPE

ENVIRONMENT_TYPE = 'env'

class BinstarSpec(*name=None*)

spec = BinstarSpec('darth/deathstar') spec.can_handle() # => True / False spec.environment # => YAML string
spec.msg # => Error messages :raises: EnvironmentFileNotDownloaded

msg

can_handle() → bool

Validates loader can process environment definition. :return: True or False

valid_name() → bool

Validates name :return: True or False

valid_package() → bool

Returns True if package has an environment file :return: True or False

binstar() → *types.ModuleType*

file_data() → list[dict[str, str]]

environment() → *conda_env.env.Environment*

package()

username() → str

packagename() → str

requirements

Define requirements.txt spec.

Classes

RequirementsSpec

Reads dependencies from a requirements.txt file

class RequirementsSpec(*filename=None, name=None, **kwargs*)

Reads dependencies from a requirements.txt file and returns an Environment object from it.

property environment

msg

extensions

_valid_file()

_valid_name()

can_handle()

yaml_file

Define YAML spec.

Classes

YamlFileSpec

```
class YamlFileSpec(filename=None, **kwargs)
```

```
    property environment
    _environment
    extensions
    can_handle()
```

Classes

<i>BinstarSpec</i>	spec = BinstarSpec('darth/deathstar')
<i>RequirementsSpec</i>	Reads dependencies from a requirements.txt file
<i>YamlFileSpec</i>	

Functions

<i>get_spec_class_from_file</i> (→ FileSpecTypes)	Determine spec class to use from the provided filename
<i>detect</i> (→ SpecTypes)	Return the appropriate spec type to use.

Attributes

FileSpecTypes

SpecTypes

```
class BinstarSpec(name=None)
```

```
    spec = BinstarSpec('darth/deathstar') spec.can_handle() # => True / False spec.environment # => YAML string
    spec.msg # => Error messages :raises: EnvironmentFileNotDownloaded
```

```
    msg
```

```
    can_handle() → bool
```

```
        Validates loader can process environment definition. :return: True or False
```

```

valid_name() → bool
    Validates name :return: True or False

valid_package() → bool
    Returns True if package has an environment file :return: True or False

binstar() → types.ModuleType

file_data() → list[dict[str, str]]

environment() → conda_env.env.Environment

package()

username() → str

packagename() → str

class RequirementsSpec(filename=None, name=None, **kwargs)
    Reads dependencies from a requirements.txt file and returns an Environment object from it.

    property environment

    msg

    extensions

    _valid_file()

    _valid_name()

    can_handle()

class YamlFileSpec(filename=None, **kwargs)

    property environment

    _environment

    extensions

    can_handle()

FileSpecTypes

get_spec_class_from_file(filename: str) → FileSpecTypes
    Determine spec class to use from the provided filename

    Raises EnvironmentFileExtensionNotValid | EnvironmentFileNotFound --

SpecTypes

detect(name: str = None, filename: str = None, directory: str = None, remote_definition: str = None) →
    SpecTypes
    Return the appropriate spec type to use.

    Raises

    • SpecNotFound -- Raised if no suitable spec class could be found given the input

    • EnvironmentFileExtensionNotValid | EnvironmentFileNotFound --

```


RELEASE NOTES

This information is drawn from the GitHub conda project changelog: <https://github.com/conda/conda/blob/main/CHANGELOG.md>

6.1 23.7.4 (2023-09-12)

6.1.1 Enhancements

- Use `os.scandir()` to find conda subcommands without `stat()` overhead. (#13033, #13067)

6.1.2 Bug fixes

- Fix S3 bucket name. (#12989)
- Fix performance regression of basic commands (e.g., `conda info`) on WSL. (#13035)
- Catch `PermissionError` raised by `conda.cli.find_commands.find_commands` when user's `$PATH` contains restricted paths. (#13062, #13089)
- Fix sorting error for `conda config --show-sources --json`. (#13076)

6.1.3 Contributors

- @beeankha
- @dholth
- @kenodegard
- @otaitleigh made their first contribution in <https://github.com/conda/conda/pull/13035>

6.2 23.7.3 (2023-08-21)

6.2.1 Bug fixes

- Fix regression for supporting conda executable plugins installed into non-base environments. (#13006)

6.2.2 Contributors

- @kenodegard

6.3 23.7.2 (2023-07-27)

6.3.1 Bug fixes

- Fix regression in parsing `--json` and `--debug` flags for executable plugins. (#12935, #12936)

6.3.2 Contributors

- @kenodegard

6.4 23.7.1 (2023-07-26)

6.4.1 Bug fixes

- Patch parsed args with `pre_args` to correctly parse `--json` and `--debug` arguments. (#12928, #12929)

6.4.2 Contributors

- @jezdez
- @kenodegard

6.5 23.7.0 (2023-07-25)

6.5.1 Enhancements

- Add `conda.deprecations.DeprecationHandler.action` helper to deprecate `argparse.Actions`. (#12493)
- Add support for the FreeBSD operating system and register `freebsd-64` as a known subdirectory for FreeBSD on x86-64. (#12647)
- Do not mock `$CONDA_PREFIX` when `--name` or `--prefix` is provided. (#12696)
- Add support for sha256 filters in the MatchSpec syntax (e.g. `*[sha256=f453db4ffe2271ec492a2913af4e61d4a6c118201f07...]`). (#12654 via #12707)

- Add a new health check to `conda doctor` detecting altered packages in an environment by comparing expected and computed sha256 checksums. (#12757)
- Add new `pre_commands` and `post_commands` plugin hooks allowing plugins to run code before and after conda subcommands. (#12712, #12758, #12864)
- Stop using `distutils` directly in favor of the vendored version in `setuptools` 60 and later or standard library equivalents. (#11136)
- Add a `CITATION.cff` file to the root of the repository to make it easier for users to cite conda. (#12781)
- Add optional `CondaSubcommand.configure_parser` allowing third-party plugins to hook into conda's argument parser. (#12814)
- Only display third-party subcommands in `conda --help` and not for every other subcommand. (#12814, #12740)
- Add a new config option, `no_plugins`, a `--no-plugins` command line flag, and a `CONDA_NO_PLUGINS` environment variable that disables external plugins for built-in conda commands. (#12748)
- Register plugins using their canonical/fully-qualified name instead of the easily spoofable entry point name. (#12869)
- De-duplicate plugin and legacy subcommands in `conda --help`. (#12893)
- Implement a 2-phase parser to better handle plugin disabling (via `--no-plugins`). (#12910)
- Refactor subcommand parsing to use a greedy parser since `argparse.REMAINDER` has [known issues](#). (#12910)

6.5.2 Bug fixes

- Use `requests.exceptions.JSONDecodeError` for ensuring compatibility with different `json` implementations used by requests. This fixes a bug that caused only the first of multiple given source URLs to be tried. This also raises the minimum required requests version to 2.27.0. (#12683)
- Don't export `__osx` virtual package when `CONDA_OVERRIDE_OSX=""`. (#12715)
- Fix erroneous `conda deactivate` behavior of unsetting preexisting environment variables that are identical to those set during `conda activate`. (#12769)
- Correct third-party subcommands to receive *remaining* arguments instead of a blanket `sys.argv[2:]` which broke `conda_cli` testing. (#12814, #12910)

6.5.3 Deprecations

- Mark `conda.base.context.context.root_dir` as pending deprecation. Use `conda.base.context.context.root_prefix` instead. (#12701)
- Mark `conda.plugins.subcommands.doctor.cli.get_prefix` as pending deprecation. Use `conda.base.context.context.target_prefix` instead. (#12725)
- Mark `conda.models.leased_path_entry.LeasePathEntry` as pending deprecation. (#12735)
- Mark `conda.models.enums.LeasePathType` as pending deprecation. (#12735)
- Mark `conda.common.temporary_content_in_file` as pending deprecation. Use `tempfile` instead. (#12795)
- Mark `conda.cli.python_api` as pending deprecation. Use `conda.testing.conda_cli` fixture instead. (#12796)

6.5.4 Docs

- Document how to use the new `pre_commands` and `post_commands` plugin hooks. (#12712, #12758)
- Add docstrings to all public modules. (#12792)
- Auto-generate API docs using `sphinx-autoapi`. (#12798)
- Convert all manual redirects into config using `sphinx-rerredirects`. (#12798)
- Revise the plugins index page to make it easier to understand how to create a conda plugin. (#12802)
- Add missing `conda env` CLI docs. (#12841)

6.5.5 Other

- Update `tests/cli/test_main_rename.py` to use latest fixtures. (#12517)
- Update `tests/test_activate.py` to test the new behavior. (#12769)
- Re-enable all `conda_env` tests and remove irrelevant tests. (#12813)
- Convert all `unittest`-style tests to `pytest`-style. (#12819)
- Convert `tests/test-recipes` into local noarch packages instead of relying on conda-test channel and local builds. (#12879)

6.5.6 Contributors

- @beeankha
- @conda-bot
- @dariocurr
- @jaimergp
- @jezdez
- @johanneskoester made their first contribution in <https://github.com/conda/conda/pull/12683>
- @jjhelmus
- @kalawac made their first contribution in <https://github.com/conda/conda/pull/12738>
- @kenodegard
- @schackartk made their first contribution in <https://github.com/conda/conda/pull/12781>
- @lestev made their first contribution in <https://github.com/conda/conda/pull/12715>
- @ForgottenProgramme
- @marcoesters made their first contribution in <https://github.com/conda/conda/pull/12863>
- @mpotane made their first contribution in <https://github.com/conda/conda/pull/11740>
- @mattkram made their first contribution in <https://github.com/conda/conda/pull/12730>
- @morremeyer made their first contribution in <https://github.com/conda/conda/pull/12871>
- @mcg1969
- @travishathaway
- @pre-commit-ci[bot]

6.6 23.5.2 (2023-07-13)

6.6.1 Bug fixes

- Correct `native_path_to_unix` failure to handle no paths (e.g., an empty string or an empty iterable). (#12880)

6.6.2 Contributors

- @kenodegard

6.7 23.5.1 (2023-07-12)

6.7.1 Bug fixes

- Add (back) the `cygpath` fallback logic since `cygpath` is not always available on Windows. (#12873)

6.7.2 Contributors

- @kenodegard

6.8 23.5.0 (2023-05-17)

6.8.1 Enhancements

- Add `conda doctor` subcommand plugin. (#474)
- Add Python 3.11 support. (#12256)
- Add `conda list --reverse` to return a reversed list of installed packages. (#11954)
- Switch from `setup.py` to `pyproject.toml` and use [Hatchling](#) for our build system. (#12509)
- Optimize which Python modules get imported during `conda activate` calls to make it faster. (#12550)
- Add `conda_cli` fixture to replace `conda.testing.helpers.run_inprocess_conda_command` and `conda.testing.integration.run_command`. (#12592)
- Add `tmp_env` fixture to replace `conda.testing.integration.make_temp_env`. (#12592)
- Add `path_factory` fixture to replace custom prefix logic like `conda.testing.integration._get_temp_prefix` and `conda.testing.integration.make_temp_prefix`. (#12592)
- Refactor the way that the `Activator` classes are defined in `conda/activate.py`. (#12627)
- Warn about misconfiguration when signature verification is enabled. (#12639)

6.8.2 Bug fixes

- `conda clean` no longer fails if we failed to get the file stats. (#12536)
- Provide fallback version if `conda.deprecations.DeprecationHandler` receives a bad version. (#12541)
- Ensure the default value for `defaults` includes `msys2` when `context.subdir` is `win-*` on non-Windows platforms. (#12555)
- Avoid `TypeError` when non-string types are written to the index cache metadata. (#12562)
- `conda.core.package_cache_data.UrlData.get_url` no longer fails when `package_path` has `.conda` extension. (#12516)
- Stop pre-converting paths to Unix style on Windows in `conda.sh`, so that they are prefix replaceable upon installation, which got broken by #12509. It also relies on `cygpath` at runtime, which all `msys2/cygwin` bash versions on Windows should have available. (#12627)

6.8.3 Deprecations

- Mark `conda_env.pip_util.get_pip_version` as pending deprecation. (#12492)
- Mark `conda_env.pip_util.PipPackage` as pending deprecation. (#12492)
- Mark `conda_env.pip_util.installed` as pending deprecation. (#12492)
- Mark `conda_env.pip_util._canonicalize_name` as pending deprecation. (#12492)
- Mark `conda_env.pip_util.add_pip_installed` as pending deprecation. (#12492)
- Mark `conda_env.env.load_from_directory` as pending deprecation. (#12492)
- Mark `python -m conda_env.cli.main` as pending deprecation. Use `conda env` instead. (#12492)
- Mark `python -m conda_env` as pending deprecation. Use `conda env` instead. (#12492)
- Mark `conda.auxlib.packaging` for deprecation in 24.3.0. (#12509)
- Rename index cache metadata file `.state.json` to `.info.json` to track draft CEP. (#12669)
- Mark `conda.testing.integration.get_conda_list_tuple` as pending deprecation. Use `conda.core.prefix_data.PrefixData().get()` instead. (#12676)
- Mark `conda.testing.encode_for_env_var` as pending deprecation. (#12677)
- Mark `conda.testing.integration.temp_chdir` as pending deprecation. Use `monkeypatch.chdir` instead. (#12678)

6.8.4 Docs

- Change the README example from IPython Notebook and NumPy to PyTorch. (#12579)
- Discuss options available to properly configure mirrored channels. (#12583, #12641)
- Add `flake8-docstrings` to `pre-commit`. (#12620)

6.8.5 Other

- Update retry language in flexible solve and repodata logs to be less ominous. (#12612)
- Improve repodata / subdir_data programming interface (#12521). Index cache metadata has changed to .info.json to better align with the [draft CEP](#). Improve cache locking when using jlap. Improve jlap logging. (#12572)
- Format with black and replaced pre-commit's darker hook with black. (#12554)
- Format with isort and add pre-commit isort hook. (#12554)
- Add functional tests around conda's content trust code. (#11805)
- Enable flake8 checks that are now handled by black. (#12620)

6.8.6 Contributors

- @beeankha
- @chbrandt made their first contribution in <https://github.com/conda/conda/pull/12419>
- @chenghlee
- @conda-bot
- @dholth
- @THEdavehogue made their first contribution in <https://github.com/conda/conda/pull/12612>
- @HeavenEvolved made their first contribution in <https://github.com/conda/conda/pull/12496>
- @eltoclear
- @jaimergp
- @jezdez
- @johnnynunez made their first contribution in <https://github.com/conda/conda/pull/12256>
- @kenodegard
- @ForgottenProgramme
- @pkmooreanaconda
- @tl-hbk made their first contribution in <https://github.com/conda/conda/pull/12604>
- @vic-ma made their first contribution in <https://github.com/conda/conda/pull/12579>
- @pre-commit-ci[bot]
- @sausagenoods made their first contribution in <https://github.com/conda/conda/pull/12631>

6.9 23.3.1 (2023-03-28)

6.9.1 Enhancements

- Fix and re-enable binstar tests. Replace custom property caching with `functools.cached_property`. (#12495)

6.9.2 Bug fixes

- Restore default argument for `SubdirData` method used by `conda-index`. (#12513)
- Include `conda.gateways.repodata.jlap` submodule in package. (#12545)

6.9.3 Other

- Add linux-s390x to multi-arch ci/dev container. (#12498)
- Expose a `MINIO_RELEASE` environment variable to provide a way to pin minio versions in CI setup scripts. (#12525)
- Add `jsonpatch` dependency to support `--experimental=jl原因` feature. (#12528)

6.9.4 Contributors

- @conda-bot
- @dbast
- @dholth
- @jaimeergp
- @kenodegard
- @ForgottenProgramme

6.10 23.3.0 (2023-03-14)

6.10.1 Enhancements

- Allow the use of environment variables for channel urls in `environment.yaml`. (#10018)
- Improved error message for `conda env create` if the environment file is missing. (#11883)
- Stop using `toolz.dicttoolz.merge` and `toolz.dicttoolz.merge_with`. (#12039)
- Add support for incremental `repodata.json` updates with `--experimental=jl原因` on the command line or `experimental: ["jl原因"]` in `.condarc` (#12090). Note: switching between “use jl原因” and “don’t use jl原因” invalidates the cache.
- Added a new `conda.deprecations` module for easier & standardized deprecation. Includes decorators to mark functions, modules, classes, and arguments for deprecation and functions to mark modules, constants, and topics for deprecation. (#12125)

- Adds a new `channel_settings` configuration parameter that will be used to override arbitrary settings on per-channel basis. (#12239)
- Improve speed of `repodata.json` parsing by deferring creation of individual `PackageRecord` objects. (#8500)
- Refactor subcommand argument parsing to make it easier to understand. This calls the plugin before invoking the default argument parsing. (#12285)
- Handle I/O errors raised while retrieving channel notices. (#12312)
- Add support for the 64-bit RISC-V architecture on Linux. (#12319)
- Update vendored version of `py-cpuinfo` to 0.9.0. (#12319)
- Improved code coverage. (#12346, #12457, #12469)
- Add a note about `use_only_tar_bz2` being enabled on `PackagesNotFoundError` exceptions. (#12353)
- Added to conda CLI help that `conda remove -n <myenv> --all` can be used to delete environments. (#12378)
- Handle Python import errors gracefully when loading conda plugins from entrypoints. (#12460)

6.10.2 Bug fixes

- Fixed errors when renaming without an active environment. (#11915)
- Prevent double solve attempt if `PackagesNotFoundError` is raised. (#12201)
- Virtual packages follow `context.subdir` instead of `platform.system()` to enable cross-platform installations. (#12219)
- Don't export `__glibc` virtual package when `CONDA_OVERRIDE_GLIBC=""`. (#12267)
- Fix `arg_parse` pass-through for `--version` and `--help` in `conda.xsh`. (#12344)
- Filter out `None` path values from `pwd.getpwall()` on Unix systems, for users without home directories, when running as root. (#12063)
- Catch `ChunkedEncodingError` exceptions to prevent network error tracebacks hitting the output. (#12196 via #12487)
- Fix race conditions in `mkdir_p_sudo_safe`. (#12490)

6.10.3 Deprecations

- Drop `toolz.itertoolz.unique` in favor of custom `conda.common.iterators.unique` implementation. (#12252)
- Stop using `OrderedDict`/`odict` since `dict` preserves insert order since Python 3.7. (#12254)
- Mark `conda._vendor.bolttons` for deprecation in 23.9.0. (#12272, #12482)
- Mark `conda_exe` in `context.py` and a topic in `print_package_info cli/main_info.py` for official deprecation. (#12398)
- Remove unused `chain`, `methodcaller`, `mkdtemp`, `StringIO` imports in `conda.common.compat`; apply other fixes from `ruff --fix` in the test suite. (#12294)
- Remove unused optimization for searching packages based on `*[track_features=<feature name>]`. (#12314)

- Remove Notebook spec support from `conda env`; this was deprecated already and scheduled to be remove in version 4.5. (#12307)
- Mark `conda_exe` in `context.py` and a topic in `print_package_info cli/main_info.py` for official deprecation. (#12276)
- Marking `conda.utils.hashsum_file` as pending deprecation. Use `conda.gateways.disk.read.compute_sum` instead. (#12414)
- Marking `conda.utils.md5_file` as pending deprecation. Use `conda.gateways.disk.read.compute_sum(path, "md5")` instead. (#12414)
- Marking `conda.gateways.disk.read.compute_md5sum` as pending deprecation. Use `conda.gateways.disk.read.compute_sum(path, "md5")` instead. (#12414)
- Marking `conda.gateways.disk.read.compute_sha256sum` as pending deprecation. Use `conda.gateways.disk.read.compute_sum(path, "sha256")` instead. (#12414)
- Drop Python 3.7 support. (#12436)

6.10.4 Docs

- Added docs for `conda.deprecations`. (#12452)
- Updated some instances of “Anaconda Cloud” to be “[Anaconda.org](https://anaconda.org)”. (#12238)
- Added documentation on the specifications for `conda search` and `conda install`. (#12304)
- Mark `conda.utils.safe_open` for deprecation. Use builtin `open` instead. (#12415)

6.10.5 Other

- Update `<cache key>.json.state repodata.json` cache format; check `mtime` against cached `repodata.json`. (#12090)
- Skip redundant `tar --no-same-owner` when running as root on Linux, since newer `conda-package-handling` avoids setting ownership from the archive. (#12231)
- Add additional extensions to `conda.common.path` for future use. (#12261)
- Pass `--cov` in test runner scripts but not in `setup.cfg` defaults, for easier debugging. (#12268)
- Constrain `conda-build` to at least `>=3.18.3`, released 2019-06-20. (#12309)
- Improve `start.bat` Windows development script. (#12311)
- Provide `conda-forge`-based Docker images and fix the bundled `minio` binary. (#12335)
- Add support for `conda-forge`-based CI runtimes. On Linux (all architectures), unit & integration tests will use Python 3.10. On Windows, Python 3.8. On macOS, only the unit tests are run with `conda-forge` (*instead* of defaults!), using Python 3.9. (#12350, #12447 via #12448)
- Fix testing data issue where the `subdir` entry in some files was mismatched. (#12389)
- Initialize `conda` after installing test requirements during CI. (#12446)
- Speedup pre-commit by a factor of 15 by removing ignored hooks (`pylint/bandit`). This locally reduces the pre-commit runtime from ~43sec to 2.9sec and thus makes it possible to run pre-commit in a loop during development to constantly provide feedback and style the code. (#12466)

6.10.6 Contributors

- @AdrianFreundQC made their first contribution in <https://github.com/conda/conda/pull/11883>
- @sanzoghenzo made their first contribution in <https://github.com/conda/conda/pull/12074>
- @beeankha
- @conda-bot
- @dbast
- @dholth
- @FelisNivalis made their first contribution in <https://github.com/conda/conda/pull/11915>
- @gforsyth made their first contribution in <https://github.com/conda/conda/pull/12344>
- @eltocier made their first contribution in <https://github.com/conda/conda/pull/12377>
- @jaimergp
- @jezdez
- @jjhelmus
- @kannanjayachandran made their first contribution in <https://github.com/conda/conda/pull/12363>
- @kathatherine
- @kenodegard
- @ForgottenProgramme
- @ryanskeith made their first contribution in <https://github.com/conda/conda/pull/12439>
- @31Sanskрати made their first contribution in <https://github.com/conda/conda/pull/12371>
- @travishathaway
- @pre-commit-ci[bot]

6.11 23.1.0 (2023-01-17)

6.11.1 Bug fixes

- Detect CUDA driver version in subprocess. (#11667)
- Fixes the behavior of the `--no-user` flag in `conda init` so that a user's `.bashrc`, etc. remains unaltered, as expected. (#11949)
- Fix several more user facing `MatchSpec` crashes that were identified by fuzzing efforts. (#12099)
- Lock `sys.stdout` to avoid corrupted `--json` multithreaded download progress. (#12231)

6.11.2 Docs

- Optional Bash completion support has been removed starting in v4.4.0, and not just deprecated. (#11171)
- Documented optional `channel::package` syntax for specifying dependencies in `environment.yml` files. (#11890)

6.11.3 Other

- Refactor `repodata.json` fetching; update on-disk cache format. Based on work by @FFY00. (#11600)
- Environment variable overwriting WARNING is printed only if the env vars are different from those specified in the OS. (#12128)
- Added `conda-libmamba-solver` run constraint. (#12156)
- Updated `ruamel.yaml` version. (#12156)
- Added `tqdm` dependency. (#12191)
- Use `itertools.chain.from_iterable` instead of equivalent `tlz.concat`. (#12165)
- Use `toolz.unique` instead of vendored copy. (#12165)
- Use `itertools.islice` instead of `toolz.take`. (#12165)
- Update CI test workflow to only run test suite when code changes occur. (#12180)
- Added Python 3.10 canary builds. (#12184)

6.11.4 Contributors

- @beeankha
- @dholth
- @dariocurr made their first contribution in <https://github.com/conda/conda/pull/12128>
- @jezdez
- @jay-tau made their first contribution in <https://github.com/conda/conda/pull/11738>
- @kenodegard
- @pkmooreanaconda
- @sven6002 made their first contribution in <https://github.com/conda/conda/pull/12162>
- @ReveStobinson made their first contribution in <https://github.com/conda/conda/pull/12213>
- @travishathaway
- @XuehaiPan made their first contribution in <https://github.com/conda/conda/pull/11667>
- @xylar made their first contribution in <https://github.com/conda/conda/pull/11949>
- @pre-commit-ci[bot]

6.12 22.11.1 (2022-12-06)

6.12.1 Bug fixes

- Restore default virtual package specs as in 22.9.0 (#12148)
 - re-add `__unix/` `__win` packages
 - restore `__archspec` version/build string composition

6.12.2 Other

- Skip test suite for non-code changes. (#12141)

6.12.3 Contributors

- @LtDan33
- @jezdez
- @kenodegard
- @mbargull
- @travishathaway

6.13 22.11.0 (2022-11-23)

6.13.1 Enhancements

- Add `LD_PRELOAD` to env variable list. (#10665)
- Improve CLI warning about updating conda. (#11300)
- Conda's initialize block in the user's profiles will check whether the conda executable exists before calling the conda hook. (#11374)
- Switch to `tqdm` as a real dependency. (#12005)
- Add a new plugin mechanism. (#11435)
- Add an informative message if explicit install fails due to requested packages not being in the cache. (#11591)
- Download and extract packages in parallel. Greatly speeds up package downloads when latency is high. Controlled by the new `fetch_threads` config parameter, defaulting to 5 parallel downloads. Thanks @shuges-uk for reporting. (#11841)
- Add a new plugin hook for virtual packages and convert existing code for virtual packages (from [index.py](#)) into plugins. (#11854)
- Require `ruamel.yaml`. (#11868, #11837)
- Stop using `toolz.accumulate`. (#12020)
- Stop using `toolz.groupby`. (#11913)
- Remove vendored `six` package. (#11979)

- Add the ability to extend the solver backends with the `conda_solvers` plugin hook. (#11993)
- Stop using `toolz.functoolz.excepts`. (#12016)
- Stop using `toolz.itertoolz.concatv`. (#12020)
- Also try UTF16 and UTF32 encodings when replacing the prefix. (#9946)

6.13.2 Bug fixes

- `conda env update` would ask for user input and hang when working with pip installs of git repos and the repo was previously checked out. Tell pip not to ask for user input for that case. (#11818)
- Fix for `conda update` and `conda install` issues related to channel notices. (#11852)
- Signature verification printed `None` when disabled, changes default `metadata_signature_status` to an empty string instead. (#11944)
- Fix importlib warnings when importing `conda.cli.python_api` on python=3.10. (#11975)
- Several user facing `MatchSpec` crashes were identified by fuzzing efforts. (#11999)
- Apply minimal fixes to deal with these (and similar) crashes. (#12014)
- Prevent `conda` from using `/bin/sh + exec` trick for its own entry point, which drops `$PS1` on some shells (#11885, #11893 via #12043).
- Handle CTRL+C during package downloading more gracefully. (#12056)
- Prefer the outer name when a `MatchSpec` specifies a package's name twice `package-name[name=package-name]` (#12062)

6.13.3 Deprecations

- Add a pending deprecation warning for when importing `tqdm` from `conda._vendor`. (#12005)
- Drop `ruamel_yaml` and `ruamel_yaml_conda` in favor of `ruamel.yaml`. (#11837)
- `context.experimental_solver` is now marked for pending deprecation. It is replaced by `context.solver`. The same applies to the `--experimental-solver` flag, the `CONDA_EXPERIMENTAL_SOLVER` environment variable, and the `ExperimentalSolverChoice` enum, which will be replaced by `--solver`, `EXPERIMENTAL_SOLVER` and `SolverChoice`, respectively. (#11889)
- Mark `context.conda_private` as pending deprecation. (#12101)

6.13.4 Docs

- Add corresponding documentation for the new plugins mechanism. (#11435)
- Update `conda` cheatsheet for the 4.14.0 release. The cheatsheet now includes an example for `conda rename`. (#11768)
- Document `conda-build` package format v2, also known as the `.conda-format`. (#11881)
- Remove `allow_other_channels` config option from documentation, as the option no longer exists. (#11866)
- Fix bad URL to “Introduction to conda for Data Scientists” course in `conda` docs. (#9782)

6.13.5 Other

- Add a comment to the code that explains why `.bashrc` is modified on Linux and `.bash_profile` is modified on Windows/macOS when executing `conda init`. (#11849)
- Add `--mach` and `--arch` options to `dev/start`. (#11851)
- Remove encoding pragma in file headers, as it's not needed in Python 3 anymore. (#11880)
- Refactor `conda init SHELLS` as argparse choices. (#11897)
- Drop pragma fixes from pre-commit checks. (#11909)
- Add `pyupgrade` to pre-commit checks. This change affects many files. Existing pull requests may need to be updated, rebased, or merged to address conflicts. (#11909)
- Add `aarch64` and `ppc64le` as additional CI platforms for smoke testing. (#11911)
- Serve package files needed for testing using local server. (#12024)
- Update canary builds to guarantee builds for the commits that trigger workflow. (#12040)

6.13.6 Contributors

- @arq0017 made their first contribution in <https://github.com/conda/conda/pull/11810>
- @beeankha
- @conda-bot
- @dbast
- @dholth
- @erykoff
- @consideRatio made their first contribution in <https://github.com/conda/conda/pull/12028>
- @jaimergp
- @jezdez
- @kathatherine
- @kenodegard
- @ForgottenProgramme made their first contribution in <https://github.com/conda/conda/pull/11926>
- @hmaarrfk made their first contribution in <https://github.com/conda/conda/pull/9946>
- @NikhilRaverkar made their first contribution in <https://github.com/conda/conda/pull/11842>
- @pavelzw made their first contribution in <https://github.com/conda/conda/pull/11849>
- @pkmooreanaconda made their first contribution in <https://github.com/conda/conda/pull/12014>
- @fragmede made their first contribution in <https://github.com/conda/conda/pull/11818>
- @SatyamVyas04 made their first contribution in <https://github.com/conda/conda/pull/11870>
- @timhoffm
- @travishathaway
- @dependabot made their first contribution in <https://github.com/conda/conda/pull/11965>
- @pre-commit-ci[bot]

- @wulmer

6.14 22.9.0 (2022-09-14)

6.14.1 Special announcement

If you have been following the conda project previously, you will notice a change in our version number for this release. We have officially switched to the [CalVer](#) versioning system as agreed upon in [CEP 8](#) (Conda Enhancement Proposal).

Please read that CEP for more information, but here is a quick synopsis. We hope that this versioning system and our release schedule will help make our releases more predictable and transparent to the community going forward. We are now committed to making at least one release every two months, but keep in mind that we can (and most likely will) be making minor version releases within this window.

6.14.2 Enhancements

- Replace vendored toolz with toolz dependency. (#11589, #11700)
- Update bundled Python launchers for Windows (conda/shell/cli-*.exe) to match the ones found in conda-build. (#11676)
- Add win-arm64 as a known platform (subdir). (#11778)

6.14.3 Bug fixes

- Remove extra prefix injection related to the shell interface breaking `conda run`. (#11666)
- Better support for shebang instructions in prefixes with spaces. (#11676)
- Fix `noarch` entry points in Unicode-containing prefixes on Windows. (#11694)
- Ensure that exceptions that are raised show up properly instead of resulting in a blank `[y/N]` prompt. (#11746)

6.14.4 Deprecations

- Mark `conda._vendor.toolz` as pending deprecation. (#11704)
- Removes vendored version of `urllib3`. (#11705)

6.14.5 Docs

- Added conda capitalization standards to CONTRIBUTING file. (#11712)

6.14.6 Other

- Add arm64 support to development script `./dev/start`. (#11752)
- Update canary-release version to resolve canary build issue. (#11761)
- Renamed canary recipe from `conda.recipe` to `recipe`. (#11774)

6.14.7 Contributors

- @beeankha
- @chenghlee
- @conda-bot
- @dholth
- @isuruf
- @jaimeergp
- @jezdez
- @razzlestorm made their first contribution in <https://github.com/conda/conda/pull/11736>
- @jakirkham
- @kathatherine
- @kenodegard
- @scdub made their first contribution in <https://github.com/conda/conda/pull/11816>
- @travishathaway
- @pre-commit-ci[bot]

6.15 4.14.0 (2022-08-02)

6.15.1 Enhancements

- Only star activated environment in `conda info --envs/conda env list`. (#10764)
- Adds new sub-command, `conda notices`, for retrieving channel notices. (#11462)
- Notices will be intermittently shown after running, `install`, `create`, `update`, `env create` or `env update`. New notices will only be shown once. (#11462)
- Implementation of a new `rename` subcommand. (#11496)
- Split `SSL` error from `HTTP` error to help resolve `HTTP 000` errors. (#11564)
- Include the invalid package name in the error message. (#11601)
- Bump requests version (`>=2.20.1`) and drop monkeypatching. (#11643)
- Rename `whitelist_channels` to `allowlist_channels`. (#11647)
- Always mention channel when notifying about a new conda update. (#11671)

6.15.2 Bug fixes

- Correct a misleading `conda --help` error message. (#11625)
- Fix support for CUDA version detection on WSL2. (#11626)
- Fixed the bug when providing empty `environment.yml` to `conda env create` command. (#11556, #11630)
- Fix MD5 hash generation for FIPS-enabled systems. (#11658)
- Fixed `TypeError` encountered when logging is set to `DEBUG` and the package's JSON cannot be read. (#11679)

6.15.3 Deprecations

- `conda.cli.common.ensure_name_or_prefix` is pending deprecation in a future release. (#11490)
- Mark `conda.lock` as pending deprecation. (#11571)
- Remove `lgtn.com` config. (#11572)
- Remove Python 2.7 `conda.common.url.is_ipv6_address_win_py27` implementation. (#11573)
- Remove redundant `conda.resolve.dashlist` definition. (#11578)
- Mark `conda_env.cli.common.get_prefix` and `conda.base.context.get_prefix` as pending deprecation in favor of `conda.base.context.determine_target_prefix`. (#11594)
- Mark `conda_env.cli.common.stdout_json` as pending deprecation in favor of `conda.cli.common.stdout_json`. (#11595)
- Mark `conda_env.cli.common.find_prefix_name` as pending deprecation. (#11596)
- Mark `conda.auxlib.decorators.memoize` as pending deprecation in favor of `functools.lru_cache`. (#11597)
- Mark `conda.exports.memoized` as pending deprecation in favor of `functools.lru_cache`. (#11597)
- Mark `conda.exports.handle_proxy_407` as pending deprecation. (#11597)
- Refactor `conda.activate._Activator.get_export_unset_vars` to use `**kwargs` instead of `OrderedDict`. (#11649)
- Mark `conda.another_to_unicode` as pending deprecation. (#11678)

6.15.4 Docs

- Corresponding documentation of `notices` subcommand. (#11462)
- Corresponding documentation of `rename` subcommand. (#11496)
- Correct docs URL to <https://docs.conda.io>. (#11508)
- Updated the list of environment variables that can now expand in the [Use CondaRC](#) section. (#11514)
- Include notice that the “All Users” installation option in the Anaconda Installer is no longer available due to [security concerns](#). (#11528)
- Update [conda-zsh-completions](#) link. (#11541)
- Missing `pip` as a dependency when including a pip-installed dependency. (#11543)
- Convert `README.rst` to `README.md`. (#11544)
- Updated docs and CLI help to include information on `conda init` arguments. (#11574)

- Added docs for writing integration tests. (#11604)
- Updated `conda env create` CLI documentation description and examples to be more helpful. (#11611)

6.15.5 Other

- Display tests summary in CI. (#11558)
- Update `Dockerfile` and `ci-images.yml` flow to build multi arch images. (#11560)
- Rename master branch to main. (#11570)

6.15.6 Contributors

- @drewja made their first contribution in #11614
- @beeankha
- @topherocity made their first contribution in #11658
- @conda-bot
- @dandv made their first contribution in #11636
- @dbast
- @dholth
- @deepyaman made their first contribution in #11598
- @dogukanteber made their first contribution in #11556/#11630
- @jaimergp
- @kathatherine
- @kenodegard
- @nps1ngh made their first contribution in #10764
- @pseudoyim made their first contribution in #11528
- @SamStudio8 made their first contribution in #11679
- @SamuelWN made their first contribution in #11543
- @spencermathews made their first contribution in #11508
- @tingates42
- @timhoffm made their first contribution in #11601
- @travishathaway
- @esc
- @pre-commit-ci[bot]

6.16 4.13.0 (2022-05-19)

6.16.1 Enhancements

- Introducing `conda clean --logfiles` to remove logfiles generated by `conda-libmamba-solver`. (#11387)
- Add the solver name and version to the user-agent. (#11415, #11455)
- Attempt parsing HTTP errors as a JSON and extract error details. If present, prefer these details instead of those hard-coded. (#11440)

6.16.2 Bug fixes

- Fix inconsistencies with `conda clean --dryrun` (#11385)
- Standardize tarball & package finding in `conda clean` (#11386, #11391)
- Fix `escape_channel_url` logic on Windows (#11416)
- Use 'Accept' header, not 'Content-Type' in GET header (#11446)
- Allow extended user-agent collection to fail but log the exception (#11455)

6.16.3 Deprecations

- Removing deprecated `conda.cli.activate`. Originally deprecated in conda 4.6.0 in May 2018. (#11309)
- Removing deprecated `conda.compat`. Originally deprecated in conda 4.6.0 in May 2018. (#11322)
- Removing deprecated `conda.install`. Originally deprecated in conda 4.6.0 in May 2018. (#11323)
- Removing deprecated `conda.cli.main_help`. Originally deprecated in conda 4.6.0 in May 2018. (#11325)
- Removed unused `conda.auxlib.configuration`. (#11349)
- Removed unused `conda.auxlib.crypt`. (#11349)
- Removed unused `conda.auxlib.deprecation`. (#11349)
- Removed unused `conda.auxlib.factory`. (#11349)
- Removed minimally used `conda.auxlib.path`. (#11349)
- Removed `conda.exports.CrossPlatformStLink`, a Windows Python <3.2 fix for `os.lstat.st_nlink`. (#11351)
- Remove Python 2.7 and other legacy code (#11364)
- `conda run --live-stream` aliases `conda run --no-capture-output`. (#11422)
- Removes unused exceptions. (#11424)
- Combines `conda_env.exceptions` with `conda.exceptions`. (#11425)
- Drop Python 3.6 support. (#11453)
- Remove outdated test `test_init_dev_and_NoBaseEnvironmentError` (#11469)

6.16.4 Docs

- Initial implementation of deep dive docs (#11059)
- Correction of RegisterPython description in Windows Installer arguments. (#11312)
- Added autodoc documentation for `conda compare`. (#11336)
- Remove duplicated instruction in `manage-python.rst` (#11381)
- Updated conda cheatsheet. (#11443)
- Fix typos throughout the codebase (#11448)
- Fix `conda activate` example (#11471)
- Updated conda 4.12 cheatsheet with new anaconda distribution version (#11479)

6.16.5 Other

- Add Python 3.10 as a test target. (#10992)
- Replace custom `conda._vendor` with `vendoring` (#11290)
- Replace `conda.auxlib.collection.frozendict` with vendored `frozendict` (#11398)
- Reorganize and new tests for `conda.cli.main_clean` (#11360)
- Removing vendored usage of `urllib3` and instead implementing our own wrapper around `std. lib urllib` (#11373)
- Bump vendored `py-cpuinfo` version 4.0.0 → 8.0.0. (#11393)
- Add informational Codecov status checks (#11400)

6.16.6 Contributors

- @beeankha made their first contribution in #11469
- @ChrisPanopoulos made their first contribution in #11312
- @conda-bot
- @dholth
- @jaimergp
- @jezdez
- @kathatherine made their first contribution in #11443
- @kenodegard
- @kianmeng made their first contribution in #11448
- @simon9500 made their first contribution in #11381
- @thomasrockhu-codecov made their first contribution in #11400
- @travishathaway made their first contribution in #11373
- @pre-commit-ci[bot]

6.17 4.12.0 (2022-03-08)

6.17.1 Enhancements

- Add support for libmamba integrations. (#11193)

This is a new **experimental and opt-in** feature that allows use of the new [conda-libmamba-solver](#) for an improved user experience, based on the libmamba community project - the library version of the [mamba package manager](#).

Please follow these steps to try out the new libmamba solver integration:

1. Make sure you have [conda-libmamba-solver](#) installed in your conda base environment.
2. Try out the solver using the `--experimental-solver=libmamba` command line option.

E.g. with a dry-run to install the `scipy` package:

```
conda create -n demo scipy --dry-run --experimental-solver=libmamba
```

Or install in an activated conda environment:

```
conda activate my-environment
conda install scipy --experimental-solver=libmamba
```

- Make sure that `conda env update -f` sets env vars from the referenced yaml file. (#10652)
- Improve command line argument quoting, especially for `conda run`. (#11189)
- Allow `conda run` to work in read-only environments. (#11215)
- Add support for `prelink_message`. (#11123)
- Added `conda.CONDA_SOURCE_ROOT`. (#11182)

6.17.2 Bug fixes

- Refactored `conda.utils.ensure_comspec_set` into `conda.utils.get_comspec`. (#11168)
- Refactored `conda.cli.common.is_valid_prefix` into `conda.cli.common.validate_prefix`. (#11172)
- Instantiate separate S3 session for thread-safety. (#11038)
- Change overly verbose info log to debug. (#11260)
- Remove `five.py` and update metaclass definitions. (#11267)
- Remove unnecessary conditional in `setup.py` (#11013)

6.17.3 Docs

- Clarify on AIE messaging in `download.rst`. (#11221)
- Fix conda environment variable echo, update example versions. (#11237)
- Fixed link in docs. (#11268)
- Update profile examples. (#11278)
- Fix typos. (#11070)
- Document `conda run` command. (#11299)

6.17.4 Other

- Added macOS to continuous integration. (#10875)
- Added ability to build per-pullrequest review builds. (#11135)
- Improved subprocess handling on Windows. (#11179)
- Add CONDA_SOURCE_ROOT env var. (#11182)
- Automatically check copyright/license disclaimer & encoding pragma. (#11183)
- Development environment per Python version. (#11233)
- Add concurrency group to cancel GHA runs on repeated pushes to branch/PR. (#11258)
- Only run GHAs on non-forks. (#11265)

6.17.5 Contributors

- @opoplowski
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- @autotmp
- @yuvipanda
- @astrojuanlu
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6.18 4.11.0 (2021-11-22)

6.18.1 Enhancements

- Allow channel_alias to interpolate environment variables.
- Support running conda with PyPy on Windows.
- Add ability to add, append and prepend to sequence values when using the conda config subcommand.
- Support Python 3.10 in version parser.
- Add XDG_CONFIG_HOME to the conda search path following the [XDG Base Directory Specification \(XDGBDS\)](#).

6.18.2 Bug fixes

- Fix the PowerShell activator to not show an error when unsetting environment variables.
- Remove superfluous `eval` statements in fish shell integration.
- Indent the conda fish integration file using `fish_indent`.
- Fix handling of environment variables containing equal signs (=).
- Handle permission errors when listing all known prefixes.
- Catch Unicode decoding errors when parsing conda-meta files.
- Fix handling write errors when trying to create package cache or env directories.

6.18.3 Docs

- Update path of conda repo in RHEL based systems to `/etc/yum.repos.d/conda.repo`.
- Fix the advanced pip example to stop using the now invalid `file:` prefix.
- Minor docs cleanup and adding Code of Conduct.
- Add auto-built architecture documentation for conda based on the [C4 Model](#). See the conda documentation for more information.
- Expand the contributing documentation with a section about static code analysis and code linting.
- Add [developer guide section](#) to the documentation, including a conda [architecture overview](#).
- Stop referring to updating anaconda when `conda update` fails with an error.

6.18.4 Other

- Build Docker images periodically on GitHub Actions for the continuous integration testing on Linux, storing them on GitHub Packages's registry for reduced latency and cost when using Docker Hub.
- Simplify the Linux GitHub actions workflows by combining used shell scripts.
- Add periodic GitHub Actions workflow to review old issues in the conda issue tracker and mark them as stale if no feedback is provided in a sensible amount of time, eventually closing them.
- Add periodic GitHub Actions workflow to lock the comment threads of old issues and pull requests in the conda GitHub repository to surface regressions with new issues instead.
- Refactor test suite to use more GitHub Actions runners in parallel, reducing total run time by 50%.
- Switched the issue tracker to use forms with additional questions for bug reporters to help in ticket triage.
- Add and automatically run pre-commit as part of the CI system to improve the code quality continuously and raise issues in contributed patches early on.

The used code linters are: `flake8`, `pylint` and `bandit`.

The [Python code formatter black](#) is used as well but is only enforced on changed code in a commit and not to the whole code base at once.

- Automatically build the conda package upon the successful merge into the master branch and upload it to the conda-canary channel on anaconda.org.

To try conda out simply run:

```
conda install -c conda-canary/label/dev conda
```

- Automate adding new issues to [public GitHub project board](#) to facilitate issue triage.
- Update GitHub issue and pull request labels to be more consistent.
- Start using [revert](#) for release management.
- (preview) Enable one-click gitpod and GitHub Codespaces setup for Linux development.

6.18.5 Contributors

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- pre-commit CI

6.19 4.10.3 (2021-06-29)

6.19.1 Bug fixes

- Reverts “Don’t create an unused S3 client at import time (#10516)” in 4.10.2 that introduced a regression for users using S3 based channels. (#10756)

6.20 4.10.2 (2021-06-25)

6.20.1 Enhancements

- Add `--dry-run` option to `conda env create` (#10635)
- Print warning about pip-installed dependencies only once (#10638)
- Explicit install now respects `--download-only` flag (#10688)
- Bump vendored tqdm version (#10721)

6.20.2 Bug fixes

- Fix `changepts1` handling for PowerShell (#10624)
- Handle unbound `$PS1` so sh activation does not fail with `set -u` (#10701)
- Fix sh activation so `$PATH` is properly restored on errors (#10631)
- Fix `-c` option handling so defaults channel is not always re-added (#10735)
- Fix artifact verification-related warnings and errors (#10627, #10677)
- Fix log level used in `conda/core/prefix_data.py` (#9998)
- Fix log level used when fetching artifact verification metadata (#10621)
- Don’t create an unused S3 client at import time (#10516)
- Don’t load `binstar_client` until needed (#10692)
- Reflect dropping of older Python versions in `setup.py` (#10642)

6.20.3 Docs

- Merge release notes and changelog to reduce maintenance burden (#10745)
- Add mentions to PyPy, Anaconda terms of service (#10329, #10712)
- Update Python versions in examples (#10329, #10744)
- Update install macOS instructions (#10728)

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6.21 4.10.1 (2021-04-12)

6.21.1 Bug fixes

- Fix version detection for `__linux` virtual package (#10599)
- Fix import from `conda_content_trust` (#10589)
- Fix how URL for verification metadata files are constructed (#10617)
- Partially fix profile `$PATH` setup on MSYS2 (#10459)
- Remove `.empty` directory even when `rsync` is not installed (#10331)

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6.22 4.10.0 (2021-03-30)

NOTE: This release formally drops support for Python 2.7 and Python < 3.6.

6.22.1 Enhancements

- Add pilot support for metadata signatures and verification (#10578)
- Add `__linux` virtual package (#10552, #10561)
- Support nested keys when using `conda config --get` (#10447, #10572)
- Support installing default packages when using `conda env create` (#10530)
- Support HTTP sources for `conda env update -f` (#10536)
- Make macOS code signing operations less verbose (#10372)

6.22.2 Bug fixes

- Fix `conda search` crashing on Python 3.9 (#10542)
- Allow `{channel}::pip` to satisfy pip requirements (#10550)
- Support `{host}:{port}` specifications in environment YAML files (#10417)
- Fall back to system `.condarc` if user `.condarc` is absent (#10479)
- Try UTF-16 if UTF-8 fails when reading environment YAML files (#10356)
- Properly parse Python version `>= 3.10` (#10478)
- Fix zsh initialization when `$ZDOTDIR` is defined (#10413)
- Fix path handling for csh (#10410)
- Fix `setup.py` requirement for vendored `ruamel_yaml_conda` (#10441)
- Fix errors when pickling vendored `auxlib` objects (#10386)

6.22.3 Docs

- Document the `__unix` and `__windows` virtual packages (#10511)
- Update list of supported and default versions of Python (#10531)
- Favor using `pip` instead of `setup.py` when setting up CI (#10308)

6.22.4 Miscellaneous

- CI: drop Python 2.7 and add Python 3.9 (#10548)

6.22.5 Contributors

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6.23 4.9.2 (2020-11-10)

6.23.1 Enhancements

- Use vendored `tqdm` in `conda.resolve` for better consistency (#10337)

6.23.2 Bug fixes

- Revert to previous naming scheme for repodata cache files when `use_only_tar_bz2` config option is false (#10350)

6.23.3 Docs

- Fix missing release notes (#10342)
- Fix permission errors when configuring deb repositories (#10347)

6.23.4 Contributors

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6.24 4.9.1 (2020-10-26)

6.24.1 Enhancements

- Respect PEP 440 ~= “compatible release” clause (#10313)

6.24.2 Bug fixes

- Remove `preload_openssl` for Win32 (#10298)
- Add `if exist` to Windows registry hook (#10305)

6.24.3 Contributors

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6.25 4.9.0 (2020-10-19)

6.25.1 Enhancements

- Add `osx-arm64` as a recognized platform (#10128, #10134, #10137)
- Resign files modified during installation on ARM64 macOS (#10260)
- Add `__archspec` virtual package to identify CPU microarchitecture (#9930)
- Add `__unix` and `__win` virtual packages (#10214)
- Add `--no-capture--output` option to `conda run` (#9646)
- Add `--live-stream` option to `conda run` (#10270)

- Export and import environment variables set using `conda env config` (#10169)
- Cache repodata from `file:// channels` (#9730)
- Do not relink already-installed packages (#10208)
- Speed up JSON formatting in `logz` module (#10189)

6.25.2 Bug fixes:

- Stop `env remove --dry-run` from actually removing environments (#10261)
- Virtual package requirements are now considered by the solver (#10057)
- Fix cached filename processing when using only `tar.bz2` (#10193)
- Stop showing solver hints about CUDA when it is not a dependency (#10275)
- Ignore virtual packages when checking environment consistency (#10196)
- Fix `config --json` output errors in certain circumstances (#10194)
- More consistent error handling by `conda shell` (#10238)
- Bump vendored version of `tqdm` to fix various threading and I/O bugs (#10266)

6.25.3 Docs

- Correctly state default `/AddToPath` option in Windows installer (#10179)
- Fix typos in `--repodata-fn` help text (#10279)

6.25.4 Miscellaneous

- Update CI infrastructure to use GitHub Actions (#10176, #10186, #10234)
- Update README badge to show GitHub Actions status (#10254)

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6.26 4.8.5 (2020-09-14)

6.26.1 Enhancements

- Add `osx-arm64` as a recognized platform (#10128, #10134)

6.26.2 Contributors

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6.27 4.8.4 (2020-08-06)

6.27.1 Enhancements

- Add `linux-ppc64` as a recognized platform (#9797, #9877)
- Add `linux-s390x` as a recognized platform (#9933, #10051)
- Add spinner to pip installer (#10032)
- Add support for running conda in PyPy (#9764)
- Support creating conda environments using remote specification files (#9835)
- Allow request retries on various HTTP errors (#9919)
- Add `compare` command for environments against a specification file (#10022)
- Add (preliminary) support for JSON-format activation (#8727)
- Properly handle the `CURL_CA_BUNDLE` environment variable (#10078)
- More uniformly handle `$CONDA_PREFIX` when exporting environments (#10092)
- Enable trailing `_` to anchor OpenSSL-like versions (#9859)
- Replace `listdir` and `glob` with `scandir` (#9889)
- Ignore virtual packages when searching for constrained packages (#10117)
- Add virtual packages to be considered in the solver (#10057)

6.27.2 Bug fixes:

- Prevent `remove --all` from deleting non-environment directories (#10086)
- Prevent `create --dry-run --yes` from deleting existing environments (#10090)
- Remove extra newline from environment export file (#9649)
- Print help on incomplete `conda env config` command rather than crashing (#9660)
- Correctly set exit code/errorlevel when `conda run` exits (#9665)
- Send “inconsistent environment” warnings to stderr to avoid breaking JSON output (#9738)
- Fix output formatting from post-link scripts (#9841)
- Fix URL parsing for channel subdirs (#9844)
- Fix `conda env export -f` sometimes producing empty output files (#9909)
- Fix handling of Python releases with two-digit minor versions (#9999)
- Do not use gid to determine if user is an admin on *nix platforms (#10002)
- Suppress spurious xonsh activation warnings (#10005)
- Fix crash when running `conda update --all` on a nonexistent environment (#10028)
- Fix collections import for Python 3.8 (#10093)
- Fix regex-related deprecation warnings (#10093, #10096)
- Fix logic error when running under Python 2.7 on 64-bit platforms (#10108)
- Fix Python 3.8 leaked semaphore issue (#10115)

6.27.3 Docs

- Fix formatting and typos (#9623, #9689, #9898, #10042)
- Correct location for yum repository configuration files (#9988)
- Clarify usage for the `--channel` option (#10054)
- Clarify Python is not installed by default into new environments (#10089)

6.27.4 Miscellaneous

- Fixes to tests and CI pipelines (#9842, #9863, #9938, #9960, #10010)
- Remove conda-forge dependencies for developing conda (#9857, #9871)
- Audit YAML usage for `safe_load` vs `round_trip_load` (#9902)

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6.28 4.8.3 (2020-03-13)

6.28.1 Docs

- Add release notes for 4.8.2 to docs (#9632)
- Fix typos in docs (#9637, #9643)
- Grammatical and formatting changes (#9647)

6.28.2 Bug fixes:

- Account for channel is specs (#9748)

6.28.3 Contributors

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6.29 4.8.2 (2020-01-24)

6.29.1 Enhancements

- Solver messaging improvements (#9560)

6.29.2 Docs

- Added precedence and conflict info (#9565)
- Added how to set env variables with config API (#9536)
- Updated user guide, deleted Overview, minor clean up (#9581)
- Add code of conduct (#9601, #9602, #9603, #9603, #9604 #9605)

6.29.3 Bug fixes:

- change fish prompt only if change_ps1 is true (#7000)
- make frozendict JSON serializable (#9539)
- Conda env create empty dir (#9543)

6.29.4 Contributors

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6.30 4.8.1 (2019-12-19)

6.30.1 Enhancements

- improve performance for conda run by avoiding Popen.communicate (#9381)
- Put conda keyring in /usr/share/keyrings on Debian (#9424)
- refactor common.logic to fix some bugs and prepare for better modularity (#9427)
- Support nested configuration (#9449)
- Support Object configuration parameters (#9465)
- Use freeze_installed to speed up conda env update (#9511)
- add networking args to conda env create (#9525)

6.30.2 Docs

- fix string concatenation running words together regarding CONDA_EXE (#9411)
- Fix typo (“list” -> “info”) (#9433)
- typo in condarc key envs_dirs (#9478)
- Clarify channel priority and package sorting (#9492)
- improve description of DLL loading verification and activating environments (#9453)
- Installing with specific build number (#9534)

6.30.3 Bug fixes:

- Fix calling python api run_command with list and string arguments (#9331)
- revert init bash completion (#9421)
- set tmp to shortened path that excludes spaces (#9409)
- avoid function redefinition upon resourcing conda.fish (#9444)
- propagate pip error level when creating envs with conda env (#9460)
- fix incorrect chown call (#9464)
- Add subdir to PackageRecord dist_str (#9418)
- Fix running conda activate in multiple processes on windows (#9477)
- Don't check in pkgs for trash (#9472)
- remove setuptools from run_constrained in recipe (#9485)
- Fix __conda_activate function to correctly return exit code (#9532)
- fix overly greedy capture done by subprocess for conda run (#9537)

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6.31 4.8.0 (2019-11-04)

6.31.1 Enhancements

- retry downloads if they fail, controlled by `remote_max_retries` and `remote_backoff_factor` configuration values (#9318)
- redact authentication information in some URLs (#9341)
- add osx version virtual package, `__osx` (#9349)
- add glibc virtual package, `__glibc` (#9358)

6.31.2 Docs

- removed references to MD5s from docs (#9247)
- Add docs on `CONDA_DLL_SEARCH_MODIFICATION_ENABLED` (#9286)
- document threads, spec history and configuration (#9327)
- more documentation on channels (#9335)
- document the `.condarc` search order (#9369)
- various minor documentation fixes (#9238, #9248, #9267, #9334, #9351, #9372, #9378, #9388, #9391, #9393)

6.31.3 Bug fixes

- fix issues with xonsh activation on Windows (#8246)
- remove unsupported `--lock` argument from `conda clean` (#8310)
- do not add `sys_prefix_path` to failed activation or deactivation (#9282)
- fix `csch` `setenv` command (#9284)
- do not memorize `PackageRecord.combined_depends` (#9289)
- use `CONDA_INTERNAL_OLDPATH` rather than `OLDPATH` in activation script (#9303)
- fixes xonsh activation and tab completion (#9305)
- fix what channels are queried when `context.offline` is `True` (#9385)

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6.32 4.7.12 (2019-09-12)

6.32.1 Enhancements

- add support for env file creation based on explicit specs in history (#9093)
- detect prefix paths when -p nor -n not given (#9135)
- Add config parameter to disable conflict finding (for faster time to errors) (#9190)

6.32.2 Bug fixes

- fix race condition with creation of repodata cache dir (#9073)
- fix ProxyError expected arguments (#9123)
- makedirs to initialize .conda folder when registering env - fixes permission errors with .conda folders not existing when package cache gets created (#9215)
- fix list duplicates errors in reading repodata/prefix data (#9132)
- fix neutered specs not being recorded in history, leading to unsatisfiable environments later (#9147)
- Standardize “conda env list” behavior between platforms (#9166)
- add JSON output to conda env create/update (#9204)
- speed up finding conflicting specs (speed regression in 4.7.11) (#9218)

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6.33 4.7.11 (2019-08-06)

6.33.1 Enhancements

- add config for control of number of threads. These can be set in condarc or using environment variables. Names/default values are: `default_threads/None`, `repodata_threads/None`, `verify_threads/1`, `execute_threads/1` (#9044)

6.33.2 Bug fixes

- fix repodata_fns from condarc not being respected (#8998)
- Fix handling of UpdateModifiers other than FREEZE_INSTALLED (#8999)
- Improve conflict finding graph traversal (#9006)
- Fix setuptools being removed due to conda run_constrains (#9014)
- Avoid calling find_conflicts until all retries are spent (#9015)
- refactor _conda_activate.bat in hopes of improving behavior in parallel environments (#9021)
- Add support for local version specs in PYPI installed packages (#9025)
- fix boto3 initialization race condition (#9037)
- Fix return condition in package_cache_data (#9039)
- utilize libarchive_enabled attribute provided by conda-package-handling to fall back to .tar.bz2 files only. (#9041, #9053)
- Fix menu creation on windows having race condition, leading to popups about python.exe not being found (#9044)
- Improve list error when egg-link leads to extra egg-infos (#9045)

- Fix incorrect RemoveError when operating on an env that has one of conda's deps, but is not the env in which the current conda in use resides (#9054)

6.33.3 Docs

- Document new package format better
- Document `conda init` command
- Document availability of RSS feed for CDN-backed channels that clone

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6.34 4.7.10 (2019-07-19)

6.34.1 Bug fixes

- fix merging of specs
- fix bugs in building of chains in prefix graph

6.34.2 Contributors

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6.35 4.7.9 (2019-07-18)

6.35.1 Bug fixes

- fix Non records in comprehension
- fix potential keyerror in depth-first search
- fix PackageNotFound attribute error

6.35.2 Contributors

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6.36 4.7.8 (2019-07-17)

6.36.1 Improvements

- improve unsatisfiable messages - try to group and explain output better. Remove lots of extraneous stuff that was showing up in 4.7.7 (#8910)
- preload openssl on windows to avoid library conflicts and missing library issues (#8949)

6.36.2 Bug fixes

- fix handling of channels where more than one channel contains packages with similar name, subdir, version and build_number. This was causing mysterious unsatisfiable errors for some users. (#8938)
- reverse logic check in checking channel equality, because == is not reciprocal to != with py27 (no __ne__) (#8938)
- fix an infinite loop or otherwise large process with building the unsatisfiable info. Improve the depth-first search implementation. (#8941)
- streamline fallback paths to unfrozen solve in case frozen fails. (#8942)
- Environment activation output only shows `conda activate envname` now, instead of sometimes showing just `activate`. (#8947)

6.36.3 Contributors

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6.37 4.7.7 (2019-07-12)

6.37.1 Improvements

- When an update command doesn't do anything because installed software conflicts with the update, information about the conflict is shown, rather than just saying "all requests are already satisfied" (#8899)

6.37.2 Bug fixes

- fix missing package_type attr in finding virtual packages (#8917)
- fix parallel operations of loading index to preserve channel ordering (#8921, #8922)
- filter PrefixRecords out from PackageRecords when making a graph to show unsatisfiable deps. Fixes comparison error between mismatched types. (#8924)
- install entry points before running post-link scripts, because post link scripts may depend on entry points. (#8925)

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6.38 4.7.6 (2019-07-11)

6.38.1 Improvements

- Improve cuda virtual package conflict messages to show the __cuda virtual package as part of the conflict (#8834)
- add additional debugging info to Resolve.solve (#8895)

6.38.2 Bug fixes

- deduplicate error messages being shown for post-link scripts. Show captured stdout/stderr on failure (#8833)
- fix the checkout step in the Windows dev env setup instructions (#8827)
- bail out early when implicit python pinning renders an explicit spec unsatisfiable (#8834)
- handle edge cases in pinned specs better (#8843)
- extract package again if url is None (#8868)
- update docs regarding indexing and subdirs (#8874)
- remove warning about conda-build needing an update that was bothering people (#8884)
- only add repodata fn into cache key when fn is not repodata.json (#8900)
- allow conda to be downgraded with an explicit spec (#8892)
- add target to specs from historic specs (#8901)
- improve message when solving with a repodata file before repodata.json fails (#8907)
- fix distutils usage for “which” functionality. Fix inability to change python version in envs with noarch packages (#8909)
- fix anaconda metapackage being removed because history matching was too restrictive (#8911)
- make freezing less aggressive; add fallback to non-frozen solve (#8912)

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6.39 4.7.5 (2019-06-24)

6.39.1 Improvements

- improve wording in informational message when a particular `*_repodata.json` can't be found. No need for alarm. (#8808)

6.39.2 Bug fixes

- restore tests being run on win-32 appveyor (#8801)
- fix Dist class handling of .conda files (#8816)
- fix strict channel priority handling when a package is unsatisfiable and thus not present in the collection (#8819)
- handle JSONDecodeError better when package is corrupted at extract time (#8820)

6.39.3 Contributors

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6.40 4.7.4 (2019-06-19)

6.40.1 Improvements

- Revert to and improve the unsatisfiability determination from 4.7.2 that was reverted in 4.7.3. It's faster. (#8783)

6.40.2 Bug fixes

- fix tcsh/csh init scripts (#8792)

6.40.3 Docs improvements

- clean up docs of run_command
- fix broken links
- update docs environment.yaml file to update conda-package-handling
- conda logo favicon
- update strict channel priority info
- noarch package content ported from conda-forge
- add info about conda-forge
- remove references to things as they were before conda 4.1. That was a long time ago. This is not a history book.

6.40.4 Contributors

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6.41 4.7.3 (2019-06-14)

6.41.1 Bug fixes

- target prefix overrid applies to entry points in addition to replacements in standard files (#8769)
- Revert to solver-based unsatisfiability determination (#8775)
- fix renaming of existing prompt function in powershell (#8774)

6.41.2 Contributors

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6.42 4.7.2 (2019-06-10)

6.42.1 Behavior changes

- unsatisfiability is determined in a slightly different way now. It no longer uses the SAT solver, but rather determines whether any specs have no candidates at all after running through `get_reduced_index`. This has been faster in benchmarks, but we welcome further data from your use cases about whether this was a good change. (#8741)
- when using the `--only-deps` flag for the `install` command, conda now explicitly records those specs in your history. This primarily serves to reduce conda accidentally removing packages that you have actually requested. (#8766)

6.42.2 Improvements

- `UnsatisfiableError` messages are now grouped into categories and explained a bit better. (#8741)
- `--repodata-fn` argument can be passed multiple times to have more fallback paths. `repodata_fns` conda config setting does the same thing, but saves you from needing to do it for every command invocation. (#8741)

6.42.3 Bug fixes

- fix channel flip-flopping that was happening when adding a channel other than earlier ones (#8741)
- refactor flow control for multiple repodata files to not use exceptions (#8741)
- force conda to use only old `.tar.bz2` files if `conda-build < 3.18.3` is installed. Conda-build breaks when inspecting file contents, and this is fixed in `conda-build 3.18.3` (#8741)
- use `--force` when using `rsync` to improve behavior with folders that may exist in the destination somehow. (#8750)
- handle `EPERM` errors when renaming, because MacOS lets you remove or create files, but not rename them. Thanks Apple. (#8755)
- fix conda removing packages installed via `install` with `--only-deps` flag when either `update` or `remove` commands are run. See behavior changes above. (#8766)

6.42.4 Contributors

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6.43 4.7.1 (2019-05-30)

6.43.1 Improvements

- Base initial solver specs map on explicitly requested specs (new and historic) (#8689)
- Improve anonymization of automatic error reporting (#8715)
- Add option to keep using .tar.bz2 files, in case new .conda isn't working for whatever reason (#8723)

6.43.2 Bug fixes

- fix parsing hyphenated PyPI specs (change hyphens in versions to .) (#8688)
- fix PrefixRecord creation when file inputs are .conda files (#8689)
- fix PrefixRecord creation for pip-installed packages (#8689)
- fix progress bar stopping at 75% (no extract progress with new libarchive) (#8689)
- preserve pre-4.7 download() interface in conda.exports (#8698)
- virtual packages (such as cuda) are represented by leading double underscores by convention, to avoid confusion with existing single underscore packages that serve other purposes (#8738)

6.43.3 Deprecations/Breaking Changes

- The `--prune` flag no longer does anything. Pruning is implicitly the standard behavior now as a result of the initial solver specs coming from explicitly requested specs. Conda will remove packages that are not explicitly requested and are not required directly or indirectly by any explicitly installed package.

6.43.4 Docs improvements

- Document removal of the `free` channel from defaults (#8682)
- Add reference to `conda config --describe` (#8712)
- Add a tutorial for `.condarc` modification (#8737)

6.43.5 Contributors

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6.44 4.7.0 (2019-05-17)

6.44.1 Improvements

- Implement support for “virtual” CUDA packages, to make conda consider the system-installed CUDA driver and act accordingly (#8267)
- Support and prefer new .conda file format where available (#8265, #8639)
- Use comma-separated env names in prompt when stacking envs (#8431)
- show valid choices in error messages for enums (#8602)
- freeze already-installed packages when running `conda install` as a first attempt, to speed up the solve in existing envs. Fall back to full solve as necessary (#8260, #8626)
- add optimization criterion to prefer arch over noarch packages when otherwise equivalent (#8267)
- Remove `free` channel from defaults collection. Add `restore_free_channel` config parameter if you want to keep it. (#8579)
- Improve unsatisfiable hints (#8638)
- Add capability to use custom repodata filename, for smaller subsets of repodata (#8670)
- Parallelize SubdirData readup (#8670)
- Parallelize transaction verification and execution (#8670)

6.44.2 Bug fixes

- Fix PATH handling with deactivate.d scripts (#8464)
- Fix usage of deprecated collections ABCs (#)
- fix tcsh/csh initialization block (#8591)
- fix missing CWD display in powershell prompt (#8596)
- `wrap_subprocess_call`: fallback to sh if no bash (#8611)
- move `TemporaryDirectory` to avoid importing from `conda.compat` (#8671)
- fix missing conda-package-handling dependency in dev/start (#8624)
- fix `path_to_url` string index out of range error (#8265)
- fix conda init for xonsh (#8644)
- fix fish activation (#8645)
- improve error handling for read-only filesystems (#8665, #8674)
- break out of minimization when bisection has nowhere to go (#8672)
- Handle None values for link channel name gracefully (#8680)

6.44.3 Contributors

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6.45 4.6.14 (2019-04-17)

6.45.1 Bug fixes

- export extra function in powershell Conda.psm1 script (fixes anaconda powershell prompt) (#8570)

6.45.2 Contributors

- @msarahan

6.46 4.6.13 (2019-04-16)

6.46.1 Bug fixes

- disable `test_legacy_repodata` on win-32 (missing dependencies) (#8540)
- Fix activation problems on windows with bash, powershell, and batch. Improve tests. (#8550, #8564)
- pass `-U` flag to for pip dependencies in conda env when running “conda env update” (#8542)
- rename `conda.common.os` to `conda.common._os` to avoid shadowing os built-in (#8548)
- raise exception when pip subprocess fails with conda env (#8562)
- fix installing recursive requirements.txt files in conda env specs with python 2.7 (#8562)
- Don’t modify powershell prompt when “changeeps1” setting in condarc is False (#8465)

6.46.2 Contributors

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6.47 4.6.12 (2019-04-10)

6.47.1 Bug fixes

- Fix compat import warning (#8507)
- Adjust collections import to avoid deprecation warning (#8499)
- Fix bug in CLI tests (#8468)
- Disallow the number sign in environment names (#8521)
- Workaround issues with noarch on certain repositories (#8523)
- Fix activation on Windows when spaces are in path (#8503)
- Fix conda init profile modification for powershell (#8531)
- Point conda.bat to condabin (#8517)
- Fix various bugs in activation (#8520, #8528)

6.47.2 Docs improvements

- Fix links in README (#8482)
- Changelogs for 4.6.10 and 4.6.11 (#8502)

6.47.3 Contributors

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6.48 4.6.11 (2019-04-04)

6.48.1 Bug fixes

- Remove sys.prefix from front of PATH in basic_posix (#8491)
- add import to fix conda.core.index.get_index (#8495)

6.48.2 Docs improvements

- Changelogs for 4.6.10

6.48.3 Contributors

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6.49 4.6.10 (2019-04-01)

6.49.1 Bug fixes

- Fix python-3 only FileNotFoundError usage in `initialize.py` (#8470)
- Fix more JSON encode errors for the _Null data type (#8471)
- Fix non-posix-compliant == in `conda.sh` (#8475, #8476)
- improve detection of pip dependency in environment.yml files to avoid warning message (#8478)
- fix condabin\conda.bat use of dp0, making PATH additions incorrect (#8480)
- init_fish_user: don't assume config file exists (#8481)
- Fix for chcp output ending with . (#8484)

6.49.2 Docs improvements

- Changelogs for 4.6.8, 4.6.9

6.49.3 Contributors

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6.50 4.6.9 (2019-03-29)

6.50.1 Improvements

- Improve CI for docs commits (#8387, #8401, #8417)
- Implement `conda init --reverse` to undo rc file and registry changes (#8400)
- Improve handling of unicode systems (#8342, #8435)
- Force the “COMSPEC” environment variable to always point to `cmd.exe` on windows. This was an implicit assumption that was not always true. (#8457, #8461)

6.50.2 Bug fixes

- Add central `C:/ProgramData/conda` as a search path on Windows (#8272)
- remove direct use of `ruamel_yaml` (prefer internal abstraction, `yaml_load`) (#8392)
- Fix/improve `conda init` support for fish shell (#8437)
- Improve solver behavior in the presence of inconsistent environments (such as `pip` as a conda dependency of `python`, but also installed via `pip` itself) (#8444)
- Handle read-only filesystems for `environments.txt` (#8451, #8453)
- Fix `conda env` commands involving `pip`-installed dependencies being installed into incorrect locations (#8435)

6.50.3 Docs improvements

- updated cheatsheet (#8402)
- updated color theme (#8403)

6.50.4 Contributors

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6.51 4.6.8 (2019-03-06)

6.51.1 Bug fixes

- detect when parser fails to parse arguments (#8328)
- separate post-link script running from package linking. Do linking of all packages first, then run any post-link scripts after all packages are present. Ideally, more forgiving in presence of cycles. (#8350)
- quote path to temporary requirements files generated by conda env. Fixes issues with spaces. (#8352)
- improve some exception handling around checking for presence of folders in extraction of tarballs (#8360)
- fix reporting of packages when channel name is None (#8379)
- fix the post-creation helper message from “source activate” to “conda activate” (#8370)
- Add safety checks for directory traversal exploits in tarfiles. These may be disabled using the `safety_checks` configuration parameter. (#8374)

6.51.2 Docs improvements

- document MKL DLL hell and new Python env vars to control DLL search behavior (#8315)
- add github template for reporting speed issues (#8344)
- add in better use of sphinx admonitions (notes, warnings) for better accentuation in docs (#8348)
- improve skipping CI builds when only docs changes are involved (#8336)

6.51.3 Contributors

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6.52 4.6.7 (2019-02-21)

6.52.1 Bug fixes

- skip scanning folders for contents during reversal of transactions. Just ignore folders. A bit messier, but a lot faster. (#8266)
- fix some logic in renaming trash files to fix permission errors (#8300)
- wrap pip subprocess calls in conda-env more cleanly and uniformly (#8307)
- revert conda prepending to PATH in cli main file on windows (#8307)

- simplify `conda run` code to use activation subprocess wrapper. Fix a few conda tests to use `conda run`. (#8307)

6.52.2 Docs improvements

- fixed duplicated “to” in managing envs section (#8298)
- flesh out docs on activation (#8314)
- correct git syntax for adding a remote in dev docs (#8316)
- unpin sphinx version in docs requirements (#8317)

6.52.3 Contributors

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6.53 4.6.6 (2019-02-18)

6.53.1 Bug fixes

- fix incorrect syntax prepending to PATH for conda CLI functionality (#8295)
- fix `rename_tmp.bat` operating on folders, leading to hung interactive dialogs. Operate only on files. (#8295)

6.53.2 Contributors

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- @msarahan

6.54 4.6.5 (2019-02-15)

6.54.1 Bug fixes

- Make super in `resolve.py` python 2 friendly (#8280)
- support unicode paths better in activation scripts on Windows (#)
- set PATH for `conda.bat` to include Conda’s root prefix, so that libraries can be found when using conda when the root env is not activated (#8287, #8292)
- clean up warnings/errors about rsync and trash files (#8290)

6.54.2 Contributors

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6.55 4.6.4 (2019-02-13)

6.55.1 Improvements

- allow configuring location of instrumentation records (#7849)
- prepend conda-env pip commands with env activation to fix library loading (#8263)

6.55.2 Bug fixes

- resolve #8176 SAT solver choice error handling (#8248)
- document pip_interop_enabled config parameter (#8250)
- ensure prefix temp files are inside prefix (#8253)
- ensure script_caller is bound before use (#8254)
- fix overzealous removal of folders after cleanup of failed post-link scripts (#8259)
- fix #8264: Allow 'int' datatype for values to non-sequence parameters (#8268)

6.55.3 Deprecations/Breaking Changes

- remove experimental featureless_minimization_disabled feature flag (#8249)

6.55.4 Contributors

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6.56 4.6.3 (2019-02-07)

6.56.1 Improvements

- Implement `-stack` switch for powershell usage of conda (#8217)
- Enable system-wide initialization for conda shell support (#8219)
- Activate environments prior to running post-link scripts (#8229)
- Instrument more solve calls to prioritize future optimization efforts (#8231)
- print more env info when searching in envs (#8240)

6.56.2 Bug fixes

- resolve #8178, fix conda pip interop assertion error with egg folders (#8184)
- resolve #8157, fix token leakage in errors and config output (#8163)
- resolve #8185, fix conda package filtering with embedded/vendored python metadata (#8198)
- resolve #8199, fix errors on `.*` in version specs that should have been specific to the `~=` operator (#8208)
- fix `.bat` scripts for handling paths on Windows with spaces (#8215)
- fix powershell scripts for handling paths on Windows with spaces (#8222)
- handle missing rename script more gracefully (especially when updating/installing conda itself) (#8212)

6.56.3 Contributors

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6.57 4.6.2 (2019-01-29)

6.57.1 Improvements

- Documentation restructuring/improvements (#8139, #8143)
- rewrite `rm_rf` to use native system utilities and rename trash files (#8134)

6.57.2 Bug fixes

- fix UnavailableInvalidChannel errors when only noarch subdir is present (#8154)
- document, but disable the `allow_conda_downgrades` flag, pending re-examination of the warning, which was blocking conda operations after an upgrade-downgrade cycle across minor versions. (#8160)
- fix conda env export missing pip entries without use of pip interop enabled setting (#8165)

6.57.3 Contributors

- @jjhelmus
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- @rrigdon

6.58 4.5.13 (2019-01-29)

6.58.1 Improvements

- document the `allow_conda_downgrades` configuration parameter (#8034)
- remove conda upgrade message (#8161)

6.58.2 Contributors

- @msarahan
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6.59 4.6.1 (2019-01-21)

6.59.1 Improvements

- optimizations in `get_reduced_index` (#8117, #8121, #8122)

6.59.2 Bug Fixes

- fix faulty `onerror` call for `rm` (#8053)
- fix `activate.bat` to use more direct call to `conda.bat` (don't require `conda init`; fix non-interactive script) (#8113)

6.59.3 Contributors

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6.60 4.6.0 (2019-01-15)

6.60.1 New Feature Highlights

- resolve #7053 preview support for conda operability with pip; disabled by default (#7067, #7370, #7710, #8050)
- conda initialize (#6518, #7388, #7629)
- resolve #7194 add ‘–stack’ flag to ‘conda activate’; remove max_shlvl config (#7195, #7226, #7233)
- resolve #7087 add non-conda-installed python packages into PrefixData (#7067, #7370)
- resolve #2682 add ‘conda run’ preview support (#7320, #7625)
- resolve #626 conda wrapper for PowerShell (#7794, #7829)

6.60.2 Deprecations/Breaking Changes

- resolve #6915 remove ‘conda env attach’ and ‘conda env upload’ (#6916)
- resolve #7061 remove pkgs/pro from defaults (#7162)
- resolve #7078 add deprecation warnings for ‘conda.cli.activate’, ‘conda.compat’, and ‘conda.install’ (#7079)
- resolve #7194 add ‘–stack’ flag to ‘conda activate’; remove max_shlvl config (#7195)
- resolve #6979, #7086 remove Dist from majority of project (#7216, #7252)
- fix #7362 remove --license from conda info and related code paths (#7386)
- resolve #7309 deprecate ‘conda info package_name’ (#7310)
- remove ‘conda clean --source-cache’ and defer to conda-build (#7731)
- resolve #7724 move windows package cache and envs dirs back to .conda directory (#7725)
- disallow env names with colons (#7801)

6.60.3 Improvements

- import speedups (#7122)
- –help cleanup (#7120)
- fish autocompletion for conda env (#7101)
- remove reference to ‘system’ channel (#7163)
- add http error body to debug information (#7160)
- warn creating env name with space is not supported (#7168)
- support complete MatchSpec syntax in environment.yml files (#7178)

- resolve #4274 add option to remove an existing environment with ‘conda create’ (#7133)
- add ability for conda prompt customization via ‘env_prompt’ config param (#7047)
- resolve #7063 add license and license_family to MatchSpec for ‘conda search’ (#7064)
- resolve #7189 progress bar formatting improvement (#7191)
- raise log level for errors to error (#7229)
- add to conda.exports (#7217)
- resolve #6845 add option -S / --satisfied-skip-solve to exit early for satisfied specs (#7291)
- add NoBaseEnvironmentError and DirectoryNotACondaEnvironmentError (#7378)
- replace menuinst subprocessing by ctypes win elevation (4.6.0a3) (#7426)
- bump minimum requests version to stable, unbundled release (#7528)
- resolve #7591 updates and improvements from namespace PR for 4.6 (#7599)
- resolve #7592 compatibility shims (#7606)
- user-agent context refactor (#7630)
- solver performance improvements with benchmarks in common.logic (#7676)
- enable fuzzy-not-equal version constraint for pip interop (#7711)
- add -d short option for --dry-run (#7719)
- add --force-pkgs-dirs option to conda clean (#7719)
- address #7709 ensure --update-deps unlocks specs from previous user requests (#7719)
- add package timestamp information to output of ‘conda search --info’ (#7722)
- resolve #7336 ‘conda search’ tries “fuzzy match” before showing PackagesNotFound (#7722)
- resolve #7656 strict channel priority via ‘channel_priority’ config option or --strict-channel-priority CLI flag (#7729)
- performance improvement to cache **hash** value on PackageRecord (#7715)
- resolve #7764 change name of ‘condacmd’ dir to ‘condabin’; use on all platforms (#7773)
- resolve #7782 implement PEP-440 ‘~=’ compatible release operator (#7783)
- disable timestamp prioritization when not needed (#7894, #8012)
- compile pyc files for noarch packages in batches (#8015)
- disable per-file sha256 safety checks by default; add extra_safety_checks condarc option to enable them (#8017)
- shorten retries for file removal on windows, where in-use files can’t be removed (#8024)
- expand env vars in custom_channels, custom_multichannels, default_channels, migrated_custom_channels, and whitelist_channels (#7826)
- encode repodata to utf-8 while caching, to fix unicode characters in repodata (#7873)

6.60.4 Bug Fixes

- fix #7107 verify hangs when a package is corrupted (#7131)
- fix #7145 progress bar uses stderr instead of stdout (#7146)
- fix typo in conda.fish (#7152)
- fix #2154 conda remove should complain if requested removals don't exist (#7135)
- fix #7094 exit early for --dry-run with explicit and clone (#7096)
- fix activation script sort order (#7176)
- fix #7109 incorrect chown with sudo (#7180)
- fix #7210 add suppressed --mkdir back to 'conda create' (fix for 4.6.0a1) (#7211)
- fix #5681 conda env create / update when --file does not exist (#7385)
- resolve #7375 enable conda config --set update_modifier (#7377)
- fix #5885 improve conda env error messages and add extra tests (#7395)
- msys2 path conversion (#7389)
- fix autocompletion in fish (#7575)
- fix #3982 following 4.4 activation refactor (#7607)
- fix #7242 configuration load error message (#7243)
- fix conda env compatibility with pip 18 (#7612)
- fix #7184 remove conflicting specs to find solution to user's active request (#7719)
- fix #7706 add conda cmd dir to cmd.exe path on first activation (#7735)
- fix #7761 spec handling errors in 4.6.0b0 (#7780)
- fix #7770 'conda list regex' only applies regex to package name (#7784)
- fix #8076 load metadata from index to resolve inconsistent envs (#8083)

6.60.5 Non-User-Facing Changes

- resolve #6595 use OO inheritance in `activate.py` (#7049)
- resolve #7220 pep8 project renamed to pycodestyle (#7221)
- proxy test routine (#7308)
- add .mailmap and .cla-signers (#7361)
- add copyright headers (#7367)
- rename common.platform to common.os and split among windows, linux, and unix utils (#7396)
- fix windows test failures when symlink not available (#7369)
- test building conda using conda-build (#7251)
- solver test metadata updates (#7664)
- explicitly add Mapping, Sequence to common.compat (#7677)
- add debug messages to communicate solver stages (#7803)

- add undocumented `sat_solver` config parameter (#7811)

6.60.6 Preview Releases

- 4.6.0a1 at d5bec21d1f64c3bc66c2999cfc690681e9c46177 on 2018-04-20
- 4.6.0a2 at c467517ca652371ebc4224f0d49315b7ec225108 on 2018-05-01
- 4.6.0b0 at 21a24f02b2687d0895de04664a4ec23ccc75c33a on 2018-09-07
- 4.6.0b1 at 1471f043eed980d62f46944e223f0add6a9a790b on 2018-10-22
- 4.6.0rc1 at 64bde065f8343276f168d2034201115dff7c5753 on 2018-12-31

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- @teake

6.61 4.5.12 (2018-12-10)

6.61.1 Improvements

- backport ‘allow_conda_downgrade’ configuration parameter, default is False (#7998)
- speed up verification by disabling per-file sha256 checks (#8017)
- indicate Python 3.7 support in `setup.py` file (#8018)
- speed up solver by reduce the size of reduced index (#8016)
- speed up solver by skipping timestamp minimization when not needed (#8012)
- compile pyc files more efficiently, will speed up install of noarch packages (#8025)
- avoid waiting for removal of files on Windows when possible (#8024)

6.61.2 Bug Fixes

- update integration tests for removal of ‘features’ key (#7726)
- fix conda.bat return code (#7944)
- ensure channel name is not NoneType (#8021)

6.61.3 Contributors

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6.62 4.5.11 (2018-08-21)

6.62.1 Improvements

- resolve #7672 compatibility with ruamel.yaml 0.15.54 (#7675)

6.62.2 Contributors

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6.63 4.5.10 (2018-08-13)

6.63.1 Bug Fixes

- fix conda env compatibility with pip 18 (#7627)
- fix py37 compat 4.5.x (#7641)
- fix #7451 don’t print name, version, and size if unknown (#7648)
- replace glob with fnmatch in PrefixData (#7645)

6.63.2 Contributors

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6.64 4.5.9 (2018-07-30)

6.64.1 Improvements

- resolve #7522 prevent conda from scheduling downgrades (#7598)
- allow skipping feature maximization in resolver (#7601)

6.64.2 Bug Fixes

- fix #7559 symlink stat in localfs adapter (#7561)
- fix #7486 activate with no PATH set (#7562)
- resolve #7522 prevent conda from scheduling downgrades (#7598)

6.64.3 Contributors

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6.65 4.5.8 (2018-07-10)

6.65.1 Bug Fixes

- fix #7524 should_bypass_proxies for requests 2.13.0 and earlier (#7525)

6.65.2 Contributors

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6.66 4.5.7 (2018-07-09)

6.66.1 Improvements

- resolve #7423 add upgrade error for unsupported repodata_version (#7415)
- raise CondaUpgradeError for conda version downgrades on environments (#7517)

6.66.2 Bug Fixes

- fix #7505 temp directory for UnlinkLinkTransaction should be in target prefix (#7516)
- fix #7506 requests monkeypatch fallback for old requests versions (#7515)

6.66.3 Contributors

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6.67 4.5.6 (2018-07-06)

6.67.1 Bug Fixes

- resolve #7473 py37 support (#7499)
- fix #7494 History spec parsing edge cases (#7500)
- fix requests 2.19 incompatibility with NO_PROXY env var (#7498)
- resolve #7372 disable http error uploads and CI cleanup (#7498, #7501)

6.67.2 Contributors

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6.68 4.5.5 (2018-06-29)

6.68.1 Bug Fixes

- fix #7165 conda version check should be restricted to channel conda is from (#7289, #7303)
- fix #7341 ValueError n cannot be negative (#7360)
- fix #6691 fix history file parsing containing comma-joined version specs (#7418)
- fix msys2 path conversion (#7471)

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6.69 4.5.4 (2018-05-14)

6.69.1 Improvements

- resolve #7189 progress bar improvement (#7191 via #7274)

6.69.2 Bug Fixes

- fix twofold tarball extraction, improve progress update (#7275)
- fix #7253 always respect copy LinkType (#7269)

6.69.3 Contributors

- @jakirkham
- @kalefranz
- @mbargull

6.70 4.5.3 (2018-05-07)

6.70.1 Bug Fixes

- fix #7240 conda's configuration context is not initialized in conda.exports (#7244)

6.71 4.5.2 (2018-04-27)

6.71.1 Bug Fixes

- fix #7107 verify hangs when a package is corrupted (#7223)
- fix #7094 exit early for --dry-run with explicit and clone (#7224)
- fix activation/deactivation script sort order (#7225)

6.72 4.5.1 (2018-04-13)

6.72.1 Improvements

- resolve #7075 add anaconda.org search message to PackagesNotFoundError (#7076)
- add CondaError details to auto-upload reports (#7060)

6.72.2 Bug Fixes

- fix #6703,#6981 index out of bound when running deactivate on fish shell (#6993)
- properly close over `$_CONDA_EXE` variable (#7004)
- fix conda map parsing with comments (#7021)
- fix #6919 csh prompt (#7041)
- add `_file_created` attribute (#7054)
- fix handling of non-ascii characters in `custom_multichannels` (#7050)
- fix #6877 handle non-zero return in CSH (#7042)
- fix #7040 update tqdm to version 4.22.0 (#7157)

6.73 4.5.0 (2018-03-20)

6.73.1 New Feature Highlights

- A new flag, ‘`--envs`’, has been added to ‘`conda search`’. In this mode, ‘`conda search`’ will look for the package query in existing conda environments on your system. If ran as UID 0 (i.e. root) on unix systems or as an Administrator user on Windows, all known conda environments for all users on the system will be searched. For example, ‘`conda search --envs openssl`’ will show the openssl version and environment location for all conda-installed openssl packages.

6.73.2 Deprecations/Breaking Changes

- resolve #6886 transition defaults from repo.continuum.io to repo.anaconda.com (#6887)
- resolve #6192 deprecate ‘`conda help`’ in favor of `--help` CLI flag (#6918)
- resolve #6894 add http errors to auto-uploaded error reports (#6895)

6.73.3 Improvements

- resolve #6791 conda search `--envs` (#6794)
- preserve exit status in fish shell (#6760)
- resolve #6810 add `CONDA_EXE` environment variable to activate (#6923)
- resolve #6695 outdated conda warning respects `--quiet` flag (#6935)
- add instructions to activate default environment (#6944)

6.73.4 API

- resolve #5610 add PrefixData, SubdirData, and PackageCacheData to conda/api.py (#6922)

6.73.5 Bug Fixes

- channel matchspec fixes (#6893)
- fix #6930 add missing return statement to S3Adapter (#6931)
- fix #5802, #6736 enforce disallowed_packages configuration parameter (#6932)
- fix #6860 infinite recursion in `resolve.py` for empty track_features (#6928)
- set encoding for PY2 stdout/stderr (#6951)
- fix #6821 non-deterministic behavior from MatchSpec merge clobbering (#6956)
- fix #6904 logic errors in prefix graph data structure (#6929)

6.73.6 Non-User-Facing Changes

- fix several `lgm.com` flags (#6757, #6883)
- cleanups and refactors for conda 4.5 (#6889)
- unify location of record types in conda/models/records.py (#6924)
- resolve #6952 memoize url search in package cache loading (#6957)

6.74 4.4.11 (2018-02-23)

6.74.1 Improvements

- resolve #6582 swallow_broken_pipe context manager and Spinner refactor (#6616)
- resolve #6882 document max_shlvl (#6892)
- resolve #6733 make empty env vars sequence-safe for sequence parameters (#6741)
- resolve #6900 don't record conda skeleton environments in environments.txt (#6908)

6.74.2 Bug Fixes

- fix potential error in ensure_pad(); add more tests (#6817)
- fix #6840 handle error return values in `conda.sh` (#6850)
- use conda.gateways.disk for `misc.py` imports (#6870)
- fix #6672 don't update conda during conda-env operations (#6773)
- fix #6811 don't attempt copy/remove fallback for rename failures (#6867)
- fix #6667 aliased posix commands (#6669)
- fix #6816 fish environment autocomplete (#6885)
- fix #6880 build_number comparison not functional in match_spec (#6881)

- fix #6910 sort key prioritizes build string over build number (#6911)
- fix #6914, #6691 conda can fail to update packages even though newer versions exist (#6921)
- fix #6899 handle Unicode output in activate commands (#6909)

6.75 4.4.10 (2018-02-09)

6.75.1 Bug Fixes

- fix #6837 require at least futures 3.0.0 (#6855)
- fix #6852 ensure temporary path is writable (#6856)
- fix #6833 improve feature mismatch metric (via 4.3.34 #6853)

6.76 4.4.9 (2018-02-06)

6.76.1 Improvements

- resolve #6632 display package removal plan when deleting an env (#6801)

6.76.2 Bug Fixes

- fix #6531 don't drop credentials for conda-build workaround (#6798)
- fix external command execution issue (#6789)
- fix #5792 conda env export error common in path (#6795)
- fix #6390 add CorruptedEnvironmentError (#6778)
- fix #5884 allow --insecure CLI flag without contradicting meaning of ssl_verify (#6782)
- fix MatchSpec.match() accepting dict (#6808)
- fix broken Anaconda Prompt for users with spaces in paths (#6825)
- JSONDecodeError was added in Python 3.5 (#6848)
- fix #6796 update PATH/prompt on reactivate (#6828)
- fix #6401 non-ascii characters on windows using expanduser (#6847)
- fix #6824 import installers before invoking any (#6849)

6.77 4.4.8 (2018-01-25)

6.77.1 Improvements

- allow falsey values for default_python to avoid pinning python (#6682)
- resolve #6700 add message for no space left on device (#6709)
- make variable 'sourced' local for posix shells (#6726)
- add column headers to conda list results (#5726)

6.77.2 Bug Fixes

- fix #6713 allow parenthesis in prefix path for conda.bat (#6722)
- fix #6684 --force message (#6723)
- fix #6693 KeyError with '--update-deps' (#6694)
- fix aggressive_update_packages availability (#6727)
- fix #6745 don't truncate channel priority map in conda installer (#6746)
- add workaround for system Python usage by lsb_release (#6769)
- fix #6624 can't start new thread (#6653)
- fix #6628 'conda install --rev' in conda 4.4 (#6724)
- fix #6707 FileNotFoundError when extracting tarball (#6708)
- fix #6704 unexpected token in conda.bat (#6710)
- fix #6208 return for no pip in environment (#6784)
- fix #6457 env var cleanup (#6790)
- fix #6645 escape paths for argparse help (#6779)
- fix #6739 handle unicode in environment variables for py2 activate (#6777)
- fix #6618 RepresenterError with 'conda config --set' (#6619)
- fix #6699 suppress memory error upload reports (#6776)
- fix #6770 CRLF for cmd.exe (#6775)
- fix #6514 add message for case-insensitive filesystem errors (#6764)
- fix #6537 AttributeError value for url not set (#6754)
- fix #6748 only warn if unable to register environment due to EACCES (#6752)

6.78 4.4.7 (2018-01-08)

6.78.1 Improvements

- resolve #6650 add upgrade message for unicode errors in python 2 (#6651)

6.78.2 Bug Fixes

- fix #6643 difference between '==' and 'exact_match_' (#6647)
- fix #6620 KeyError(u'CONDA_PREFIX',) (#6652)
- fix #6661 remove env from environments.txt (#6662)
- fix #6629 'conda update --name' AssertionError (#6656)
- fix #6630 repodata AssertionError (#6657)
- fix #6626 add setuptools as constrained dependency (#6654)
- fix #6659 conda list explicit should be dependency sorted (#6671)
- fix #6665 KeyError for channel '' (#6668, #6673)
- fix #6627 AttributeError on 'conda activate' (#6655)

6.79 4.4.6 (2017-12-31)

6.79.1 Bug Fixes

- fix #6612 do not assume Anaconda Python on Windows nor Library\bin hack (#6615)
- recipe test improvements and associated bug fixes (#6614)

6.80 4.4.5 (2017-12-29)

6.80.1 Bug Fixes

- fix #6577, #6580 single quote in PS1 (#6585)
- fix #6584 os.getcwd() FileNotFoundError (#6589)
- fix #6592 deactivate command order (#6602)
- fix #6579 python not recognized as command (#6588)
- fix #6572 cached repodata PermissionsError (#6573)
- change instances of 'root' to 'base' (#6598)
- fix #6607 use subprocess rather than execv for conda command extensions (#6609)
- fix #6581 git-bash activation (#6587)
- fix #6599 space in path to base prefix (#6608)

6.81 4.4.4 (2017-12-24)

6.81.1 Improvements

- add SUDO_ env vars to info reports (#6563)
- add additional information to the #6546 exception (#6551)

6.81.2 Bug Fixes

- fix #6548 'conda update' installs packages not in prefix #6550
- fix #6546 update after creating an empty env (#6568)
- fix #6557 conda list FileNotFoundError (#6558)
- fix #6554 package cache FileNotFoundError (#6555)
- fix #6529 yaml parse error (#6560)
- fix #6562 repodata_record.json permissions error stack trace (#6564)
- fix #6520 --use-local flag (#6526)

6.82 4.4.3 (2017-12-22)

6.82.1 Improvements

- adjust error report message (#6534)

6.82.2 Bug Fixes

- fix #6530 package cache JsonDecodeError / ValueError (#6533)
- fix #6538 BrokenPipeError (#6540)
- fix #6532 remove anaconda metapackage hack (#6539)
- fix #6536 'conda env export' for old versions of pip (#6535)
- fix #6541 py2 and unicode in environments.txt (#6542)

6.82.3 Non-User-Facing Changes

- regression tests for #6512 (#6515)

6.83 4.4.2 (2017-12-22)

6.83.1 Deprecations/Breaking Changes

- resolve #6523 don't prune with --update-all (#6524)

6.83.2 Bug Fixes

- fix #6508 environments.txt permissions error stack trace (#6511)
- fix #6522 error message formatted incorrectly (#6525)
- fix #6516 hold channels over from get_index to install_actions (#6517)

6.84 4.4.1 (2017-12-21)

6.84.1 Bug Fixes

- fix #6512 reactivate does not accept arguments (#6513)

6.85 4.4.0 (2017-12-20)

6.85.1 Recommended change to enable conda in your shell

With the release of conda 4.4, we recommend a change to how the `conda` command is made available to your shell environment. All the old methods still work as before, but you'll need the new method to enable the new `conda activate` and `conda deactivate` commands.

For the “Anaconda Prompt” on Windows, there is no change.

For Bourne shell derivatives (bash, zsh, dash, etc.), you likely currently have a line similar to

```
export PATH="/opt/conda/bin:$PATH"
```

in your `~/.bashrc` file (or `~/.bash_profile` file on macOS). The effect of this line is that your base environment is put on `PATH`, but without actually *activating* that environment. (In 4.4 we've renamed the 'root' environment to the 'base' environment.) With conda 4.4, we recommend removing the line where the `PATH` environment variable is modified, and replacing it with

```
. /opt/conda/etc/profile.d/conda.sh
conda activate base
```

In the above, it's assumed that `/opt/conda` is the location where you installed miniconda or Anaconda. It may also be something like `~/Anaconda3` or `~/miniconda2`.

For system-wide conda installs, to make the `conda` command available to all users, rather than manipulating individual `~/.bashrc` (or `~/.bash_profile`) files for each user, just execute once

```
$ sudo ln -s /opt/conda/etc/profile.d/conda.sh /etc/profile.d/conda.sh
```

This will make the `conda` command itself available to all users, but conda’s base (root) environment will *not* be activated by default. Users will still need to run `conda activate base` to put the base environment on `PATH` and gain access to the executables in the base environment.

After updating to conda 4.4, we also recommend pinning conda to a specific channel. For example, executing the command

```
$ conda config --system --add pinned_packages conda-canary::conda
```

will make sure that whenever conda is installed or changed in an environment, the source of the package is always being pulled from the `conda-canary` channel. This will be useful for people who use `conda-forge`, to prevent conda from flipping back and forth between 4.3 and 4.4.

6.85.2 New Feature Highlights

- **conda activate:** The logic and mechanisms underlying environment activation have been reworked. With conda 4.4, `conda activate` and `conda deactivate` are now the preferred commands for activating and deactivating environments. You’ll find they are much more snappy than the `source activate` and `source deactivate` commands from previous conda versions. The `conda activate` command also has advantages of (1) being universal across all OSes, shells, and platforms, and (2) not having path collisions with scripts from other packages like `python virtualenv`’s `activate` script.
- **constrained, optional dependencies:** Conda now allows a package to constrain versions of other packages installed alongside it, even if those constrained packages are not themselves hard dependencies for that package. In other words, it lets a package specify that, if another package ends up being installed into an environment, it must at least conform to a certain version specification. In effect, constrained dependencies are a type of “reverse” dependency. It gives a tool to a parent package to exclude other packages from an environment that might otherwise want to depend on it.

Constrained optional dependencies are supported starting with `conda-build 3.0` (via [conda/conda-build#2001](<https://github.com/conda/conda-build/pull/2001>)). A new `run_constrained` keyword, which takes a list of package specs similar to the `run` keyword, is recognized under the `requirements` section of `meta.yaml`. For backward compatibility with versions of conda older than 4.4, a requirement may be listed in both the `run` and the `run_constrained` section. In that case older versions of conda will see the package as a hard dependency, while conda 4.4 will understand that the package is meant to be optional.

Optional, constrained dependencies end up in `repodata.json` under a `constrains` keyword, parallel to the `depends` keyword for a package’s hard dependencies.

- **enhanced package query language:** Conda has a built-in query language for searching for and matching packages, what we often refer to as `MatchSpec`. The `MatchSpec` is what users input on the command line when they specify packages for `create`, `install`, `update`, and `remove` operations. With this release, `MatchSpec` (rather than a regex) becomes the default input for `conda search`. We have also substantially enhanced our `MatchSpec` query language.

For example,

```
conda install conda-forge::python
```

is now a valid command, which specifies that regardless of the active list of channel priorities, the `python` package itself should come from the `conda-forge` channel. As before, the difference between `python=3.5` and `python==3.5` is that the first contains a “fuzzy” version while the second contains an *exact* version. The fuzzy spec will match all `python` packages with versions `>=3.5` and `<3.6`. The exact spec will match only `python` packages with version `3.5`, `3.5.0`, `3.5.0.0`, etc. The canonical string form for a `MatchSpec` is thus

```
(channel::)name(version(build_string))
```

which should feel natural to experienced conda users. Specifications however are often necessarily more complicated than this simple form can support, and for these situations we've extended the specification to include an optional square bracket `[]` component containing comma-separated key-value pairs to allow matching on most any field contained in a package's metadata. Take, for example,

```
conda search 'conda-forge/linux-64:*[md5=e42a03f799131d5af4196ce31a1084a7]' --info
```

which results in information for the single package

```
cytoolz 0.8.2 py35_0
-----
file name      : cytoolz-0.8.2-py35_0.tar.bz2
name           : cytoolz
version        : 0.8.2
build string    : py35_0
build number    : 0
size           : 1.1 MB
arch           : x86_64
platform       : Platform.linux
license        : BSD 3-Clause
subdir         : linux-64
url            : https://conda.anaconda.org/conda-forge/linux-64/cytoolz-0.8.2-py35_0.
               ↪tar.bz2
md5            : e42a03f799131d5af4196ce31a1084a7
dependencies:
  - python 3.5*
  - toolz >=0.8.0
```

The square bracket notation can also be used for any field that we match on outside the package name, and will override information given in the “simple form” position. To give a contrived example, `python==3.5[version='>=2.7,<2.8']` will match 2.7.* versions and not 3.5.

- **environments track user-requested state:** Building on our enhanced MatchSpec query language, conda environments now also track and differentiate (a) packages added to an environment because of an explicit user request from (b) packages brought into an environment to satisfy dependencies. For example, executing

```
conda install conda-forge::scikit-learn
```

will confine all future changes to the scikit-learn package in the environment to the conda-forge channel, until the spec is changed again. A subsequent command `conda install scikit-learn=0.18` would drop the conda-forge channel restriction from the package. And in this case, scikit-learn is the only user-defined spec, so the solver chooses dependencies from all configured channels and all available versions.

- **errors posted to core maintainers:** In previous versions of conda, unexpected errors resulted in a request for users to consider posting the error as a new issue on conda's github issue tracker. In conda 4.4, we've implemented a system for users to opt-in to sending that same error report via an HTTP POST request directly to the core maintainers.

When an unexpected error is encountered, users are prompted with the error report followed by a `[y/N]` input. Users can elect to send the report, with 'no' being the default response. Users can also permanently opt-in or opt-out, thereby skipping the prompt altogether, using the boolean `report_errors` configuration parameter.

- **various UI improvements:** To push through some of the big leaps with transactions in conda 4.3, we accepted some regressions on progress bars and other user interface features. All of those indicators of progress, and more, have been brought back and further improved.
- **aggressive updates:** Conda now supports an `aggressive_update_packages` configuration parameter that

holds a sequence of MatchSpec strings, in addition to the `pinned_packages` configuration parameter. Currently, the default value contains the packages `ca-certificates`, `certifi`, and `openssl`. When manipulating configuration with the `conda config` command, use of the `--system` and `--env` flags will be especially helpful here. For example,

```
conda config --add aggressive_update_packages defaults::pyopenssl --system
```

would ensure that, system-wide, solves on all environments enforce using the latest version of `pyopenssl` from the `defaults` channel.

```
conda config --add pinned_packages python=2.7 --env
```

would lock all solves for the current active environment to python versions matching `2.7.*`.

- **other configuration improvements:** In addition to `conda config --describe`, which shows detailed descriptions and default values for all available configuration parameters, we have a new `conda config --write-default` command. This new command simply writes the contents of `conda config --describe` to a `condarc` file, which is a great starter template. Without additional arguments, the command will write to the `.condarc` file in the user's home directory. The command also works with the `--system`, `--env`, and `--file` flags to write the contents to alternate locations.

Conda exposes a tremendous amount of flexibility via configuration. For more information, [The Conda Configuration Engine for Power Users](#) blog post is a good resource.

6.85.3 Deprecations/Breaking Changes

- the conda 'root' environment is now generally referred to as the 'base' environment
- Conda 4.4 now warns when available information about per-path sha256 sums and file sizes do not match the recorded information. The warning is scheduled to be an error in conda 4.5. Behavior is configurable via the `safety_checks` configuration parameter.
- remove support for `with_features_depends` (#5191)
- resolve #5468 remove `--alt-hint` from CLI API (#5469)
- resolve #5834 change default value of 'allow_softlinks' from True to False (#5835)
- resolve #5842 add deprecation warnings for 'conda env upload' and 'conda env attach' (#5843)

6.85.4 API

- Add Solver from `conda.core.solver` with three methods to `conda.api` (4.4.0rc1) (#5838)

6.85.5 Improvements

- constrained, optional dependencies (#4982)
- conda shell function (#5044, #5141, #5162, #5169, #5182, #5210, #5482)
- resolve #5160 conda xontrib plugin (#5157)
- resolve #1543 add support and tests for `--no-deps` and `--only-deps` (#5265)
- resolve #988 allow channel name to be part of the package name spec (#5365, #5791)
- resolve #5530 add ability for users to choose to post unexpected errors to core maintainers (#5531, #5571, #5585)

- Solver, UI, History, and Other (#5546, #5583, #5740)
- improve ‘conda search’ to leverage new MatchSpec query language (#5597)
- filter out unwritable package caches from conda clean command (#4620)
- envs_manager, requested spec history, declarative solve, and private env tests (#4676, #5114, #5094, #5145, #5492)
- make python entry point format match pip entry points (#5010)
- resolve #5113 clean up CLI imports to improve process startup time (#4799)
- resolve #5121 add features/track_features support for MatchSpec (#5054)
- resolve #4671 hold verify backoff count in transaction context (#5122)
- resolve #5078 record package metadata after tarball extraction (#5148)
- resolve #3580 support stacking environments (#5159)
- resolve #3763, #4378 allow pip requirements.txt syntax in environment files (#3969)
- resolve #5147 add ‘config files’ to conda info (#5269)
- use --format=json to parse list of pip packages (#5205)
- resolve #1427 remove startswith ‘.’ environment name constraint (#5284)
- link packages from extracted tarballs when tarball is gone (#5289)
- resolve #2511 accept config information from stdin (#5309)
- resolve #4302 add ability to set map parameters with conda config (#5310)
- resolve #5256 enable conda config --get for all primitive parameters (#5312)
- resolve #1992 add short flag -C for --use-index-cache (#5314)
- resolve #2173 add --quiet option to conda clean (#5313)
- resolve #5358 conda should exec to subcommands, not subprocess (#5359)
- resolve #5411 add ‘conda config --write-default’ (#5412)
- resolve #5081 make pinned packages optional dependencies (#5414)
- resolve #5430 eliminate current deprecation warnings (#5422)
- resolve #5470 make stdout/stderr capture in python_api customizable (#5471)
- logging simplifications/improvements (#5547, #5578)
- update license information (#5568)
- enable threadpool use for repodata collection by default (#5546, #5587)
- conda info now raises PackagesNotFoundError (#5655)
- index building optimizations (#5776)
- fix #5811 change safety_checks default to ‘warn’ for conda 4.4 (4.4.0rc1) (#5824)
- add constrained dependencies to conda’s own recipe (4.4.0rc1) (#5823)
- clean up parser imports (4.4.0rc2) (#5844)
- resolve #5983 add --download-only flag to create, install, and update (4.4.0rc2) (#5988)
- add ca-certificates and certifi to aggressive_update_packages default (4.4.0rc2) (#5994)

- use environments.txt to list all known environments (4.4.0rc2) (#6313)
- resolve #5417 ensure unlink order is correctly sorted (4.4.0) (#6364)
- resolve #5370 index is only prefix and cache in --offline mode (4.4.0) (#6371)
- reduce redundant sys call during file copying (4.4.0rc3) (#6421)
- enable aggressive_update_packages (4.4.0rc3) (#6392)
- default `conda.sh` to dash if otherwise can't detect (4.4.0rc3) (#6414)
- canonicalize package names when comparing with pip (4.4.0rc3) (#6438)
- add target prefix override configuration parameter (4.4.0rc3) (#6413)
- resolve #6194 warn when conda is outdated (4.4.0rc3) (#6370)
- add information to displayed error report (4.4.0rc3) (#6437)
- csh wrapper (4.4.0) (#6463)
- resolve #5158 --override-channels (4.4.0) (#6467)
- fish update for conda 4.4 (4.4.0) (#6475, #6502)
- skip an unnecessary environments.txt rewrite (4.4.0) (#6495)

6.85.6 Bug Fixes

- fix some conda-build compatibility issues (#5089)
- resolve #5123 export toposort (#5124)
- fix #5132 signal handler can only be used in main thread (#5133)
- fix orphaned --clobber parser arg (#5188)
- fix #3814 don't remove directory that's not a conda environment (#5204)
- fix #4468 _license stack trace (#5206)
- fix #4987 conda update --all no longer displays full list of packages (#5228)
- fix #3489 don't error on remove --all if environment doesn't exist (#5231)
- fix #1509 bash doesn't need full path for pre/post link/unlink scripts on unix (#5252)
- fix #462 add regression test (#5286)
- fix #5288 confirmation prompt doesn't accept no (#5291)
- fix #1713 'conda package -w' is case dependent on Windows (#5308)
- fix #5371 try falling back to pip's vendored requests if no requests available (#5372)
- fix #5356 skip root logger configuration (#5380)
- fix #5466 scrambled URL of non-alias channel with token (#5467)
- fix #5444 environment.yml file not found (#5475)
- fix #3200 use proper unbound checks in bash code and test (#5476)
- invalidate PrefixData cache on rm_rf for conda-build (#5491, #5499)
- fix exception when generating JSON output (#5628)
- fix target prefix determination (#5642)

- use proxy to avoid segfaults (#5716)
- fix #5790 incorrect activation message (4.4.0rc1) (#5820)
- fix #5808 assertion error when loading package cache (4.4.0rc1) (#5815)
- fix #5809 `_pip_install_via_requirements` got an unexpected keyword argument 'prune' (4.4.0rc1) (#5814)
- fix #5811 change `safety_checks` default to 'warn' for conda 4.4 (4.4.0rc1) (#5824)
- fix #5825 `--json` output format (4.4.0rc1) (#5831)
- fix `force_reinstall` for case when packages aren't actually installed (4.4.0rc1) (#5836)
- fix #5680 empty pip subsection error in `environment.yml` (4.4.0rc2) (#6275)
- fix #5852 bad tokens from history crash conda installs (4.4.0rc2) (#6076)
- fix #5827 no error message on invalid command (4.4.0rc2) (#6352)
- fix exception handler for 'conda activate' (4.4.0rc2) (#6365)
- fix #6173 double prompt immediately after conda 4.4 upgrade (4.4.0rc2) (#6351)
- fix #6181 keep existing python's pinned to minor version (4.4.0rc2) (#6363)
- fix #6201 incorrect subdir shown for conda search when package not found (4.4.0rc2) (#6367)
- fix #6045 help message and zsh shift (4.4.0rc3) (#6368)
- fix noarch python package resintall (4.4.0rc3) (#6394)
- fix #6366 shell activation message (4.4.0rc3) (#6369)
- fix #6429 `AttributeError` on 'conda remove' (4.4.0rc3) (#6434)
- fix #6449 problems with 'conda info --envs' (#6451)
- add debug exception for #6430 (4.4.0rc3) (#6435)
- fix #6441 `NotImplementedError` on 'conda list' (4.4.0rc3) (#6442)
- fix #6445 scale back directory activation in `PWD` (4.4.0rc3) (#6447)
- fix #6283 no-deps for conda update case (4.4.0rc3) (#6448)
- fix #6419 set `PS1` in python code (4.4.0rc3) (#6446)
- fix #6466 `sp_dir` doesn't exist (#6470)
- fix #6350 `--update-all` removes too many packages (4.4.0) (#6491)
- fix #6057 unlink-link order for python noarch packages on windows 4.4.x (4.4.0) (#6494)

6.85.7 Non-User-Facing Changes

- eliminate index modification in `Resolve` init (#4333)
- new `MatchSpec` implementation (#4158, #5517)
- update `conda.recipe` for 4.4 (#5086)
- resolve #5118 organization and cleanup for 4.4 release (#5115)
- remove unused disk space check instructions (#5167)
- `localfs` adapter tests (#5181)
- extra config command tests (#5185)

- add coverage for confirm (#5203)
- clean up FileNotFoundError and DirectoryNotFoundError (#5237)
- add assertion that a path only has a single hard link before rewriting prefixes (#5305)
- remove pycrypto as requirement on windows (#5326)
- import cleanup, dead code removal, coverage improvements, and other housekeeping (#5472, #5474, #5480)
- rename CondaFileNotFoundError to PathNotFoundError (#5521)
- work toward repodata API (#5267)
- rename PackageNotFoundError to PackagesNotFoundError and fix message formatting (#5602)
- update conda 4.4 bld.bat windows recipe (#5573)
- remove last remnant of CondaEnvRuntimeError (#5643)
- fix typo (4.4.0rc2) (#6043)
- replace Travis-CI with CircleCI (4.4.0rc2) (#6345)
- key-value features (#5645); reverted in 4.4.0rc2 (#6347, #6492)
- resolve #6431 always add env_vars to info_dict (4.4.0rc3) (#6436)
- move shell inside conda directory (4.4.0) (#6479)
- remove dead code (4.4.0) (#6489)

6.86 4.3.34 (2018-02-09)

6.86.1 Bug Fixes

- fix #6833 improve feature mismatch metric (#6853)

6.87 4.3.33 (2018-01-24)

6.87.1 Bug Fixes

- fix #6718 broken 'conda install --rev' (#6719)
- fix #6765 adjust the feature score assigned to packages not installed (#6766)

6.88 4.3.32 (2018-01-10)

6.88.1 Improvements

- resolve #6711 fall back to copy/unlink for EINVAL, EXDEV rename failures (#6712)

6.88.2 Bug Fixes

- fix #6057 unlink-link order for python noarch packages on windows (#6277)
- fix #6509 custom_channels incorrect in 'conda config --show' (#6510)

6.89 4.3.31 (2017-12-15)

6.89.1 Improvements

- add delete_trash to conda_env create (#6299)

6.89.2 Bug Fixes

- fix #6023 assertion error for temp file (#6154)
- fix #6220 --no-builds flag for 'conda env export' (#6221)
- fix #6271 timestamp prioritization results in undesirable race-condition (#6279)

6.89.3 Non-User-Facing Changes

- fix two failing integration tests after anaconda.org API change (#6182)
- resolve #6243 mark root as not writable when sys.prefix is not a conda environment (#6274)
- add timing instrumentation (#6458)

6.90 4.3.30 (2017-10-17)

6.90.1 Improvements

- address #6056 add additional proxy variables to 'conda info --all' (#6083)

6.90.2 Bug Fixes

- address #6164 move add_defaults_to_specs after augment_specs (#6172)
- fix #6057 add additional detail for message 'cannot link source that does not exist' (#6082)
- fix #6084 setting default_channels from CLI raises NotImplementedError (#6085)

6.91 4.3.29 (2017-10-09)

6.91.1 Bug Fixes

- fix #6096 coerce to millisecond timestamps (#6131)

6.92 4.3.28 (2017-10-06)

6.92.1 Bug Fixes

- fix #5854 remove imports of pkg_resources (#5991)
- fix millisecond timestamps (#6001)

6.93 4.3.27 (2017-09-18)

6.93.1 Bug Fixes

- fix #5980 always delete_prefix_from_linked_data in rm_rf (#5982)

6.94 4.3.26 (2017-09-15)

6.94.1 Deprecations/Breaking Changes

- resolve #5922 prioritize channels within multi-channels (#5923)
- add <https://repo.continuum.io/pkgs/main> to defaults multi-channel (#5931)

6.94.2 Improvements

- add a channel priority minimization pass to solver logic (#5859)
- invoke cmd.exe with /D for pre/post link/unlink scripts (#5926)
- add boto3 use to s3 adapter (#5949)

6.94.3 Bug Fixes

- always remove linked prefix entry with rm_rf (#5846)
- resolve #5920 bump repodata pickle version (#5921)
- fix msys2 activate and deactivate (#5950)

6.95 4.3.25 (2017-08-16)

6.95.1 Deprecations/Breaking Changes

- resolve #5834 change default value of 'allow_softlinks' from True to False (#5839)

6.95.2 Improvements

- add non-admin check to optionally disable non-privileged operation (#5724)
- add extra warning message to always_softlink configuration option (#5826)

6.95.3 Bug Fixes

- fix #5763 channel url string splitting error (#5764)
- fix regex for repodata _mod and _etag (#5795)
- fix uncaught OSError for missing device (#5830)

6.96 4.3.24 (2017-07-31)

6.96.1 Bug Fixes

- fix #5708 package priority sort order (#5733)

6.97 4.3.23 (2017-07-21)

6.97.1 Improvements

- resolve #5391 PackageNotFound and NoPackagesFoundError clean up (#5506)

6.97.2 Bug Fixes

- fix #5525 too many Nones in CondaHttpError (#5526)
- fix #5508 assertion failure after test file not cleaned up (#5533)
- fix #5523 catch OSError when home directory doesn't exist (#5549)
- fix #5574 traceback formatting (#5580)
- fix #5554 logger configuration levels (#5555)
- fix #5649 create_default_packages configuration (#5703)

6.98 4.3.22 (2017-06-12)

6.98.1 Improvements

- resolve #5428 clean up cli import in conda 4.3.x (#5429)
- resolve #5302 add warning when creating environment with space in path (#5477)
- for ftp connections, ignore host IP from PASV as it is often wrong (#5489)
- expose common race condition exceptions in exports for conda-build (#5498)

6.98.2 Bug Fixes

- fix #5451 conda clean --json bug (#5452)
- fix #5400 confusing deactivate message (#5473)
- fix #5459 custom subdir channel parsing (#5478)
- fix #5483 problem with setuptools / pkg_resources import (#5496)

6.99 4.3.21 (2017-05-25)

6.99.1 Bug Fixes

- fix #5420 conda-env update error (#5421)
- fix #5425 is_admin on win int not callable (#5426)

6.100 4.3.20 (2017-05-23)

6.100.1 Improvements

- resolve #5217 skip user confirm in python_api, force always_yes (#5404)

6.100.2 Bug Fixes

- fix #5367 conda info always shows 'unknown' for admin indicator on Windows (#5368)
- fix #5248 drop plan description information that might not always be accurate (#5373)
- fix #5378 duplicate log messages (#5379)
- fix #5298 record has 'build', not 'build_string' (#5382)
- fix #5384 silence logging info to avoid interfering with JSON output (#5393)
- fix #5356 skip root/conda logger init for cli.python_api (#5405)

6.100.3 Non-User-Facing Changes

- avoid persistent state after channel priority test (#5392)
- resolve #5402 add regression test for #5384 (#5403)
- clean up inner function definition inside for loop (#5406)

6.101 4.3.19 (2017-05-18)

6.101.1 Improvements

- resolve #3689 better error messaging for missing anaconda-client (#5276)
- resolve #4795 conda env export lacks -p flag (#5275)
- resolve #5315 add alias verify_ssl for ssl_verify (#5316)
- resolve #3399 add netrc existence/location to 'conda info' (#5333)
- resolve #3810 add --prefix to conda env update (#5335)

6.101.2 Bug Fixes

- fix #5272 conda env export ugliness under python2 (#5273)
- fix #4596 warning message from pip on conda env export (#5274)
- fix #4986 --yes not functioning for conda clean (#5311)
- fix #5329 unicode errors on Windows (#5328, #5357)
- fix sys_prefix_unfollowed for Python 3 (#5334)
- fix #5341 --json flag with conda-env (#5342)
- fix 5321 ensure variable PROMPT is set in activate.bat (#5351)

6.101.3 Non-User-Facing Changes

- test conda 4.3 with requests 2.14.2 (#5281)
- remove pycrypto as requirement on windows (#5325)
- fix typo avaiable -> available (#5345)
- fix test failures related to menuinst update (#5344, #5362)

6.102 4.3.18 (2017-05-09)

6.102.1 Improvements

- resolve #4224 warn when pysocks isn't installed (#5226)
- resolve #5229 add --insecure flag to skip ssl verification (#5230)
- resolve #4151 add admin indicator to conda info on windows (#5241)

6.102.2 Bug Fixes

- fix #5152 conda info spacing (#5166)
- fix --use-index-cache actually hitting the index cache (#5134)
- backport LinkPathAction verify from 4.4 (#5171)
- fix #5184 stack trace on invalid map configuration parameter (#5186)
- fix #5189 stack trace on invalid sequence config param (#5192)
- add support for the linux-aarch64 platform (#5190)
- fix repodata fetch with the --offline flag (#5146)
- fix #1773 conda remove spell checking (#5176)
- fix #3470 reduce excessive error messages (#5195)
- fix #1597 make extra sure --dry-run doesn't take any actions (#5201)
- fix #3470 extra newlines around exceptions (#5200)
- fix #5214 install messages for 'nothing_to_do' case (#5216)
- fix #598 stack trace for condarc write permission denied (#5232)
- fix #4960 extra information when exception can't be displayed (#5236)
- fix #4974 no matching dist in linked data for prefix (#5239)
- fix #5258 give correct element types for conda config --describe (#5259)
- fix #4911 separate shutil.copy2 into copy and copystat (#5261)

6.102.3 Non-User-Facing Changes

- resolve #5138 add test of rm_rf of symlinked files (#4373)
- resolve #4516 add extra trace-level logging (#5249, #5250)
- add tests for --update-deps flag (#5264)

6.103 4.3.17 (2017-04-24)

6.103.1 Improvements

- fall back to copy if hardlink fails (#5002)
- add timestamp metadata for tiebreaking conda-build 3 hashed packages (#5018)
- resolve #5034 add subdirs configuration parameter (#5030)
- resolve #5081 make pinned packages optional/constrained dependencies (#5088)
- resolve #5108 improve behavior and add tests for spaces in paths (#4786)

6.103.2 Bug Fixes

- quote prefix paths for locations with spaces (#5009)
- remove binstar logger configuration overrides (#4989)
- fix #4969 error in DirectoryNotFoundError (#4990)
- fix #4998 pinned string format (#5011)
- fix #5039 collecting main_info shouldn't fail on requests import (#5090)
- fix #5055 improve bad token message for anaconda.org (#5091)
- fix #5033 only re-register valid signal handlers (#5092)
- fix #5028 imports in main_list (#5093)
- fix #5073 allow client_ssl_cert[_key] to be of type None (#5096)
- fix #4671 backoff for package validate race condition (#5098)
- fix #5022 gnu_get_libc_version => linux_get_libc_version (#5099)
- fix #4849 package name match bug (#5103)
- fixes #5102 allow proxy_servers to be of type None (#5107)
- fix #5111 incorrect typify for str + NoneType (#5112)

6.103.3 Non-User-Facing Changes

- resolve #5012 remove CondaRuntimeError and RuntimeError (#4818)
- full audit ensuring relative import paths within project (#5090)
- resolve #5116 refactor conda/cli/activate.py to help menuinst (#4406)

6.104 4.3.16 (2017-03-30)

6.104.1 Improvements

- additions to configuration `SEARCH_PATH` to improve consistency (#4966)
- add `'conda config --describe'` and extra config documentation (#4913)
- enable packaging pinning in `condarc` using `pinned_packages` config parameter as beta feature (#4921, #4964)

6.104.2 Bug Fixes

- fix #4914 handle directory creation on top of file paths (#4922)
- fix #3982 issue with `CONDA_ENV` and using powerline (#4925)
- fix #2611 update instructions on how to source `conda.fish` (#4924)
- fix #4860 missing information on package not found error (#4935)
- fix #4944 command not found error error (#4963)

6.105 4.3.15 (2017-03-20)

6.105.1 Improvements

- allow `pkgs_dirs` to be configured using `conda config` (#4895)

6.105.2 Bug Fixes

- remove incorrect elision of `delete_prefix_from_linked_data()` (#4814)
- fix `envs_dirs` order for read-only root prefix (#4821)
- fix break-point in `conda clean` (#4801)
- fix long shebangs when creating entry points (#4828)
- fix spelling and typos (#4868, #4869)
- fix #4840 `TypeError reduce()` of empty sequence with no initial value (#4843)
- fix `zos` subdir (#4875)
- fix exceptions triggered during `activate` (#4873)

6.106 4.3.14 (2017-03-03)

6.106.1 Improvements

- use cPickle in place of pickle for repodata (#4717)
- ignore pyc compile failure (#4719)
- use conda.exe for windows entry point executable (#4716, #4720)
- localize use of conda_signal_handler (#4730)
- add skip_safety_checks configuration parameter (#4767)
- never symlink executables using ORIGIN (#4625)
- set activate.bat codepage to CP_ACP (#4558)

6.106.2 Bug Fixes

- fix #4777 package cache initialization speed (#4778)
- fix #4703 menuinst PathNotFoundException (#4709)
- ignore permissions error if user_site can't be read (#4710)
- fix #4694 don't import requests directly in models (#4711)
- fix #4715 include resources directory in recipe (#4716)
- fix CondaHttpError for URLs that contain '%' (#4769)
- bug fixes for preferred envs (#4678)
- fix #4745 check for info/index.json with package is_extracted (#4776)
- make sure url gets included in CondaHTTPError (#4779)
- fix #4757 map-type configs set to None (#4774)
- fix #4788 partial package extraction (#4789)

6.106.3 Non-User-Facing Changes

- test coverage improvement (#4607)
- CI configuration improvements (#4713, #4773, #4775)
- allow sha256 to be None (#4759)
- add cache_fn_url to exports (#4729)
- add unicode paths for PY3 integration tests (#4760)
- additional unit tests (#4728, #4783)
- fix conda-build compatibility and tests (#4785)

6.107 4.3.13 (2017-02-17)

6.107.1 Improvements

- resolve #4636 environment variable expansion for pkgs_dirs (#4637)
- link, symlink, islink, and readlink for Windows (#4652, #4661)
- add extra information to CondaHTTPError (#4638, #4672)

6.107.2 Bug Fixes

- maximize requested builds after feature determination (#4647)
- fix #4649 incorrect assert statement concerning package cache directory (#4651)
- multi-user mode bug fixes (#4663)

6.107.3 Non-User-Facing Changes

- path_actions unit tests (#4654)
- remove dead code (#4369, #4655, #4660)
- separate repodata logic from index into a new core/repodata.py module (#4669)

6.108 4.3.12 (2017-02-14)

6.108.1 Improvements

- prepare conda for uploading to pypi (#4619)
- better general http error message (#4627)
- disable old python noarch warning (#4576)

6.108.2 Bug Fixes

- fix UnicodeDecodeError for ensure_text_type (#4585)
- fix determination of if file path is writable (#4604)
- fix #4592 BufferError cannot close exported pointers exist (#4628)
- fix run_script current working directory (#4629)
- fix pkgs_dirs permissions regression (#4626)

6.108.3 Non-User-Facing Changes

- fixes for tests when conda-bld directory doesn't exist (#4606)
- use requirements.txt and Makefile for travis-ci setup (#4600, #4633)
- remove hasattr use from compat functions (#4634)

6.109 4.3.11 (2017-02-09)

6.109.1 Bug Fixes

- fix attribute error in add_defaults_to_specs (#4577)

6.110 4.3.10 (2017-02-07)

6.110.1 Improvements

- remove .json from pickle path (#4498)
- improve empty repodata noarch warning and error messages (#4499)
- don't add python and lua as default specs for private envs (#4529, #4533)
- let default_python be None (#4547, #4550)

6.110.2 Bug Fixes

- fix #4513 null pointer exception for channel without noarch (#4518)
- fix ssl_verify set type (#4517)
- fix bug for windows multiuser (#4524)
- fix clone with noarch python packages (#4535)
- fix ipv6 for python 2.7 on Windows (#4554)

6.110.3 Non-User-Facing Changes

- separate integration tests with a marker (#4532)

6.111 4.3.9 (2017-01-31)

6.111.1 Improvements

- improve repodata caching for performance (#4478, #4488)
- expand scope of packages included by bad_installed (#4402)
- silence pre-link warning for old noarch (#4451)

- add configuration to optionally require noarch repodata (#4450)
- improve conda subprocessing (#4447)
- respect info/link.json (#4482)

6.111.2 Bug Fixes

- fix #4398 ‘hard’ was used for link type at one point (#4409)
- fixed “No matches for wildcard ‘\$activate_d/*fish’” warning (#4415)
- print correct activate/deactivate message for fish shell (#4423)
- fix ‘Dist’ object has no attribute ‘fn’ (#4424)
- fix noarch generic and add additional integration test (#4431)
- fix #4425 unknown encoding (#4433)

6.111.3 Non-User-Facing Changes

- fail CI on conda-build fail (#4405)
- run doctests (#4414)
- make index record mutable again (#4461)
- additional test for conda list --json (#4480)

6.112 4.3.8 (2017-01-23)

6.112.1 Bug Fixes

- fix #4309 ignore EXDEV error for directory renames (#4392)
- fix #4393 by force-renaming certain backup files if the path already exists (#4397)

6.113 4.3.7 (2017-01-20)

6.113.1 Bug Fixes

- actually revert json output for leaky plan (#4383)
- fix not raising on pre/post-link error (#4382)
- fix find_commands and find_executable for symlinks (#4387)

6.114 4.3.6 (2017-01-18)

6.114.1 Bug Fixes

- fix ‘Uncaught backoff with errno 41’ warning on windows (#4366)
- revert json output for leaky plan (#4349)
- audit os.environ setting (#4360)
- fix #4324 using old dist string instead of dist object (#4361)
- fix #4351 infinite recursion via code in #4120 (#4370)
- fix #4368 conda -h (#4367)
- workaround for symlink race conditions on activate (#4346)

6.115 4.3.5 (2017-01-17)

6.115.1 Improvements

- add exception message for corrupt repodata (#4315)

6.115.2 Bug Fixes

- fix package not being found in cache after download (#4297)
- fix logic for Content-Length mismatch (#4311, #4326)
- use unicode_escape after etag regex instead of utf-8 (#4325)
- fix #4323 central condarc file being ignored (#4327)
- fix #4316 a bug in deactivate (#4316)
- pass target_prefix as env_prefix regardless of is_unlink (#4332)
- pass positional argument ‘context’ to BasicClobberError (#4335)

6.115.3 Non-User-Facing Changes

- additional package pinning tests (#4317)

6.116 4.3.4 (2017-01-13)

6.116.1 Improvements

- vendor url parsing from urllib3 (#4289)

6.116.2 Bug Fixes

- fix some bugs in windows multi-user support (#4277)
- fix problems with channels of type (#4290)
- include aliases for first command-line argument (#4279)
- fix for multi-line FTP status codes (#4276)

6.116.3 Non-User-Facing Changes

- make arch in IndexRecord a StringField instead of EnumField
- improve conda-build compatibility (#4266)

6.117 4.3.3 (2017-01-10)

6.117.1 Improvements

- respect Cache-Control max-age header for repodata (#4220)
- add 'local_repodata_ttl' configurability (#4240)
- remove questionable “nothing to install” logic (#4237)
- relax channel noarch requirement for 4.3; warn now, raise in future feature release (#4238)
- add additional info to `setup.py` warning message (#4258)

6.117.2 Bug Fixes

- remove features properly (#4236)
- do not use IFS to find activate/deactivate scripts to source (#4239)
- fix #4235 print message to stderr (#4241)
- fix relative path to python in activate.bat (#4242)
- fix args.channel references (#4245, #4246)
- ensure cache_fn_url right pad (#4255)
- fix #4256 subprocess calls must have env wrapped in str (#4259)

6.118 4.3.2 (2017-01-06)

6.118.1 Deprecations/Breaking Changes

- Further refine conda channels specification. To verify if the url of a channel represents a valid conda channel, we check that `noarch/repodata.json` and/or `noarch/repodata.json.bz2` exist, even if empty. (#3739)

6.118.2 Improvements

- add new ‘path_conflict’ and ‘clobber’ configuration options (#4119)
- separate fetch/extract pass for explicit URLs (#4125)
- update conda homepage to conda.io (#4180)

6.118.3 Bug Fixes

- fix pre/post unlink/link scripts (#4113)
- fix package version regex and bug in create_link (#4132)
- fix history tracking (#4143)
- fix index creation order (#4131)
- fix #4152 conda env export failure (#4175)
- fix #3779 channel UNC path encoding errors on windows (#4190)
- fix progress bar (#4191)
- use context.channels instead of args.channel (#4199)
- don’t use local cached repodata for file:// urls (#4209)

6.118.4 Non-User-Facing Changes

- xfail anaconda token test if local token is found (#4124)
- fix open-ended test failures relating to python 3.6 release (#4145)
- extend timebomb for test_multi_channel_export (#4169)
- don’t unlink dists that aren’t in the index (#4130)
- add python 3.6 and new conda-build test targets (#4194)

6.119 4.3.1 (2016-12-19)

6.119.1 Improvements

- additional pre-transaction validation (#4090)
- export FileMode enum for conda-build (#4080)
- memoize disk permissions tests (#4091)
- local caching of repodata without remote server calls; new ‘repodata_timeout_secs’ configuration parameter (#4094)
- performance tuning (#4104)
- add additional fields to dist object serialization (#4102)

6.119.2 Bug Fixes

- fix a noarch install bug on windows (#4071)
- fix a spec mismatch that resulted in python versions getting mixed during packaging (#4079)
- fix rollback linked record (#4092)
- fix #4097 keep split in PREFIX_PLACEHOLDER (#4100)

6.120 4.3.0 (2016-12-14) Safety

6.120.1 New Features

- **Unlink and Link Packages in a Single Transaction:** In the past, conda hasn't always been safe and defensive with its disk-mutating actions. It has gleefully clobbered existing files, and mid-operation failures leave environments completely broken. In some of the most severe examples, conda can appear to “uninstall itself.” With this release, the unlinking and linking of packages for an executed command is done in a single transaction. If a failure occurs for any reason while conda is mutating files on disk, the environment will be returned its previous state. While we've implemented some pre-transaction checks (verifying package integrity for example), it's impossible to anticipate every failure mechanism. In some circumstances, OS file permissions cannot be fully known until an operation is attempted and fails. And conda itself is not without bugs. Moving forward, unforeseeable failures won't be catastrophic. (#3833, #4030)
- **Progressive Fetch and Extract Transactions:** Like package unlinking and linking, the download and extract phases of package handling have also been given transaction-like behavior. The distinction is the rollback on error is limited to a single package. Rather than rolling back the download and extract operation for all packages, the single-package rollback prevents the need for having to re-download every package if an error is encountered. (#4021, #4030)
- **Generic- and Python-Type Noarch/Universal Packages:** Along with conda-build 2.1.0, a noarch/universal type for python packages is officially supported. These are much like universal python wheels. Files in a python noarch package are linked into a prefix just like any other conda package, with the following additional features
 1. conda maps the `site-packages` directory to the correct location for the python version in the environment,
 2. conda maps the `python-scripts` directory to either `PREFIX/bin` or `PREFIX/Scripts` depending on platform,
 3. conda creates the python entry points specified in the conda-build recipe, and
 4. conda compiles pyc files at install time when prefix write permissions are guaranteed.

Python noarch packages must be “fully universal.” They cannot have OS- or python version-specific dependencies. They cannot have OS- or python version-specific “scripts” files. If these features are needed, traditional conda packages must be used. (#3712)
- **Multi-User Package Caches:** While the on-disk package cache structure has been preserved, the core logic implementing package cache handling has had a complete overhaul. Writable and read-only package caches are fully supported. (#4021)
- **Python API Module:** An oft requested feature is the ability to use conda as a python library, obviating the need to “shell out” to another python process. Conda 4.3 includes a `conda.cli.python_api` module that facilitates this use case. While we maintain the user-facing command-line interface, conda commands can be executed in-process. There is also a `conda.exports` module to facilitate longer-term usage of conda as a library across conda releases. However, conda's python code is considered internal and private, subject to change at any time across releases. At the moment, conda will not install itself into environments other than its original install environment. (#4028)

- **Remove All Locks:** Locking has never been fully effective in conda, and it often created a false sense of security. In this release, multi-user package cache support has been implemented for improved safety by hard-linking packages in read-only caches to the user's primary user package cache. Still, users are cautioned that undefined behavior can result when conda is running in multiple process and operating on the same package caches and/or environments. (#3862)

6.120.2 Deprecations/Breaking Changes

- Conda will refuse to clobber existing files that are not within the unlink instructions of the transaction. At the risk of being user-hostile, it's a step forward for conda. We do anticipate some growing pains. For example, conda will not clobber packages that have been installed with pip (or any other package manager). In other instances, conda packages that contain overlapping file paths but are from different package families will not install at the same time. The `--force` command line flag is the escape hatch. Using `--force` will let your operation proceed, but also makes clear that you want conda to do something it considers unsafe.
- Conda signed packages have been removed in 4.3. Vulnerabilities existed. An illusion of security is worse than not having the feature at all. We will be incorporating The Update Framework into conda in a future feature release. (#4064)
- Conda 4.4 will drop support for older versions of conda-build.

6.120.3 Improvements

- create a new "trace" log level enabled by `-v -v -v` or `-vvv` (#3833)
- allow conda to be installed with pip, but only when used as a library/dependency (#4028)
- the 'r' channel is now part of defaults (#3677)
- private environment support for conda (#3988)
- support v1 info/paths.json file (#3927, #3943)
- support v1 info/package_metadata.json (#4030)
- improved solver hint detection, simplified filtering (#3597)
- cache VersionOrder objects to improve performance (#3596)
- fix documentation and typos (#3526, #3572, #3627)
- add multikey configuration validation (#3432)
- some Fish autocompletions (#2519)
- reduce priority for packages removed from the index (#3703)
- add user-agent, uid, gid to conda info (#3671)
- add conda.exports module (#3429)
- make http timeouts configurable (#3832)
- add a pkgs_dirs config parameter (#3691)
- add an 'always_softlink' option (#3870, #3876)
- pre-checks for disk space, etc for fetch and extract (#4007)
- address #3879 don't print activate message when quiet config is enabled (#3886)
- add zos-z subdir (#4060)

- add elapsed time to HTTP errors (#3942)

6.120.4 Bug Fixes

- account for the Windows Python 2.7 os.environ unicode aversion (#3363)
- fix link field in record object (#3424)
- anaconda api token bug fix; additional tests (#3673)
- fix #3667 unicode literals and unicode decode (#3682)
- add conda-env entrypoint (#3743)
- fix #3807 json dump on conda config --show --json (#3811)
- fix #3801 location of temporary hard links of index.json (#3813)
- fix invalid yml example (#3849)
- add arm platforms back to subdirs (#3852)
- fix #3771 better error message for assertion errors (#3802)
- fix #3999 spaces in shebang replacement (#4008)
- config --show-sources shouldn't show force by default (#3891)
- fix #3881 don't install conda-env in clones of root (#3899)
- conda-build dist compatibility (#3909)

6.120.5 Non-User-Facing Changes

- remove unnecessary eval (#3428)
- remove dead install_tar function (#3641)
- apply PEP-8 to conda-env (#3653)
- refactor dist into an object (#3616)
- vendor appdirs; remove conda's dependency on anaconda-client import (#3675)
- revert boto patch from #2380 (#3676)
- move and update ROOT_NO_RM (#3697)
- integration tests for conda clean (#3695, #3699)
- disable coverage on s3 and ftp requests adapters (#3696, #3701)
- github repo hygiene (#3705, #3706)
- major install refactor (#3712)
- remove test timebombs (#4012)
- LinkType refactor (#3882)
- move CrossPlatformStLink and make available as export (#3887)
- make Record immutable (#3965)
- project housekeeping (#3994, #4065)
- context-dependent `setup.py` files (#4057)

6.121 4.2.17 (unreleased)

6.121.1 Improvements

- silence pre-link warning for old noarch 4.2.x backport (#4453)

6.121.2 Bug Fixes

- remove incorrect elision of `delete_prefix_from_linked_data()` (#4813)
- fix CB #1825 context clobbering (#4867)
- fix #5101 `api->conda` regex substitution for Anaconda API channels (#5100)

6.121.3 Non-User-Facing Changes

- build 4.2.x against conda-build 2.1.2 and enforce passing (#4462)

6.122 4.2.16 (2017-01-20)

6.122.1 Improvements

- vendor url parsing from `urllib3` (#4289)
- workaround for symlink race conditions on activate (#4346)

6.122.2 Bug Fixes

- do not replace `\` with `/` in `file://` URLs on Windows (#4269)
- include aliases for first command-line argument (#4279)
- fix for multi-line FTP status codes (#4276)
- fix errors with unknown type channels (#4291)
- change `sys.exit` to raise `UpgradeError` when info/files not found (#4388)

6.122.3 Non-User-Facing Changes

- start using doctests in test runs and coverage (#4304)
- additional package pinning tests (#4312)

6.123 4.2.15 (2017-01-10)

6.123.1 Improvements

- use ‘post’ instead of ‘dev’ for commits according to PEP-440 (#4234)
- do not use IFS to find activate/deactivate scripts to source (#4243)
- fix relative path to python in activate.bat (#4244)

6.123.2 Bug Fixes

- replace sed with python for activate and deactivate #4257

6.124 4.2.14 (2017-01-07)

6.124.1 Improvements

- use install.rm_rf for TemporaryDirectory cleanup (#3425)
- improve handling of local dependency information (#2107)
- add default channels to exports for Windows and Unix (#4103)
- make subdir configurable (#4178)

6.124.2 Bug Fixes

- fix conda/install.py single-file behavior (#3854)
- fix the api->conda substitution (#3456)
- fix silent directory removal (#3730)
- fix location of temporary hard links of index.json (#3975)
- fix potential errors in multi-channel export and offline clone (#3995)
- fix auxlib/packaging, git hashes are not limited to 7 characters (#4189)
- fix compatibility with requests >=2.12, add pyopenssl as dependency (#4059)
- fix #3287 activate in 4.1-4.2.3 clobbers non-conda PATH changes (#4211)

6.124.3 Non-User-Facing Changes

- fix open-ended test failures relating to python 3.6 release (#4166)
- allow args passed to cli.main() (#4193, #4200, #4201)
- test against python 3.6 (#4197)

6.125 4.2.13 (2016-11-22)

6.125.1 Deprecations/Breaking Changes

- show warning message for pre-link scripts (#3727)
- error and exit for install of packages that require conda minimum version 4.3 (#3726)

6.125.2 Improvements

- double/extend http timeouts (#3831)
- let descriptive http errors cover more http exceptions (#3834)
- backport some conda-build configuration (#3875)

6.125.3 Bug Fixes

- fix conda/install.py single-file behavior (#3854)
- fix the api->conda substitution (#3456)
- fix silent directory removal (#3730)
- fix #3910 null check for is_url (#3931)

6.125.4 Non-User-Facing Changes

- flake8 E116, E121, & E123 enabled (#3883)

6.126 4.2.12 (2016-11-02)

6.126.1 Bug Fixes

- fix #3732, #3471, #3744 CONDA_BLD_PATH (#3747)
- fix #3717 allow no-name channels (#3748)
- fix #3738 move conda-env to ruamel_yaml (#3740)
- fix conda-env entry point (#3745 via #3743)
- fix again #3664 trash emptying (#3746)

6.127 4.2.11 (2016-10-23)

6.127.1 Improvements

- only try once for windows trash removal (#3698)

6.127.2 Bug Fixes

- fix anaconda api token bug (#3674)
- fix #3646 FileMode enum comparison (#3683)
- fix #3517 conda install --mkdir (#3684)
- fix #3560 hack anaconda token coverup on conda info (#3686)
- fix #3469 alias envs_path to envs_dirs (#3685)

6.128 4.2.10 (2016-10-18)

6.128.1 Improvements

- add json output for `conda info -s` (#3588)
- ignore certain binary prefixes on windows (#3539)
- allow conda config files to have .yaml extensions or 'condarc' anywhere in filename (#3633)

6.128.2 Bug Fixes

- fix conda-build's `handle_proxy_407` import (#3666)
- fix #3442, #3459, #3481, #3531, #3548 multiple networking and auth issues (#3550)
- add back linux-ppc64le subdir support (#3584)
- fix #3600 ensure links are removed when unlinking (#3625)
- fix #3602 search channels by platform (#3629)
- fix duplicated packages when updating environment (#3563)
- fix #3590 exception when parsing invalid yaml (#3593 via #3634)
- fix #3655 a string decoding error (#3656)

6.128.3 Non-User-Facing Changes

- backport conda.exports module to 4.2.x (#3654)
- travis-ci OSX fix (#3615 via #3657)

6.129 4.2.9 (2016-09-27)

6.129.1 Bug Fixes

- fix #3536 conda-env messaging to stdout with --json flag (#3537)
- fix #3525 writing to sys.stdout with --json flag for post-link scripts (#3538)
- fix #3492 make NULL falsey with python 3 (#3524)

6.130 4.2.8 (2016-09-26)

6.130.1 Improvements

- add “error” key back to json error output (#3523)

6.130.2 Bug Fixes

- fix #3453 conda fails with create_default_packages (#3454)
- fix #3455 --dry-run fails (#3457)
- dial down error messages for rm_rf (#3522)
- fix #3467 AttributeError encountered for map config parameter validation (#3521)

6.131 4.2.7 (2016-09-16)

6.131.1 Deprecations/Breaking Changes

- revert to 4.1.x behavior of `conda list --export` (#3450, #3451)

6.131.2 Bug Fixes

- don’t add binstar token if it’s given in the channel spec (#3427, #3440, #3444)
- fix #3433 failure to remove broken symlinks (#3436)

6.131.3 Non-User-Facing Changes

- use `install.rm_rf` for `TemporaryDirectory` cleanup (#3425)

6.132 4.2.6 (2016-09-14)

6.132.1 Improvements

- add support for client TLS certificates (#3419)
- address #3267 allow migration of `channel_alias` (#3410)
- `conda-env` version matches `conda` version (#3422)

6.132.2 Bug Fixes

- fix #3409 unsatisfiable dependency error message (#3412)
- fix #3408 quiet `rm_rf` (#3413)
- fix #3407 padding error messaging (#3416)
- account for the Windows Python 2.7 `os.environ` unicode aversion (#3363 via #3420)

6.133 4.2.5 (2016-09-08)

6.133.1 Deprecations/Breaking Changes

- partially revert #3041 giving `conda config --add` previous `--prepend` behavior (#3364 via #3370)
- partially revert #2760 adding back `conda package` command (#3398)

6.133.2 Improvements

- order output of `conda config --show`; make `--json` friendly (#3384 via #3386)
- clean the pid based lock on exception (#3325)
- improve file removal on all platforms (#3280 via #3396)

6.133.3 Bug Fixes

- fix #3332 allow download urls with `::` in them (#3335)
- fix `always_yes` and `not-set` `argparse` args overriding other sources (#3374)
- fix ftp fetch timeout (#3392)
- fix #3307 add `try/except` block for touch lock (#3326)
- fix `CONDA_CHANNELS` environment variable splitting (#3390)
- fix #3378 `CONDA_FORCE_32BIT` environment variable (#3391)

- make conda info channel urls actually give urls (#3397)
- fix cio_test compatibility (#3395 via #3400)

6.134 4.2.4 (2016-08-18)

6.134.1 Bug Fixes

- fix #3277 conda list package order (#3278)
- fix channel priority issue with duplicated channels (#3283)
- fix local channel channels; add full conda-build unit tests (#3281)
- fix conda install with no package specified (#3284)
- fix #3253 exporting and importing conda environments (#3286)
- fix priority messaging on conda config --get (#3304)
- fix conda list --export; additional integration tests (#3291)
- fix conda update --all idempotence; add integration tests for channel priority (#3306)

6.134.2 Non-User-Facing Changes

- additional conda-env integration tests (#3288)

6.135 4.2.3 (2016-08-11)

6.135.1 Improvements

- added zsh and zsh.exe to Windows shells (#3257)

6.135.2 Bug Fixes

- allow conda to downgrade itself (#3273)
- fix breaking changes to conda-build from 4.2.2 (#3265)
- fix empty environment issues with conda and conda-env (#3269)

6.135.3 Non-User-Facing Changes

- add integration tests for conda-env (#3270)
- add more conda-build smoke tests (#3274)

6.136 4.2.2 (2016-08-09)

6.136.1 Improvements

- enable binary prefix replacement on windows (#3262)
- add `--verbose` command line flag (#3237)
- improve logging and exception detail (#3237, #3252)
- do not remove empty environment without asking; raise an error when a named environment can't be found (#3222)

6.136.2 Bug Fixes

- fix #3226 user condarc not available on Windows (#3228)
- fix some bugs in `conda config --show*` (#3212)
- fix `conda-build` local channel bug (#3202)
- remove subprocess exiting message (#3245)
- fix comment parsing and channels in `conda-env environment.yml` (#3258, #3259)
- fix context error with `conda-env` (#3232)
- fix #3182 `conda install` silently skipping failed linking (#3184)

6.137 4.2.1 (2016-08-01)

6.137.1 Improvements

- improve an error message that can happen during `conda install --revision` (#3181)
- use `clean sys.exit` with user choice 'No' (#3196)

6.137.2 Bug Fixes

- critical fix for 4.2.0 error when no git is on PATH (#3193)
- revert #3171 lock cleaning on exit pending further refinement
- patches for `conda-build` compatibility with 4.2 (#3187)
- fix a bug in `--show-sources` output that ignored aliased parameter names (#3189)

6.137.3 Non-User-Facing Changes

- move scripts in bin to shell directory (#3186)

6.138 4.2.0 (2016-07-28) Configuration

6.138.1 New Features

- **New Configuration Engine:** Configuration and “operating context” are the foundation of conda’s functionality. Conda now has the ability to pull configuration information from a multitude of on-disk locations, including `.d` directories and a `.condarc` file *within* a conda environment), along with full `CONDA_` environment variable support. Helpful validation errors are given for improperly-specified configuration. Full documentation updates pending. (#2537, #3160, #3178)
- **New Exception Handling Engine:** Previous releases followed a pattern of premature exiting (with hard calls to `sys.exit()`) when exceptional circumstances were encountered. This release replaces over 100 `sys.exit` calls with python exceptions. For conda developers, this will result in tests that are easier to write. For developers using conda, this is a first step on a long path toward conda being directly importable. For conda users, this will eventually result in more helpful and descriptive errors messages. (#2899, #2993, #3016, #3152, #3045)
- **Empty Environments:** Conda can now create “empty” environments when no initial packages are specified, alleviating a common source of confusion. (#3072, #3174)
- **Conda in Private Env:** Conda can now be configured to live within its own private environment. While it’s not yet default behavior, this represents a first step toward separating the `root` environment into a “conda private” environment and a “user default” environment. (#3068)
- **Regex Version Specification:** Regular expressions are now valid version specifiers. For example, `^1\.[5-8]\.1$|2.2.` (#2933)

6.138.2 Deprecations/Breaking Changes

- remove conda init (#2759)
- remove conda package and conda bundle (#2760)
- deprecate conda-env repo; pull into conda proper (#2950, #2952, #2954, #3157, #3163, #3170)
- force use of ruamel_yaml (#2762)
- implement conda config --prepend; change behavior of --add to --append (#3041)
- exit on link error instead of logging it (#2639)

6.138.3 Improvements

- improve locking (#2962, #2989, #3048, #3075)
- clean up requests usage for fetching packages (#2755)
- remove excess output from conda --help (#2872)
- remove `os.remove` in `update_prefix` (#3006)
- better error behavior if conda is spec’d for a non-root environment (#2956)
- scale back `try_write` function on unix (#3076)

6.138.4 Bug Fixes

- remove psutil requirement, fixes annoying error message (#3135, #3183)
- fix #3124 add threading lock to memoize (#3134)
- fix a failure with multi-threaded repodata downloads (#3078)
- fix windows file url (#3139)
- address #2800, error with environment.yml and non-default channels (#3164)

6.138.5 Non-User-Facing Changes

- project structure enhancement (#2929, #3132, #3133, #3136)
- clean up channel handling with new channel model (#3130, #3151)
- add Anaconda Cloud / Binstar auth handler (#3142)
- remove dead code (#2761, #2969)
- code refactoring and additional tests (#3052, #3020)
- remove auxlib from project root (#2931)
- vendor auxlib 0.0.40 (#2932, #2943, #3131)
- vendor toolz 0.8.0 (#2994)
- move progressbar to vendor directory (#2951)
- fix conda.recipe for new quirks with conda-build (#2959)
- move captured function to common module (#3083)
- rename CHANGELOG to md (#3087)

6.139 4.1.13 (unreleased)

- improve handling of local dependency information, #2107
- show warning message for pre-link scripts, #3727
- error and exit for install of packages that require conda minimum version 4.3, #3726
- fix conda/install.py single-file behavior, #3854
- fix open-ended test failures relating to python 3.6 release, #4167
- fix #3287 activate in 4.1-4.2.3 clobbers non-conda PATH changes, #4211
- fix relative path to python in activate.bat, #4244

6.140 4.1.12 (2016-09-08)

- fix #2837 “File exists” in symlinked path with parallel activations, #3210
- fix prune option when installing packages, #3354
- change check for placeholder to be more friendly to long PATH, #3349

6.141 4.1.11 (2016-07-26)

- fix PS1 backup in activate script, #3135 via #3155
- correct resolution for ‘handle failures in binstar_client more generally’, #3156

6.142 4.1.10 (2016-07-25)

- ignore symlink failure because of read-only file system, #3055
- backport shortcut tests, #3064
- fix #2979 redefinition of \$SHELL variable, #3081
- fix #3060 --clone root --copy exception, #3080

6.143 4.1.9 (2016-07-20)

- fix #3104, add global BINSTAR_TOKEN_PATH
- handle failures in binstar_client more generally

6.144 4.1.8 (2016-07-12)

- fix #3004 UNAUTHORIZED for url (null binstar token), #3008
- fix overwrite existing redirect shortcuts when symlinking envs, #3025
- partially revert no default shortcuts, #3032, #3047

6.145 4.0.11 2016-07-09

- allow auto_update_conda from sysrc, #3015 via #3021

6.146 4.1.7 (2016-07-07)

- add msys2 channel to defaults on Windows, #2999
- fix #2939 channel_alias issues; improve offline enforcement, #2964
- fix #2970, #2974 improve handling of file:// URLs inside channel, #2976

6.147 4.1.6 (2016-07-01)

- slow down exp backoff from 1 ms to 100 ms factor, #2944
- set max time on exp_backoff to ~6.5 sec, #2955
- fix #2914 add/subtract from PATH; kill folder output text, #2917
- normalize use of get_index behavior across clone/explicit, #2937
- wrap root prefix check with normcase, #2938

6.148 4.1.5 (2016-06-29)

- more conservative auto updates of conda #2900
- fix some permissions errors with more aggressive use of move_path_to_trash, #2882
- fix #2891 error if allow_other_channels setting is used, #2896
- fix #2886, #2907 installing a tarball directly from the package cache, #2908
- fix #2681, #2778 reverting #2320 lock behavior changes, #2915

6.149 4.0.10 (2016-06-29)

- fix #2846 revert the use of UNC paths; shorten trash filenames, #2859 via #2878
- fix some permissions errors with more aggressive use of move_path_to_trash, #2882 via #2894

6.150 4.1.4 (2016-06-27)

- fix #2846 revert the use of UNC paths; shorten trash filenames, #2859
- fix exp backoff on Windows, #2860
- fix #2845 URL for local file repos, #2862
- fix #2764 restore full path var on win; create to CONDA_PREFIX env var, #2848
- fix #2754 improve listing pip installed packages, #2873
- change root prefix detection to avoid clobbering root activate scripts, #2880
- address #2841 add lowest and highest priority indication to channel config output, #2875
- add SYMLINK_CONDA to planned instructions, #2861

- use CONDA_PREFIX, not CONDA_DEFAULT_ENV for activate.d, #2856
- call scripts with redirect on win; more error checking to activate, #2852

6.151 4.1.3 (2016-06-23)

- ensure conda-env auto update, along with conda, #2772
- make yaml booleans behave how everyone expects them to, #2784
- use accept-encoding for repodata; prefer repodata.json to repodata.json.bz2, #2821
- additional integration and regression tests, #2757, #2774, #2787
- add offline mode to printed info; use offline flag when grabbing channels, #2813
- show conda-env version in conda info, #2819
- adjust channel priority superseded list, #2820
- support epoch ! characters in command line specs, #2832
- accept old default names and new ones when canonicalizing channel URLs #2839
- push PATH, PS1 manipulation into shell scripts, #2796
- fix #2765 broken source activate without arguments, #2806
- fix standalone execution of `install.py`, #2756
- fix #2810 activating conda environment broken with git bash on Windows, #2795
- fix #2805, #2781 handle both file-based channels and explicit file-based URLs, #2812
- fix #2746 conda create --clone of root, #2838
- fix #2668, #2699 shell recursion with activate #2831

6.152 4.1.2 (2016-06-17)

- improve messaging for “downgrades” due to channel priority, #2718
- support conda config channel append/prepend, handle duplicates, #2730
- remove --shortcuts option to internal CLI code, #2723
- fix an issue concerning space characters in paths in activate.bat, #2740
- fix #2732 restore yes/no/on/off for booleans on the command line, #2734
- fix #2642 tarball install on Windows, #2729
- fix #2687, #2697 WindowsError when creating environments on Windows, #2717
- fix #2710 link instruction in conda create causes TypeError, #2715
- revert #2514, #2695, disabling of .netrc files, #2736
- revert #2281 printing progress bar to terminal, #2707

6.153 4.1.1 (2016-06-16)

- add `auto_update_conda` config parameter, #2686
- fix #2669 conda config --add channels can leave out defaults, #2670
- fix #2703 ignore activate symlink error if links already exist, #2705
- fix #2693 install duplicate packages with older version of Anaconda, #2701
- fix #2677 respect `HTTP_PROXY`, #2695
- fix #2680 broken fish integration, #2685, #2694
- fix an issue with conda never exiting, #2689
- fix #2688 explicit file installs, #2708
- fix #2700 conda list UnicodeDecodeError, #2706

6.154 4.0.9 (2016-06-15)

- add `auto_update_conda` config parameter, #2686

6.155 4.1.0 (2016-06-14) Channel Priority

- clean up activate and deactivate scripts, moving back to conda repo, #1727, #2265, #2291, #2473, #2501, #2484
- replace `pyyaml` with `ruamel_yaml`, #2283, #2321
- better handling of channel collisions, #2323, #2369 #2402, #2428
- improve listing of pip packages with conda list, #2275
- re-license progressbar under BSD 3-clause, #2334
- reduce the amount of extraneous info in hints, #2261
- add --shortcuts option to install shortcuts on windows, #2623
- skip binary replacement on windows, #2630
- don't show channel urls by default in conda list, #2282
- package resolution and solver tweaks, #2443, #2475, #2480
- improved version & build matching, #2442, #2488
- print progress to the terminal rather than stdout, #2281
- verify version specs given on command line are valid, #2246
- fix for `try_write` function in case of odd permissions, #2301
- fix a conda search --spec error, #2343
- update User-Agent for conda connections, #2347
- remove some dead code paths, #2338, #2374
- fixes a thread safety issue with http requests, #2377, #2383
- manage BeeGFS hard-links non-POSIX configuration, #2355

- prevent version downgrades during removes, #2394
- fix conda info --json, #2445
- truncate shebangs over 127 characters using /usr/bin/env, #2479
- extract packages to a temporary directory then rename, #2425, #2483
- fix help in install, #2460
- fix re-install bug when sha1 differs, #2507
- fix a bug with file deletion, #2499
- disable .netrc files, #2514
- dont fetch index on remove --all, #2553
- allow track_features to be a string *or* a list in .condarc, #2541
- fix #2415 infinite recursion in invalid_chains, #2566
- allow channel_alias to be different than binstar, #2564

6.156 4.0.8 (2016-06-03)

- fix a potential problem with moving files to trash, #2587

6.157 4.0.7 (2016-05-26)

- workaround for boto bug, #2380

6.158 4.0.6 (2016-05-11)

- log “custom” versions as updates rather than downgrades, #2290
- fixes a TypeError exception that can occur on install/update, #2331
- fixes an error on Windows removing files with long path names, #2452

6.159 4.0.5 (2016-03-16)

- improved help documentation for install, update, and remove, #2262
- fixes #2229 and #2250 related to conda update errors on Windows, #2251
- fixes #2258 conda list for pip packages on Windows, #2264

6.160 4.0.4 (2016-03-10)

- revert #2217 closing request sessions, #2233

6.161 4.0.3 (2016-03-10)

- adds a `conda clean --all` feature, #2211
- solver performance improvements, #2209
- fixes conda list for pip packages on windows, #2216
- quiets some logging for package downloads under python 3, #2217
- more urls for `conda list --explicit`, #1855
- prefer more “latest builds” for more packages, #2227
- fixes a bug with dependency resolution and features, #2226

6.162 4.0.2 (2016-03-08)

- fixes `track_features` in `~/.condarc` being a list, see also #2203
- fixes incorrect path in lock file error #2195
- fixes issues with cloning environments, #2193, #2194
- fixes a strange interaction between features and versions, #2206
- fixes a bug in low-level SAT clause generation creating a preference for older versions, #2199

6.163 4.0.1 (2016-03-07)

- fixes an install issue caused by md5 checksum mismatches, #2183
- remove auxlib build dependency, #2188

6.164 4.0.0 (2016-03-04) Solver

- The solver has been retooled significantly. Performance should be improved in most circumstances, and a number of issues involving feature conflicts should be resolved.
- `conda update <package>` now handles dependencies properly according to the setting of the “`update_deps`” configuration: `--update-deps`: conda will also update any dependencies as needed to install the latest version of the requested packages. The minimal set of changes required to achieve this is sought. `--no-update-deps`: conda will update the packages *only* to the extent that no updates to the dependencies are required. The previous behavior, which would update the packages without regard to their dependencies, could result in a broken configuration, and has been removed.
- Conda finally has an official logo.
- Fix `conda clean --packages` on Windows, #1944

- Conda sub-commands now support dashes in names, #1840

6.165 3.19.4 (unreleased)

- improve handling of local dependency information, #2107
- use `install.rm_rf` for `TemporaryDirectory` cleanup, #3425
- fix the `api->conda` substitution, #3456
- error and exit for install of packages that require conda minimum version 4.3, #3726
- show warning message for pre-link scripts, #3727
- fix silent directory removal, #3730
- fix `conda/install.py` single-file behavior, #3854

6.166 3.19.3 (2016-02-19)

- fix critical issue, see #2106

6.167 3.19.2 (2016-02-19)

- add basic `activate/deactivate`, `conda activate/deactivate/ls` for fish, see #545
- remove error when `CONDA_FORCE_32BIT` is set on 32-bit systems, #1985
- suppress help text for `--unknown` option, #2051
- fix issue with `conda create --clone` post-link scripts, #2007
- fix a permissions issue on windows, #2083

6.168 3.19.1 (2016-02-01)

- `resolve.py`: properly escape periods in version numbers, #1926
- support for pinning Lua by default, #1934
- remove hard-coded test URLs, a module `cio_test` is now expected when `CIO_TEST` is set

6.169 3.19.0 (2015-12-17)

- OpenBSD 5.x support, #1891
- improve install CLI to make Miniconda `-f` work, #1905

6.170 3.18.9 (2015-12-10)

- allow chaining default_channels (only applies to “system” condarc), from from CLI, #1886
- improve default for --show-channel-urls in conda list, #1900

6.171 3.18.8 (2015-12-03)

- always attempt to delete files in rm_rf, #1864

6.172 3.18.7 (2015-12-02)

- simplify call to menuinst.install()
- add menuinst as dependency on Windows
- add ROOT_PREFIX to post-link (and pre_unlink) environment

6.173 3.18.6 (2015-11-19)

- improve conda clean when user lacks permissions, #1807
- make show_channel_urls default to True, #1771
- cleaner write tests, #1735
- fix documentation, #1709
- improve conda clean when directories don't exist, #1808

6.174 3.18.5 (2015-11-11)

- fix bad menuinst exception handling, #1798
- add workaround for unresolved dependencies on Windows

6.175 3.18.4 (2015-11-09)

- allow explicit file to contain MD5 hashsums
- add --md5 option to “conda list --explicit”
- stop infinite recursion during certain resolve operations, #1749
- add dependencies even if strictness == 3, #1766

6.176 3.18.3 (2015-10-15)

- added a pruning step for more efficient solves, #1702
- disallow conda-env to be installed into non-root environment
- improve error output for bad command input, #1706
- pass env name and setup cmd to menuinst, #1699

6.177 3.18.2 (2015-10-12)

- add “conda list --explicit” which contains the URLs of all conda packages to be installed, and can be used with the install/create --file option, #1688
- fix a potential issue in conda clean
- avoid issues with LookupErrors when updating Python in the root environment on Windows
- don’t fetch the index from the network with conda remove
- when installing conda packages directly, “conda install .tar.bz2”, unlink any installed package with that name (not just the installed one)
- allow menu items to be installed in non-root env, #1692

6.178 3.18.1 (2015-09-28)

- fix: removed reference to win_ignore_root in plan module

6.179 3.18.0 (2015-09-28)

- allow Python to be updated in root environment on Windows, #1657
- add defaults to specs after getting pinned specs (allows to pin a different version of Python than what is installed)
- show what older versions are in the solutions in the resolve debug log
- fix some issues with Python 3.5
- respect --no-deps when installing from .tar or .tar.bz2
- avoid infinite recursion with NoPackagesFound and conda update --all --file
- fix conda update --file
- toposort: Added special case to remove ‘pip’ dependency from ‘python’
- show dotlog messages during hint generation with --debug
- disable the max_only heuristic during hint generation
- new version comparison algorithm, which consistently compares any version string, and better handles version strings using things like alpha, beta, rc, post, and dev. This should remove any inconsistent version comparison that would lead to conda installing an incorrect version.
- use the trash in rm_rf, meaning more things will get the benefit of the trash system on Windows

- add the ability to pass the `--file` argument multiple times
- add conda upgrade alias for conda update
- add `update_dependencies` conda rc option and `--update-deps/--no-update-deps` command line flags
- allow specs with conda update `--all`
- add `--show-channel-urls` and `--no-show-channel-urls` command line options
- add `always_copy` conda rc option
- conda clean properly handles multiple envs directories. This breaks backwards compatibility with some of the `--json` output. Some of the old `-json` keys are kept for backwards compatibility.

6.180 3.17.0 (2015-09-11)

- add `windows_forward_slashes` option to `walk_prefix()`, see #1513
- add ability to set `CONDA_FORCE_32BIT` environment variable, it should only be used when running conda-build, #1555
- add `config` option to makes the python dependency on pip optional, #1577
- fix an `UnboundLocalError`
- print note about pinned specs in no packages found error
- allow wildcards in AND-connected version specs
- print pinned specs to the debug log
- fix conda create `--clone` with `create_default_packages`
- give a better error when a proxy isn't found for a given scheme
- enable running 'conda run' in offline mode
- fix issue where hardlinked cache contents were being overwritten
- correctly skip packages whose dependencies can't be found with conda update `--all`
- use clearer terminology in `-m help` text.
- use splitlines to break up multiple lines throughout the codebase
- fix `AttributeError` with `SSL` error

6.181 3.16.0 (2015-08-10)

- rename `binstar` -> `anaconda`, see #1458
- fix `--use-local` when the `conda-bld` directory doesn't exist
- fixed `--offline` option when using "conda create `--clone`", see #1487
- don't mask recursion depth errors
- add conda search `--reverse-dependency`
- check whether hardlinking is available before linking when using "python `install.py` `--link`" directly, see #1490
- don't exit nonzero when installing a package with no dependencies

- check which features are installed in an environment via `track_features`, not `features`
- set the `verify` flag directly on `CondaSession` (fixes conda skeleton not respecting the `ssl_verify` option)

6.182 3.15.1 (2015-07-23)

- fix conda with older versions of `argcomplete`
- restore the `--force-pscheck` option as a no-op for backwards compatibility

6.183 3.15.0 (2015-07-22)

- sort the output of `conda info` package correctly
- enable tab completion of conda command extensions using `argcomplete`. Command extensions that import conda should use `conda.cli.conda_argparse.ArgumentParser` instead of `argparse.ArgumentParser`. Otherwise, they should enable `argcomplete` completion manually.
- allow `psutil` and `pycosat` to be updated in the root environment on Windows
- remove all mentions of `pscheck`. The `--force-pscheck` flag has been removed.
- added support for S3 channels
- fix color issues from `pip` in `conda list` on Windows
- add support for other machine types on Linux, in particular `ppc64le`
- add `non_x86_linux_machines` set to `config` module
- allow `ssl_verify` to accept strings in addition to boolean values in `condarc`
- enable `--set` to work with both boolean and string values

6.184 3.14.1 (2015-06-29)

- make use of `Crypto.Signature.PKCS1_PSS` module, see #1388
- note when features are being used in the unsatisfiable hint

6.185 3.14.0 (2015-06-16)

- add ability to verify signed packages, see #1343 (and `conda-build` #430)
- fix issue when trying to add 'pip' dependency to old python packages
- provide option “`conda info --unsafe-channels`” for getting unobscured channel list, #1374

6.186 3.13.0 (2015-06-04)

- avoid the Windows file lock by moving files to a trash directory, #1133
- handle env dirs not existing in the Environments completer
- rename binstar.org -> anaconda.org, see #1348
- speed up ‘source activate’ by ~40%

6.187 3.12.0 (2015-05-05)

- correctly allow conda to update itself
- print which file leads to the “unable to remove file” error on Windows
- add support for the `no_proxy` environment variable, #1171
- add a much faster hint generation for unsatisfiable packages, which is now always enabled (previously it would not run if there were more than ten specs). The new hint only gives one set of conflicting packages, rather than all sets, so multiple passes may be necessary to fix such issues
- conda extensions that import conda should use `conda.cli.conda_argparser.ArgumentParser` instead of `argparse.ArgumentParser` to conform to the conda help guidelines (e.g., all help messages should be capitalized with periods, and the options should be preceded by “Options:” for the sake of `help2man`).
- add confirmation dialog to conda remove. Fixes conda remove --dry-run.

6.188 3.11.0 (2015-04-22)

- fix issue where forced update on Windows could cause a package to break
- remove detection of running processes that might conflict
- deprecate `--force-pscheck` (now a no-op argument)
- make conda search --outdated --names-only work, fixes #1252
- handle the history file not having read or write permissions better
- make multiple package resolutions warning easier to read
- add `--full-name` to conda list
- improvements to command help

6.189 3.10.1 (2015-04-06)

- fix logic in `@memoized` for unhashable args
- restored json cache of repodata, see #1249
- hide binstar tokens in conda info --json
- handle `CIO_TEST='2'`
- always find the solution with minimal number of packages, even if there are many solutions

- allow comments at the end of the line in requirement files
- don't update the progressbar until after the item is finished running
- add conda/ to HTTP header User-Agent string

6.190 3.10.0 (2015-03-12)

- change default repo urls to be https
- add --offline to conda search
- add --names-only and --full-name to conda search
- add tab completion for packages to conda search

6.191 3.9.1 (2015-02-24)

- pscheck: check for processes in the current environment, see #1157
- don't write to the history file if nothing has changed, see #1148
- conda update --all installs packages without version restrictions (except for Python), see #1138
- conda update --all ignores the anaconda metapackage, see #1138
- use forward slashes for file urls on Windows
- don't symlink conda in the root environment from activate
- use the correct package name in the progress bar info
- use json progress bars for unsatisfiable dependencies hints
- don't let requests decode gz files when downloaded

6.192 3.9.0 (2015-02-16)

- remove (de)activation scripts from conda, those are now in conda-env
- pip is now always added as a Python dependency
- allow conda to be installed into environments which start with _
- add argcomplete tab completion for environments with the -n flag, and for package names with install, update, create, and remove

6.193 3.8.4 (2015-02-03)

- copy (de)activate scripts from conda-env
- Add noarch (sub) directory support

6.194 3.8.3 (2015-01-28)

- simplified how ROOT_PREFIX is obtained in (de)activate

6.195 3.8.2 (2015-01-27)

- add conda clean --source-cache to clean the conda build source caches
- add missing quotes in (de)activate.bat, fixes problem in Windows when conda is installed into a directory with spaces
- fix conda install --copy

6.196 3.8.1 (2015-01-23)

- add missing utf-8 decoding, fixes Python 3 bug when icondata to json file

6.197 3.8.0 (2015-01-22)

- move active script into conda-env, which is now a new dependency
- load the channel urls in the correct order when using concurrent.futures
- add optional 'icondata' key to json files in conda-meta directory, which contain the base64 encoded png file or the icon
- remove a debug print statement

6.198 3.7.4 (2014-12-18)

- add --offline option to install, create, update and remove commands, and also add ability to set "offline: True" in condarc file
- add conda uninstall as alias for conda remove
- add conda info --root
- add conda.pip module
- fix CONDARC pointing to non-existing file, closes issue #961
- make update -f work if the package is already up-to-date
- fix possible TypeError when printing an error message

- link packages in topologically sorted order (so that pre-link scripts can assume that the dependencies are installed)
- add --copy flag to install
- prevent the progressbar from crashing conda when fetching in some situations

6.199 3.7.3 (2014-11-05)

- conda install from a local conda package (or a tar file which contains conda packages), will now also install the dependencies listed by the installed packages.
- add SOURCE_DIR environment variable in pre-link subprocess
- record all created environments in ~/.conda/environments.txt

6.200 3.7.2 (2014-10-31)

- only show the binstar install message once
- print the fetching repodata dot after the repodata is fetched
- write the install and remove specs to the history file
- add '-y' as an alias to '--yes'
- the --file option to conda config now defaults to os.environ.get('CONDARC')
- some improvements to documentation (--help output)
- add user_rc_path and sys_rc_path to conda info --json
- cache the proxy username and password
- avoid warning about conda in pscheck
- make ~/.conda/envs the first user envs dir

6.201 3.7.1 (2014-10-07)

- improve error message for forgetting to use source with activate and deactivate, see issue #601
- don't allow to remove the current environment, see issue #639
- don't fail if binstar_client can't be imported for other reasons, see issue #925
- allow spaces to be contained in conda run
- only show the conda install binstar hint if binstar is not installed
- conda info package_spec now gives detailed info on packages. conda info path has been removed, as it is duplicated by conda package -w path.

6.202 3.7.0 (2014-09-19)

- faster algorithm for `--alt-hint`
- don't allow `channel_alias` with `allow_other_channels: false` if it is set in the system `.condarc`
- don't show long "no packages found" error with `update --all`
- automatically add the Binstar token to urls when the binstar client is installed and logged in
- carefully avoid showing the binstar token or writing it to a file
- be more careful in `conda config` about keys that are the wrong type
- don't expect directories starting with `conda-` to be commands
- no longer recommend to run `conda init` after `pip` installing `conda`. A `pip` installed `conda` will now work without being initialized to create and manage other environments
- the `rm` function on Windows now works around access denied errors
- fix channel urls now showing with `conda list` with `show_channel_urls` set to `true`

6.203 3.6.4 (2014-09-08)

- fix removing packages that aren't in the channels any more
- Pretties output for `--alt-hint`

6.204 3.6.3 (2014-09-04)

- skip packages that can't be found with `update --all`
- add `--use-local` to search and remove
- allow `--use-local` to be used along with `-c` (`--channels`) and `--override-channels`. `--override-channels` now requires either `-c` or `--use-local`
- allow paths in `has_prefix` to be quoted, to allow for spaces in paths on Windows
- retain Unix style path separators for prefixes in `has_prefix` on Windows (if the placeholder path uses `/`, replace it with a path that uses `/`, not `\`)
- fix bug in `--use-local` due to API changes in `conda-build`
- include user site directories in `conda info -s`
- make binary `has_prefix` replacement work with spaces after the prefix
- make binary `has_prefix` replacement replace multiple occurrences of the placeholder in the same null-terminated string
- don't show packages from other platforms as installed or cached in `conda search`
- be more careful about not warning about `conda` itself in `pscheck`
- Use a progress bar for the unsatisfiable packages hint generation
- Don't use `TemporaryFile` in `try_write`, as it is too slow when it fails
- Ignore `InsecureRequestWarning` when `ssl_verify` is `False`

- conda remove removes features tracked by removed packages in track_features

6.205 3.6.2 (2014-08-20)

- add --use-index-cache to conda remove
- fix a bug where features (like mkl) would be selected incorrectly
- use concurrent.futures.ThreadPool to fetch package metadata asynchronously in Python 3.
- do the retries in rm_rf on every platform
- use a higher cutoff for package name misspellings
- allow changing default channels in “system” .condarc

6.206 3.6.1 (2014-08-13)

- add retries to download in fetch module
- improved error messages for missing packages
- more robust rm_rf on Windows
- print multiline help for subcommands correctly

6.207 3.6.0 (2014-08-11)

- correctly check if a package can be hard-linked if it isn't extracted yet
- change how the package plan is printed to better show what is new, updated, and downgraded
- use suggest_normalized_version in the resolve module. Now versions like 1.0alpha that are not directly recognized by verlib's NormalizedVersion are supported better
- conda run command, to run apps and commands from packages
- more complete --json API. Every conda command should fully support --json output now.
- show the conda_build and requests versions in conda info
- include packages from [setup.py](#) develop in conda list (with use_pip)
- raise a warning instead of dying when the history file is invalid
- use urllib.quote on the proxy password
- make conda search --outdated --canonical work
- pin the Python version during conda init
- fix some metadata that is written for Python during conda init
- allow comments in a pinned file
- allow installing and updating menuinst on Windows
- allow conda create with both --file and listed packages
- better handling of some nonexistent packages

- fix command line flags in conda package
- fix a bug in the ftp adapter

6.208 3.5.5 (2014-06-10)

- remove another instance pycosat version detection, which fails on Windows, see issue #761

6.209 3.5.4 (2014-06-10)

- remove pycosat version detection, which fails on Windows, see issue #761

6.210 3.5.3 (2014-06-09)

- fix conda update to correctly not install packages that are already up-to-date
- always fail with connection error in download
- the package resolution is now much faster and uses less memory
- add ssl_verify option in condarc to allow ignoring SSL certificate verification, see issue #737

6.211 3.5.2 (2014-05-27)

- fix bug in activate.bat and deactivate.bat on Windows

6.212 3.5.1 (2014-05-26)

- fix proxy support - conda now prompts for proxy username and password again
- fix activate.bat on Windows with spaces in the path
- update optional psutil dependency was updated to psutil 2.0 or higher

6.213 3.5.0 (2014-05-15)

- replace use of urllib2 with requests. requests is now a hard dependency of conda.
- add ability to only allow system-wise specified channels
- hide binstar from output of conda info

6.214 3.4.3 (2014-05-05)

- allow prefix replacement in binary files, see issue #710
- check if creating hard link is possible and otherwise copy, during install
- allow circular dependencies

6.215 3.4.2 (2014-04-21)

- conda clean --lock: skip directories that don't exist, fixes #648
- fixed empty history file causing crash, issue #644
- remove timezone information from history file, fixes issue #651
- fix PackagesNotFound error for missing recursive dependencies
- change the default for adding cache from the local package cache - known is now the default and the option to use index metadata from the local package cache is --unknown
- add --alt-hint as a method to get an alternate form of a hint for unsatisfiable packages
- add conda package --ls-files to list files in a package
- add ability to pin specs in an environment. To pin a spec, add a file called pinned to the environment's conda-meta directory with the specs to pin. Pinned specs are always kept installed, unless the --no-pin flag is used.
- fix keyboard interrupting of external commands. Now keyboard interrupting conda build correctly removes the lock file
- add no_link ability to conda, see issue #678

6.216 3.4.1 (2014-04-07)

- always use a pkgs cache directory associated with an envs directory, even when using -p option with an arbitrary a prefix which is not inside an envs dir
- add setting of PYTHONHOME to conda info --system
- skip packages with bad metadata

6.217 3.4.0 (2014-04-02)

- added revision history to each environment:
 - conda list --revisions
 - conda install --revision
 - log is stored in conda-meta/history
- allow parsing pip-style requirement files with --file option and in command line arguments, e.g. conda install 'numpy>=1.7', issue #624
- fix error message for --file option when file does not exist
- allow DEFAULTS in CONDA_ENVS_PATH, which expands to the defaults settings, including the condarc file

- don't install a package with a feature (like mkl) unless it is specifically requested (i.e., that feature is already enabled in that environment)
- add ability to show channel URLs when displaying what is going to be downloaded by setting "show_channel_urls: True" in condaarc
- fix the --quiet option
- skip packages that have dependencies that can't be found

6.218 3.3.2 (2014-03-24)

- fix the --file option
- check install arguments before fetching metadata
- fix a printing glitch with the progress bars
- give a better error message for conda clean with no arguments
- don't include unknown packages when searching another platform

6.219 3.3.1 (2014-03-19)

- Fix setting of PS1 in activate.
- Add conda update --all.
- Allow setting CONDA_RC=' ' to use no condaarc.
- Add conda clean --packages.
- Don't include bin/conda, bin/activate, or bin/deactivate in conda package.

6.220 3.3.0 (2014-03-18)

- allow new package specification, i.e. ==, >=, >, <=, <, != separated by ',' for example: >=2.3,<3.0
- add ability to disable self update of conda, by setting "self_update: False" in .condaarc
- Try installing packages using the old way of just installing the maximum versions of things first. This provides a major speedup of solving the package specifications in the cases where this scheme works.
- Don't include python=3.3 in the specs automatically for the Python 3 version of conda. This allows you to do "conda create -n env package" for a package that only has a Python 2 version without specifying "python=2". This change has no effect in Python 2.
- Automatically put symlinks to conda, activate, and deactivate in each environment on Unix.
- On Unix, activate and deactivate now remove the root environment from the PATH. This should prevent "bleed through" issues with commands not installed in the activated environment but that are installed in the root environment. If you have "setup.py develop" installed conda on Unix, you should run this command again, as the activate and deactivate scripts have changed.
- Begin work to support Python 3.4.
- Fix a bug in version comparison

- Fix usage of sys.stdout and sys.stderr in environments like pythonw on Windows where they are nonstandard file descriptors.

6.221 3.2.1 (2014-03-12)

- fix installing packages with irrational versions
- fix installation in the api
- use a logging handler to print the dots

6.222 3.2.0 (2014-03-11)

- print dots to the screen for progress
- move logic functions from resolve to logic module

6.223 3.2.0a1 (2014-03-07)

- conda now uses pseudo-boolean constraints in the SAT solver. This allows it to search for all versions at once, rather than only the latest (issue #491).
- Conda contains a brand new logic submodule for converting pseudo-boolean constraints into SAT clauses.

6.224 3.1.1 (2014-03-07)

- check if directory exists, fixed issue #591

6.225 3.1.0 (2014-03-07)

- local packages in cache are now added to the index, this may be disabled by using the --known option, which only makes conda use index metadata from the known remote channels
- add --use-index-cache option to enable using cache of channel index files
- fix ownership of files when installing as root on Linux
- conda search: add '.' symbol for extracted (cached) packages

6.226 3.0.6 (2014-02-20)

- fix ‘conda update’ taking build number into account

6.227 3.0.5 (2014-02-17)

- allow packages from `create_default_packages` to be overridden from the command line
- fixed typo `install.py`, issue #566
- try to prevent accidentally installing into a non-root conda environment

6.228 3.0.4 (2014-02-14)

- conda update: don’t try to update packages that are already up-to-date

6.229 3.0.3 (2014-02-06)

- improve the speed of `clean --lock`
- some fixes to conda config
- more tests added
- choose the first solution rather than the last when there are more than one, since this is more likely to be the one you want.

6.230 3.0.2 (2014-02-03)

- fix detection of prefix being writable

6.231 3.0.1 (2014-01-31)

- bug: not having `track_features` in `condarc` now uses default again
- improved test suite
- remove numpy version being treated special in plan module
- if the `post-link.(bat|sh)` fails, don’t treat it as though it installed, i.e. it is not added to `conda-meta`
- fix activate if `CONDA_DEFAULT_ENV` is invalid
- fix conda config `--get` to work with list keys again
- print the total download size
- fix a bug that was preventing conda from working in Python 3
- add ability to run pre-link script, issue #548

6.232 3.0.0 (2014-01-24)

- removed build, convert, index, and skeleton commands, which are now part of the conda-build project: <https://github.com/conda/conda-build>
- limited pip integration to `conda list`, that means `conda install` no longer calls `pip install` # !!!
- add ability to call sub-commands named ‘conda-x’
- The `-c` flag to `conda search` is now shorthand for `--channel`, not `--canonical` (this is to be consistent with other conda commands)
- allow changing location of `.condarc` file using the `CONDARC` environment variable
- `conda search` now shows the channel that the package comes from
- `conda search` has a new `--platform` flag for searching for packages in other platforms.
- remove `condarc` warnings: issue #526#issuecomment-33195012

6.233 2.3.1 (2014-01-17)

- add ability create `info/no_softlink`
- add `conda convert` command to convert non-platform-dependent packages from one platform to another (experimental)
- unify create, install, and update code. This adds many features to create and update that were previously only available to install. A backwards incompatible change is that `conda create -f` now means `--force`, not `--file`.

6.234 2.3.0 (2014-01-16)

- automatically prepend <http://conda.binstar.org/> (or the value of `channel_alias` in the `.condarc` file) to channels whenever the channel is not a URL or the word ‘defaults’ or ‘system’
- recipes made with the `skeleton pypi` command will use `setuptools` instead of `distribute`
- re-work the `setuptools` dependency and `entry_point` logic so that non `console_script` `entry_points` for packages with a dependency on `setuptools` will get correct build script with `conda skeleton pypi`
- add `-m`, `--mkdir` option to `conda install`
- add ability to disable soft-linking

6.235 2.2.8 (2014-01-06)

- add check for `chrpath` (on Linux) before build is started, see issue #469
- `conda build`: fixed ELF headers not being recognized on Python 3
- fixed issues: #467, #476

6.236 2.2.7 (2014-01-02)

- fixed bug in conda build related to lchmod not being available on all platforms

6.237 2.2.6 (2013-12-31)

- fix test section for automatic recipe creation from pypi using `--build-recipe`
- minor Py3k fixes for conda build on Linux
- copy symlinks as symlinks, issue #437
- fix explicit install (e.g. from output of `conda list -e`) in root env
- add pyyaml to the list of packages which can not be removed from root environment
- fixed minor issues: #365, #453

6.238 2.2.5 (2013-12-17)

- conda build: move broken packages to conda-bld/broken
- conda config: automatically add the 'defaults' channel
- conda build: improve error handling for invalid recipe directory
- add ability to set build string, issue #425
- fix LD_RUN_PATH not being set on Linux under Python 3, see issue #427, thanks peter1000

6.239 2.2.4 (2013-12-10)

- add support for execution with the `-m` switch (issue #398), i.e. you can execute conda also as: `python -m conda`
- add a deactivate script for windows
- conda build adds `.pth`-file when it encounters an egg (TODO)
- add ability to preserve egg directory when building using `build/preserve_egg_dir: True`
- allow `track_features` in `~/.condarc`
- Allow arbitrary source, issue #405
- fixed minor issues: #393, #402, #409, #413

6.240 2.2.3 (2013-12-03)

- add “foreign mode”, i.e. disallow install of certain packages when using a “foreign” Python, such as the system Python
- remove activate/deactivate from source tarball created by [sdist.sh](#), in order to not overwrite activate script from virtualenvwrapper

6.241 2.2.2 (2013-11-27)

- remove ARCH environment variable for being able to change architecture
- add PKG_NAME, PKG_VERSION to environment when running [build.sh](#), [.-post-link.sh](#) and [.-pre-unlink.sh](#)

6.242 2.2.1 (2013-11-15)

- minor fixes related to make conda pip installable
- generated conda meta-data missing ‘files’ key, fixed issue #357

6.243 2.2.0 (2013-11-14)

- add conda init command, to allow installing conda via pip
- fix prefix being replaced by placeholder after conda build on Unix
- add ‘use_pip’ to condarc configuration file
- fixed activate on Windows to set CONDA_DEFAULT_ENV
- allow setting “always_yes: True” in condarc file, which implies always using the --yes option whenever asked to proceed

6.244 2.1.0 (2013-11-07)

- fix rm_egg_dirs so that the .egg_info file can be a zip file
- improve integration with pip
 - conda list now shows pip installed packages
 - conda install will try to install via “pip install” if no conda package is available (unless --no-pip is provided)
 - conda build has a new --build-recipe option which will create a recipe (stored in /conda-recipes) from pypi then build a conda package (and install it)
 - pip list and pip install only happen if pip is installed
- enhance the locking mechanism so that conda can call itself in the same process.

6.245 2.0.4 (2013-11-04)

- ensure lowercase name when generating package info, fixed issue #329
- on Windows, handle the .nonadmin files

6.246 2.0.3 (2013-10-28)

- update bundle format
- fix bug when displaying packages to be downloaded (thanks Crystal)

6.247 2.0.2 (2013-10-27)

- add --index-cache option to clean command, see issue #321
- use RPATH (instead of RUNPATH) when building packages on Linux

6.248 2.0.1 (2013-10-23)

- add --no-prompt option to conda skeleton pypi
- add create_default_packages to condarc (and --no-default-packages option to create command)

6.249 2.0.0 (2013-10-01)

- added user/root mode and ability to soft-link across filesystems
- added create --clone option for copying local environments
- fixed behavior when installing into an environment which does not exist yet, i.e. an error occurs
- fixed install --no-deps option
- added --export option to list command
- allow building of packages in “user mode”
- regular environment locations now used for build and test
- add ability to disallow specification names
- add ability to read help messages from a file when install location is RO
- restore backwards compatibility of share/clone for conda-api
- add new conda bundle command and format
- pass ARCH environment variable to build scripts
- added progress bar to source download for conda build, issue #230
- added ability to use url instead of local file to conda install --file and conda create --file options

6.250 1.9.1 (2013-09-06)

- fix bug in new caching of repodata index

6.251 1.9.0 (2013-09-05)

- add caching of repodata index
- add activate command on Windows
- add conda package --which option, closes issue 163
- add ability to install file which contains multiple packages, issue 256
- move conda share functionality to conda package --share
- update documentation
- improve error messages when external dependencies are unavailable
- add implementation for issue 194: post-link or pre-unlink may append to a special file \${PREFIX}/.messages.txt for messages, which is display to the user's console after conda completes all actions
- add conda search --outdated option, which lists only installed packages for which newer versions are available
- fixed numerous Py3k issues, in particular with the build command

6.252 1.8.2 (2013-08-16)

- add conda build --check option
- add conda clean --lock option
- fixed error in recipe causing conda traceback, issue 158
- fixes conda build error in Python 3, issue 238
- improve error message when test command fails, as well as issue 229
- disable Python (and other packages which are used by conda itself) to be updated in root environment on Windows
- simplified locking, in particular locking should never crash conda when files cannot be created due to permission problems

6.253 1.8.1 (2013-08-07)

- fixed conda update for no arguments, issue 237
- fix setting prefix before calling should_do_win_subprocess() part of issue 235
- add basic subversion support when building
- add --output option to conda build

6.254 1.8.0 (2013-07-31)

- add Python 3 support (thanks almarklein)
- add Mercurial support when building from source (thanks delicb)
- allow Python (and other packages which are used by conda itself) to be updated in root environment on Windows
- add conda config command
- add conda clean command
- removed the conda pip command
- improve locking to be finer grained
- made activate/deactivate work with zsh (thanks to mika-fischer)
- allow conda build to take tarballs containing a recipe as arguments
- add PKG_CONFIG_PATH to build environment variables
- fix entry point scripts pointing to wrong python when building Python 3 packages
- allow source/sha1 in meta.yaml, issue 196
- more informative message when there are unsatisfiable package specifications
- ability to set the proxy urls in condarc
- conda build asks to upload to binstar. This can also be configured by changing binstar_upload in condarc.
- basic tab completion if the argcomplete package is installed and eval “\$(register-python-argcomplete conda)” is added to the bash profile.

6.255 1.7.2 (2013-07-02)

- fixed conda update when packages include a post-link step which was caused by subprocess being lazily imported, fixed by 0d0b860
- improve error message when ‘chrpath’ or ‘patch’ is not installed and needed by build framework
- fixed sharing/cloning being broken (issue 179)
- add the string LOCKERROR to the conda lock error message

6.256 1.7.1 (2013-06-21)

- fix “executable” not being found on Windows when ending with .bat when launching application
- give a better error message from when a repository does not exist

6.257 1.7.0 (2013-06-20)

- allow \${PREFIX} in app_entry
- add binstar upload information after conda build finishes

6.258 1.7.0a2 (2013-06-20)

- add global conda lock file for only allowing one instance of conda to run at the same time
- add conda skeleton command to create recipes from PyPI
- add ability to run post-link and pre-unlink script

6.259 1.7.0a1 (2013-06-13)

- add ability to build conda packages from “recipes”, using the conda build command, for some examples, see: <https://github.com/ContinuumIO/conda-recipes>
- fixed bug in conda install --force
- conda update command no longer uses anaconda as default package name
- add proxy support
- added application API to conda.api module
- add -c/--channel and --override-channels flags (issue 121).
- add default and system meta-channels, for use in .condarc and with -c (issue 122).
- fixed ability to install ipython=0.13.0 (issue 130)

6.260 1.6.0 (2013-06-05)

- update package command to reflect changes in repodata
- fixed refactoring bugs in share/clone
- warn when anaconda processes are running on install in Windows (should fix most permissions errors on Windows)

6.261 1.6.0rc2 (2013-05-31)

- conda with no arguments now prints help text (issue 111)
- don't allow removing conda from root environment
- conda update python does no longer update to Python 3, also ensure that conda itself is always installed into the root environment (issue 110)

6.262 1.6.0rc1 (2013-05-30)

- major internal refactoring
- use new “depends” key in repodata
- uses pycosat to solve constraints more efficiently
- add hard-linking on Windows
- fixed linking across filesystems (issue 103)
- add conda remove --features option
- added more tests, in particular for new dependency resolver
- add internal DSL to perform install actions
- add package size to download preview
- add conda install --force and --no-deps options
- fixed conda help command
- add conda remove --all option for removing entire environment
- fixed source activate on systems where sourcing a gives “bash” as \$0
- add information about installed versions to conda search command
- removed known “locations”
- add output about installed packages when update and install do nothing
- changed default when prompted for y/n in CLI to yes

6.263 1.5.2 (2013-04-29)

- fixed issue 59: bad error message when pkgs dir is not writable

6.264 1.5.1 (2013-04-19)

- fixed issue 71 and (73 duplicate): not being able to install packages starting with conda (such as ‘conda-api’)
- fixed issue 69 (not being able to update Python / NumPy)
- fixed issue 76 (cannot install mkl on OSX)

6.265 1.5.0 (2013-03-22)

- add conda share and clone commands
- add (hidden) --output-json option to clone, share and info commands to support the conda-api package
- add repo sub-directory type ‘linux-armv6l’

6.266 1.4.6 (2013-03-12)

- fixed channel selection (issue #56)

6.267 1.4.5 (2013-03-11)

- fix issue #53 with install for meta packages
- add `-q/--quiet` option to update command

6.268 1.4.4 (2013-03-09)

- use numpy 1.7 as default on all platforms

6.269 1.4.3 (2013-03-09)

- fixed bug in `conda.builder.share.clone_bundle()`

6.270 1.4.2 (2013-03-08)

- feature selection fix for update
- Windows: don't allow linking or unlinking python from the root environment because the file lock, see issue #42

6.271 1.4.1 (2013-03-07)

- fix some feature selection bugs
- never exit in activate and deactivate
- improve help and error messages

6.272 1.4.0 (2013-03-05)

- fixed `conda pip NAME==VERSION`
- added `conda info --license` option
- add source activate and deactivate commands
- rename the old activate and deactivate to link and unlink
- add ability for environments to track “features”
- add ability to distinguish conda build packages from Anaconda packages by adding a “file_hash” meta-data field in `info/index.json`
- add `conda.builder.share` module

6.273 1.3.5 (2013-02-05)

- fixed detecting untracked files on Windows
- removed backwards compatibility to conda 1.0 version

6.274 1.3.4 (2013-01-28)

- fixed conda installing itself into environments (issue #10)
- fixed non-existing channels being silently ignored (issue #12)
- fixed trailing slash in ~/.condarc file cause crash (issue #13)
- fixed conda list not working when ~/.condarc is missing (issue #14)
- fixed conda install not working for Python 2.6 environment (issue #17)
- added simple first cut implementation of remove command (issue #11)
- pip, build commands: only package up new untracked files
- allow a system-wide <sys.prefix>/condarc (~/.condarc takes precedence)
- only add pro channel is no condarc file exists (and license is valid)

6.275 1.3.3 (2013-01-23)

- fix conda create not filtering channels correctly
- remove (hidden) --test and --testgui options

6.276 1.3.2 (2013-01-23)

- fix deactivation of packages with same build number note that conda upgrade did not suffer from this problem, as was using separate logic

6.277 1.3.1 (2013-01-22)

- fix bug in conda update not installing new dependencies

6.278 1.3.0 (2013-01-22)

- added conda package command
- added conda index command
- added -c, --canonical option to list and search commands
- fixed conda --version on Windows
- add this changelog

6.279 1.2.1 (2012-11-21)

- remove ambiguity from conda update command

6.280 1.2.0 (2012-11-20)

- “conda upgrade” now updates from AnacondaCE to Anaconda (removed upgrade2pro)
- add versioneer

6.281 1.1.0 (2012-11-13)

- Many new features implemented by Bryan

6.282 1.0.0 (2012-09-06)

- initial release

PYTHON MODULE INDEX

C

- conda, 231
- conda.__main__, 231
- conda.__version__, 231
- conda._vendor, 231
- conda._vendor.appdirs, 231
- conda._vendor.boltons, 235
- conda._vendor.boltons.setutils, 235
- conda._vendor.boltons.timeutils, 239
- conda._vendor.cpuinfo, 246
- conda._vendor.cpuinfo.cpuinfo, 246
- conda._vendor.distro, 257
- conda._vendor.frozendict, 266
- conda._vendor.toolz, 267
- conda._vendor.toolz.compatibility, 267
- conda._vendor.toolz.dicttoolz, 268
- conda._vendor.toolz.itertoolz, 272
- conda._vendor.toolz.recipes, 283
- conda._vendor.toolz.utils, 283
- conda._vendor.tqdm, 284
- conda._vendor.tqdm.__main__, 284
- conda._vendor.tqdm._main, 284
- conda._vendor.tqdm._monitor, 285
- conda._vendor.tqdm._tqdm, 285
- conda._vendor.tqdm._utils, 291
- conda._vendor.tqdm.asyncio, 291
- conda._vendor.tqdm.auto, 292
- conda._vendor.tqdm.cli, 297
- conda._vendor.tqdm.std, 297
- conda._vendor.tqdm.utils, 302
- conda._vendor.tqdm.version, 306
- conda.activate, 312
- conda.api, 317
- conda.auxlib, 322
- conda.auxlib.collection, 323
- conda.auxlib.compat, 324
- conda.auxlib.decorators, 325
- conda.auxlib.entity, 328
- conda.auxlib.exceptions, 339
- conda.auxlib.ish, 340
- conda.auxlib.logz, 340
- conda.auxlib.packaging, 343
- conda.auxlib.type_coercion, 345
- conda.base, 347
- conda.base.constants, 348
- conda.base.context, 353
- conda.base.exceptions, 360
- conda.cli, 361
- conda.cli.common, 361
- conda.cli.conda_argparse, 362
- conda.cli.find_commands, 368
- conda.cli.install, 369
- conda.cli.main, 370
- conda.cli.main_clean, 370
- conda.cli.main_compare, 372
- conda.cli.main_config, 372
- conda.cli.main_create, 373
- conda.cli.main_info, 373
- conda.cli.main_init, 374
- conda.cli.main_install, 374
- conda.cli.main_list, 375
- conda.cli.main_notices, 375
- conda.cli.main_package, 376
- conda.cli.main_pip, 377
- conda.cli.main_remove, 377
- conda.cli.main_rename, 378
- conda.cli.main_run, 378
- conda.cli.main_search, 378
- conda.cli.main_update, 379
- conda.cli.python_api, 379
- conda.common, 381
- conda.common._logic, 381
- conda.common._os, 385
- conda.common._os.linux, 385
- conda.common._os.unix, 385
- conda.common._os.windows, 385
- conda.common.compat, 387
- conda.common.configuration, 389
- conda.common.constants, 398
- conda.common.cuda, 398
- conda.common.decorators, 399
- conda.common.disk, 399
- conda.common.io, 399
- conda.common.iterators, 404

- conda.common.logic, 404
- conda.common.path, 407
- conda.common.pkg_formats, 411
- conda.common.pkg_formats.python, 411
- conda.common.serialize, 419
- conda.common.signals, 420
- conda.common.toposort, 421
- conda.common.url, 421
- conda.core, 427
- conda.core.envs_manager, 427
- conda.core.index, 428
- conda.core.initialize, 429
- conda.core.link, 434
- conda.core.package_cache, 437
- conda.core.package_cache_data, 437
- conda.core.path_actions, 440
- conda.core.portability, 445
- conda.core.prefix_data, 446
- conda.core.solve, 448
- conda.core.subdir_data, 451
- conda.deprecations, 453
- conda.exception_handler, 455
- conda.exceptions, 456
- conda.exports, 462
- conda.gateways, 466
- conda.gateways.anaconda_client, 467
- conda.gateways.connection, 467
- conda.gateways.connection.adapters, 467
- conda.gateways.connection.adapters.ftp, 467
- conda.gateways.connection.adapters.localfs, 470
- conda.gateways.connection.adapters.s3, 470
- conda.gateways.connection.download, 471
- conda.gateways.connection.session, 472
- conda.gateways.disk, 474
- conda.gateways.disk.create, 474
- conda.gateways.disk.delete, 476
- conda.gateways.disk.link, 477
- conda.gateways.disk.permissions, 477
- conda.gateways.disk.read, 478
- conda.gateways.disk.test, 479
- conda.gateways.disk.update, 480
- conda.gateways.logging, 481
- conda.gateways.repodata, 483
- conda.gateways.repodata.jlap, 483
- conda.gateways.repodata.jlap.core, 483
- conda.gateways.repodata.jlap.fetch, 485
- conda.gateways.repodata.jlap.interface, 487
- conda.gateways.repodata.lock, 488
- conda.gateways.subprocess, 496
- conda.history, 497
- conda.instructions, 499
- conda.lock, 501
- conda.misc, 503
- conda.models, 504
- conda.models.channel, 504
- conda.models.dist, 506
- conda.models.enums, 509
- conda.models.leased_path_entry, 512
- conda.models.match_spec, 512
- conda.models.package_info, 519
- conda.models.prefix_graph, 520
- conda.models.records, 522
- conda.models.version, 529
- conda.notices, 534
- conda.notices.cache, 534
- conda.notices.core, 536
- conda.notices.fetch, 537
- conda.notices.types, 538
- conda.notices.views, 539
- conda.plan, 540
- conda.plugins, 542
- conda.plugins.hookspec, 542
- conda.plugins.manager, 545
- conda.plugins.solvers, 546
- conda.plugins.subcommands, 546
- conda.plugins.subcommands.doctor, 546
- conda.plugins.subcommands.doctor.cli, 546
- conda.plugins.subcommands.doctor.health_checks, 547
- conda.plugins.types, 548
- conda.plugins.virtual_packages, 550
- conda.plugins.virtual_packages.archspec, 550
- conda.plugins.virtual_packages.cuda, 550
- conda.plugins.virtual_packages.freebsd, 551
- conda.plugins.virtual_packages.linux, 551
- conda.plugins.virtual_packages.osx, 551
- conda.plugins.virtual_packages.windows, 551
- conda.resolve, 554
- conda.testing, 557
- conda.testing.cases, 557
- conda.testing.fixtures, 558
- conda.testing.gateways, 559
- conda.testing.gateways.fixtures, 559
- conda.testing.helpers, 559
- conda.testing.integration, 562
- conda.testing.notices, 565
- conda.testing.notices.fixtures, 565
- conda.testing.notices.helpers, 566
- conda.testing.solver_helpers, 567
- conda.trust, 572
- conda.trust.constants, 572
- conda.trust.signature_verification, 572
- conda.utils, 573
- conda_env, 577
- conda_env.__main__, 577
- conda_env.cli, 577
- conda_env.cli.common, 577

- conda_env.cli.main, [578](#)
- conda_env.cli.main_config, [578](#)
- conda_env.cli.main_create, [579](#)
- conda_env.cli.main_export, [581](#)
- conda_env.cli.main_list, [581](#)
- conda_env.cli.main_remove, [582](#)
- conda_env.cli.main_update, [583](#)
- conda_env.cli.main_vars, [584](#)
- conda_env.env, [586](#)
- conda_env.installers, [588](#)
- conda_env.installers.base, [588](#)
- conda_env.installers.conda, [588](#)
- conda_env.installers.pip, [589](#)
- conda_env.pip_util, [589](#)
- conda_env.specs, [590](#)
- conda_env.specs.binstar, [590](#)
- conda_env.specs.requirements, [591](#)
- conda_env.specs.yaml_file, [592](#)

Symbols

- `_Action` (class in `conda.core.path_actions`), 441
- `_Activator` (class in `conda.activate`), 313
- `_BOUNDS` (in module `conda._vendor.boltons.timeutils`), 241
- `_BOUND_DELTAS` (in module `conda._vendor.boltons.timeutils`), 241
- `_ClauseArray` (class in `conda.common._logic`), 382
- `_ClauseList` (class in `conda.common._logic`), 382
- `_DISTRO_RELEASE_BASENAME_PATTERN` (in module `conda._vendor.distro`), 259
- `_DISTRO_RELEASE_CONTENT_REVERSED_PATTERN` (in module `conda._vendor.distro`), 259
- `_DISTRO_RELEASE_IGNORE_BASENAMES` (in module `conda._vendor.distro`), 259
- `_DUMPS` (in module `conda.auxlib.logz`), 342
- `_EXTS` (in module `conda.cli.main_clean`), 371
- `_FLOAT_PATTERN` (in module `conda._vendor.boltons.timeutils`), 241
- `_FORMATTER` (in module `conda.common.io`), 401
- `_FeaturesField` (class in `conda.models.records`), 524
- `_GreedySubParsersAction` (class in `conda.cli.conda_argparse`), 365
- `_MATCHER_CACHE` (*MatchSpec* attribute), 515
- `_NONDIGIT_RE` (in module `conda._vendor.boltons.timeutils`), 241
- `_OS_RELEASE_BASENAME` (in module `conda._vendor.distro`), 259
- `_PARSE_CACHE` (in module `conda.models.match_spec`), 517
- `_PARSE_TD_KW_MAP` (in module `conda._vendor.boltons.timeutils`), 241
- `_PARSE_TD_RE` (in module `conda._vendor.boltons.timeutils`), 241
- `_PaddingError`, 445
- `_PyCryptoSatSolver` (class in `conda.common._logic`), 383
- `_PySatSolver` (class in `conda.common._logic`), 383
- `_PycoSatSolver` (class in `conda.common._logic`), 383
- `_RE_CUSTOM_EXPANDVARS` (in module `conda.common.configuration`), 397
- `_RE_UNSAFE` (in module `conda.utils`), 575
- `_SatSolver` (class in `conda.common._logic`), 383
- `_SignatureVerification` (class in `conda.trust.signature_verification`), 573
- `_StrMatchMixin` (class in `conda.models.match_spec`), 517
- `_UNIXCONFDIR` (in module `conda._vendor.distro`), 259
- `_VERSION_REGEX` (in module `conda.common.path`), 409
- `__aiter__` () (*tqdm_asyncio* method), 291
- `__anext__` () (*tqdm_asyncio* method), 291
- `__author__` (in module `conda`), 576
- `__author__` (in module `conda.auxlib`), 347
- `__bool__` () (*Channel* method), 493, 506
- `__bool__` () (*tqdm* method), 288, 295, 300, 310
- `__call__` () (*ChannelPriorityMeta* method), 352
- `__call__` () (*ChannelType* method), 505
- `__call__` () (*CondaCLIFixture* method), 571
- `__call__` () (*CondaHttpAuth* method), 473
- `__call__` () (*CondaSessionType* method), 473
- `__call__` () (*ContextDecorator* method), 401
- `__call__` () (*DeprecationHandler* method), 453
- `__call__` () (*DistType* method), 507
- `__call__` () (*ExceptionHandler* method), 455
- `__call__` () (*ExtendConstAction* method), 367
- `__call__` () (*MatchSpecType* method), 513
- `__call__` () (*NullCountAction* method), 366
- `__call__` () (*PackageCacheType* method), 438
- `__call__` () (*PathFactoryFixture* method), 571
- `__call__` () (*PrefixDataType* method), 447
- `__call__` () (*SingleStrArgCachingType* method), 530
- `__call__` () (*SubdirDataType* method), 451
- `__call__` () (*TmpEnvFixture* method), 572
- `__call__` () (*_GreedySubParsersAction* method), 365
- `__call__` () (*_SignatureVerification* method), 573
- `__call__` () (*excepts* method), 284
- `__call__` () (*memoized* method), 465
- `__call__` () (*time_recorder* method), 404
- `__contains__` () (*Completer* method), 465
- `__contains__` () (*Dist* method), 509
- `__contains__` () (*IndexedSet* method), 236
- `__contains__` () (*MatchSpec* method), 516
- `__contains__` () (*UrlsData* method), 439
- `__contains__` () (*frozendict* method), 267

`__copyright__` (in module `conda`), 576
`__copyright__` (in module `conda.auxlib`), 347
`__del__` () (*TemporaryDirectory* method), 475
`__del__` () (*tqdm* method), 288, 295, 300, 310
`__delattr__` () (*ImmutableEntity* method), 338
`__delete__` () (*Field* method), 334
`__dump_fields` () (*Entity* class method), 338
`__email__` (in module `conda`), 576
`__email__` (in module `conda.auxlib`), 347
`__enter__` () (*FileLock* method), 502
`__enter__` () (*History* method), 498
`__enter__` () (*Spinner* method), 402
`__enter__` () (*SwallowBrokenPipe* method), 401
`__enter__` () (*TemporaryDirectory* method), 475
`__enter__` () (*TmpDownload* method), 472
`__enter__` () (*time_recorder* method), 404
`__enter__` () (*tqdm* method), 288, 295, 300, 310
`__eq__` () (*BaseSpec* method), 533
`__eq__` () (*Channel* method), 492, 505
`__eq__` () (*Comparable* method), 304
`__eq__` () (*DisableOnWriteError* method), 305
`__eq__` () (*Dist* method), 509
`__eq__` () (*Entity* method), 338
`__eq__` () (*FeatureMatch* method), 518
`__eq__` () (*IndexedSet* method), 236
`__eq__` () (*LoadedParameter* method), 392
`__eq__` () (*MatchSpec* method), 516
`__eq__` () (*PackageRecord* method), 527
`__eq__` () (*PrimitiveLoadedParameter* method), 393
`__eq__` () (*ProgressiveFetchExtract* method), 439
`__eq__` () (*SimpleTextIOWrapper* method), 305
`__eq__` () (*SplitStrMatch* method), 518
`__eq__` () (*VersionOrder* method), 532
`__eq__` () (*_StrMatchMixin* method), 517
`__exit__` () (*FileLock* method), 502
`__exit__` () (*History* method), 498
`__exit__` () (*Spinner* method), 402
`__exit__` () (*SwallowBrokenPipe* method), 401
`__exit__` () (*TemporaryDirectory* method), 475
`__exit__` () (*TmpDownload* method), 472
`__exit__` () (*time_recorder* method), 404
`__exit__` () (*tqdm* method), 288, 295, 300, 310
`__fields__` (*Entity* attribute), 338
`__format__` () (*FormatReplace* method), 304
`__ge__` () (*Comparable* method), 304
`__ge__` () (*Dist* method), 508
`__ge__` () (*VersionOrder* method), 532
`__get__` () (*ChannelField* method), 525
`__get__` () (*Field* method), 334
`__get__` () (*FilenameField* method), 525
`__get__` () (*Md5Field* method), 528
`__get__` () (*PackageTypeField* method), 526
`__get__` () (*ParameterLoader* method), 397
`__get__` () (*SubdirField* method), 525
`__get__` () (*TimestampField* method), 524
`__get__` () (*classproperty* method), 328
`__getattr__` () (*ObjectWrapper* method), 304
`__getattr__` () (*ProgressFileWrapper* method), 475
`__getattr__` () (*StdStreamHandler* method), 483
`__getitem__` () (*IndexedSet* method), 237
`__getitem__` () (*PackageRecordList* method), 451
`__getitem__` () (*frozendict* method), 267
`__gt__` () (*Comparable* method), 304
`__gt__` () (*Dist* method), 508
`__gt__` () (*VersionOrder* method), 532
`__hash__` () (*BaseSpec* method), 533
`__hash__` () (*Channel* method), 493, 505
`__hash__` () (*Dist* method), 508
`__hash__` () (*Entity* method), 338
`__hash__` () (*FeatureMatch* method), 518
`__hash__` () (*LoadedParameter* method), 392
`__hash__` () (*MatchSpec* method), 516
`__hash__` () (*PackageRecord* method), 527
`__hash__` () (*PrimitiveLoadedParameter* method), 393
`__hash__` () (*ProgressiveFetchExtract* method), 439
`__hash__` () (*Resolve* method), 554
`__hash__` () (*SplitStrMatch* method), 518
`__hash__` () (*_StrMatchMixin* method), 517
`__hash__` () (*frozendict* method), 267
`__hash__` () (*tqdm* method), 288, 295, 301, 310
`__iand__` () (*IndexedSet* method), 237
`__important_split_value` (*EnvRawParameter* property), 391
`__int__` () (*LinkType* method), 510
`__ior__` () (*IndexedSet* method), 237
`__isub__` () (*IndexedSet* method), 237
`__iter__` () (*Completer* method), 465
`__iter__` () (*IndexedSet* method), 236
`__iter__` () (*UrlsData* method), 439
`__iter__` () (*frozendict* method), 267
`__iter__` () (*tqdm* method), 288, 295, 301, 310
`__ixor__` () (*IndexedSet* method), 237
`__json__` () (*Arch* method), 510
`__json__` () (*Channel* method), 493, 506
`__json__` () (*LeasedPathType* method), 511
`__json__` () (*LinkType* method), 510
`__json__` () (*MatchSpec* method), 516
`__json__` () (*PathType* method), 511
`__json__` () (*Platform* method), 510
`__json__` () (*frozendict* method), 267
`__key__` () (*Dist* method), 508
`__le__` () (*Comparable* method), 304
`__le__` () (*Dist* method), 508
`__le__` () (*VersionOrder* method), 532
`__len__` () (*IndexedSet* method), 236
`__len__` () (*frozendict* method), 267
`__len__` () (*tqdm* method), 288, 295, 300, 310
`__license__` (in module `conda`), 576

__license__ (in module conda.auxlib), 347
 __lt__() (Comparable method), 304
 __lt__() (Dist method), 508
 __lt__() (VersionOrder method), 532
 __missing__() (RepodataState method), 495
 __name__ (ChannelPriority attribute), 352
 __name__ (in module conda), 576
 __ne__() (BaseSpec method), 533
 __ne__() (Comparable method), 304
 __ne__() (Dist method), 509
 __ne__() (VersionOrder method), 532
 __nonzero__() (Channel method), 493, 506
 __nonzero__() (tqdm method), 288, 295, 300, 310
 __register__() (Entity class method), 338
 __repr__() (BaseSpec method), 533
 __repr__() (BuildNumberMatch method), 534
 __repr__() (Channel method), 492, 505
 __repr__() (ChannelMatch method), 519
 __repr__() (ClobberError method), 457
 __repr__() (CondaError method), 490, 576
 __repr__() (CondaMultiError method), 577
 __repr__() (ConstantTZInfo method), 244
 __repr__() (Entity method), 338
 __repr__() (FeatureMatch method), 518
 __repr__() (IndexedSet method), 236
 __repr__() (LinuxDistribution method), 264
 __repr__() (LocalTZInfo method), 245
 __repr__() (MatchSpec method), 516
 __repr__() (PackageCacheData method), 439, 491
 __repr__() (RawParameter method), 391
 __repr__() (SplitStrMatch method), 518
 __repr__() (TemporaryDirectory method), 475
 __repr__() (USTimeZone method), 245
 __repr__() (VersionOrder method), 532
 __repr__() (_Action method), 441
 __repr__() (_StrMatchMixin method), 517
 __repr__() (frozendict method), 267
 __reversed__() (IndexedSet method), 236
 __rsub__() (IndexedSet method), 237
 __set__() (Field method), 334
 __set__() (classproperty method), 328
 __setattr__() (ImmutableEntity method), 338
 __setattr__() (ObjectWrapper method), 304
 __setattr__() (ProgressFileWrapper method), 475
 __setitem__() (RepodataState method), 495
 __slots__ (ExactStrMatch attribute), 517
 __slots__ (FeatureMatch attribute), 518
 __slots__ (GlobStrMatch attribute), 518
 __slots__ (SplitStrMatch attribute), 518
 __str__() (BaseSpec method), 533
 __str__() (BuildNumberMatch method), 534
 __str__() (CacheUrlAction method), 444
 __str__() (Channel method), 492, 505
 __str__() (ChannelMatch method), 518
 __str__() (CondaError method), 490, 576
 __str__() (CondaMultiError method), 577
 __str__() (DepsModifier method), 351
 __str__() (Dist method), 508
 __str__() (ExtractPackageAction method), 445
 __str__() (FeatureMatch method), 518
 __str__() (FileMode method), 510
 __str__() (LeasedPathType method), 511
 __str__() (LinkType method), 510
 __str__() (MatchSpec method), 516
 __str__() (PackageRecord method), 527
 __str__() (ParameterFlag method), 391
 __str__() (PathConflict method), 351
 __str__() (PathType method), 511
 __str__() (PipPackage method), 590
 __str__() (SafetyChecks method), 351
 __str__() (SplitStrMatch method), 518
 __str__() (UpdateModifier method), 352
 __str__() (Url method), 424
 __str__() (ValueEnum method), 352
 __str__() (VersionOrder method), 532
 __str__() (_StrMatchMixin method), 517
 __str__() (tqdm method), 288, 295, 300, 310
 __sub__ (IndexedSet attribute), 236
 __summary__ (in module conda), 576
 __summary__ (in module conda.auxlib), 347
 __url__ (in module conda), 576
 __url__ (in module conda.auxlib), 347
 __version__ (in module conda._vendor.appdirs), 232
 __version__ (in module conda._vendor.toolz), 284
 __version__ (in module conda._vendor.tqdm), 312
 __version__ (in module conda._vendor.tqdm.version), 306
 __version__ (in module conda.auxlib), 347
 __version_info__ (in module conda._vendor.appdirs), 232
 _add_dead() (IndexedSet method), 236
 _add_http_value_to_dict() (in module conda.gateways.repodata), 494
 _add_info_dir() (in module conda.cli.main_package), 376
 _add_prefix_to_path() (_Activator method), 314
 _add_specs() (Solver method), 450
 _aggressive_update_packages (Context attribute), 357
 _alias_canonical_channel_name_cache_to_file_prefixed() (in module conda.testing.helpers), 562
 _aliased (RepodataState attribute), 494
 _apply_basic_auth() (CondaHttpAuth static method), 473
 _arch_names (in module conda.base.context), 355
 _ask_upload() (ExceptionHandler method), 456
 _asm_func() (CUID method), 250, 256
 _assign() (Clauses method), 406

_b64_to_obj() (in module conda._vendor.cpuinfo), 255
 _b64_to_obj() (in module conda._vendor.cpuinfo.cpuinfo), 249
 _basestring (in module conda._vendor.tqdm.utils), 304
 _bashrc_content() (in module conda.core.initialize), 434
 _broader() (Resolve method), 556
 _build_activate_stack() (_Activator method), 314
 _build_activator_cls() (in module conda.activate), 317
 _build_components() (MatchSpec method), 516
 cache (BuildNumberMatch attribute), 534
 cache (Channel attribute), 492, 505
 cache (Dist attribute), 508
 cache (PackageCacheData attribute), 438, 491
 cache (PrefixData attribute), 447
 cache (SubdirData attribute), 452
 cache (VersionOrder attribute), 532
 cache (VersionSpec attribute), 534
 _calculate_change_report() (UnlinkLinkTransaction static method), 437
 _calculate_md5sum() (PackageCacheRecord method), 528
 _canonicalize_name() (in module conda_env.pip_util), 590
 _canonicalize_regex (in module conda_env.pip_util), 590
 _cardinalize_time_unit() (in module conda._vendor.boltons.timeutils), 242
 _change_report_str() (UnlinkLinkTransaction method), 437
 _channel_alias (Context attribute), 357
 _channel_packages (SimpleEnvironment property), 568
 _channels (Context attribute), 357
 _check_arch() (in module conda._vendor.cpuinfo), 255
 _check_arch() (in module conda._vendor.cpuinfo.cpuinfo), 249
 _check_files() (PythonDistribution method), 413
 _check_literal() (Clauses method), 405
 _check_path_data() (PythonDistribution method), 413
 _check_value() (ArgumentParser method), 365
 _check_variable() (Clauses method), 405
 _check_writable() (PackageCacheData method), 439, 491
 _classify_bad_deps() (Resolve method), 555
 _clean_environments_txt() (in module conda.core.envs_manager), 427
 _clean_tarball_path_and_get_md5sum() (PackageCacheData static method), 439, 491
 _closed (TemporaryDirectory attribute), 475
 _collect_all_metadata() (Solver method), 450
 _collect_validation_error() (Configuration static method), 398
 _compact() (IndexedSet method), 236
 _comparable (tqdm property), 286, 292, 298, 307
 _conda_build (Context attribute), 359
 _config_fish_content() (in module conda.core.initialize), 433
 _config_xonsh_content() (in module conda.core.initialize), 434
 _convert() (Clauses method), 406
 _convert() (FeatureMatch method), 518
 _convert() (SplitStrMatch method), 518
 _copy_new_fields() (in module conda._vendor.cpuinfo), 255
 _copy_new_fields() (in module conda._vendor.cpuinfo.cpuinfo), 249
 _croot (Context attribute), 359
 _cuda_driver_version_detector_target() (in module conda.plugins.virtual_packages.cuda), 550
 _cull() (IndexedSet method), 236
 _custom_channels (Context attribute), 358
 _custom_multichannels (Context attribute), 358
 _dead_index_count (IndexedSet property), 236
 _decr_instances() (tqdm class method), 287, 294, 300, 309
 _dedupe_pkgs_dir_contents() (PackageCacheData static method), 439, 491
 _default_channels (Context attribute), 358
 _default_env() (_Activator method), 314
 _default_threads (Context attribute), 357
 _description (in module conda_env.cli.main_remove), 583
 _digest_path() (in module conda.gateways.disk.read), 479
 _distro (in module conda._vendor.distro), 266
 _do_copy() (in module conda.gateways.disk.create), 476
 _do_softlink() (in module conda.gateways.disk.create), 476
 _dst_offset (LocalTZInfo attribute), 245
 _element_type (LoadedParameter attribute), 392
 _element_type (Parameter attribute), 395
 _ensure_dir() (time_recorder method), 404
 _ensure_value() (NullCountAction static method), 366
 _environ_cols_wrapper() (in module conda._vendor.tqdm.utils), 305
 _environment (YamlFileSpec attribute), 592, 593
 _envs_dirs (Context attribute), 357
 _eq() (VersionOrder method), 532
 _eval() (Clauses method), 406
 _example (in module conda_env.cli.main_remove), 583
 _exec() (in module conda.cli.conda_argparse), 365
 _exec_unix() (in module conda.cli.conda_argparse), 366

_exec_win() (in module conda.cli.conda_argparse), 366
 _execute() (UnlinkLinkTransaction method), 436
 _execute() (in module conda.cli.main_clean), 371
 _execute_actions() (UnlinkLinkTransaction static method), 436
 _execute_channel() (CacheUrlAction method), 444
 _execute_local() (CacheUrlAction method), 444
 _execute_post_link_actions() (UnlinkLinkTransaction static method), 436
 _execute_threads (Context attribute), 357
 _execute_upload() (ExceptionHandler method), 456
 _expand_channels() (in module conda_env.env), 587
 _expand_search_path() (Configuration static method), 397
 _export_subdir_data_to_repodata() (in module conda.testing.helpers), 561
 _fetch_channel_signing_data() (_SignatureVerification method), 573
 _fetch_threads (Context attribute), 357
 _filter_dict_keys_with_empty_values() (in module conda._vendor.cpuinfo), 256
 _filter_dict_keys_with_empty_values() (in module conda._vendor.cpuinfo.cpuinfo), 250
 _finalize() (JSONFormatMixin method), 317
 _finalize() (_Activator method), 313
 _find_inconsistent_packages() (Solver method), 450
 _first_important_matches() (LoadedParameter static method), 393
 _first_sunday_on_or_after() (in module conda._vendor.boltons.timeutils), 245
 _first_writable_envs_dir() (in module conda.base.context), 360
 _format_chain_str() (UnsatisfiableError method), 460
 _format_exc() (in module conda.exceptions), 462
 _format_output() (in module conda.gateways.subprocess), 497
 _friendly_bytes_to_int() (in module conda._vendor.cpuinfo), 256
 _friendly_bytes_to_int() (in module conda._vendor.cpuinfo.cpuinfo), 250
 _generate_message() (DeprecationHandler method), 454
 _get_activate_scripts() (_Activator method), 314
 _get_apparent_index() (IndexedSet method), 236
 _get_attr() (in module conda.auxlib.ish), 340
 _get_best_prec_match() (in module conda.plan), 541
 _get_binstar_token_directory() (in module conda.gateways.anaconda_client), 467
 _get_channel_for_name() (in module conda.models.channel), 506
 _get_cpu_info() (in module conda.base.context), 360
 _get_cpu_info_from_cat_var_run_dmesg_boot() (in module conda._vendor.cpuinfo), 257
 _get_cpu_info_from_cat_var_run_dmesg_boot() (in module conda._vendor.cpuinfo.cpuinfo), 251
 _get_cpu_info_from_cpufreq_info() (in module conda._vendor.cpuinfo), 256
 _get_cpu_info_from_cpufreq_info() (in module conda._vendor.cpuinfo.cpuinfo), 251
 _get_cpu_info_from_cpuid() (in module conda._vendor.cpuinfo), 256
 _get_cpu_info_from_cpuid() (in module conda._vendor.cpuinfo.cpuinfo), 250
 _get_cpu_info_from_cpuid_actual() (in module conda._vendor.cpuinfo), 256
 _get_cpu_info_from_cpuid_actual() (in module conda._vendor.cpuinfo.cpuinfo), 250
 _get_cpu_info_from_cpuid_subprocess_wrapper() (in module conda._vendor.cpuinfo), 256
 _get_cpu_info_from_cpuid_subprocess_wrapper() (in module conda._vendor.cpuinfo.cpuinfo), 250
 _get_cpu_info_from_dmesg() (in module conda._vendor.cpuinfo), 257
 _get_cpu_info_from_dmesg() (in module conda._vendor.cpuinfo.cpuinfo), 251
 _get_cpu_info_from_ibm_pa_features() (in module conda._vendor.cpuinfo), 257
 _get_cpu_info_from_ibm_pa_features() (in module conda._vendor.cpuinfo.cpuinfo), 251
 _get_cpu_info_from_kstat() (in module conda._vendor.cpuinfo), 257
 _get_cpu_info_from_kstat() (in module conda._vendor.cpuinfo.cpuinfo), 251
 _get_cpu_info_from_lscpu() (in module conda._vendor.cpuinfo), 256
 _get_cpu_info_from_lscpu() (in module conda._vendor.cpuinfo.cpuinfo), 251
 _get_cpu_info_from_platform_uname() (in module conda._vendor.cpuinfo), 257
 _get_cpu_info_from_platform_uname() (in module conda._vendor.cpuinfo.cpuinfo), 251
 _get_cpu_info_from_proc_cpuinfo() (in module conda._vendor.cpuinfo), 256
 _get_cpu_info_from_proc_cpuinfo() (in module conda._vendor.cpuinfo.cpuinfo), 251
 _get_cpu_info_from_registry() (in module conda._vendor.cpuinfo), 257
 _get_cpu_info_from_registry() (in module conda._vendor.cpuinfo.cpuinfo), 251
 _get_cpu_info_from_sysctl() (in module conda._vendor.cpuinfo), 257
 _get_cpu_info_from_sysctl() (in module conda._vendor.cpuinfo.cpuinfo), 251

<code>_get_cpu_info_from_sysinfo()</code> (in module <code>conda._vendor.cpuinfo</code>), 257	<code>_get_python_version()</code> (<i>UnlinkLinkTransaction</i> static method), 436
<code>_get_cpu_info_from_sysinfo()</code> (in module <code>conda._vendor.cpuinfo.cpuinfo</code>), 251	<code>_get_real_index()</code> (<i>IndexedSet</i> method), 236
<code>_get_cpu_info_from_sysinfo_v1()</code> (in module <code>conda._vendor.cpuinfo</code>), 257	<code>_get_sat_solver_cls()</code> (in module <code>conda.resolve</code>), 554
<code>_get_cpu_info_from_sysinfo_v1()</code> (in module <code>conda._vendor.cpuinfo.cpuinfo</code>), 251	<code>_get_size()</code> (in module <code>conda.cli.main_clean</code>), 371
<code>_get_cpu_info_from_sysinfo_v2()</code> (in module <code>conda._vendor.cpuinfo</code>), 257	<code>_get_solver_class()</code> (in module <code>conda.core.solve</code>), 448
<code>_get_cpu_info_from_sysinfo_v2()</code> (in module <code>conda._vendor.cpuinfo.cpuinfo</code>), 251	<code>_get_starting_path_list()</code> (<i>_Activator</i> method), 314
<code>_get_cpu_info_from_wmic()</code> (in module <code>conda._vendor.cpuinfo</code>), 257	<code>_get_strict_channel()</code> (<i>Resolve</i> method), 556
<code>_get_cpu_info_from_wmic()</code> (in module <code>conda._vendor.cpuinfo.cpuinfo</code>), 251	<code>_get_subactions()</code> (<i>_GreedySubParsersAction</i> method), 365
<code>_get_cpu_info_internal()</code> (in module <code>conda._vendor.cpuinfo</code>), 257	<code>_get_temp_prefix()</code> (in module <code>conda.testing.integration</code>), 564
<code>_get_cpu_info_internal()</code> (in module <code>conda._vendor.cpuinfo.cpuinfo</code>), 251	<code>_get_total_size()</code> (in module <code>conda.cli.main_clean</code>), 371
<code>_get_deactivate_scripts()</code> (<i>_Activator</i> method), 314	<code>_get_version_from_git_clone()</code> (in module <code>conda.auxlib.packaging</code>), 344
<code>_get_distro_release_info()</code> (<i>LinuxDistribution</i> method), 266	<code>_get_version_from_git_tag()</code> (in module <code>conda.auxlib.packaging</code>), 344
<code>_get_environment_env_vars()</code> (<i>_Activator</i> method), 314	<code>_get_version_from_version_file()</code> (in module <code>conda.auxlib.packaging</code>), 344
<code>_get_environment_state_file()</code> (<i>PrefixData</i> method), 447	<code>_get_win_folder</code> (in module <code>conda._vendor.appdirs</code>), 234
<code>_get_field()</code> (in module <code>conda._vendor.cpuinfo</code>), 255	<code>_get_win_folder_from_registry()</code> (in module <code>conda._vendor.appdirs</code>), 234
<code>_get_field()</code> (in module <code>conda._vendor.cpuinfo.cpuinfo</code>), 250	<code>_get_win_folder_with_ctypes()</code> (in module <code>conda._vendor.appdirs</code>), 234
<code>_get_field_actual()</code> (in module <code>conda._vendor.cpuinfo</code>), 255	<code>_get_win_folder_with_pywin32()</code> (in module <code>conda._vendor.appdirs</code>), 234
<code>_get_field_actual()</code> (in module <code>conda._vendor.cpuinfo.cpuinfo</code>), 250	<code>_get_yaml_key_comment()</code> (<i>YamlRawParameter</i> static method), 392
<code>_get_free_pos()</code> (<i>tqdm</i> class method), 287, 294, 299, 309	<code>_get_yaml_list_comment_item()</code> (<i>YamlRawParameter</i> static method), 392
<code>_get_json_fn()</code> (<i>PrefixData</i> method), 447	<code>_get_yaml_list_comments()</code> (<i>YamlRawParameter</i> class method), 392
<code>_get_lsb_release_info()</code> (<i>LinuxDistribution</i> method), 266	<code>_get_yaml_map_comments()</code> (<i>YamlRawParameter</i> static method), 392
<code>_get_module()</code> (<i>DeprecationHandler</i> method), 454	<code>_git_describe_tags()</code> (in module <code>conda.auxlib.packaging</code>), 344
<code>_get_multiple_data()</code> (<i>PythonDistributionMetadata</i> method), 415	<code>_handle_menuinst()</code> (in module <code>conda.plan</code>), 541
<code>_get_name_tuple()</code> (in module <code>conda.cli.main_compare</code>), 372	<code>_has_python()</code> (<i>PrefixData</i> method), 447
<code>_get_os_release_info()</code> (<i>LinuxDistribution</i> method), 265	<code>_hash_key()</code> (<i>MatchSpec</i> method), 516
<code>_get_package_pool()</code> (<i>Resolve</i> method), 556	<code>_help</code> (in module <code>conda_env.cli.main_remove</code>), 583
<code>_get_path_dirs()</code> (<i>_Activator</i> method), 314	<code>_hook_postamble()</code> (<i>PowerShellActivator</i> method), 317
<code>_get_pfe()</code> (<i>UnlinkLinkTransaction</i> method), 436	<code>_hook_postamble()</code> (<i>_Activator</i> method), 314
<code>_get_pkgs_dirs()</code> (in module <code>conda.cli.main_clean</code>), 371	<code>_hook_preamble()</code> (<i>CmdExeActivator</i> method), 316
<code>_get_python_info()</code> (in module <code>conda.core.initialize</code>), 434	<code>_hook_preamble()</code> (<i>CshActivator</i> method), 315
	<code>_hook_preamble()</code> (<i>FishActivator</i> method), 316
	<code>_hook_preamble()</code> (<i>JSONFormatMixin</i> method), 317
	<code>_hook_preamble()</code> (<i>PosixActivator</i> method), 315
	<code>_hook_preamble()</code> (<i>PowerShellActivator</i> method), 317

- `_hook_preamble()` (*XonshActivator* method), 315
- `_hook_preamble()` (*_Activator* method), 313
- `_hookspec` (in module *conda.plugins.hookspec*), 542
- `_hz_friendly_to_full()` (in module *conda._vendor.cpuinfo*), 255
- `_hz_friendly_to_full()` (in module *conda._vendor.cpuinfo.cpuinfo*), 250
- `_hz_short_to_friendly()` (in module *conda._vendor.cpuinfo*), 255
- `_hz_short_to_friendly()` (in module *conda._vendor.cpuinfo.cpuinfo*), 250
- `_hz_short_to_full()` (in module *conda._vendor.cpuinfo*), 255
- `_hz_short_to_full()` (in module *conda._vendor.cpuinfo.cpuinfo*), 250
- `_implementors` (in module *conda.models.match_spec*), 519
- `_initd` (*Entity* property), 338
- `_initialize_dev_bash()` (in module *conda.core.initialize*), 432
- `_initialize_dev_cmdexe()` (in module *conda.core.initialize*), 432
- `_inject_UNLINKLINKTRANSACTION()` (in module *conda.plan*), 541
- `_install_file()` (in module *conda.core.initialize*), 433
- `_instances` (*tqdm* attribute), 286, 292, 298, 307
- `_is_ascii()` (in module *conda._vendor.tqdm.utils*), 305
- `_is_bit_set()` (in module *conda._vendor.cpuinfo*), 256
- `_is_bit_set()` (in module *conda._vendor.cpuinfo.cpuinfo*), 250
- `_is_literal()` (in module *conda.common.pkg_formats.python*), 419
- `_is_selinux_enforcing()` (in module *conda._vendor.cpuinfo*), 256
- `_is_selinux_enforcing()` (in module *conda._vendor.cpuinfo.cpuinfo*), 250
- `_is_simple()` (*MatchSpec* method), 516
- `_is_single()` (*MatchSpec* method), 516
- `_is_unix_executable_using_ORIGIN()` (in module *conda.gateways.disk.create*), 476
- `_is_utf()` (in module *conda._vendor.tqdm.utils*), 305
- `_isatty` (*ExceptionHandler* property), 455
- `_iter_records_by_name()` (*SubdirData* method), 452
- `_lazy_validate` (*Dist* attribute), 508
- `_lazy_validate` (*Entity* attribute), 338
- `_load()` (*SubdirData* method), 452
- `_load_requires_provides_file()` (*PythonDistribution* method), 413
- `_load_search_path()` (*Configuration* class method), 397
- `_load_single_record()` (*PrefixData* method), 447
- `_load_site_packages()` (*PrefixData* method), 447
- `_load_state()` (*SubdirData* method), 452
- `_lock_impl()` (in module *conda.gateways.repodata.lock*), 489
- `_lock_noop()` (in module *conda.gateways.repodata.lock*), 488
- `_logger_lock()` (in module *conda.common.io*), 402
- `_make_channel_priorities()` (*Resolve* static method), 556
- `_make_compile_actions()` (*UnlinkLinkTransaction* static method), 436
- `_make_component()` (*MatchSpec* static method), 516
- `_make_entry_point_actions()` (*UnlinkLinkTransaction* static method), 436
- `_make_legacy_action_groups()` (*UnlinkLinkTransaction* method), 436
- `_make_link_actions()` (*UnlinkLinkTransaction* static method), 436
- `_make_milliseconds()` (*TimestampField* static method), 524
- `_make_seconds()` (*TimestampField* static method), 524
- `_make_single_record()` (*PackageCacheData* method), 439, 491
- `_make_virtual_package()` (in module *conda.core.index*), 429
- `_match_individual()` (*MatchSpec* method), 516
- `_match_key_is_important()` (*LoadedParameter* static method), 393
- `_md5_not_for_security()` (in module *conda.gateways.repodata*), 496
- `_merge()` (*MatchSpec* method), 516
- `_message_to_dict()` (*PythonDistributionMetadata* class method), 415
- `_migrated_channel_aliases` (*Context* attribute), 358
- `_new_makepasv()` (in module *conda.gateways.connection.adapters.ftp*), 468
- `_notify_conda_outdated()` (*Solver* method), 450
- `_obj_to_b64()` (in module *conda._vendor.cpuinfo*), 255
- `_obj_to_b64()` (in module *conda._vendor.cpuinfo.cpuinfo*), 249
- `_old_makepasv` (in module *conda.gateways.connection.adapters.ftp*), 468
- `_order_helper` (*Field* attribute), 334
- `_override()` (*Context* method), 359
- `_package_cache_records` (*PackageCacheData* property), 438, 490
- `_package_data()` (*SimpleEnvironment* method), 568
- `_package_has_updates()` (*Solver* method), 450
- `_package_is_installed()` (in module *conda.testing.integration*), 565
- `_parse_and_set_args()` (*_Activator* method), 314
- `_parse_arch()` (in module *conda._vendor.cpuinfo*), 256
- `_parse_arch()` (in module *conda._vendor.cpuinfo.cpuinfo*), 250
- `_parse_channel()` (in module *conda.gateways.repodata.lock*), 489

- `conda.models.match_spec`), 517
- `_parse_comment_line()` (*History* class method), 498
- `_parse_cpu_brand_string()` (in module `conda._vendor.cpuinfo`), 256
- `_parse_cpu_brand_string()` (in module `conda._vendor.cpuinfo.cpuinfo`), 250
- `_parse_cpu_brand_string_dx()` (in module `conda._vendor.cpuinfo`), 256
- `_parse_cpu_brand_string_dx()` (in module `conda._vendor.cpuinfo.cpuinfo`), 250
- `_parse_distro_release_content()` (*LinuxDistribution* static method), 266
- `_parse_distro_release_file()` (*LinuxDistribution* method), 266
- `_parse_dmesg_output()` (in module `conda._vendor.cpuinfo`), 256
- `_parse_dmesg_output()` (in module `conda._vendor.cpuinfo.cpuinfo`), 250
- `_parse_entries_file_data()` (*PythonDistribution* static method), 413
- `_parse_iso_timestamp()` (*ChannelNoticeResponse* static method), 539
- `_parse_legacy_dist()` (in module `conda.models.match_spec`), 516
- `_parse_lsb_release_content()` (*LinuxDistribution* static method), 266
- `_parse_notice_level()` (*ChannelNoticeResponse* static method), 539
- `_parse_old_format_specs_string()` (*History* static method), 498
- `_parse_os_release_content()` (*LinuxDistribution* static method), 265
- `_parse_requires_file_data()` (*PythonDistribution* static method), 413
- `_parse_spec_str()` (in module `conda.models.match_spec`), 517
- `_parse_version_plus_build()` (in module `conda.models.match_spec`), 516
- `_patch_for_local_exports()` (in module `conda.testing.helpers`), 562
- `_path` (*LeasedPathEntry* attribute), 512
- `_path` (*PathData* attribute), 526
- `_pickle_me()` (*SubdirData* method), 452
- `_pickle_valid_checks()` (*SubdirData* method), 452
- `_pip_install_via_requirements()` (in module `conda_env.installers.pip`), 589
- `_pkey` (*PackageRecord* property), 526
- `_pkgs_dirs` (*Context* attribute), 357
- `_plan_from_actions()` (in module `conda.plan`), 541
- `_platform_map` (in module `conda.base.context`), 354
- `_post_sat_handling()` (*Solver* method), 450
- `_post_upload()` (*ExceptionHandler* method), 456
- `_powershell_profile_content()` (in module `conda.core.initialize`), 434
- `_prefix_records` (*PrefixData* property), 447
- `_prepare()` (*Solver* method), 450
- `_prepare()` (*UnlinkLinkTransaction* class method), 436
- `_print_conda_exception()` (*ExceptionHandler* method), 455
- `_process_path()` (*PythonDistributionMetadata* static method), 415
- `_process_raw_repodata()` (*SubdirData* method), 452
- `_process_raw_repodata_str()` (*SubdirData* method), 452
- `_program_paths()` (in module `conda._vendor.cpuinfo`), 255
- `_program_paths()` (in module `conda._vendor.cpuinfo.cpuinfo`), 249
- `_progress_bar()` (*ProgressiveFetchExtract* static method), 439
- `_prompt_modifier()` (*_Activator* method), 314
- `_python_pkg_record` (*PrefixData* property), 447
- `_range` (in module `conda._vendor.tqdm.utils`), 304
- `_raw_parameters_from_single_source()` (*ParameterLoader* method), 397
- `_read_channel_configuration()` (in module `conda.models.channel`), 506
- `_read_local_repodata()` (*SubdirData* method), 452
- `_read_metadata()` (*PythonDistributionMetadata* class method), 415
- `_read_pickled()` (*SubdirData* method), 452
- `_read_windows_registry()` (in module `conda.core.initialize`), 434
- `_read_windows_registry_key()` (in module `conda._vendor.cpuinfo`), 255
- `_read_windows_registry_key()` (in module `conda._vendor.cpuinfo.cpuinfo`), 249
- `_remove_node()` (*PrefixGraph* method), 521
- `_remove_prefix_from_path()` (*_Activator* method), 314
- `_remove_specs()` (*Solver* method), 450
- `_replace_prefix_in_path()` (*_Activator* method), 314
- `_repo` (*RepodataFetch* property), 495
- `_repo` (*SubdirData* property), 452
- `_repodata_fn` (*CondaRepoInterface* attribute), 494
- `_repodata_threads` (*Context* attribute), 357
- `_reset_cache()` (*Configuration* method), 398
- `_reset_state()` (*Channel* static method), 492, 505
- `_reverse_actions()` (*UnlinkLinkTransaction* static method), 436
- `_rewrite_environments_txt()` (in module `conda.core.envs_manager`), 427
- `_rm_rf()` (in module `conda.cli.main_clean`), 371
- `_root_prefix` (*Context* attribute), 357
- `_run_and_get_stdout()` (in module `conda._vendor.cpuinfo`), 255
- `_run_and_get_stdout()` (in module

`conda._vendor.cpuinfo.cpuinfo`), 249
`_run_asm()` (*CPUID method*), 250, 256
`_run_sat()` (*Clauses method*), 384
`_run_sat()` (*Solver method*), 450
`_safe_toposort()` (in module `conda.common.toposort`), 421
`_sat_solver_cls_to_str` (in module `conda.common._logic`), 384
`_sat_solver_str_to_cls` (in module `conda.common._logic`), 384
`_sat_solvers` (in module `conda.resolve`), 554
`_save_state()` (*SubdirData method*), 452
`_scan_for_dist_no_channel()` (*PackageCacheData method*), 439, 491
`_screen_shape_linux()` (in module `conda._vendor.tqdm.utils`), 305
`_screen_shape_tput()` (in module `conda._vendor.tqdm.utils`), 305
`_screen_shape_windows()` (in module `conda._vendor.tqdm.utils`), 305
`_screen_shape_wrapper()` (in module `conda._vendor.tqdm.utils`), 305
`_send_boto()` (*S3Adapter method*), 471
`_send_boto3()` (*S3Adapter method*), 471
`_set_argparse_args()` (*Configuration method*), 398
`_set_entry_name()` (*time_recorder method*), 404
`_set_env_vars()` (*Configuration method*), 397
`_set_name()` (*ParameterLoader method*), 397
`_set_raw_data()` (*Configuration method*), 398
`_set_search_path()` (*Configuration method*), 397
`_should_freeze()` (*Solver method*), 450
`_signing_metadata_url_base` (*Context attribute*), 357
`_solve()` (in module `conda_env.installers.conda`), 588
`_split_platform_re()` (in module `conda.common.url`), 426
`_start_spinning()` (*Spinner method*), 402
`_std_offset` (*LocalTZInfo attribute*), 245
`_strings` (*RepodataState attribute*), 494
`_subdir` (*Context attribute*), 357
`_subdirs` (*Context attribute*), 357
`_subprocess_clean_env()` (in module `conda.gateways.subprocess`), 497
`_supplement_index_with_cache()` (in module `conda.core.index`), 429
`_supplement_index_with_features()` (in module `conda.core.index`), 429
`_supplement_index_with_prefix()` (in module `conda.core.index`), 429
`_supplement_index_with_system()` (in module `conda.core.index`), 429
`_supports_unicode()` (in module `conda._vendor.tqdm.utils`), 305
`_symlink_conda_hlp()` (in module `conda.exports`), 466
`_sync_channel_to_disk()` (in module `conda.testing.helpers`), 561
`_term_move_up()` (in module `conda._vendor.tqdm.utils`), 305
`_test` (*TMonitor attribute*), 285, 306
`_text_width` (in module `conda._vendor.tqdm.utils`), 305
`_to_decimal_string()` (in module `conda._vendor.cpuinfo`), 255
`_to_decimal_string()` (in module `conda._vendor.cpuinfo.cpuinfo`), 250
`_to_filename_do_not_use()` (*MatchSpec method*), 516
`_to_friendly_bytes()` (in module `conda._vendor.cpuinfo`), 256
`_to_friendly_bytes()` (in module `conda._vendor.cpuinfo.cpuinfo`), 250
`_to_str()` (in module `conda.cli.main_compare`), 372
`_topo_sort_handle_cycles()` (*PrefixGraph class method*), 521
`_toposort()` (*PrefixGraph method*), 521
`_toposort()` (in module `conda.common.toposort`), 421
`_toposort_pop_key()` (*PrefixGraph static method*), 521
`_toposort_prepare_graph()` (*PrefixGraph static method*), 521
`_toposort_raise_on_cycles()` (*PrefixGraph class method*), 521
`_tqdm()` (*ProgressBar static method*), 402
`_type` (*BooleanField attribute*), 334
`_type` (*DateField attribute*), 336
`_type` (*IntegerField attribute*), 335
`_type` (*ListField attribute*), 337
`_type` (*LoadedParameter attribute*), 392
`_type` (*MapField attribute*), 337
`_type` (*MapLoadedParameter attribute*), 393
`_type` (*MapParameter attribute*), 395
`_type` (*NumberField attribute*), 335
`_type` (*ObjectLoadedParameter attribute*), 394
`_type` (*ObjectParameter attribute*), 396
`_type` (*Parameter attribute*), 394
`_type` (*SequenceLoadedParameter attribute*), 394
`_type` (*SequenceParameter attribute*), 396
`_type` (*StringField attribute*), 336
`_typify_data_structure()` (*LoadedParameter static method*), 393
`_unich` (in module `conda._vendor.tqdm.utils`), 304
`_unicode` (in module `conda._vendor.tqdm.utils`), 304
`_update_old_plan()` (in module `conda.plan`), 541
`_update_prompt()` (*CshActivator method*), 315
`_update_prompt()` (*PosixActivator method*), 315
`_update_prompt()` (*_Activator method*), 314
`_upload()` (*ExceptionHandler method*), 455
`_url` (*CondaRepoInterface attribute*), 494
`_use_only_tar_bz2` (*Context attribute*), 358

- `_utf_to_str()` (in module `conda._vendor.cpuinfo`), 255
 - `_utf_to_str()` (in module `conda._vendor.cpuinfo.cpuinfo`), 249
 - `_valid_file()` (*RequirementsSpec* method), 591, 593
 - `_valid_name()` (*RequirementsSpec* method), 591, 593
 - `_verbosity` (Context attribute), 358
 - `_verified` (*_Action* attribute), 441
 - `_verify()` (*UnlinkLinkTransaction* method), 436
 - `_verify_individual_level()` (*UnlinkLinkTransaction* static method), 436
 - `_verify_pre_link_message()` (*UnlinkLinkTransaction* method), 436
 - `_verify_prefix_level()` (*UnlinkLinkTransaction* static method), 436
 - `_verify_threads` (Context attribute), 357
 - `_verify_transaction_level()` (*UnlinkLinkTransaction* static method), 436
 - `_version` (*DeprecationHandler* attribute), 453
 - `_wait_and_close_handle()` (in module `conda.common._os.windows`), 387
 - `_write_environment_state_file()` (*PrefixData* method), 448
 - `_write_installed_packages()` (*SimpleEnvironment* method), 568
 - `_write_repo_packages()` (*SimpleEnvironment* method), 568
 - `_write_tempfile()` (*S3Adapter* method), 471
 - `_write_windows_registry()` (in module `conda.core.initialize`), 434
 - `_yaml_round_trip()` (in module `conda.common.serialize`), 420
 - `_yaml_safe()` (in module `conda.common.serialize`), 420
 - `_yield_commands()` (*JSONFormatMixin* method), 317
 - `_yield_commands()` (*_Activator* method), 314
- ## A
- `aarch64` (*Arch* attribute), 509
 - `ACCESS_DENIED` (*ERROR* attribute), 386
 - `accumulate()` (in module `conda._vendor.toolz.itertoolz`), 273
 - `action` (*CondaPostCommand* attribute), 224, 549, 552
 - `action` (*CondaPreCommand* attribute), 224, 549, 553
 - `action` (*CondaSubcommand* attribute), 226, 548, 553
 - `action()` (*DeprecationHandler* method), 454
 - `ACTION_CODES` (in module `conda.instructions`), 501
 - `ActionGroup` (class in `conda.core.link`), 435
 - `actions` (*ActionGroup* attribute), 435
 - `activate()` (*_Activator* method), 313
 - `ActivateHelp`, 456
 - `activator_map` (in module `conda.activate`), 317
 - `active_prefix` (Context property), 355
 - `add()` (*Dependencies* method), 587
 - `add()` (*IndexedSet* method), 236
 - `add()` (*JLAP* method), 485
 - `add_anaconda_token` (Context attribute), 357
 - `add_binstar_token()` (*CondaHttpAuth* static method), 473
 - `add_channels()` (*Environment* method), 587
 - `add_clause()` (*Clauses* method), 406
 - `add_clauses()` (*Clauses* method), 406
 - `add_defaults_to_specs()` (in module `conda.plan`), 541
 - `add_export_unset_vars()` (*_Activator* method), 313
 - `add_feature_records_legacy()` (in module `conda.testing.helpers`), 561
 - `add_output_and_prompt_options()` (in module `conda.cli.conda_argparse`), 368
 - `add_parser_channels()` (in module `conda.cli.conda_argparse`), 368
 - `add_parser_create_install_update()` (in module `conda.cli.conda_argparse`), 368
 - `add_parser_default_packages()` (in module `conda.cli.conda_argparse`), 368
 - `add_parser_help()` (in module `conda.cli.conda_argparse`), 368
 - `add_parser_json()` (in module `conda.cli.conda_argparse`), 368
 - `add_parser_known()` (in module `conda.cli.conda_argparse`), 368
 - `add_parser_networking()` (in module `conda.cli.conda_argparse`), 368
 - `add_parser_package_install_options()` (in module `conda.cli.conda_argparse`), 368
 - `add_parser_prefix()` (in module `conda.cli.conda_argparse`), 368
 - `add_parser_prune()` (in module `conda.cli.conda_argparse`), 368
 - `add_parser_pscheck()` (in module `conda.cli.conda_argparse`), 368
 - `add_parser_show_channel_urls()` (in module `conda.cli.conda_argparse`), 368
 - `add_parser_solver()` (in module `conda.cli.conda_argparse`), 368
 - `add_parser_solver_mode()` (in module `conda.cli.conda_argparse`), 368
 - `add_parser_update_modifiers()` (in module `conda.cli.conda_argparse`), 368
 - `add_pip_as_python_dependency` (Context attribute), 356
 - `add_pip_installed()` (in module `conda_env.pip_util`), 590
 - `add_resp_to_mock()` (in module `conda.testing.notices.helpers`), 567
 - `add_subdir()` (in module `conda.testing.helpers`), 561
 - `add_subdir_to_iter()` (in module `conda.testing.helpers`), 561
 - `add_unlink()` (in module `conda.plan`), 541
 - `add_url()` (*UrlsData* method), 439

add_username_and_password() (in module *conda.common.url*), 426
 AggregateCompileMultiPycAction (class in *conda.core.path_actions*), 443
 aggressive_update_packages (Context property), 356
 All() (Clauses method), 384, 406
 all_ancestors() (PrefixGraph method), 521
 all_caches_writable_first() (PackageCacheData class method), 438, 491
 all_channel_urls() (in module *conda.models.channel*), 506
 all_descendants() (PrefixGraph method), 521
 all_match() (BaseSpec method), 534
 all_subdir_urls() (PrefixData method), 447
 allow_conda_downgrades (Context attribute), 356
 allow_cycles (Context attribute), 356
 allow_non_channel_urls (Context attribute), 357
 allow_softlinks (Context attribute), 356
 allowlist_channels (Context attribute), 358
 always_copy (Context attribute), 358
 always_softlink (Context attribute), 358
 always_true_match() (BaseSpec method), 534
 always_yes (Context attribute), 358
 anaconda_upload (Context attribute), 359
 AND (in module *conda.common.pkg_formats.python*), 419
 And() (Clauses method), 384, 406
 Any() (Clauses method), 384, 406
 any_match() (BaseSpec method), 533
 any_subprocess() (in module *conda.gateways.subprocess*), 497
 APP_NAME (in module *conda.base.constants*), 350
 AppDirs (class in *conda._vendor.appdirs*), 234
 AppDirsError, 232
 append() (_ClauseArray method), 382
 application_entry_point (LeasedPathType attribute), 511
 application_entry_point_template (in module *conda.gateways.disk.create*), 475
 application_entry_point_windows_exe (LeasedPathType attribute), 511
 application_softlink (LeasedPathType attribute), 511
 apply() (ContextStack method), 360
 apply() (ContextStackObject method), 359
 apply_patches() (in module *conda.gateways.repodata.jlap.fetch*), 487
 appname (in module *conda._vendor.appdirs*), 234
 Arch (class in *conda.models.enums*), 509
 arch (PackageRecord attribute), 527
 arch_name (Context property), 355
 arch_name (in module *conda.exports*), 464
 arch_string_raw (DataSource attribute), 248, 254
 arg2spec() (in module *conda.cli.common*), 362
 ArgParseRawParameter (class in *conda.common.configuration*), 392
 argument() (DeprecationHandler method), 453
 ArgumentError, 456
 ArgumentParser (class in *conda.cli.conda_argparse*), 365
 argv() (in module *conda.common.io*), 402
 arm64 (Arch attribute), 509
 armv6l (Arch attribute), 509
 armv7l (Arch attribute), 509
 as_array() (_ClauseArray method), 382
 as_array() (_ClauseList method), 382
 as_completed (in module *conda.common.io*), 403
 as_completed() (tqdm_asyncio class method), 291
 as_dict() (Url method), 424
 as_list() (_ClauseArray method), 382
 as_list() (_ClauseList method), 382
 as_list() (_SatSolver method), 383
 as_list() (Clauses method), 384, 405
 ASM (class in *conda._vendor.cpuinfo*), 256
 ASM (class in *conda._vendor.cpuinfo.cpuinfo*), 250
 assert_equals() (in module *conda.testing.helpers*), 561
 assert_in() (in module *conda.testing.helpers*), 561
 assert_not_in() (in module *conda.testing.helpers*), 561
 assert_unsatisfiable() (SolverTests method), 569
 assign() (Clauses method), 384
 AssignmentError, 339
 assoc() (in module *conda._vendor.toolz.dicttoolz*), 270
 assoc_in() (in module *conda._vendor.toolz.dicttoolz*), 270
 ASSOC_INCOMPLETE (ERROR attribute), 386
 AtMostOne() (Clauses method), 406
 AtMostOne_BDD() (Clauses method), 384, 406
 AtMostOne_NSQ() (Clauses method), 384, 406
 attach_stderr() (in module *conda.auxlib.logz*), 341
 attach_stderr_handler() (in module *conda.common.io*), 402
 AttrDict (class in *conda.auxlib.collection*), 323
 auth (PrefixRecord attribute), 528
 auth (Url property), 424
 AuthenticationError, 339, 459
 auto_activate_base (Context attribute), 356
 auto_injector_fixture() (BaseTestCase method), 558
 auto_stack (Context attribute), 356
 auto_update_conda (Context attribute), 356
 AuxlibError (class in *conda.auxlib.exceptions*), 339
 av_data_dir (Context property), 356

B

backend (CondaSolver attribute), 225, 549, 553

- backoff_rename() (in module *conda.gateways.disk.update*), 481
 backoff_rmdir() (in module *conda.gateways.disk.delete*), 477
 backslash_to_forwardslash() (in module *conda.activate*), 314
 BAD_FORMAT (*ERROR* attribute), 386
 bad_installed() (*Resolve* method), 557
 base_env_name (in module *conda_env.cli.common*), 578
 base_url (*Channel* property), 492, 505
 base_url (*Dist* attribute), 508
 base_url (*MultiChannel* property), 506
 base_urls (*Channel* property), 492, 505
 base_urls (*MultiChannel* property), 506
 BaseSpec (class in *conda.models.version*), 533
 BaseTestCase (class in *conda.testing.cases*), 557
 basic_types() (*PathType* method), 511
 BasicClobberError, 457
 BDD() (*Clauses* method), 384
 BIN_DIRECTORY (in module *conda.testing.integration*), 564
 binary (*FileMode* attribute), 510
 binary_replace() (in module *conda.core.portability*), 446
 BinaryPrefixReplacementError, 461
 binstar() (*BinstarSpec* method), 591, 593
 binstar_upload (*Context* property), 356
 binstar_upload (in module *conda.exports*), 464
 BinstarSpec (class in *conda_env.specs*), 592
 BinstarSpec (class in *conda_env.specs.binstar*), 591
 bits (*Context* property), 355
 bits (*DataSource* attribute), 248, 254
 bits (in module *conda.exports*), 464
 bld_path (*Context* attribute), 359
 body (*JLAP* property), 484
 BooleanField (class in *conda.auxlib.entity*), 334
 BoolField (in module *conda.auxlib.entity*), 334
 boolify() (in module *conda.auxlib.type_coercion*), 346
 bottom (*ParameterFlag* attribute), 391
 box() (*_FeaturesField* method), 524
 box() (*BooleanField* method), 334
 box() (*ComposableField* method), 338
 box() (*DateField* method), 336
 box() (*EnumField* method), 336
 box() (*Field* method), 334
 box() (*LinkTypeField* method), 523
 box() (*ListField* method), 337
 box() (*MapField* method), 337
 box() (*NoarchField* method), 519, 524
 box() (*StringField* method), 336
 box() (*TimestampField* method), 524
 breadth_first_search_by_name() (*GeneralGraph* method), 522
 breadth_first_search_for_dep_graph() (*Resolve* method), 555
 build (*CondaVirtualPackage* attribute), 227, 548, 554
 build (*Dist* property), 507
 build (*PackageInfo* property), 520
 build (*PackageRecord* attribute), 527
 build_activate() (*_Activator* method), 314
 build_binary_response() (in module *conda.gateways.connection.adapters.ftp*), 469
 build_conflict_map() (*Resolve* method), 555
 build_deactivate() (*_Activator* method), 314
 build_graph_of_deps() (*Resolve* method), 555
 build_headers() (in module *conda.gateways.repodata.jlap.fetch*), 487
 build_number (*Dist* attribute), 508
 build_number (*DistDetails* attribute), 507
 build_number (*PackageInfo* property), 520
 build_number (*PackageRecord* attribute), 527
 build_number() (in module *conda._vendor.distro*), 262
 build_number() (*LinuxDistribution* method), 264
 build_reactivate() (*_Activator* method), 314
 build_response() (in module *conda.gateways.connection.adapters.ftp*), 469
 build_stack() (*_Activator* method), 314
 build_string (*Dist* attribute), 508
 build_string (*DistDetails* attribute), 507
 build_text_response() (in module *conda.gateways.connection.adapters.ftp*), 469
 BuildNumberMatch (class in *conda.models.version*), 534
 BuildPyCommand (class in *conda.auxlib.packaging*), 344
 BUILTIN_COMMANDS (in module *conda.cli.conda_argparse*), 365
- ## C
- cache_actions (*ProgressiveFetchExtract* property), 439
 cache_control (*RepodataState* property), 494
 CACHE_CONTROL_KEY (in module *conda.gateways.repodata*), 493
 cache_fn_url() (in module *conda.gateways.repodata*), 496
 cache_path_base (*RepodataFetch* attribute), 495
 cache_path_base (*SubdirData* property), 452
 cache_path_json (*RepodataCache* property), 495
 cache_path_json (*RepodataFetch* property), 495
 cache_path_json (*SubdirData* property), 452
 cache_path_pickle (*SubdirData* property), 452
 cache_path_state (*RepodataCache* property), 495
 cache_path_state (*RepodataFetch* property), 495
 cache_path_state (*SubdirData* property), 452
 CACHE_STATE_SUFFIX (in module *conda.gateways.repodata*), 493

- cached_cuda_version() (in module *conda.plugins.virtual_packages.cuda*), 550
- cached_response() (in module *conda.notices.cache*), 535
- CacheUrlAction (class in *conda.core.path_actions*), 444
- calculate_channel_urls() (in module *conda.core.index*), 429
- call() (in module *conda.auxlib.packaging*), 344
- call_each() (in module *conda.auxlib.collection*), 324
- CallbackIOWrapper (class in *conda._vendor.tqdm.utils*), 305
- CAN_CALL_CPUID_IN_SUBPROCESS (in module *conda._vendor.cpuinfo*), 254
- CAN_CALL_CPUID_IN_SUBPROCESS (in module *conda._vendor.cpuinfo.cpuinfo*), 248
- can_cpuid (DataSource attribute), 248, 254
- can_handle() (BinStarSpec method), 591, 592
- can_handle() (RequirementsSpec method), 591, 593
- can_handle() (YamlFileSpec method), 592, 593
- CancelOperation, 480
- canonical_name (Channel property), 492, 505
- canonical_name (MultiChannel property), 506
- capsys (CondaCLIFixture attribute), 571
- capture_json_with_argv() (in module *conda.testing.helpers*), 561
- captured() (in module *conda.common.io*), 401
- captured() (in module *conda.testing.helpers*), 561
- CaptureTarget (class in *conda.common.io*), 401
- CaseInsensitiveStrMatch (class in *conda.models.match_spec*), 519
- cat_proc_cpuinfo() (DataSource static method), 249, 255
- cat_var_run_dmesg_boot() (DataSource static method), 249, 255
- category_map (Context property), 356
- Central (in module *conda._vendor.boltons.timeutils*), 245
- changepys1 (Context attribute), 356
- ChangeReport (class in *conda.core.link*), 436
- Channel (class in *conda.gateways.repodata*), 492
- Channel (class in *conda.models.channel*), 505
- channel (Dist attribute), 508
- channel (PackageInfo attribute), 520
- channel (PackageRecord attribute), 527
- channel (RepodataFetch attribute), 495
- channel_alias() (Context method), 359
- channel_alias_validation() (in module *conda.base.context*), 355
- CHANNEL_DIR (in module *conda.testing.helpers*), 561
- channel_location (Channel property), 492, 505
- channel_location (MultiChannel property), 506
- channel_name (Channel property), 492, 505
- channel_name (ChannelNotice attribute), 538
- channel_notices (ChannelNoticeResultSet attribute), 539
- channel_priority (Context attribute), 357
- channel_settings (Context attribute), 357
- ChannelError, 458
- ChannelField (class in *conda.models.records*), 525
- ChannelMatch (class in *conda.models.match_spec*), 518
- ChannelName (in module *conda.notices.core*), 536
- ChannelNotAllowed, 458
- ChannelNotice (class in *conda.notices.types*), 538
- ChannelNoticeResponse (class in *conda.notices.types*), 539
- ChannelNoticeResultSet (class in *conda.notices.types*), 538
- ChannelPriority (class in *conda.base.constants*), 352
- ChannelPriorityMeta (class in *conda.base.constants*), 352
- channels (Context property), 356
- ChannelType (class in *conda.models.channel*), 505
- ChannelUrl (in module *conda.notices.core*), 536
- check_allowlist() (in module *conda.core.index*), 428
- CHECK_ALTERNATE_FORMAT_INTERVAL (in module *conda.gateways.repodata*), 493
- CHECK_EXTRACT (in module *conda.instructions*), 500
- CHECK_FETCH (in module *conda.instructions*), 500
- check_files_in_package() (in module *conda.instructions*), 501
- check_non_admin() (in module *conda.cli.common*), 362
- check_prefix() (in module *conda.cli.install*), 369
- check_source() (Configuration method), 398
- check_whitelist() (in module *conda.core.index*), 428
- ChecksumMismatchError, 459
- classproperty (class in *conda.auxlib.decorators*), 328
- Clauses (class in *conda.common._logic*), 384
- Clauses (class in *conda.common.logic*), 405
- CLEAN (Commands attribute), 380, 565
- cleanup() (_Action method), 441
- cleanup() (CacheUrlAction method), 444
- cleanup() (CompileMultiPycAction method), 443
- cleanup() (CreateInPrefixPathAction method), 442
- cleanup() (ExtractPackageAction method), 445
- cleanup() (RegisterEnvironmentLocationAction method), 443
- cleanup() (RemoveMenuAction method), 444
- cleanup() (TemporaryDirectory method), 475
- cleanup() (UnlinkPathAction method), 444
- cleanup() (UnregisterEnvironmentLocationAction method), 444
- cleanup() (UpdateHistoryAction method), 443
- clear() (IndexedSet method), 236
- clear() (PackageCacheData class method), 439, 491
- clear() (tqdm method), 289, 295, 301, 310

`clear_cached_local_channel_data()` (*SubdirData class method*), 452
`clear_has_format()` (*RepodataState method*), 494
`clear_memoized_methods()` (in module *conda.auxlib.decorators*), 327
`clear_subdir_cache()` (in module *conda.testing.fixtures*), 558
`client_ssl_cert` (*Context attribute*), 357
`client_ssl_cert_key` (*Context attribute*), 357
`clobber` (*Context attribute*), 356
`clobber` (*PathConflict attribute*), 351
`ClobberError`, 457
`clone()` (in module *conda.cli.install*), 369
`clone_env()` (in module *conda.misc*), 503
`close()` (*EnforceUnusedAdapter method*), 472
`close()` (*FTPAdapter method*), 468
`close()` (*HashWriter method*), 487
`close()` (*LocalFSAdapter method*), 470
`close()` (*ProgressBar method*), 402
`close()` (*S3Adapter method*), 471
`close()` (*tqdm method*), 289, 295, 301, 310
`CmdExeActivator` (class in *conda.activate*), 315
`codename()` (in module *conda._vendor.distro*), 262
`codename()` (*LinuxDistribution method*), 265
`coerce()` (*NoarchType static method*), 512
`collect_all()` (*Configuration method*), 398
`collect_errors()` (*LoadedParameter method*), 392
`collect_errors()` (*MapLoadedParameter method*), 393
`collect_errors()` (*ObjectLoadedParameter method*), 394
`collect_errors()` (*SequenceLoadedParameter method*), 394
`colorama` (in module *conda._vendor.tqdm.utils*), 304
`com_pat` (*History attribute*), 498
`Combine()` (*Clauses method*), 384
`combined_depends` (*PackageRecord property*), 526
`command_header()` (*Trace method*), 248, 254
`command_join` (*_Activator attribute*), 313
`command_join` (*CmdExeActivator attribute*), 316
`command_join` (*CshActivator attribute*), 315
`command_join` (*FishActivator attribute*), 316
`command_join` (*JSONFormatMixin attribute*), 317
`command_join` (*PosixActivator attribute*), 314
`command_join` (*PowerShellActivator attribute*), 316
`command_join` (*XonshActivator attribute*), 315
`command_output()` (*Trace method*), 248, 254
`CommandNotFoundError`, 457
`Commands` (class in *conda.cli.python_api*), 380
`Commands` (class in *conda.testing.integration*), 564
`commands` (in module *conda.instructions*), 501
`commands()` (*_Activator method*), 313
`Comparable` (class in *conda._vendor.tqdm.utils*), 304
`COMPARE` (*Commands attribute*), 565
`COMPARE_OP` (in module *conda.common.pkg_formats.python*), 418
`compare_packages()` (in module *conda.cli.main_compare*), 372
`compatible_release_operator()` (in module *conda.models.version*), 533
`COMPATIBLE_SHELLS` (in module *conda.base.constants*), 350
`compile()` (*ASM method*), 250, 256
`compile_action_groups` (*PrefixActionGroup attribute*), 435
`compile_multiple_pyc()` (in module *conda.gateways.disk.create*), 476
`CompileMultiPycAction` (class in *conda.core.path_actions*), 442
`complement()` (in module *conda._vendor.boltons.setutils*), 237
`Completer` (class in *conda.exports*), 465
`ComposableField` (class in *conda.auxlib.entity*), 337
`compute_md5sum()` (in module *conda.gateways.disk.read*), 479
`compute_sha256sum()` (in module *conda.gateways.disk.read*), 479
`compute_sum()` (in module *conda.gateways.disk.read*), 479
`concat()` (in module *conda._vendor.toolz.itertoolz*), 277
`concatv()` (in module *conda._vendor.toolz.itertoolz*), 277
`conda`
 module, 231
`conda.__main__`
 module, 231
`conda.__version__`
 module, 231
`conda._vendor`
 module, 231
`conda._vendor.appdirs`
 module, 231
`conda._vendor.boltons`
 module, 235
`conda._vendor.boltons.setutils`
 module, 235
`conda._vendor.boltons.timeutils`
 module, 239
`conda._vendor.cpuinfo`
 module, 246
`conda._vendor.cpuinfo.cpuinfo`
 module, 246
`conda._vendor.distro`
 module, 257
`conda._vendor.frozendict`
 module, 266
`conda._vendor.toolz`
 module, 267

conda._vendor.toolz.compatibility	conda.auxlib.packaging
module, 267	module, 343
conda._vendor.toolz.dicttoolz	conda.auxlib.type_coercion
module, 268	module, 345
conda._vendor.toolz.itertoolz	conda.base
module, 272	module, 347
conda._vendor.toolz.recipes	conda.base.constants
module, 283	module, 348
conda._vendor.toolz.utils	conda.base.context
module, 283	module, 353
conda._vendor.tqdm	conda.base.exceptions
module, 284	module, 360
conda._vendor.tqdm.__main__	conda.cli
module, 284	module, 361
conda._vendor.tqdm._main	conda.cli.common
module, 284	module, 361
conda._vendor.tqdm._monitor	conda.cli.conda_argparse
module, 285	module, 362
conda._vendor.tqdm._tqdm	conda.cli.find_commands
module, 285	module, 368
conda._vendor.tqdm._utils	conda.cli.install
module, 291	module, 369
conda._vendor.tqdm.asyncio	conda.cli.main
module, 291	module, 370
conda._vendor.tqdm.auto	conda.cli.main_clean
module, 292	module, 370
conda._vendor.tqdm.cli	conda.cli.main_compare
module, 297	module, 372
conda._vendor.tqdm.std	conda.cli.main_config
module, 297	module, 372
conda._vendor.tqdm.utils	conda.cli.main_create
module, 302	module, 373
conda._vendor.tqdm.version	conda.cli.main_info
module, 306	module, 373
conda.activate	conda.cli.main_init
module, 312	module, 374
conda.api	conda.cli.main_install
module, 317	module, 374
conda.auxlib	conda.cli.main_list
module, 322	module, 375
conda.auxlib.collection	conda.cli.main_notices
module, 323	module, 375
conda.auxlib.compat	conda.cli.main_package
module, 324	module, 376
conda.auxlib.decorators	conda.cli.main_pip
module, 325	module, 377
conda.auxlib.entity	conda.cli.main_remove
module, 328	module, 377
conda.auxlib.exceptions	conda.cli.main_rename
module, 339	module, 378
conda.auxlib.ish	conda.cli.main_run
module, 340	module, 378
conda.auxlib.logz	conda.cli.main_search
module, 340	module, 378

conda.cli.main_update	conda.core.initialize
module, 379	module, 429
conda.cli.python_api	conda.core.link
module, 379	module, 434
conda.common	conda.core.package_cache
module, 381	module, 437
conda.common._logic	conda.core.package_cache_data
module, 381	module, 437
conda.common._os	conda.core.path_actions
module, 385	module, 440
conda.common._os.linux	conda.core.portability
module, 385	module, 445
conda.common._os.unix	conda.core.prefix_data
module, 385	module, 446
conda.common._os.windows	conda.core.solve
module, 385	module, 448
conda.common.compat	conda.core.subdir_data
module, 387	module, 451
conda.common.configuration	conda.deprecations
module, 389	module, 453
conda.common.constants	conda.exception_handler
module, 398	module, 455
conda.common.cuda	conda.exceptions
module, 398	module, 456
conda.common.decorators	conda.exports
module, 399	module, 462
conda.common.disk	conda.gateways
module, 399	module, 466
conda.common.io	conda.gateways.anaconda_client
module, 399	module, 467
conda.common.iterators	conda.gateways.connection
module, 404	module, 467
conda.common.logic	conda.gateways.connection.adapters
module, 404	module, 467
conda.common.path	conda.gateways.connection.adapters.ftp
module, 407	module, 467
conda.common.pkg_formats	conda.gateways.connection.adapters.localfs
module, 411	module, 470
conda.common.pkg_formats.python	conda.gateways.connection.adapters.s3
module, 411	module, 470
conda.common.serialize	conda.gateways.connection.download
module, 419	module, 471
conda.common.signals	conda.gateways.connection.session
module, 420	module, 472
conda.common.toposort	conda.gateways.disk
module, 421	module, 474
conda.common.url	conda.gateways.disk.create
module, 421	module, 474
conda.core	conda.gateways.disk.delete
module, 427	module, 476
conda.core.envs_manager	conda.gateways.disk.link
module, 427	module, 477
conda.core.index	conda.gateways.disk.permissions
module, 428	module, 477

conda.gateways.disk.read	conda.notices.core
module, 478	module, 536
conda.gateways.disk.test	conda.notices.fetch
module, 479	module, 537
conda.gateways.disk.update	conda.notices.types
module, 480	module, 538
conda.gateways.logging	conda.notices.views
module, 481	module, 539
conda.gateways.repodata	conda.plan
module, 483	module, 540
conda.gateways.repodata.jlap	conda.plugins
module, 483	module, 542
conda.gateways.repodata.jlap.core	conda.plugins.hookspec
module, 483	module, 542
conda.gateways.repodata.jlap.fetch	conda.plugins.manager
module, 485	module, 545
conda.gateways.repodata.jlap.interface	conda.plugins.solvers
module, 487	module, 546
conda.gateways.repodata.lock	conda.plugins.subcommands
module, 488	module, 546
conda.gateways.subprocess	conda.plugins.subcommands.doctor
module, 496	module, 546
conda.history	conda.plugins.subcommands.doctor.cli
module, 497	module, 546
conda.instructions	conda.plugins.subcommands.doctor.health_checks
module, 499	module, 547
conda.lock	conda.plugins.types
module, 501	module, 548
conda.misc	conda.plugins.virtual_packages
module, 503	module, 550
conda.models	conda.plugins.virtual_packages.archspec
module, 504	module, 550
conda.models.channel	conda.plugins.virtual_packages.cuda
module, 504	module, 550
conda.models.dist	conda.plugins.virtual_packages.freebsd
module, 506	module, 551
conda.models.enums	conda.plugins.virtual_packages.linux
module, 509	module, 551
conda.models.leased_path_entry	conda.plugins.virtual_packages.osx
module, 512	module, 551
conda.models.match_spec	conda.plugins.virtual_packages.windows
module, 512	module, 551
conda.models.package_info	conda.resolve
module, 519	module, 554
conda.models.prefix_graph	conda.testing
module, 520	module, 557
conda.models.records	conda.testing.cases
module, 522	module, 557
conda.models.version	conda.testing.fixtures
module, 529	module, 558
conda.notices	conda.testing.gateways
module, 534	module, 559
conda.notices.cache	conda.testing.gateways.fixtures
module, 534	module, 559

conda.testing.helpers
 module, 559

conda.testing.integration
 module, 562

conda.testing.notices
 module, 565

conda.testing.notices.fixtures
 module, 565

conda.testing.notices.helpers
 module, 566

conda.testing.solver_helpers
 module, 567

conda.trust
 module, 572

conda.trust.constants
 module, 572

conda.trust.signature_verification
 module, 572

conda.utils
 module, 573

conda_build (*Context property*), 355

conda_build (*in module conda.exports*), 465

conda_build_form() (*MatchSpec method*), 516

conda_build_local_paths (*Context property*), 355

conda_build_local_urls (*Context property*), 355

conda_check_versions_aligned() (*in module conda.testing*), 571

conda_cli (*TmpEnvFixture attribute*), 572

conda_cli() (*in module conda.testing*), 571

conda_ensure_sys_python_is_base_env_python() (*in module conda.testing*), 571

conda_env
 module, 577

conda_env.__main__
 module, 577

conda_env.cli
 module, 577

conda_env.cli.common
 module, 577

conda_env.cli.main
 module, 578

conda_env.cli.main_config
 module, 578

conda_env.cli.main_create
 module, 579

conda_env.cli.main_export
 module, 581

conda_env.cli.main_list
 module, 581

conda_env.cli.main_remove
 module, 582

conda_env.cli.main_update
 module, 583

conda_env.cli.main_vars
 module, 584

conda_env.env
 module, 586

conda_env.installers
 module, 588

conda_env.installers.base
 module, 588

conda_env.installers.conda
 module, 588

conda_env.installers.pip
 module, 589

conda_env.pip_util
 module, 589

conda_env.specs
 module, 590

conda_env.specs.binstar
 module, 590

conda_env.specs.requirements
 module, 591

conda_env.specs.yaml_file
 module, 592

CONDA_ENV_VARS_UNSET_VAR (*in module conda.base.constants*), 353

conda_exception_handler() (*in module conda.exception_handler*), 456

conda_exe (*Context property*), 356

conda_exe_vars_dict (*Context property*), 356

CONDA_HOME PAGE_URL (*in module conda.base.constants*), 350

CONDA_HOME PAGE_URL (*in module conda.gateways.repodata*), 490

conda_http_errors() (*in module conda.gateways.repodata*), 494

CONDA_INITIALIZE_PS_RE_BLOCK (*in module conda.core.initialize*), 432

CONDA_INITIALIZE_RE_BLOCK (*in module conda.core.initialize*), 432

conda_installed_files() (*in module conda.misc*), 503

CONDA_LOGS_DIR (*in module conda.base.constants*), 350

conda_move_to_front_of_PATH() (*in module conda.testing*), 571

conda_name (*PythonDistribution property*), 412

conda_notices_args_n_parser() (*in module conda.testing.notices.fixtures*), 566

CONDA_PACKAGE_EXTENSION_V1 (*in module conda.base.constants*), 350

CONDA_PACKAGE_EXTENSION_V2 (*in module conda.base.constants*), 350

CONDA_PACKAGE_EXTENSIONS (*in module conda.base.constants*), 350

CONDA_PACKAGE_ROOT (*in module conda*), 576

conda_package_types() (*PackageType static method*), 511

- `conda_post_commands()` (*CondaSpecs* method), 544
- `conda_post_commands()` (in module *conda.plugins.hookspec.CondaSpecs*), 224
- `conda_pre_commands()` (*CondaSpecs* method), 544
- `conda_pre_commands()` (in module *conda.plugins.hookspec.CondaSpecs*), 224
- `conda_prefix` (*Context* property), 356
- `conda_private` (*Context* property), 355
- `CONDA_SESSION_SCHEMES` (in module *conda.gateways.connection.session*), 472
- `conda_signal_handler()` (in module *conda*), 577
- `conda_solvers()` (*CondaSpecs* method), 542
- `conda_solvers()` (in module *conda.plugins.hookspec.CondaSpecs*), 225
- `conda_solvers()` (in module *conda.plugins.solvers*), 546
- `conda_subcommands()` (*CondaSpecs* method), 543
- `conda_subcommands()` (in module *conda.plugins.hookspec.CondaSpecs*), 226
- `conda_subcommands()` (in module *conda.plugins.subcommands.doctor.cli*), 547
- `CONDA_TARBALL_EXTENSION` (in module *conda.base.constants*), 350
- `CONDA_TEMP_EXTENSION` (in module *conda.base.constants*), 350
- `CONDA_TEMP_EXTENSIONS` (in module *conda.base.constants*), 350
- `conda_tests_ctxt_mgmt_def_pol` (in module *conda.base.context*), 360
- `conda_v_pat` (*History* attribute), 498
- `conda_virtual_packages()` (*CondaSpecs* method), 543
- `conda_virtual_packages()` (in module *conda.plugins.hookspec.CondaSpecs*), 227
- `conda_virtual_packages()` (in module *conda.plugins.virtual_packages.archspec*), 550
- `conda_virtual_packages()` (in module *conda.plugins.virtual_packages.cuda*), 550
- `conda_virtual_packages()` (in module *conda.plugins.virtual_packages.freebsd*), 551
- `conda_virtual_packages()` (in module *conda.plugins.virtual_packages.linux*), 551
- `conda_virtual_packages()` (in module *conda.plugins.virtual_packages.osx*), 551
- `conda_virtual_packages()` (in module *conda.plugins.virtual_packages.windows*), 552
- `CondaCLIFixture` (class in *conda.testing*), 571
- `CondaDependencyError`, 461, 491
- `CondaEnvException`, 461
- `CondaEnvironmentError`, 458
- `CondaError`, 490, 576
- `CondaExitZero`, 577
- `CondaFileIOError`, 458
- `CondaHistoryError`, 460
- `CondaHistoryWarning`, 498
- `CondaHttpAuth` (class in *conda.gateways.connection.session*), 473
- `CondaHTTPError`, 459, 491
- `CondaImportError`, 459
- `CondaIndexError`, 460
- `CondaIOError`, 458
- `CondaKeyError`, 458
- `CondaMemoryError`, 461
- `CondaMultiError`, 576
- `CondaOSError`, 458
- `CondaOSError` (in module *conda.exports*), 465
- `CondaPluginManager` (class in *conda.plugins.manager*), 545
- `CondaPostCommand` (class in *conda.plugins*), 552
- `CondaPostCommand` (class in *conda.plugins.types*), 223, 549
- `CondaPreCommand` (class in *conda.plugins*), 552
- `CondaPreCommand` (class in *conda.plugins.types*), 224, 549
- `CONDARC_FILENAMES` (in module *conda.common.configuration*), 397
- `CondaRepoInterface` (class in *conda.gateways.repodata*), 494
- `CondaSession` (class in *conda.gateways.connection.session*), 473
- `CondaSession` (class in *conda.gateways.repodata*), 493
- `CondaSessionType` (class in *conda.gateways.connection.session*), 472
- `CondaSignalInterrupt`, 456
- `CondaSolver` (class in *conda.plugins*), 553
- `CondaSolver` (class in *conda.plugins.types*), 225, 548
- `CondaSpecs` (class in *conda.plugins.hookspec*), 542
- `CondaSSLError`, 459, 491
- `CondaSubcommand` (class in *conda.plugins*), 553
- `CondaSubcommand` (class in *conda.plugins.types*), 226, 548
- `CondaSystemExit`, 458
- `CondaUpgradeError`, 460
- `CondaValueError`, 460
- `CondaVerificationError`, 460
- `CondaVirtualPackage` (class in *conda.plugins*), 553
- `CondaVirtualPackage` (class in *conda.plugins.types*), 227, 548
- `CONFIG` (*Commands* attribute), 380, 565
- `config_description` (in module *conda_env.cli.main_config*), 579
- `config_example` (in module *conda_env.cli.main_config*), 579
- `config_files` (*Context* property), 356

Configuration (class in *conda.common.configuration*), 397
 ConfigurationError, 390
 ConfigurationLoadError, 390
 ConfigurationObject (class in *conda.common.configuration*), 394
 ConfigurationType (class in *conda.common.configuration*), 397
 configure_parser (CondaSubcommand attribute), 226, 548, 553
 configure_parser() (in module *conda.plugins.subcommands.doctor.cli*), 547
 configure_parser() (in module *conda_env.cli.main_config*), 579
 configure_parser() (in module *conda_env.cli.main_create*), 580
 configure_parser() (in module *conda_env.cli.main_export*), 581
 configure_parser() (in module *conda_env.cli.main_list*), 582
 configure_parser() (in module *conda_env.cli.main_remove*), 583
 configure_parser() (in module *conda_env.cli.main_update*), 584
 configure_parser() (in module *conda_env.cli.main_vars*), 586
 configure_parser_clean() (in module *conda.cli.conda_argparse*), 367
 configure_parser_compare() (in module *conda.cli.conda_argparse*), 367
 configure_parser_config() (in module *conda.cli.conda_argparse*), 367
 configure_parser_create() (in module *conda.cli.conda_argparse*), 367
 configure_parser_info() (in module *conda.cli.conda_argparse*), 367
 configure_parser_init() (in module *conda.cli.conda_argparse*), 367
 configure_parser_install() (in module *conda.cli.conda_argparse*), 367
 configure_parser_list() (in module *conda.cli.conda_argparse*), 367
 configure_parser_notices() (in module *conda.cli.conda_argparse*), 368
 configure_parser_package() (in module *conda.cli.conda_argparse*), 367
 configure_parser_plugins() (in module *conda.cli.conda_argparse*), 367
 configure_parser_remove() (in module *conda.cli.conda_argparse*), 368
 configure_parser_rename() (in module *conda.cli.conda_argparse*), 368
 configure_parser_run() (in module *conda.cli.conda_argparse*), 368
 configure_parser_search() (in module *conda.cli.conda_argparse*), 368
 configure_parser_update() (in module *conda.cli.conda_argparse*), 368
 confirm() (in module *conda.cli.common*), 361
 confirm_yn() (in module *conda.cli.common*), 361
 cons() (in module *conda._vendor.toolz.itertoolz*), 277
 constant() (DeprecationHandler method), 454
 ConstantTZInfo (class in *conda._vendor.boltons.timeutils*), 244
 constrains (PackageRecord attribute), 527
 construct_states() (History method), 499
 contains() (CondaMultiError method), 577
 Context (class in *conda.base.context*), 355
 context (in module *conda.base.context*), 360
 context (in module *conda.gateways.repodata*), 490
 context (in module *conda.testing*), 571
 context_stack (in module *conda.base.context*), 360
 ContextDecorator (class in *conda.common.io*), 401
 ContextStack (class in *conda.base.context*), 360
 ContextStackObject (class in *conda.base.context*), 359
 convert_path() (in module *conda.auxlib.packaging*), 345
 convert_to_dist_str() (in module *conda.testing.helpers*), 562
 copy (LinkType attribute), 510
 copy() (frozendict method), 267
 copy() (in module *conda.gateways.disk.create*), 476
 CorruptedEnvironmentError, 460
 CouldntParseError, 459
 count() (in module *conda._vendor.toolz.itertoolz*), 280
 count() (IndexedSet method), 237
 countby() (in module *conda._vendor.toolz.recipes*), 283
 cp_or_copy (in module *conda.testing.integration*), 564
 cpu_count (DataSource attribute), 248, 254
 cpu_flags() (Context method), 359
 cpufreq_info() (DataSource static method), 249, 255
 CPUID (class in *conda._vendor.cpuinfo*), 256
 CPUID (class in *conda._vendor.cpuinfo.cpuinfo*), 250
 CPUINFO_VERSION (in module *conda._vendor.cpuinfo*), 254
 CPUINFO_VERSION (in module *conda._vendor.cpuinfo.cpuinfo*), 248
 CPUINFO_VERSION_STRING (in module *conda._vendor.cpuinfo*), 254
 CPUINFO_VERSION_STRING (in module *conda._vendor.cpuinfo.cpuinfo*), 248
 CREATE (Commands attribute), 380, 565
 create_actions() (CompileMultiPycAction class method), 442
 create_actions() (CreateNonadminAction class method), 442

- [create_actions\(\)](#) (*CreatePrefixRecordAction* class method), 443
[create_actions\(\)](#) (*CreatePythonEntryPointAction* class method), 443
[create_actions\(\)](#) (*MakeMenuAction* class method), 442
[create_actions\(\)](#) (*RemoveMenuAction* class method), 444
[create_actions\(\)](#) (*UpdateHistoryAction* class method), 443
[create_application_entry_point\(\)](#) (in module *conda.gateways.disk.create*), 475
[create_cache_dir\(\)](#) (in module *conda.gateways.repodata*), 496
[create_conda_pkg\(\)](#) (in module *conda.cli.main_package*), 377
[create_default_packages](#) (Context attribute), 356
[create_directory_actions\(\)](#) (*LinkPathAction* class method), 442
[create_envs_directory\(\)](#) (in module *conda.gateways.disk.create*), 476
[create_fake_executable_softlink\(\)](#) (in module *conda.gateways.disk.create*), 476
[create_file_link_actions\(\)](#) (*LinkPathAction* class method), 442
[create_hard_link_or_copy\(\)](#) (in module *conda.gateways.disk.create*), 476
[create_info\(\)](#) (in module *conda.cli.main_package*), 376
[create_link\(\)](#) (in module *conda.gateways.disk.create*), 476
[create_notice_cache_files\(\)](#) (in module *conda.testing.notices.helpers*), 567
[create_package_cache_directory\(\)](#) (in module *conda.gateways.disk.create*), 476
[create_parser\(\)](#) (in module *conda_env.cli.main*), 578
[create_python_entry_point\(\)](#) (in module *conda.gateways.disk.create*), 475
[create_python_entry_point_windows_exe_action\(\)](#) (*LinkPathAction* class method), 442
[create_temp_location\(\)](#) (in module *conda.testing.integration*), 565
[created_at](#) (*ChannelNotice* attribute), 538
[CreateInPrefixPathAction](#) (class in *conda.core.path_actions*), 441
[CreateNonadminAction](#) (class in *conda.core.path_actions*), 442
[CreatePrefixRecordAction](#) (class in *conda.core.path_actions*), 443
[CreatePythonEntryPointAction](#) (class in *conda.core.path_actions*), 443
[CRITICAL](#) (*NoticeLevel* attribute), 353
[croot](#) (Context property), 355
[CshActivator](#) (class in *conda.activate*), 315
[cuda_detect\(\)](#) (in module *conda.common.cuda*), 398
[cuda_version\(\)](#) (Context method), 359
[cuda_version\(\)](#) (in module *conda.plugins.virtual_packages.cuda*), 550
[CUR_OS](#) (in module *conda._vendor.tqdm.utils*), 304
[custom_channels\(\)](#) (Context method), 359
[custom_expandvars\(\)](#) (in module *conda.common.configuration*), 397
[custom_multichannels\(\)](#) (Context method), 359
[CustomValidationError](#), 391
[CyclicalDependencyError](#), 460
[cygwin_path_to_win\(\)](#) (in module *conda.utils*), 574
- ## D
- [dals\(\)](#) (in module *conda.auxlib.ish*), 340
[dashlist\(\)](#) (in module *conda.common.io*), 401
[data_callback_factory\(\)](#) (in module *conda.gateways.connection.adapters.ftp*), 469
[DataSource](#) (class in *conda._vendor.cpuinfo*), 254
[DataSource](#) (class in *conda._vendor.cpuinfo.cpuinfo*), 248
[date](#) (*PackageRecord* attribute), 527
[DateField](#) (class in *conda.auxlib.entity*), 336
[daterange\(\)](#) (in module *conda._vendor.boltons.timeutils*), 243
[DDE_BUSY](#) (*ERROR* attribute), 386
[DDE_FAIL](#) (*ERROR* attribute), 386
[DDE_TIMEOUT](#) (*ERROR* attribute), 386
[deactivate\(\)](#) (*_Activator* method), 313
[DeactivateHelp](#), 456
[debug](#) (Context attribute), 358
[DEBUG_FORMATTER](#) (in module *conda.auxlib.logz*), 341
[decimal_relative_time\(\)](#) (in module *conda._vendor.boltons.timeutils*), 242
[default](#) (*Field* property), 334
[default](#) (*Parameter* property), 394
[default\(\)](#) (*DumpEncoder* method), 342
[DEFAULT_AGGRESSIVE_UPDATE_PACKAGES](#) (in module *conda.base.constants*), 350
[DEFAULT_CHANNEL_ALIAS](#) (in module *conda.base.constants*), 350
[DEFAULT_CHANNELS](#) (in module *conda.base.constants*), 350
[default_channels\(\)](#) (Context method), 359
[DEFAULT_CHANNELS_UNIX](#) (in module *conda.base.constants*), 350
[DEFAULT_CHANNELS_WIN](#) (in module *conda.base.constants*), 350
[DEFAULT_CUSTOM_CHANNELS](#) (in module *conda.base.constants*), 350
[default_filter\(\)](#) (*Resolve* method), 555
[default_in_dump](#) (*Field* property), 334

- DEFAULT_IV (in module *conda.gateways.repodata.jlap.core*), 484
- DEFAULT_MARKER_CONTEXT (in module *conda.common.pkg_formats.python*), 419
- DEFAULT_NOTICE_MESG (in module *conda.testing.notices.helpers*), 567
- default_prefix (Context property), 355
- default_prefix (in module *conda.exports*), 464
- default_python (Context attribute), 356
- default_python (in module *conda.exports*), 464
- default_python_default() (in module *conda.base.context*), 355
- default_python_validation() (in module *conda.base.context*), 355
- default_threads (Context property), 355
- DEFAULTS_CHANNEL_NAME (in module *conda.base.constants*), 350
- DefaultValueRawParameter (class in *conda.common.configuration*), 392
- delete_prefix_from_linked_data() (in module *conda.core.prefix_data*), 448
- delete_trash() (in module *conda.gateways.disk.delete*), 477
- DeltaSecondsFormatter (class in *conda.common.io*), 400
- Dependencies (class in *conda_env.env*), 587
- dependency_sort() (Resolve method), 556
- depends (PackageRecord attribute), 527
- deprecated (in module *conda._vendor.boltions*), 246
- deprecated (in module *conda._vendor.toolz*), 284
- deprecated (in module *conda.deprecations*), 455
- deprecated (in module *conda.gateways.repodata*), 491
- deprecated (in module *conda.testing*), 571
- DeprecatedError, 453
- DeprecationHandler (class in *conda.deprecations*), 453
- deps_modifier (Context attribute), 358
- DepsModifier (class in *conda.base.constants*), 351
- DepsModifier (in module *conda.api*), 318
- describe_all_parameters() (in module *conda.cli.main_config*), 373
- describe_parameter() (Configuration method), 398
- description (in module *conda_env.cli.main_create*), 580
- description (in module *conda_env.cli.main_export*), 581
- description (in module *conda_env.cli.main_list*), 582
- description (in module *conda_env.cli.main_update*), 583
- description_map() (Context method), 359
- detach_stderr() (in module *conda.auxlib.logz*), 341
- detect() (in module *conda_env.specs*), 593
- determine_constricting_specs() (Solver method), 450
- determine_link_type() (in module *conda.core.link*), 435
- determine_target_prefix() (in module *conda.base.context*), 360
- dev (Context attribute), 358
- dict_cls (frozendict attribute), 267
- dict_cls (FrozenOrderedDict attribute), 267
- diff() (in module *conda._vendor.toolz.itertoolz*), 281
- diff_for_unlink_link_precs() (in module *conda.core.solve*), 450
- difference() (IndexedSet method), 237
- difference_update() (IndexedSet method), 237
- DIGEST_SIZE (in module *conda.gateways.repodata.jlap.core*), 484
- DIGEST_SIZE (in module *conda.gateways.repodata.jlap.fetch*), 486
- directory (LinkType attribute), 510
- directory (PathType attribute), 511
- DirectoryLock (class in *conda.lock*), 502
- DirectoryNotACondaEnvironmentError, 458
- DirectoryNotFoundError, 457
- disable_channel_notices() (in module *conda.testing.fixtures*), 558
- disable_external_plugins() (CondaPluginManager method), 546
- disable_logger() (in module *conda.common.io*), 402
- disable_on_exception() (DisableOnWriteError static method), 305
- disable_ssl_verify_warning() (in module *conda.gateways.connection.download*), 471
- DISABLED (ChannelPriority attribute), 352
- disabled (SafetyChecks attribute), 351
- DisableOnWriteError (class in *conda._vendor.tqdm.utils*), 305
- disallowed_packages (Context attribute), 357
- DisallowedPackageError, 460
- discard() (IndexedSet method), 236
- disp_features() (in module *conda.cli.common*), 362
- disp_len() (in module *conda._vendor.tqdm.utils*), 305
- disp_trim() (in module *conda._vendor.tqdm.utils*), 305
- display() (tqdm method), 289, 296, 302, 311
- display_actions() (in module *conda.exports*), 465
- display_actions() (in module *conda.plan*), 541
- display_health_checks() (in module *conda.plugins.subcommands.doctor.health_checks*), 547
- display_notices() (in module *conda.notices.core*), 536
- display_report_heading() (in module *conda.plugins.subcommands.doctor.health_checks*), 547
- dissoc() (in module *conda._vendor.toolz.dicttoolz*), 270
- Dist (class in *conda.models.dist*), 507
- dist_fields_dump() (PackageRecord method), 527

- `dist_name` (*Dist* attribute), 508
 - `dist_name` (*DistDetails* attribute), 507
 - `dist_str()` (*MatchSpec* method), 515
 - `dist_str()` (*PackageInfo* method), 520
 - `dist_str()` (*PackageRecord* method), 527
 - `dist_str_in_index()` (in module *conda.core.index*), 429
 - `dist_str_to_quad()` (in module *conda.models.dist*), 509
 - DistDetails* (class in *conda.models.dist*), 507
 - `distro_release_attr()` (in module *conda._vendor.distro*), 264
 - `distro_release_attr()` (*LinuxDistribution* method), 265
 - `distro_release_info()` (in module *conda._vendor.distro*), 263
 - `distro_release_info()` (*LinuxDistribution* method), 265
 - DistType* (class in *conda.models.dist*), 507
 - `DLL_NOT_FOUND` (*ERROR* attribute), 386
 - `dmesg_a()` (*DataSource* static method), 249, 255
 - `do_cache_action()` (in module *conda.core.package_cache_data*), 439
 - `do_call()` (in module *conda.cli.conda_argparse*), 365
 - `do_call()` (in module *conda_env.cli.main*), 578
 - `do_cleanup()` (in module *conda.core.package_cache_data*), 439
 - `do_extract_action()` (in module *conda.core.package_cache_data*), 439
 - `do_reverse()` (in module *conda.core.package_cache_data*), 439
 - `done_callback()` (in module *conda.core.package_cache_data*), 439
 - `downgraded_precs` (*ChangeReport* attribute), 436
 - `download()` (in module *conda.core.package_cache_data*), 440
 - `download()` (in module *conda.exports*), 466
 - `download()` (in module *conda.gateways.connection.download*), 471
 - `download_and_extract()` (*UnlinkLinkTransaction* method), 436
 - `download_and_hash()` (in module *conda.gateways.repodata.jlap.fetch*), 487
 - `download_only` (*Context* attribute), 356
 - `download_text()` (in module *conda.gateways.connection.download*), 471
 - `drop()` (in module *conda._vendor.toolz.itertoolz*), 275
 - `dry_run` (*Context* attribute), 358
 - `dry_run()` (in module *conda_env.installers.conda*), 588
 - `DRY_RUN_PREFIX` (in module *conda.base.constants*), 351
 - DryRunExit*, 458
 - `dst()` (*ConstantTZInfo* method), 244
 - `dst()` (*LocalTZInfo* method), 245
 - `dst()` (*USTimeZone* method), 245
 - `DSTEND_1967_1986` (in module *conda._vendor.boltons.timeutils*), 245
 - `DSTEND_1987_2006` (in module *conda._vendor.boltons.timeutils*), 245
 - `DSTEND_2007` (in module *conda._vendor.boltons.timeutils*), 245
 - `DSTSTART_1967_1986` (in module *conda._vendor.boltons.timeutils*), 245
 - `DSTSTART_1987_2006` (in module *conda._vendor.boltons.timeutils*), 245
 - `DSTSTART_2007` (in module *conda._vendor.boltons.timeutils*), 245
 - `dt_to_timestamp()` (in module *conda._vendor.boltons.timeutils*), 241
 - DummyArgs* (class in *conda.testing.notices.helpers*), 567
 - DummyExecutor* (class in *conda.common.io*), 402
 - `dump()` (*_FeaturesField* method), 524
 - `dump()` (*Channel* method), 493, 506
 - `dump()` (*ChannelField* method), 525
 - `dump()` (*ComposableField* method), 338
 - `dump()` (*DateField* method), 336
 - `dump()` (*Entity* method), 338
 - `dump()` (*EnumField* method), 336
 - `dump()` (*Field* method), 334
 - `dump()` (*ListField* method), 337
 - `dump()` (*MultiChannel* method), 506
 - `dump()` (*TimestampField* method), 524
 - `dump_map()` (*CondaError* method), 490, 576
 - `dump_map()` (*CondaMultiError* method), 577
 - `dump_record()` (in module *conda.cli.main_info*), 374
 - DumpEncoder* (class in *conda.auxlib.logz*), 342
- ## E
- Eastern* (in module *conda._vendor.boltons.timeutils*), 245
 - `emit()` (*StdStreamHandler* method), 483
 - `EMPTY_LINK` (in module *conda.models.records*), 524
 - `EMPTY_MAP` (in module *conda.common.configuration*), 390
 - `empty_prefix()` (in module *conda.testing.solver_helpers*), 568
 - `enable_private_envs` (*Context* attribute), 356
 - `enabled` (*_SignatureVerification* property), 573
 - `enabled` (*SafetyChecks* attribute), 351
 - `ENCODE_ARGS` (in module *conda.common.compat*), 388
 - `encode_arguments()` (in module *conda.common.compat*), 388
 - `ENCODE_ENVIRONMENT` (in module *conda.common.compat*), 388
 - `encode_environment()` (in module *conda.common.compat*), 388
 - `encode_for_env_var()` (in module *conda.common.compat*), 388
 - `encode_for_env_var()` (in module *conda.testing*), 571

- EncodingError, 461
 EnforceUnusedAdapter (class in *conda.gateways.connection.session*), 472
 ensure_binary() (in module *conda.activate*), 314
 ensure_binary() (in module *conda.common.compat*), 388
 ensure_dir_exists() (in module *conda.utils*), 575
 ensure_fs_path_encoding() (in module *conda.activate*), 314
 ensure_fs_path_encoding() (in module *conda.common.compat*), 388
 ensure_name_or_prefix() (in module *conda.cli.common*), 361
 ensure_pad() (in module *conda.common.path*), 409
 ensure_text_type() (in module *conda.common.compat*), 388
 ensure_unicode() (in module *conda.common.compat*), 388
 ensure_utf8_encoding() (in module *conda.common.compat*), 388
 Entity (class in *conda.auxlib.entity*), 338
 ENTRY_POINT (in module *conda_env.installers.base*), 588
 entry_point_action_groups (PrefixActionGroup attribute), 435
 entry_points (Noarch attribute), 519
 ENTRY_POINTS_FILES (PythonDistribution attribute), 413
 ENTRY_POINTS_FILES (PythonEggInfoDistribution attribute), 414
 ENTRY_POINTS_FILES (PythonInstalledDistribution attribute), 414
 EnumField (class in *conda.auxlib.entity*), 336
 env() (SolverTests method), 569
 env_name() (in module *conda.base.context*), 360
 env_or_set (in module *conda.testing.integration*), 564
 env_override() (in module *conda.common.decorators*), 399
 env_prompt (Context attribute), 356
 env_unmodified() (in module *conda.common.io*), 401
 env_var() (in module *conda.common.io*), 401
 env_vars() (in module *conda.common.io*), 401
 EnvAppDirs (class in *conda.gateways.anaconda_client*), 467
 Environment (class in *conda_env.env*), 587
 environment (RequirementsSpec property), 591, 593
 environment (YamlFileSpec property), 592, 593
 environment() (BinstarSpec method), 591, 593
 environment_is_consistent() (Resolve method), 557
 ENVIRONMENT_TYPE (in module *conda_env.specs.binstar*), 591
 EnvironmentFileEmpty, 462
 EnvironmentFileExtensionNotValid, 462
 EnvironmentFileNotDownloaded, 462
 EnvironmentFileNotFound, 462
 EnvironmentLocationNotFound, 457
 EnvironmentNameNotFound, 457
 EnvironmentNotWritableError, 461
 EnvRawParameter (class in *conda.common.configuration*), 391
 envs_dirs (Context property), 355
 envs_dirs (in module *conda.exports*), 464
 EPOCH_AWARE (in module *conda._vendor.boltons.timeutils*), 244
 EPOCH_NAIVE (in module *conda._vendor.boltons.timeutils*), 244
 ERROR (class in *conda.common._os.windows*), 386
 error_upload_url (Context attribute), 358
 error_upload_url (ExceptionHandler property), 455
 ERROR_UPLOAD_URL (in module *conda.base.constants*), 350
 escape_channel_url() (in module *conda.common.url*), 426
 escape_for_winpath() (in module *conda.testing.integration*), 564
 escaped_sys_rc_path (in module *conda.cli.conda_argparse*), 365
 escaped_user_rc_path (in module *conda.cli.conda_argparse*), 364
 etag (RepodataState property), 494
 ETAG_KEY (in module *conda.gateways.repodata*), 493
 Eval() (Clauses method), 384
 evaluate() (Evaluator method), 419
 Evaluator (class in *conda.common.pkg_formats.python*), 419
 evaluator (in module *conda.common.pkg_formats.python*), 419
 exact_match() (BaseSpec method), 534
 exact_value (_StrMatchMixin property), 517
 exact_value (BaseSpec property), 533
 exact_value (BuildNumberMatch property), 534
 exact_value (FeatureMatch property), 518
 exact_value (GlobStrMatch property), 517
 exact_value (MatchInterface property), 517
 exact_value (SplitStrMatch property), 518
 ExactLowerStrMatch (class in *conda.models.match_spec*), 517
 ExactlyOne() (Clauses method), 406
 ExactlyOne_BDD() (Clauses method), 384, 406
 ExactlyOne_NSQ() (Clauses method), 384, 406
 exactness_and_number_of_deps() (in module *conda.resolve*), 554
 ExactStrMatch (class in *conda.models.match_spec*), 517
 example (in module *conda_env.cli.main_create*), 580
 example (in module *conda_env.cli.main_export*), 581
 example (in module *conda_env.cli.main_list*), 582
 example (in module *conda_env.cli.main_update*), 584

- ExceptionHandler (class in *conda.exception_handler*), 455
- excepts (class in *conda._vendor.toolz*), 284
- executable_paths (PreferredEnv attribute), 520
- execute() (*_Action* method), 441
- execute() (*_Activator* method), 313
- execute() (*CacheUrlAction* method), 444
- execute() (*CompileMultiPycAction* method), 443
- execute() (*CreateNonadminAction* method), 442
- execute() (*CreatePrefixRecordAction* method), 443
- execute() (*CreatePythonEntryPointAction* method), 443
- execute() (*ExtractPackageAction* method), 445
- execute() (in module *conda.cli.main_clean*), 371
- execute() (in module *conda.cli.main_compare*), 372
- execute() (in module *conda.cli.main_config*), 372
- execute() (in module *conda.cli.main_create*), 373
- execute() (in module *conda.cli.main_info*), 374
- execute() (in module *conda.cli.main_init*), 374
- execute() (in module *conda.cli.main_install*), 375
- execute() (in module *conda.cli.main_list*), 375
- execute() (in module *conda.cli.main_notices*), 376
- execute() (in module *conda.cli.main_package*), 376
- execute() (in module *conda.cli.main_remove*), 377
- execute() (in module *conda.cli.main_rename*), 378
- execute() (in module *conda.cli.main_run*), 378
- execute() (in module *conda.cli.main_search*), 379
- execute() (in module *conda.cli.main_update*), 379
- execute() (in module *conda.plugins.subcommands.doctor.cli*), 547
- execute() (in module *conda_env.cli.main_config*), 579
- execute() (in module *conda_env.cli.main_create*), 580
- execute() (in module *conda_env.cli.main_export*), 581
- execute() (in module *conda_env.cli.main_list*), 582
- execute() (in module *conda_env.cli.main_remove*), 583
- execute() (in module *conda_env.cli.main_update*), 584
- execute() (*LinkPathAction* method), 442
- execute() (*MakeMenuAction* method), 442
- execute() (*PrefixReplaceLinkAction* method), 442
- execute() (*ProgressiveFetchExtract* method), 439
- execute() (*RegisterEnvironmentLocationAction* method), 443
- execute() (*RemoveLinkedPackageRecordAction* method), 444
- execute() (*RemoveMenuAction* method), 444
- execute() (*UnlinkLinkTransaction* method), 436
- execute() (*UnlinkPathAction* method), 444
- execute() (*UnregisterEnvironmentLocationAction* method), 444
- execute() (*UpdateHistoryAction* method), 443
- execute_actions() (in module *conda.plan*), 541
- execute_config() (in module *conda.cli.main_config*), 373
- execute_instructions() (in module *conda.plan*), 541
- execute_list() (in module *conda_env.cli.main_vars*), 586
- execute_plan() (in module *conda.plan*), 541
- execute_set() (in module *conda_env.cli.main_vars*), 586
- execute_threads (Context property), 355
- execute_unset() (in module *conda_env.cli.main_vars*), 586
- exit() (*TMonitor* method), 285, 306
- exp_backoff_fn() (in module *conda.gateway.disk*), 481
- expand() (in module *conda.activate*), 314
- expand() (in module *conda.common.path*), 408
- expand() (*LoadedParameter* method), 393
- expand_environment_variables() (in module *conda.common.configuration*), 390
- expected_error_prefix (in module *conda.testing.helpers*), 561
- experimental (Context attribute), 358
- experimental_solver (Context property), 355
- expired_at (*ChannelNotice* attribute), 538
- explicit() (in module *conda.misc*), 503
- explode_directories() (in module *conda.common.path*), 409
- export_var_tmpl (*_Activator* attribute), 313
- export_var_tmpl (*CmdExeActivator* attribute), 316
- export_var_tmpl (*CshActivator* attribute), 315
- export_var_tmpl (*FishActivator* attribute), 316
- export_var_tmpl (*PosixActivator* attribute), 314
- export_var_tmpl (*PowerShellActivator* attribute), 316
- export_var_tmpl (*XonshActivator* attribute), 315
- EXPORTED_CHANNELS_DIR (in module *conda.testing.helpers*), 561
- extend() (*_ClauseArray* method), 382
- ExtendConstAction (class in module *conda.cli.conda_argparse*), 366
- extensions (*RequirementsSpec* attribute), 591, 593
- extensions (*YamlFileSpec* attribute), 592, 593
- external_write_mode() (*tqdm* class method), 287, 294, 300, 309
- extra_safety_checks (Context attribute), 357
- EXTRACT (in module *conda.instructions*), 500
- extract_actions (*ProgressiveFetchExtract* property), 439
- EXTRACT_CMD() (in module *conda.instructions*), 501
- extract_tarball() (in module *conda.gateway.disk.create*), 475
- EXTRACT_THREADS (in module *conda.core.package_cache_data*), 438
- extracted_package_dir (*PackageCacheRecord* attribute), 528
- extracted_package_dir (*PackageInfo* attribute), 520
- extracted_package_dir (*PrefixRecord* attribute), 528

ExtractPackageAction (class in *conda.core.path_actions*), 444

F

fail() (Trace method), 248, 254

FALSE (in module *conda.common_logic*), 382

FALSE (in module *conda.common_logic*), 405

FeatureMatch (class in *conda.models.match_spec*), 518

features (PackageRecord attribute), 527

FETCH (in module *conda.instructions*), 500

FETCH_CMD() (in module *conda.instructions*), 501

fetch_index() (in module *conda.core.index*), 428

fetch_index() (in module *conda.exports*), 465

fetch_jlap() (in module *conda.gateways.repodata.jlap.fetch*), 487

fetch_latest() (RepodataFetch method), 496

fetch_latest_parsed() (RepodataFetch method), 496

fetch_latest_path() (RepodataFetch method), 496

fetch_precs (ChangeReport attribute), 436

fetch_repodata_remote_request() (in module *conda.core.subdir_data*), 453

fetch_threads (Context property), 355

Field (class in *conda.auxlib.entity*), 333

FIELD_NAMES (MatchSpec attribute), 515

FIELD_NAMES_SET (MatchSpec attribute), 515

file_data() (BinstarSpec method), 591, 593

file_is_empty() (History method), 498

file_mode (PathData attribute), 526

FILE_NAMES (PythonDistributionMetadata attribute), 415

FILE_NOT_FOUND (ERROR attribute), 386

file_path_is_writable() (in module *conda.gateways.disk.test*), 480

file_scheme (in module *conda.common.url*), 423

FileLock (class in *conda.lock*), 502

FileMode (class in *conda.models.enums*), 510

FilenameField (class in *conda.models.records*), 525

FileNotFoundError (in module *conda.core.package_cache_data*), 438

FileNotFoundError (in module *conda.core.path_actions*), 441

files (PrefixRecord attribute), 528

FileSpecTypes (in module *conda_env.specs*), 593

FILESYSTEM_ENCODING (in module *conda.common.compat*), 388

filter() (TokenURLFilter method), 482

filter_notices() (in module *conda.notices.core*), 537

final (ParameterFlag attribute), 391

find_altered_packages() (in module *conda.plugins.subcommands.doctor.health_checks*), 547

find_builtin_commands() (in module *conda.cli.conda_argparse*), 365

find_commands() (in module *conda.cli.find_commands*), 369

find_conflicts() (Resolve method), 555

find_executable() (in module *conda.cli.find_commands*), 369

find_index_cache() (in module *conda.cli.main_clean*), 371

find_logfiles() (in module *conda.cli.main_clean*), 371

find_matches() (Resolve method), 556

find_matches_with_strict() (Resolve method), 555

find_or_none() (in module *conda.auxlib.ish*), 340

find_or_raise() (in module *conda.auxlib.ish*), 340

find_package() (SolverTests method), 569

find_package_in_list() (SolverTests method), 569

find_packages() (in module *conda.auxlib.packaging*), 345

find_packages_with_missing_files() (in module *conda.plugins.subcommands.doctor.health_checks*), 547

find_patches() (in module *conda.gateways.repodata.jlap.fetch*), 487

find_pkgs() (in module *conda.cli.main_clean*), 371

find_pkgs_dirs() (in module *conda.cli.main_clean*), 371

find_prefix_name() (in module *conda_env.cli.common*), 578

find_tarballs() (in module *conda.cli.main_clean*), 371

find_tempfiles() (in module *conda.cli.main_clean*), 371

finish() (ProgressBar method), 402

first() (in module *conda._vendor.toolz.itertoolz*), 276

first() (in module *conda.auxlib.collection*), 323

first_writable() (PackageCacheData class method), 438, 491

first_writable() (PackageCacheData static method), 321

firstitem() (in module *conda.auxlib.collection*), 324

FishActivator (class in *conda.activate*), 316

fix_shebang() (in module *conda.cli.main_package*), 376

fixture_names (BaseTestCase attribute), 558

flatten_notice_responses() (in module *conda.notices.core*), 537

FLEXIBLE (ChannelPriority attribute), 352

fmt (Dist attribute), 508

fmt (DistDetails attribute), 507

fn (Dist property), 508

fn (MatchSpec property), 515

fn (PackageRecord attribute), 527

force (Context attribute), 358

force_32bit (Context attribute), 356

force_reinstall (Context attribute), 358

- [force_remove](#) (*Context attribute*), 358
[FORCE_temp_prefix\(\)](#) (in module *conda.testing.integration*), 564
[format\(\)](#) (*DeltaSecondsFormatter method*), 401
[format_dict](#) (*tqdm property*), 286, 292, 298, 307
[format_dict\(\)](#) (in module *conda.cli.main_config*), 372
[format_hash\(\)](#) (in module *conda.gateways.repodata.jlap.fetch*), 487
[format_interval\(\)](#) (*tqdm static method*), 286, 292, 298, 308
[format_meter\(\)](#) (*tqdm static method*), 286, 293, 299, 308
[format_num\(\)](#) (*tqdm static method*), 286, 293, 298, 308
[format_sizeof\(\)](#) (*tqdm static method*), 286, 292, 298, 307
[FormatReplace](#) (*class in conda._vendor.tqdm.utils*), 304
[formatter_map](#) (in module *conda.activate*), 317
[free\(\)](#) (*ASM method*), 250, 256
[freebsd](#) (*Platform attribute*), 510
[FREEZE_INSTALLED](#) (*UpdateModifier attribute*), 352
[frequencies\(\)](#) (in module *conda._vendor.toolz.itertoolz*), 277
[fresh_context\(\)](#) (in module *conda.base.context*), 359
[from_channel_name\(\)](#) (*Channel static method*), 492, 505
[from_dist_str\(\)](#) (*MatchSpec class method*), 515
[from_environment\(\)](#) (in module *conda_env.env*), 587
[from_file\(\)](#) (in module *conda_env.env*), 587
[from_index\(\)](#) (*Clauses method*), 406
[from_iterable\(\)](#) (*IndexedSet class method*), 236
[from_json\(\)](#) (*Entity class method*), 338
[from_lines\(\)](#) (*JLAP class method*), 484
[from_name\(\)](#) (*Clauses method*), 406
[from_name\(\)](#) (*ParameterFlag class method*), 391
[from_objects\(\)](#) (*Entity class method*), 338
[from_parse_result\(\)](#) (*Url class method*), 424
[from_path\(\)](#) (*JLAP class method*), 485
[from_string\(\)](#) (*Dist class method*), 508
[from_string\(\)](#) (*ParameterFlag class method*), 391
[from_sys\(\)](#) (*Arch class method*), 510
[from_sys\(\)](#) (*Platform class method*), 510
[from_url\(\)](#) (*Channel static method*), 492, 505
[from_url\(\)](#) (*Dist class method*), 508
[from_value\(\)](#) (*Channel static method*), 492, 505
[from_value\(\)](#) (*ParameterFlag class method*), 391
[from_yaml\(\)](#) (in module *conda_env.env*), 587
[frozendict](#) (*class in conda._vendor.frozendict*), 267
[FrozenOrderedDict](#) (*class in conda._vendor.frozendict*), 267
[FTPAdapter](#) (*class in conda.gateways.connection.adapters.ftp*), 468
[full_name](#) (*Dist property*), 507
[fullname\(\)](#) (in module *conda.auxlib.logz*), 342
G
[g_trace](#) (in module *conda._vendor.cpuinfo*), 254
[g_trace](#) (in module *conda._vendor.cpuinfo.cpuinfo*), 248, 251
[gather\(\)](#) (*tqdm_asyncio class method*), 291
[gen_clauses\(\)](#) (*Resolve method*), 556
[GeneralGraph](#) (*class in conda.models.prefix_graph*), 521
[generate_feature_count\(\)](#) (*Resolve method*), 556
[generate_feature_metric\(\)](#) (*Resolve method*), 556
[generate_install_count\(\)](#) (*Resolve method*), 556
[generate_package_count\(\)](#) (*Resolve method*), 556
[generate_parser\(\)](#) (in module *conda.cli.conda_argparse*), 365
[generate_parser\(\)](#) (in module *conda.cli.main*), 370
[generate_pre_parser\(\)](#) (in module *conda.cli.conda_argparse*), 365
[generate_removal_count\(\)](#) (*Resolve method*), 556
[generate_shebang_for_entry_point\(\)](#) (in module *conda.core.portability*), 446
[generate_spec_constraints\(\)](#) (*Resolve method*), 556
[generate_update_count\(\)](#) (*Resolve method*), 556
[generate_version_metrics\(\)](#) (*Resolve method*), 556
[generic](#) (*NoarchType attribute*), 512
[GenericHelp](#), 456
[get\(\)](#) (in module *conda._vendor.toolz.itertoolz*), 276
[get\(\)](#) (*MatchSpec method*), 515
[get\(\)](#) (*PackageCacheData method*), 320, 438, 491
[get\(\)](#) (*PrefixData method*), 321, 447
[get_all_directories\(\)](#) (in module *conda.common.path*), 409
[get_all_extracted_entries\(\)](#) (*PackageCacheData class method*), 438, 491
[get_all_matches\(\)](#) (*MapParameter method*), 395
[get_all_matches\(\)](#) (*ObjectParameter method*), 396
[get_all_matches\(\)](#) (*Parameter method*), 395
[get_all_matches\(\)](#) (*SequenceParameter method*), 396
[get_archspec_name\(\)](#) (in module *conda.core.index*), 429
[get_bin_directory_short_path\(\)](#) (in module *conda.common.path*), 409
[get_blank_actions\(\)](#) (in module *conda.plan*), 541
[get_cache\(\)](#) (*CPUID method*), 250, 256
[get_cache_control_max_age\(\)](#) (in module *conda.core.subdir_data*), 452
[get_cache_control_max_age\(\)](#) (in module *conda.gateways.repodata*), 496
[get_cache_key\(\)](#) (*ChannelNoticeResponse class method*), 539
[get_cached_solver_backend](#) (*CondaPluginManager attribute*), 545
[get_canonical_name\(\)](#) (*CondaPluginManager method*), 545

`get_channel_name_and_urls()` (in module `conda.notices.core`), 537
`get_channel_notice_response()` (in module `conda.notices.fetch`), 538
`get_channel_objs()` (in module `conda.models.channel`), 506
`get_classifiers()` (`PythonDistributionMetadata` method), 418
`get_clause_count()` (`_ClauseArray` method), 382
`get_clause_count()` (`_ClauseList` method), 382
`get_clause_count()` (`_SatSolver` method), 383
`get_clause_count()` (`Clauses` method), 384, 405
`get_comspec()` (in module `conda.utils`), 575
`get_conda_anchor_files_and_records()` (in module `conda.core.prefix_data`), 448
`get_conda_build_local_url()` (in module `conda.models.channel`), 506
`get_conda_dependencies()` (`PythonDistribution` method), 413
`get_conda_list_tuple()` (in module `conda.testing.integration`), 565
`get_conflicting_specs()` (`Resolve` method), 557
`get_constrained_packages()` (`Solver` method), 450
`get_cpu_info()` (in module `conda._vendor.cpuinfo`), 257
`get_cpu_info()` (in module `conda._vendor.cpuinfo.cpuinfo`), 251
`get_cpu_info_json()` (in module `conda._vendor.cpuinfo`), 257
`get_cpu_info_json()` (in module `conda._vendor.cpuinfo.cpuinfo`), 251
`get_default_marker_context()` (in module `conda.common.pkg_formats.python`), 419
`get_default_urls` (in module `conda.exports`), 464
`get_descriptions()` (`Configuration` method), 398
`get_descriptions()` (`Context` method), 359
`get_dist_file_from_egg_link()` (in module `conda.common.pkg_formats.python`), 418
`get_dist_obsolete()` (`PythonDistributionMetadata` method), 417
`get_dist_provides()` (`PythonDistributionMetadata` method), 417
`get_dist_requirements()` (`PythonDistribution` method), 413
`get_dist_requirements()` (`PythonDistributionMetadata` method), 415
`get_entry_points()` (`PythonDistribution` method), 413
`get_entry_to_link()` (`PackageCacheData` class method), 438, 491
`get_env_vars_str()` (in module `conda.cli.main_info`), 374
`get_environment_env_vars()` (`PrefixData` method), 448
`get_error_report()` (`ExceptionHandler` method), 455
`get_exact_value()` (`MatchSpec` method), 515
`get_export_unset_vars()` (`_Activator` method), 313
`get_external_requirements()` (`PythonDistribution` method), 413
`get_external_requirements()` (`PythonDistributionMetadata` method), 416
`get_extra_provides()` (`PythonDistribution` method), 413
`get_extra_provides()` (`PythonDistributionMetadata` method), 417
`get_filename()` (in module `conda_env.cli.common`), 578
`get_flags()` (`CPUID` method), 250, 256
`get_free_space_on_unix()` (in module `conda.common._os.unix`), 385
`get_free_space_on_windows()` (in module `conda.common._os.windows`), 386
`get_hook_results()` (`CondaPluginManager` method), 545
`get_host_and_path_from_url()` (`FTPAdapter` method), 469
`get_in()` (in module `conda._vendor.toolz.dicttoolz`), 271
`get_index()` (in module `conda.core.index`), 428
`get_index()` (in module `conda.exports`), 465
`get_index_cuda()` (in module `conda.testing.helpers`), 562
`get_index_must_unfreeze()` (in module `conda.testing.helpers`), 562
`get_index_r_1()` (in module `conda.testing.helpers`), 562
`get_index_r_2()` (in module `conda.testing.helpers`), 562
`get_index_r_4()` (in module `conda.testing.helpers`), 562
`get_index_r_5()` (in module `conda.testing.helpers`), 562
`get_info()` (`CPUID` method), 250, 256
`get_info_dict()` (in module `conda.cli.main_info`), 374
`get_installed_version()` (in module `conda.cli.main_package`), 376
`get_installer()` (in module `conda_env.installers.base`), 588
`get_instances()` (`TMonitor` method), 285, 306
`get_instrumentation_record_file()` (in module `conda.common.io`), 403
`get_items()` (`Completer` method), 465
`get_leaf_directories()` (in module `conda.common.path`), 409
`get_local_urls` (in module `conda.exports`), 465
`get_lock()` (`ProgressBar` class method), 402
`get_lock()` (`tqdm` class method), 288, 294, 300, 309
`get_main_info_str()` (in module `conda.cli.main_info`), 374

[get_major_minor_version\(\)](#) (in module *conda.common.path*), 409
[get_matcher\(\)](#) (*BuildNumberMatch* method), 534
[get_matcher\(\)](#) (*VersionSpec* method), 534
[get_max_extension_support\(\)](#) (*CPUID* method), 250, 256
[get_node_by_name\(\)](#) (*PrefixGraph* method), 521
[get_notice_cache_filenames\(\)](#) (in module *conda.testing.notices.helpers*), 567
[get_notice_response_from_cache\(\)](#) (in module *conda.notices.cache*), 535
[get_notice_responses\(\)](#) (in module *conda.notices.fetch*), 538
[get_notices_cache_dir\(\)](#) (in module *conda.notices.cache*), 535
[get_notices_cache_file\(\)](#) (in module *conda.notices.cache*), 535
[get_optional_dependencies\(\)](#) (*PythonDistribution* method), 413
[get_packages\(\)](#) (in module *conda.cli.main_compare*), 372
[get_packages\(\)](#) (in module *conda.cli.main_list*), 375
[get_paths\(\)](#) (*PythonDistribution* method), 413
[get_pinned_specs\(\)](#) (in module *conda.core.solve*), 450
[get_pip_installed_packages\(\)](#) (in module *conda_env.pip_util*), 590
[get_pip_version\(\)](#) (in module *conda_env.pip_util*), 590
[get_pkgs\(\)](#) (*Resolve* method), 556
[get_plugin_manager\(\)](#) (in module *conda.plugins.manager*), 546
[get_prefix\(\)](#) (in module *conda.base.context*), 360
[get_prefix\(\)](#) (in module *conda.plugins.subcommands.doctor.cli*), 546
[get_prefix\(\)](#) (in module *conda_env.cli.common*), 578
[get_processor_brand\(\)](#) (*CPUID* method), 250, 256
[get_proxy_username_and_pass\(\)](#) (in module *conda.common.url*), 426
[get_python_noarch_target_path\(\)](#) (in module *conda.common.path*), 410
[get_python_requirements\(\)](#) (*PythonDistribution* method), 413
[get_python_requirements\(\)](#) (*PythonDistribution-Metadata* method), 416
[get_python_short_path\(\)](#) (in module *conda.common.path*), 409
[get_python_site_packages_short_path\(\)](#) (in module *conda.common.path*), 409
[get_python_version_for_prefix\(\)](#) (in module *conda.core.prefix_data*), 448
[get_raw_hz\(\)](#) (*CPUID* method), 250, 256
[get_raw_value\(\)](#) (*MatchSpec* method), 515
[get_rc_urls](#) (in module *conda.exports*), 465
[get_reduced_index\(\)](#) (in module *conda.core.index*), 429
[get_reduced_index\(\)](#) (*Resolve* method), 556
[get_repo_interface\(\)](#) (in module *conda.gateways.repodata*), 494
[get_request_package_in_solution\(\)](#) (*Solver* method), 450
[get_requested_specs_map\(\)](#) (*History* method), 499
[get_revision\(\)](#) (in module *conda.cli.install*), 369
[get_scripts_export_unset_vars\(\)](#) (*_Activator* method), 313
[get_scripts_export_unset_vars\(\)](#) (*JSONFormat-Mixin* method), 317
[get_shortcut_dir\(\)](#) (in module *conda.testing.integration*), 565
[get_signal_name\(\)](#) (in module *conda.common.signals*), 420
[get_site_packages_anchor_files\(\)](#) (in module *conda.common.pkg_formats.python*), 418
[get_solver\(\)](#) (in module *conda.testing.helpers*), 562
[get_solver_2\(\)](#) (in module *conda.testing.helpers*), 562
[get_solver_4\(\)](#) (in module *conda.testing.helpers*), 562
[get_solver_5\(\)](#) (in module *conda.testing.helpers*), 562
[get_solver_aggregate_1\(\)](#) (in module *conda.testing.helpers*), 562
[get_solver_aggregate_2\(\)](#) (in module *conda.testing.helpers*), 562
[get_solver_backend\(\)](#) (*CondaPluginManager* method), 545
[get_solver_cuda\(\)](#) (in module *conda.testing.helpers*), 562
[get_solver_must_unfreeze\(\)](#) (in module *conda.testing.helpers*), 562
[get_spec_class_from_file\(\)](#) (in module *conda_env.specs*), 593
[get_state\(\)](#) (*History* method), 499
[get_status_code_from_code_response\(\)](#) (in module *conda.gateways.connection.adapters.ftp*), 469
[get_subcommands\(\)](#) (*CondaPluginManager* method), 546
[get_test_notices\(\)](#) (in module *conda.testing.notices.helpers*), 567
[get_ticks_func\(\)](#) (*CPUID* method), 250, 256
[get_url\(\)](#) (*UrlsData* method), 439
[get_user_environments_txt_file\(\)](#) (in module *conda.core.envs_manager*), 427
[get_user_requests\(\)](#) (*History* method), 499
[get_user_site\(\)](#) (in module *conda.cli.main_info*), 374
[get_username_password_from_header\(\)](#) (*FT-PAAdapter* method), 469
[get_vendor_id\(\)](#) (*CPUID* method), 250, 256
[get_version\(\)](#) (in module *conda.auxlib.packaging*), 344

- get_viewed_channel_notice_ids() (in module *conda.notices.cache*), 535
- GIT_DESCRIBE_REGEX (in module *conda.auxlib.packaging*), 344
- GlobLowerStrMatch (class in *conda.models.match_spec*), 518
- GlobStrMatch (class in *conda.models.match_spec*), 517
- groupby() (in module *conda._vendor.toolz.itertoolz*), 273
- groupby_to_dict() (in module *conda.common.iterators*), 404
- ## H
- h (in module *conda.history*), 499
- handle_407() (*CondaHttpAuth* static method), 473
- handle_application_exception() (*ExceptionHandler* method), 455
- handle_exception() (*ExceptionHandler* method), 455
- handle_proxy_407() (in module *conda.exports*), 464
- handle_reportable_application_exception() (*ExceptionHandler* method), 455
- handle_txn() (in module *conda.cli.install*), 369
- handle_unexpected_exception() (*ExceptionHandler* method), 455
- hardlink (*LinkType* attribute), 510
- hardlink (*PathType* attribute), 511
- hardlink_supported() (in module *conda.gateways.disk.test*), 480
- has_cpufreq_info() (*DataSource* static method), 249, 254
- has_dmesg() (*DataSource* static method), 249, 254
- has_format() (*RepodataState* method), 494
- has_ibm_pa_features() (*DataSource* static method), 249, 255
- has_isainfo() (*DataSource* static method), 249, 254
- has_kstat() (*DataSource* static method), 249, 255
- has_lscpu() (*DataSource* static method), 249, 255
- has_platform() (in module *conda.common.url*), 426
- has_proc_cpuinfo() (*DataSource* static method), 248, 254
- has_pyzzzer_entry_point() (in module *conda.core.portability*), 446
- has_scheme() (in module *conda.common.url*), 425
- has_sestatus() (*DataSource* static method), 249, 254
- has_sysctl() (*DataSource* static method), 249, 254
- has_sysinfo() (*DataSource* static method), 249, 255
- has_var_run_dmesg_boot() (*DataSource* static method), 249, 254
- has_wmic() (*DataSource* static method), 249, 255
- hash() (in module *conda.gateways.repodata.jlap.fetch*), 486
- hash_file() (in module *conda.exports*), 465
- hashsum_file() (in module *conda.utils*), 575
- HashWriter (class in *conda.gateways.repodata.jlap.fetch*), 487
- have_boto3 (in module *conda.gateways.connection.adapters.s3*), 470
- header() (*Trace* method), 248, 254
- HEADERS (in module *conda.gateways.repodata.jlap.fetch*), 486
- Help, 456
- hex_octal_to_int() (in module *conda.common.url*), 423
- HIDE (SW attribute), 386
- History (class in *conda.history*), 498
- hook() (*_Activator* method), 313
- hook_source_path (*_Activator* attribute), 313
- hook_source_path (*CmdExeActivator* attribute), 316
- hook_source_path (*CshActivator* attribute), 315
- hook_source_path (*FishActivator* attribute), 316
- hook_source_path (*PosixActivator* attribute), 315
- hook_source_path (*PowerShellActivator* attribute), 316
- hook_source_path (*XonshActivator* attribute), 315
- hookimpl (in module *conda.plugins*), 552
- hookimpl (in module *conda.plugins.hookspec*), 542
- HOURL (in module *conda._vendor.boltons.timeutils*), 244
- http_timeout (*ExceptionHandler* property), 455
- human_bytes() (in module *conda.utils*), 574
- ## I
- ibm_pa_features() (*DataSource* static method), 249, 255
- icondata (*PackageInfo* attribute), 520
- id (*ChannelNotice* attribute), 538
- id() (in module *conda._vendor.distro*), 259
- id() (*LinuxDistribution* method), 264
- IDENTIFIER (in module *conda.common.pkg_formats.python*), 418
- IGNORE_FIELDS (in module *conda.cli.main_info*), 374
- ignore_pinned (*Context* attribute), 358
- immutable (*Field* property), 334
- ImmutableEntity (class in *conda.auxlib.entity*), 338
- import_module() (in module *conda._vendor.toolz.compatibility*), 268
- in_dump (*Field* property), 334
- index() (*IndexedSet* method), 237
- index_packages() (in module *conda.testing.solver_helpers*), 568
- IndexedSet (class in *conda._vendor.boltons.setutils*), 235
- IndexRecord (in module *conda.exports*), 465
- IndexRecord (in module *conda.models.dist*), 507
- INFO (*Commands* attribute), 380, 565
- INFO (*NoticeLevel* attribute), 353
- info() (in module *conda._vendor.distro*), 262
- info() (*LinuxDistribution* method), 265

INFO_FORMATTER (in module *conda.auxlib.logz*), 341
 init() (*PythonDistribution* static method), 413
 init_cmd_exe_registry() (in module *conda.core.initialize*), 434
 init_fish_user() (in module *conda.core.initialize*), 433
 init_log_file() (*History* method), 498
 init_loggers() (in module *conda.cli.main*), 370
 init_loggers() (in module *conda.testing*), 571
 init_long_path() (in module *conda.core.initialize*), 434
 init_powershell_user() (in module *conda.core.initialize*), 434
 init_sh_system() (in module *conda.core.initialize*), 434
 init_sh_user() (in module *conda.core.initialize*), 434
 init_xonsh_user() (in module *conda.core.initialize*), 434
 INITIAL_TRUST_ROOT (in module *conda.trust.constants*), 572
 InitializationError, 339
 initialize() (in module *conda.core.initialize*), 432
 initialize_dev() (in module *conda.core.initialize*), 432
 initialize_logging() (in module *conda.auxlib.logz*), 342
 initialize_logging() (in module *conda.gateways.logging*), 483
 initialize_root_logger() (in module *conda.gateways.logging*), 483
 initialize_std_loggers() (in module *conda.gateways.logging*), 483
 inode_paths (*PathDataV1* attribute), 526
 insert() (*PackageCacheData* method), 438, 491
 insert() (*PrefixData* method), 447
 INSTALL (*Commands* attribute), 380, 565
 install() (in module *conda.cli.install*), 369
 install() (in module *conda.core.initialize*), 432
 install() (in module *conda_env.installers.conda*), 588
 install() (in module *conda_env.installers.pip*), 589
 install() (*Resolve* method), 557
 install() (*SimpleEnvironment* method), 568
 install_actions() (in module *conda.plan*), 541
 install_activate() (in module *conda.core.initialize*), 433
 install_activate_bat() (in module *conda.core.initialize*), 433
 install_anaconda_prompt() (in module *conda.core.initialize*), 433
 install_conda_csh() (in module *conda.core.initialize*), 433
 install_conda_fish() (in module *conda.core.initialize*), 433
 install_conda_hook_ps1() (in module *conda.core.initialize*), 433
 install_conda_psm1() (in module *conda.core.initialize*), 433
 install_conda_sh() (in module *conda.core.initialize*), 433
 install_conda_xsh() (in module *conda.core.initialize*), 433
 install_condabin_conda_activate_bat() (in module *conda.core.initialize*), 433
 install_condabin_conda_auto_activate_bat() (in module *conda.core.initialize*), 433
 install_condabin_conda_bat() (in module *conda.core.initialize*), 433
 install_condabin_hook_bat() (in module *conda.core.initialize*), 433
 install_condabin_rename_tmp_bat() (in module *conda.core.initialize*), 433
 install_deactivate() (in module *conda.core.initialize*), 433
 install_deactivate_bat() (in module *conda.core.initialize*), 433
 install_library_bin_conda_bat() (in module *conda.core.initialize*), 433
 install_Scripts_activate_bat() (in module *conda.core.initialize*), 433
 install_specs() (*Resolve* method), 557
 installed() (in module *conda_env.pip_util*), 590
 InstalledPackages (class in *conda.exports*), 465
 IntegerField (class in *conda.auxlib.entity*), 334
 interleave() (in module *conda._vendor.toolz.itertoolz*), 274
 interpose() (in module *conda._vendor.toolz.itertoolz*), 277
 interpret() (in module *conda.common.pkg_formats.python*), 419
 INTERRUPT_SIGNALS (in module *conda.common.signals*), 420
 intersection() (*IndexedSet* method), 236
 intersection_update() (*IndexedSet* method), 237
 interval (*ChannelNotice* attribute), 538
 IntField (in module *conda.auxlib.entity*), 335
 invalid_chains() (*Resolve* method), 555
 InvalidInstaller, 588
 InvalidMatchSpec, 461
 InvalidSpec, 461
 InvalidTypeError, 391
 InvalidVersionSpec, 461
 invoke() (*_PycoSatSolver* method), 383
 invoke() (*_PyCryptoSatSolver* method), 383
 invoke() (*_PySatSolver* method), 383
 invoke() (*_SatSolver* method), 383
 invoke_post_commands() (*CondaPluginManager* method), 546
 invoke_pre_commands() (*CondaPluginManager*

- method), 545
- is_active_prefix() (in module *conda.cli.common*), 361
- is_admin_on_unix() (in module *conda.common.os.unix*), 385
- is_admin_on_windows() (in module *conda.common.os.windows*), 387
- is_channel (*Dist* property), 508
- is_channel_notices_cache_expired() (in module *conda.notices.core*), 537
- is_channel_notices_enabled() (in module *conda.notices.core*), 537
- is_conda_environment() (in module *conda.gateways.disk.test*), 480
- is_diff() (in module *conda.history*), 498
- is_dst() (*LocalTZInfo* method), 245
- is_exact() (*BaseSpec* method), 533
- is_executable() (in module *conda.gateways.disk.permissions*), 477
- is_extracted (*PackageCacheRecord* property), 528
- is_feature_package (*Dist* property), 508
- is_fetched (*PackageCacheRecord* property), 528
- is_ip_address() (in module *conda.common.url*), 425
- is_ipv4_address() (in module *conda.common.url*), 424
- is_ipv6_address() (in module *conda.common.url*), 424
- is_linked() (in module *conda.exports*), 466
- is_manageable (*PythonEggInfoDistribution* property), 414
- is_manageable (*PythonEggLinkDistribution* attribute), 414
- is_manageable (*PythonInstalledDistribution* attribute), 414
- is_name_only_spec (*MatchSpec* property), 515
- IS_NIX (in module *conda._vendor.tqdm.utils*), 304
- is_notice_response_cache_expired() (in module *conda.notices.cache*), 535
- is_nullable (*Field* property), 334
- is_package_file() (in module *conda.common.path*), 410
- is_path() (in module *conda.common.path*), 408
- is_private_env_name() (in module *conda.common.path*), 409
- is_private_env_path() (in module *conda.common.path*), 410
- is_unmanageable (*PackageRecord* property), 526
- is_url() (in module *conda.common.url*), 424
- IS_WIN (in module *conda._vendor.tqdm.utils*), 304
- is_windows (*DataSource* attribute), 248, 254
- is_writable (*PackageCacheData* property), 320, 438, 491
- is_writable (*PrefixData* property), 321, 447
- isainfo_vb() (*DataSource* static method), 249, 255
- isdisjoint() (*IndexedSet* method), 236
- isdistinct() (in module *conda._vendor.toolz.itertoolz*), 275
- isiterable() (in module *conda._vendor.toolz.itertoolz*), 275
- isiterable() (in module *conda.auxlib.compat*), 324
- isiterable() (in module *conda.common.compat*), 388
- islink (in module *conda.gateways.disk.link*), 477
- isoparse() (in module *conda._vendor.boltons.timeutils*), 241
- issubset() (*IndexedSet* method), 236
- issuperset() (*IndexedSet* method), 236
- ITE() (*Clauses* method), 384, 406
- itemfilter() (in module *conda._vendor.toolz.dicttoolz*), 270
- itemmap() (in module *conda._vendor.toolz.dicttoolz*), 269
- iter_difference() (*IndexedSet* method), 236
- iter_intersection() (*IndexedSet* method), 236
- iter_records() (*PackageCacheData* method), 321, 438, 491
- iter_records() (*PrefixData* method), 322, 447
- iter_records() (*SubdirData* method), 320, 452
- iter_records_sorted() (*PrefixData* method), 447
- iter_slice() (*IndexedSet* method), 237
- iterate() (in module *conda._vendor.toolz.itertoolz*), 278
- iteritems (in module *conda._vendor.frozendict*), 267
- iteritems() (in module *conda.exports*), 465
- itersolve() (*Clauses* method), 406
- intervalues() (*PackageCacheData* method), 439, 491
- ## J
- JLAP (class in *conda.gateways.repodata.jlap.core*), 484
- Jlap304NotModified, 486
- JLAP_KEY (in module *conda.gateways.repodata.jlap.fetch*), 486
- JLAP_UNAVAILABLE (in module *conda.gateways.repodata.jlap.fetch*), 486
- JlapPatchNotFound, 486
- JlapRepoInterface (class in *conda.gateways.repodata.jlap.interface*), 488
- JlapSkipZst, 486
- join() (in module *conda._vendor.toolz.itertoolz*), 280
- join() (in module *conda.common.url*), 425
- join_url (in module *conda.common.url*), 425
- join_url (in module *conda.gateways.repodata*), 490
- json (*Context* attribute), 358
- json() (*Entity* method), 338
- json() (*MockResponse* method), 567
- json_data (*ChannelNoticeResponse* attribute), 539
- json_dump() (in module *conda.common.serialize*), 420
- json_load() (in module *conda.common.serialize*), 420

jsondumps() (in module conda.auxlib.logz), 342
 JSONFormatMixin (class in conda.activate), 317

K

key_mgr (_SignatureVerification property), 573
 KEY_MGR_FILE (in module conda.trust.constants), 572
 keyed_hash() (in module conda.gateways.repodata.jlap.core), 484
 keyfilter() (in module conda._vendor.toolz.dicttoolz), 270
 keyflag() (ArgParseRawParameter method), 392
 keyflag() (DefaultValueRawParameter method), 392
 keyflag() (EnvRawParameter method), 391
 keyflag() (RawParameter method), 391
 keyflag() (YamlRawParameter method), 392
 keymap() (in module conda._vendor.toolz.dicttoolz), 269
 KEYS (in module conda.exports), 465
 keys() (Trace method), 248, 254
 KEYS_DIR (in module conda.exports), 465
 KNOWN_EXTENSIONS (in module conda.common.path), 408
 known_subdirs() (Context method), 359
 KnownPackageClobberError, 457
 kstat_m_cpu_info() (DataSource static method), 249, 255

L

last (JLAP property), 484
 last() (in module conda._vendor.toolz.itertoolz), 276
 last() (in module conda.auxlib.collection), 324
 LAST_CHANNEL_URLS (in module conda.core.index), 428
 LAST_MODIFIED_KEY (in module conda.gateways.repodata), 493
 LATEST (in module conda.gateways.repodata.jlap.fetch), 486
 LB_Preprocess() (Clauses method), 384
 lchmod (in module conda.gateways.disk.link), 477
 leased_path (LeasedPathEntry attribute), 512
 leased_path_type (LeasedPathEntry attribute), 512
 LeasedPathEntry (class in module conda.models.leased_path_entry), 512
 LeasedPathType (class in module conda.models.enums), 511
 legacy_bz2_md5 (PackageRecord attribute), 527
 legacy_bz2_size (PackageRecord attribute), 527
 level (ChannelNotice attribute), 538
 libc_family_version() (Context method), 359
 license (PackageRecord attribute), 527
 license_family (PackageRecord attribute), 527
 like() (in module conda._vendor.distro), 262
 like() (LinuxDistribution method), 265
 line_and_pos() (in module conda.gateways.repodata.jlap.core), 484
 LinearBound() (Clauses method), 384, 406
 Link (class in module conda.models.records), 524

link (in module conda.gateways.disk.link), 477
 LINK (in module conda.instructions), 501
 link (PrefixRecord attribute), 528
 link_action_groups (PrefixActionGroup attribute), 435
 link_precs (PrefixSetup attribute), 435
 linked() (in module conda.exports), 466
 linked_data() (in module conda.exports), 466
 linked_package_record (PathType attribute), 511
 LinkError, 458
 LinkError (in module conda.exports), 465
 LinkPathAction (class in module conda.core.path_actions), 442
 LinkType (class in module conda.models.enums), 510
 LinkTypeField (class in module conda.models.records), 523
 linux (Platform attribute), 510
 linux_distribution() (in module conda._vendor.distro), 259
 linux_distribution() (LinuxDistribution method), 264
 linux_get_libc_version() (in module conda.common._os.linux), 385
 LinuxDistribution (class in module conda._vendor.distro), 264
 LIST (Commands attribute), 380, 565
 list() (FTPAdapter method), 468
 list_all_known_prefixes() (in module conda.core.envs_manager), 427
 list_description (in module conda_env.cli.main_vars), 585
 list_example (in module conda_env.cli.main_vars), 585
 list_packages() (in module conda.cli.main_list), 375
 list_parameters() (Configuration method), 398
 listdir (in module conda.gateways.disk.read), 478
 ListField (class in module conda.auxlib.entity), 336
 listify() (in module conda.auxlib.type_coercion), 347
 load() (Entity class method), 338
 load() (MapParameter method), 395
 load() (ObjectParameter method), 396
 load() (PackageCacheData method), 438, 491
 load() (Parameter method), 395
 load() (PrefixData method), 447
 load() (PrimitiveParameter method), 395
 load() (RepodataCache method), 495
 load() (RepodataState method), 494
 load() (SequenceParameter method), 396
 load() (SubdirData method), 452
 load_condarc (in module conda.exports), 465
 load_entrypoints() (CondaPluginManager method), 545
 load_file_configs() (in module conda.common.configuration), 392

- load_from_directory() (in module *conda_env.env*), 586
- load_plugins() (*CondaPluginManager* method), 545
- load_state() (*RepodataCache* method), 495
- LoadedParameter (class in *conda.common.configuration*), 392
- local_build_root (*Context* property), 355
- local_repodata_ttl (*Context* attribute), 357
- LocalFSAdapter (class in *conda.gateways.connection.adapters.localfs*), 470
- LocalTZ (in module *conda._vendor.bolttons.timeutils*), 245
- LocalTZInfo (class in *conda._vendor.bolttons.timeutils*), 244
- locate_prefix_by_name() (in module *conda.base.context*), 360
- lock() (in module *conda.gateways.repodata*), 493
- lock() (in module *conda.gateways.repodata.lock*), 489
- LOCK_ATTEMPTS (in module *conda.gateways.repodata.lock*), 488
- LOCK_BYTE (in module *conda.gateways.repodata.lock*), 488
- LOCK_EXTENSION (in module *conda.lock*), 502
- LOCK_SLEEP (in module *conda.gateways.repodata.lock*), 488
- Locked (in module *conda.lock*), 502
- LockError, 456
- LOCKSTR (in module *conda.lock*), 502
- log_totals() (*time_recorder* class method), 404
- logger (in module *conda.notices.cache*), 535
- logger (in module *conda.notices.core*), 536
- logger (in module *conda.notices.fetch*), 538
- logger (in module *conda.plugins.subcommands.doctor.health_checks*), 392
- 547
- lsb_release_attr() (in module *conda._vendor.distro*), 263
- lsb_release_attr() (*LinuxDistribution* method), 265
- lsb_release_info() (in module *conda._vendor.distro*), 263
- lsb_release_info() (*LinuxDistribution* method), 265
- lscpu() (*DataSource* static method), 249, 255
- ## M
- m (*Clauses* property), 405
- machine_bits (in module *conda.base.constants*), 350
- main() (in module *conda._vendor.cpuinfo*), 257
- main() (in module *conda._vendor.cpuinfo.cpuinfo*), 251
- main() (in module *conda._vendor.distro*), 266
- main() (in module *conda._vendor.tqdm*), 306
- main() (in module *conda._vendor.tqdm._main*), 284
- main() (in module *conda._vendor.tqdm.cli*), 297
- main() (in module *conda.cli*), 381
- main() (in module *conda.cli.main*), 370
- main() (in module *conda.cli.main_pip*), 377
- main() (in module *conda_env.cli.main*), 578
- main_sourced() (in module *conda.cli.main*), 370
- main_subshell() (in module *conda.cli.main*), 370
- major_version() (in module *conda._vendor.distro*), 262
- major_version() (*LinuxDistribution* method), 264
- make_actions_for_record() (*ProgressiveFetchExtract* static method), 439
- make_conda_egg_link() (in module *conda.core.initialize*), 434
- make_dev_egg_info_file() (in module *conda.core.initialize*), 434
- make_diff() (in module *conda.core.initialize*), 434
- make_entry_point() (in module *conda.core.initialize*), 433
- make_entry_point_exe() (in module *conda.core.initialize*), 433
- make_executable() (in module *conda.gateways.disk.permissions*), 477
- make_feature_record() (in module *conda.core.subdir_data*), 452
- make_immutable() (in module *conda.auxlib.collection*), 323
- make_initialize_plan() (in module *conda.core.initialize*), 432
- make_install_plan() (in module *conda.core.initialize*), 432
- make_menu() (in module *conda.gateways.disk.create*), 476
- make_menu_action_groups (*PrefixActionGroup* attribute), 435
- make_raw_parameters() (*ArgParseRawParameter* class method), 392
- make_raw_parameters() (*EnvRawParameter* class method), 392
- make_raw_parameters() (*RawParameter* class method), 391
- make_raw_parameters() (*YamlRawParameter* class method), 392
- make_raw_parameters_from_file() (*YamlRawParameter* class method), 392
- make_read_only() (in module *conda.gateways.disk.permissions*), 477
- make_release_tree() (*SDistCommand* method), 344
- make_simple_channel() (*Channel* static method), 492, 505
- make_tarbz2() (in module *conda.cli.main_package*), 377
- make_temp_channel() (in module *conda.testing.integration*), 565
- make_temp_env() (in module *conda.testing.integration*), 565
- make_temp_package_cache() (in module

conda.testing.integration), 565
 make_temp_prefix() (in module *conda.testing.integration*), 564
 make_unlink_actions() (in module *conda.core.link*), 435
 make_writable() (in module *conda.gateways.disk.permissions*), 477
 MakeMenuAction (class in *conda.core.path_actions*), 442
 MANDATORY_FILES (*PythonDistribution* attribute), 413
 MANDATORY_FILES (*PythonEggInfoDistribution* attribute), 414
 MANDATORY_FILES (*PythonInstalledDistribution* attribute), 414
 MANIFEST_FILES (*PythonDistribution* attribute), 413
 MANIFEST_FILES (*PythonEggInfoDistribution* attribute), 414
 MANIFEST_FILES (*PythonInstalledDistribution* attribute), 414
 manifest_full_path() (*PythonDistribution* method), 413
 map (in module *conda._vendor.toolz.compatibility*), 268
 map() (*DummyExecutor* method), 403
 mapcat() (in module *conda._vendor.toolz.itertoolz*), 277
 MapField (class in *conda.auxlib.entity*), 337
 MapLoadedParameter (class in *conda.common.configuration*), 393
 MapParameter (class in *conda.common.configuration*), 395
 mark_channel_notices_as_viewed() (in module *conda.notices.cache*), 535
 MARKER_OP (in module *conda.common.pkg_formats.python*), 419
 mask_anaconda_token() (in module *conda.common.url*), 425
 massage_arguments() (in module *conda.utils*), 575
 match() (*CaseInsensitiveStrMatch* method), 519
 match() (*ChannelMatch* method), 518
 match() (*ExactLowerStrMatch* method), 517
 match() (*ExactStrMatch* method), 517
 match() (*FeatureMatch* method), 518
 match() (*GlobStrMatch* method), 518
 match() (*MatchInterface* method), 517
 match() (*MatchSpec* method), 516
 match() (*SplitStrMatch* method), 518
 match_any() (*Resolve* method), 556
 match_specs_to_dists() (in module *conda.core.link*), 435
 matches() (*MatchInterface* method), 517
 matches_all (*GlobStrMatch* property), 518
 MatchInterface (class in *conda.models.match_spec*), 517
 MatchSpec (class in *conda.models.match_spec*), 514
 MatchSpecType (class in *conda.models.match_spec*), 513
 MAX_CHANNEL_PRIORITY (in module *conda.base.constants*), 350
 MAX_REPODATA_VERSION (in module *conda.core.subdir_data*), 451
 MAX_SHEBANG_LENGTH (in module *conda.core.portability*), 445
 MAX_TRIES (in module *conda.gateways.disk*), 481
 MAXIMIZE (SW attribute), 386
 maybe_add_auth() (in module *conda.common.url*), 426
 maybe_raise() (in module *conda.exceptions*), 462
 maybe_unquote() (in module *conda.common.url*), 426
 maybe_unquote() (in module *conda.gateways.repodata*), 490
 maybecall() (in module *conda.auxlib.type_coercion*), 347
 md5 (*PackageCacheRecord* attribute), 528
 md5 (*PackageRecord* attribute), 527
 md5_file() (in module *conda.utils*), 575
 Md5Field (class in *conda.models.records*), 528
 memoize() (in module *conda.auxlib.decorators*), 325
 memoized (class in *conda.exports*), 465
 memoizedproperty() (in module *conda.auxlib.decorators*), 327
 memoizemethod() (in module *conda.auxlib.decorators*), 326
 merge() (*BaseSpec* method), 533
 merge() (*BuildNumberMatch* method), 534
 merge() (in module *conda._vendor.toolz.dicttoolz*), 268
 merge() (*LoadedParameter* method), 393
 merge() (*MapLoadedParameter* method), 394
 merge() (*MatchInterface* method), 517
 merge() (*MatchSpec* class method), 516
 merge() (*ObjectLoadedParameter* method), 394
 merge() (*PrimitiveLoadedParameter* method), 393
 merge() (*SequenceLoadedParameter* method), 394
 merge() (*VersionSpec* method), 534
 merge_sorted() (in module *conda._vendor.toolz.itertoolz*), 274
 merge_with() (in module *conda._vendor.toolz.dicttoolz*), 269
 message (*ChannelNotice* attribute), 538
 messages() (in module *conda.core.link*), 437
 metadata_signature_status (*PackageRecord* attribute), 527
 MetadataWarning, 412
 migrated_channel_aliases (*Context* property), 356
 migrated_custom_channels (*Context* attribute), 358
 minimal_unsatisfiable_subset() (in module *conda.common.logic*), 406
 MINIMIZE (SW attribute), 386
 minimize() (*Clauses* method), 384, 406
 MINIO_EXE (in module *conda.testing.gateways.fixtures*), 559

`minio_s3_server` (in module `conda.testing.gateways.fixtures`), 559

`minio_s3_server()` (in module `conda.testing.gateways.fixtures`), 559

`minor_version()` (in module `conda._vendor.distro`), 262

`minor_version()` (*LinuxDistribution* method), 264

`missing_pyc_files()` (in module `conda.common.path`), 409

`makedirs_p` (in module `conda.gateways.disk.create`), 475

`makedirs_p()` (in module `conda.gateways.disk`), 481

`makedirs_p_sudo_safe()` (in module `conda.gateways.disk`), 481

`makedirs_p_sudo_safe()` (in module `conda.gateways.repodata`), 493

`mockable_context_envs_dirs()` (in module `conda.base.context`), 355

`MockResponse` (class in `conda.testing.notices.helpers`), 567

`mod` (*RepodataState* property), 494

`MODIFIED` (*Result* attribute), 432

`modify_easy_install_pth()` (in module `conda.core.initialize`), 434

module

- `conda`, 231
- `conda.__main__`, 231
- `conda.__version__`, 231
- `conda._vendor`, 231
- `conda._vendor.appdirs`, 231
- `conda._vendor.boltons`, 235
- `conda._vendor.boltons.setutils`, 235
- `conda._vendor.boltons.timeutils`, 239
- `conda._vendor.cpuinfo`, 246
- `conda._vendor.cpuinfo.cpuinfo`, 246
- `conda._vendor.distro`, 257
- `conda._vendor.frozendict`, 266
- `conda._vendor.toolz`, 267
- `conda._vendor.toolz.compatibility`, 267
- `conda._vendor.toolz.dicttoolz`, 268
- `conda._vendor.toolz.itertoolz`, 272
- `conda._vendor.toolz.recipes`, 283
- `conda._vendor.toolz.utils`, 283
- `conda._vendor.tqdm`, 284
- `conda._vendor.tqdm.__main__`, 284
- `conda._vendor.tqdm._main`, 284
- `conda._vendor.tqdm._monitor`, 285
- `conda._vendor.tqdm._tqdm`, 285
- `conda._vendor.tqdm._utils`, 291
- `conda._vendor.tqdm.asyncio`, 291
- `conda._vendor.tqdm.auto`, 292
- `conda._vendor.tqdm.cli`, 297
- `conda._vendor.tqdm.std`, 297
- `conda._vendor.tqdm.utils`, 302
- `conda._vendor.tqdm.version`, 306
- `conda.activate`, 312
- `conda.api`, 317
- `conda.auxlib`, 322
- `conda.auxlib.collection`, 323
- `conda.auxlib.compat`, 324
- `conda.auxlib.decorators`, 325
- `conda.auxlib.entity`, 328
- `conda.auxlib.exceptions`, 339
- `conda.auxlib.ish`, 340
- `conda.auxlib.logz`, 340
- `conda.auxlib.packaging`, 343
- `conda.auxlib.type_coercion`, 345
- `conda.base`, 347
- `conda.base.constants`, 348
- `conda.base.context`, 353
- `conda.base.exceptions`, 360
- `conda.cli`, 361
- `conda.cli.common`, 361
- `conda.cli.conda_argparse`, 362
- `conda.cli.find_commands`, 368
- `conda.cli.install`, 369
- `conda.cli.main`, 370
- `conda.cli.main_clean`, 370
- `conda.cli.main_compare`, 372
- `conda.cli.main_config`, 372
- `conda.cli.main_create`, 373
- `conda.cli.main_info`, 373
- `conda.cli.main_init`, 374
- `conda.cli.main_install`, 374
- `conda.cli.main_list`, 375
- `conda.cli.main_notices`, 375
- `conda.cli.main_package`, 376
- `conda.cli.main_pip`, 377
- `conda.cli.main_remove`, 377
- `conda.cli.main_rename`, 378
- `conda.cli.main_run`, 378
- `conda.cli.main_search`, 378
- `conda.cli.main_update`, 379
- `conda.cli.python_api`, 379
- `conda.common`, 381
- `conda.common._logic`, 381
- `conda.common._os`, 385
- `conda.common._os.linux`, 385
- `conda.common._os.unix`, 385
- `conda.common._os.windows`, 385
- `conda.common.compat`, 387
- `conda.common.configuration`, 389
- `conda.common.constants`, 398
- `conda.common.cuda`, 398
- `conda.common.decorators`, 399
- `conda.common.disk`, 399
- `conda.common.io`, 399
- `conda.common.iterators`, 404
- `conda.common.logic`, 404

conda.common.path, 407
 conda.common.pkg_formats, 411
 conda.common.pkg_formats.python, 411
 conda.common.serialize, 419
 conda.common.signals, 420
 conda.common.toposort, 421
 conda.common.url, 421
 conda.core, 427
 conda.core.envs_manager, 427
 conda.core.index, 428
 conda.core.initialize, 429
 conda.core.link, 434
 conda.core.package_cache, 437
 conda.core.package_cache_data, 437
 conda.core.path_actions, 440
 conda.core.portability, 445
 conda.core.prefix_data, 446
 conda.core.solve, 448
 conda.core.subdir_data, 451
 conda.deprecations, 453
 conda.exception_handler, 455
 conda.exceptions, 456
 conda.exports, 462
 conda.gateways, 466
 conda.gateways.anaconda_client, 467
 conda.gateways.connection, 467
 conda.gateways.connection.adapters, 467
 conda.gateways.connection.adapters.ftp, 467
 conda.gateways.connection.adapters.localfs, 470
 conda.gateways.connection.adapters.s3, 470
 conda.gateways.connection.download, 471
 conda.gateways.connection.session, 472
 conda.gateways.disk, 474
 conda.gateways.disk.create, 474
 conda.gateways.disk.delete, 476
 conda.gateways.disk.link, 477
 conda.gateways.disk.permissions, 477
 conda.gateways.disk.read, 478
 conda.gateways.disk.test, 479
 conda.gateways.disk.update, 480
 conda.gateways.logging, 481
 conda.gateways.repodata, 483
 conda.gateways.repodata.jlap, 483
 conda.gateways.repodata.jlap.core, 483
 conda.gateways.repodata.jlap.fetch, 485
 conda.gateways.repodata.jlap.interface, 487
 conda.gateways.repodata.lock, 488
 conda.gateways.subprocess, 496
 conda.history, 497
 conda.instructions, 499
 conda.lock, 501
 conda.misc, 503
 conda.models, 504
 conda.models.channel, 504
 conda.models.dist, 506
 conda.models.enums, 509
 conda.models.leased_path_entry, 512
 conda.models.match_spec, 512
 conda.models.package_info, 519
 conda.models.prefix_graph, 520
 conda.models.records, 522
 conda.models.version, 529
 conda.notices, 534
 conda.notices.cache, 534
 conda.notices.core, 536
 conda.notices.fetch, 537
 conda.notices.types, 538
 conda.notices.views, 539
 conda.plan, 540
 conda.plugins, 542
 conda.plugins.hookspec, 542
 conda.plugins.manager, 545
 conda.plugins.solvers, 546
 conda.plugins.subcommands, 546
 conda.plugins.subcommands.doctor, 546
 conda.plugins.subcommands.doctor.cli, 546
 conda.plugins.subcommands.doctor.health_checks, 547
 conda.plugins.types, 548
 conda.plugins.virtual_packages, 550
 conda.plugins.virtual_packages.archspec, 550
 conda.plugins.virtual_packages.cuda, 550
 conda.plugins.virtual_packages.freebsd, 551
 conda.plugins.virtual_packages.linux, 551
 conda.plugins.virtual_packages.osx, 551
 conda.plugins.virtual_packages.windows, 551
 conda.resolve, 554
 conda.testing, 557
 conda.testing.cases, 557
 conda.testing.fixtures, 558
 conda.testing.gateways, 559
 conda.testing.gateways.fixtures, 559
 conda.testing.helpers, 559
 conda.testing.integration, 562
 conda.testing.notices, 565
 conda.testing.notices.fixtures, 565
 conda.testing.notices.helpers, 566
 conda.testing.solver_helpers, 567
 conda.trust, 572
 conda.trust.constants, 572
 conda.trust.signature_verification, 572

- conda.utils, 573
 - conda_env, 577
 - conda_env.__main__, 577
 - conda_env.cli, 577
 - conda_env.cli.common, 577
 - conda_env.cli.main, 578
 - conda_env.cli.main_config, 578
 - conda_env.cli.main_create, 579
 - conda_env.cli.main_export, 581
 - conda_env.cli.main_list, 581
 - conda_env.cli.main_remove, 582
 - conda_env.cli.main_update, 583
 - conda_env.cli.main_vars, 584
 - conda_env.env, 586
 - conda_env.installers, 588
 - conda_env.installers.base, 588
 - conda_env.installers.conda, 588
 - conda_env.installers.pip, 589
 - conda_env.pip_util, 589
 - conda_env.specs, 590
 - conda_env.specs.binstar, 590
 - conda_env.specs.requirements, 591
 - conda_env.specs.yaml_file, 592
 - module() (*DeprecationHandler* method), 454
 - monitor (*tqdm* attribute), 286, 292, 298, 307
 - monitor_interval (*tqdm* attribute), 286, 292, 298, 307
 - Mountain (in module *conda._vendor.boltons.timeutils*), 246
 - moveto() (*tqdm* method), 289, 296, 302, 311
 - ms_depends() (*Resolve* method), 556
 - msg (*BinstarSpec* attribute), 591, 592
 - msg (*RequirementsSpec* attribute), 591, 593
 - msys2_shell_base (in module *conda.utils*), 575
 - MultiChannel (class in *conda.models.channel*), 506
 - MultiPathAction (class in *conda.core.path_actions*), 441
 - MULTIPLE_USE_KEYS (*PythonDistributionMetadata* attribute), 415
 - MultipleKeysError, 390
 - MultiValidationError, 391
- ## N
- name (*ChannelNoticeResponse* attribute), 539
 - name (*CondaPostCommand* attribute), 224, 549, 552
 - name (*CondaPreCommand* attribute), 224, 549, 553
 - name (*CondaSolver* attribute), 225, 549, 553
 - name (*CondaSubcommand* attribute), 226, 548, 553
 - name (*CondaVirtualPackage* attribute), 227, 548, 553
 - name (*Dist* attribute), 508
 - name (*DistDetails* attribute), 507
 - name (*Field* property), 333
 - name (*MatchSpec* property), 515
 - name (*PackageInfo* property), 520
 - name (*PackageRecord* attribute), 526
 - name (*ParameterLoader* property), 397
 - name (*PreferredEnv* attribute), 520
 - name (*PythonDistribution* property), 412
 - name (*PythonDistributionMetadata* property), 415
 - name (*TemporaryDirectory* attribute), 475
 - name() (in module *conda._vendor.distro*), 260
 - name() (*LinuxDistribution* method), 264
 - name_var() (*Clauses* method), 406
 - namekey (*PackageRecord* property), 526
 - names (*ParameterLoader* property), 397
 - names_in_specs() (in module *conda.cli.common*), 362
 - NAMESPACE_PACKAGE_NAMES (in module *conda.base.constants*), 353
 - NAMESPACES (in module *conda.base.constants*), 353
 - NAMESPACES_MAP (in module *conda.base.constants*), 353
 - native_path_to_unix() (in module *conda.activate*), 314
 - NEEDS_SUDO (*Result* attribute), 432
 - netloc (*Url* property), 424
 - neutered_specs (*PrefixSetup* attribute), 435
 - new_precs (*ChangeReport* attribute), 436
 - new_var() (*Clauses* method), 384, 406
 - nlst() (*FTPAdapter* method), 469
 - NO_ASSOC (*ERROR* attribute), 386
 - NO_CHANGE (*Result* attribute), 432
 - no_default (in module *conda._vendor.toolz.utils*), 284
 - NO_DEPS (*DepsModifier* attribute), 351
 - no_link (*PathData* attribute), 526
 - no_plugins (*Context* attribute), 359
 - NO_PLUGINS (in module *conda.base.constants*), 353
 - Noarch (class in *conda.models.package_info*), 519
 - noarch (*PackageMetadata* attribute), 520
 - noarch (*PackageRecord* attribute), 527
 - NOARCH_GENERIC (*PackageType* attribute), 511
 - NOARCH_PYTHON (*PackageType* attribute), 511
 - NoarchField (class in *conda.models.package_info*), 519
 - NoarchField (class in *conda.models.records*), 523
 - NoarchType (class in *conda.models.enums*), 512
 - NoBaseEnvironmentError, 457
 - NOMINAL_HASH (in module *conda.gateways.repodata.jlap.fetch*), 486
 - non_admin_enabled (*Context* attribute), 356
 - NON_SPACE (in module *conda.common.pkg_formats.python*), 419
 - non_x86_linux_machines (in module *conda.exports*), 464
 - non_x86_machines (in module *conda.base.context*), 354
 - NoneType (in module *conda.auxlib.compat*), 324
 - NoneType (in module *conda.common.compat*), 388
 - norm_name (*PythonDistribution* property), 412
 - norm_package_name() (in module *conda.common.pkg_formats.python*), 418
 - norm_package_version() (in module *conda.common.pkg_formats.python*), 418

- NORMALIZED_DISTRO_ID (in module *conda._vendor.distro*), 259
- NORMALIZED_LSB_ID (in module *conda._vendor.distro*), 259
- NORMALIZED_OS_ID (in module *conda._vendor.distro*), 259
- normalized_version() (in module *conda.models.version*), 530
- NoSpaceLeftError, 461
- Not() (Clauses method), 384, 406
- NOT_SET (DepsModifier attribute), 351
- NotFoundError, 339
- nothing_to_do (UnlinkLinkTransaction property), 436
- NoticeLevel (class in *conda.base.constants*), 353
- notices (ChannelNoticeResponse property), 539
- NOTICES (Commands attribute), 380
- notices() (in module *conda.notices*), 540
- notices() (in module *conda.notices.core*), 536
- notices_cache_dir() (in module *conda.testing.notices.fixtures*), 566
- NOTICES_CACHE_FN (in module *conda.base.constants*), 351
- NOTICES_CACHE_SUBDIR (in module *conda.base.constants*), 351
- notices_decorator_assert_message_in_stdout() (in module *conda.testing.notices.helpers*), 567
- NOTICES_DECORATOR_DISPLAY_INTERVAL (in module *conda.base.constants*), 351
- NOTICES_DESCRIPTION (in module *conda.cli.conda_argparse*), 368
- NOTICES_FN (in module *conda.base.constants*), 351
- NOTICES_HELP (in module *conda.cli.conda_argparse*), 368
- notices_mock_http_session_get() (in module *conda.testing.notices.fixtures*), 566
- notify_outdated_conda (Context attribute), 356
- NotWritableError, 461, 492
- NoWritableEnvsDirError, 461
- NoWritablePkgsDirError, 461
- nth() (in module *conda._vendor.toolz.itertoolz*), 276
- NULL (in module *conda.common.constants*), 398
- nullable (Field property), 334
- NullCountAction (class in *conda.cli.conda_argparse*), 366
- NullHandler (in module *conda.auxlib.logz*), 341
- number_channel_notices (Context attribute), 358
- NumberField (class in *conda.auxlib.entity*), 335
- numberify() (in module *conda.auxlib.type_coercion*), 345
- O**
- object_log() (History method), 499
- ObjectLoadedParameter (class in *conda.common.configuration*), 394
- ObjectParameter (class in *conda.common.configuration*), 396
- ObjectWrapper (class in *conda._vendor.tqdm.utils*), 304
- offline (Context attribute), 358
- offline_keep() (in module *conda.models.channel*), 506
- offset_cache_file_mtime() (in module *conda.testing.notices.helpers*), 567
- OK_MARK (in module *conda.plugins.subcommands.doctor.health_checks*), 547
- ON_DISK_HASH (in module *conda.gateways.repodata.jlap.fetch*), 486
- on_linux (in module *conda.common.compat*), 388
- on_mac (in module *conda.common.compat*), 388
- on_win (in module *conda.cli.conda_argparse*), 364
- on_win (in module *conda.common._os*), 387
- on_win (in module *conda.common.compat*), 388
- on_win (in module *conda.gateways.disk*), 481
- on_win (in module *conda.testing*), 571
- ONLY_DEPS (DepsModifier attribute), 351
- OOM (ERROR attribute), 386
- OP_ORDER (in module *conda.instructions*), 501
- open() (in module *conda.common.compat*), 388
- openbsd (Platform attribute), 510
- OperationNotAllowed, 459
- operations (Evaluator attribute), 419
- OPERATOR_MAP (in module *conda.models.version*), 533
- operator_match() (BaseSpec method), 533
- OPERATOR_START (in module *conda.models.version*), 533
- optional (MatchSpec property), 515
- OR (in module *conda.common.pkg_formats.python*), 419
- Or() (Clauses method), 384, 406
- OrderedDict (in module *conda._vendor.frozendict*), 267
- original_spec_str (MatchSpec property), 515
- os_distribution_name_version() (Context method), 359
- os_release_attr() (in module *conda._vendor.distro*), 263
- os_release_attr() (LinuxDistribution method), 265
- os_release_info() (in module *conda._vendor.distro*), 263
- os_release_info() (LinuxDistribution method), 265
- osx (Platform attribute), 510
- override_channels_enabled (Context attribute), 358
- P**
- Pacific (in module *conda._vendor.bolttons.timeutils*), 246
- package() (BinstarSpec method), 591, 593
- package_cache() (in module *conda.exports*), 465
- PACKAGE_CACHE_MAGIC_FILE (in module *conda.base.constants*), 353
- package_dict() (in module *conda.testing.solver_helpers*), 568

<code>PACKAGE_ENV_VARS_DIR</code> (in module <i>conda.base.constants</i>), 353	<code>parse_conda_channel_url()</code> (in module <i>conda.models.channel</i>), 506
<code>package_is_installed()</code> (in module <i>conda.testing.integration</i>), 565	<code>parse_dist_name()</code> (<i>Dist</i> static method), 508
<code>package_metadata</code> (<i>PackageInfo</i> attribute), 520	<code>parse_entry_point_def()</code> (in module <i>conda.common.path</i>), 409
<code>package_metadata_version</code> (<i>PackageMetadata</i> attribute), 520	<code>parse_marker()</code> (in module <i>conda.common.pkg_formats.python</i>), 418
<code>package_name</code> (<i>LeasedPathEntry</i> attribute), 512	<code>parse_multipart_files()</code> (in module <i>conda.gateways.connection.adapters.ftp</i>), 469
<code>package_string()</code> (in module <i>conda.testing.solver_helpers</i>), 568	<code>parse_specification()</code> (in module <i>conda.common.pkg_formats.python</i>), 418
<code>package_string_set()</code> (in module <i>conda.testing.solver_helpers</i>), 568	<code>parse_td</code> (in module <i>conda._vendor.bolttons.timeutils</i>), 242
<code>package_tarball_full_path</code> (<i>PackageCacheRecord</i> attribute), 528	<code>parse_timedelta()</code> (in module <i>conda._vendor.bolttons.timeutils</i>), 241
<code>package_tarball_full_path</code> (<i>PackageInfo</i> attribute), 520	<code>ParseError</code> , 459
<code>package_tarball_full_path</code> (<i>PrefixRecord</i> attribute), 528	<code>PARTIAL_PYPI_SPEC_PATTERN</code> (in module <i>conda.common.pkg_formats.python</i>), 412
<code>package_type</code> (<i>PackageRecord</i> attribute), 527	<code>partition()</code> (in module <i>conda._vendor.toolz.itertoolz</i>), 279
<code>PackageCacheData</code> (class in <i>conda.api</i>), 320	<code>partition_all()</code> (in module <i>conda._vendor.toolz.itertoolz</i>), 279
<code>PackageCacheData</code> (class in <i>conda.core.package_cache_data</i>), 438	<code>partitionby()</code> (in module <i>conda._vendor.toolz.recipes</i>), 283
<code>PackageCacheData</code> (class in <i>conda.gateways.repodata</i>), 490	<code>path</code> (<i>PathData</i> property), 526
<code>PackageCacheRecord</code> (class in <i>conda.models.records</i>), 528	<code>path_conflict</code> (<i>Context</i> attribute), 357
<code>PackageCacheType</code> (class in <i>conda.core.package_cache_data</i>), 438	<code>path_conversion</code> (<i>_Activator</i> attribute), 313
<code>PackageInfo</code> (class in <i>conda.models.package_info</i>), 520	<code>path_conversion</code> (<i>CmdExeActivator</i> attribute), 316
<code>PackageMetadata</code> (class in <i>conda.models.package_info</i>), 520	<code>path_conversion</code> (<i>CshActivator</i> attribute), 315
<code>packagename()</code> (<i>BinstarSpec</i> method), 591, 593	<code>path_conversion</code> (<i>FishActivator</i> attribute), 316
<code>PackageNotInstalledError</code> , 459	<code>path_conversion</code> (<i>PosixActivator</i> attribute), 314
<code>PackageRecord</code> (class in <i>conda.models.records</i>), 526	<code>path_conversion</code> (<i>PowerShellActivator</i> attribute), 316
<code>PackageRecordList</code> (class in <i>conda.core.subdir_data</i>), 451	<code>path_conversion</code> (<i>XonshActivator</i> attribute), 315
<code>PackagesNotFoundError</code> , 459	<code>path_factory</code> (<i>TmpEnvFixture</i> attribute), 572
<code>PackageType</code> (class in <i>conda.models.enums</i>), 511	<code>path_factory()</code> (in module <i>conda.testing</i>), 572
<code>PackageTypeField</code> (class in <i>conda.models.records</i>), 526	<code>path_identity()</code> (in module <i>conda.activate</i>), 314
<code>PaddingError</code> , 458	<code>path_identity()</code> (in module <i>conda.utils</i>), 574
<code>PaddingError</code> (in module <i>conda.exports</i>), 465	<code>path_is_clean()</code> (in module <i>conda.gateways.disk.delete</i>), 477
<code>pair</code> (<i>Dist</i> property), 508	<code>PATH_MATCH_REGEX</code> (in module <i>conda.common.path</i>), 408
<code>pandas()</code> (<i>tqdm</i> class method), 288, 294, 300, 309	<code>PATH_NOT_FOUND</code> (<i>ERROR</i> attribute), 386
<code>Parameter</code> (class in <i>conda.common.configuration</i>), 394	<code>path_to_url()</code> (in module <i>conda.common.url</i>), 423
<code>parameter_description_builder()</code> (in module <i>conda.cli.main_config</i>), 373	<code>path_type</code> (<i>PathData</i> attribute), 526
<code>ParameterFlag</code> (class in <i>conda.common.configuration</i>), 391	<code>PathAction</code> (class in <i>conda.core.path_actions</i>), 441
<code>ParameterLoader</code> (class in <i>conda.common.configuration</i>), 397	<code>PathConflict</code> (class in <i>conda.base.constants</i>), 351
<code>parse()</code> (<i>Dependencies</i> method), 587	<code>PathData</code> (class in <i>conda.models.records</i>), 526
<code>parse()</code> (<i>History</i> method), 498	<code>PathDataV1</code> (class in <i>conda.models.records</i>), 526
<code>parse_args()</code> (<i>ArgumentParser</i> method), 365	<code>PathFactoryFixture</code> (class in <i>conda.testing</i>), 571
	<code>PathNotFoundError</code> , 457
	<code>paths</code> (<i>PathsData</i> attribute), 526
	<code>paths_data</code> (<i>PackageInfo</i> attribute), 520
	<code>paths_data</code> (<i>PrefixRecord</i> attribute), 528

- `paths_equal()` (in module `conda.common.path`), 408
- `paths_version` (*PathsData* attribute), 526
- PathsData* (class in `conda.models.records`), 526
- `pathsep_join` (*_Activator* attribute), 313
- `pathsep_join` (*CmdExeActivator* attribute), 315
- `pathsep_join` (*CshActivator* attribute), 315
- `pathsep_join` (*FishActivator* attribute), 316
- `pathsep_join` (*JSONFormatMixin* attribute), 317
- `pathsep_join` (*PosixActivator* attribute), 314
- `pathsep_join` (*PowerShellActivator* attribute), 316
- `pathsep_join` (*XonshActivator* attribute), 315
- PathType* (class in `conda.models.enums`), 510
- `peek()` (in module `conda._vendor.toolz.itertoolz`), 282
- `penultimate` (*JLAP* property), 484
- `percent_decode()` (in module `conda.common.url`), 423
- PHANDLE* (in module `conda.common._os.windows`), 386
- `pinned_packages` (*Context* attribute), 357
- `pinned_specs()` (*SolverStateContainer* method), 450
- `pip_installed_post_parse_hook()` (in module `conda.cli.main_pip`), 377
- `pip_interop_enabled` (*Context* attribute), 356
- `pip_subprocess()` (in module `conda_env.pip_util`), 590
- PipPackage* (class in `conda_env.pip_util`), 590
- `pkg_data` (*ActionGroup* attribute), 435
- `pkgs_dirs` (*Context* property), 355
- `pkgs_dirs` (in module `conda.exports`), 464
- Platform* (class in `conda.models.enums`), 510
- `platform` (*Context* property), 355
- `platform` (*Dist* attribute), 508
- `platform` (in module `conda.exports`), 465
- `platform` (*PackageRecord* attribute), 527
- `platform_system_release()` (*Context* method), 359
- `pluck()` (in module `conda._vendor.toolz.itertoolz`), 280
- `plugin_manager` (*Context* property), 355
- PluginError*, 462
- `plugins` (in module `conda.plugins.subcommands`), 547
- `plugins` (in module `conda.plugins.virtual_packages`), 552
- `pop()` (*ContextStack* method), 360
- `pop()` (*IndexedSet* method), 237
- `pop_key()` (in module `conda.common.toposort`), 421
- POPULAR_ENCODINGS* (in module `conda.core.portability`), 445
- PosixActivator* (class in `conda.activate`), 314
- `post_build_validation()` (*Configuration* method), 398
- `post_build_validation()` (*Context* method), 359
- PowerShellActivator* (class in `conda.activate`), 316
- `ppc64` (*Arch* attribute), 509
- `ppc64le` (*Arch* attribute), 509
- `preferred_env` (*PackageMetadata* attribute), 520
- `preferred_env` (*PackageRecord* attribute), 527
- PreferredEnv* (class in `conda.models.package_info`), 520
- `prefix` (*ChangeReport* attribute), 436
- PREFIX* (in module `conda.instructions`), 500
- PREFIX_CMD* (in module `conda.instructions`), 501
- `prefix_data()` (*SolverStateContainer* method), 450
- PREFIX_MAGIC_FILE* (in module `conda.base.constants`), 353
- PREFIX_NAME_DISALLOWED_CHARS* (in module `conda.base.constants`), 351
- PREFIX_PLACEHOLDER* (in module `conda.base.constants`), 350
- `prefix_placeholder` (*PathData* attribute), 526
- `prefix_record_groups` (*PrefixActionGroup* attribute), 435
- `prefix_specified` (*Context* property), 356
- PREFIX_STATE_FILE* (in module `conda.base.constants`), 353
- PrefixActionGroup* (class in `conda.core.link`), 435
- PrefixData* (class in `conda.api`), 321
- PrefixData* (class in `conda.core.prefix_data`), 447
- PrefixDataType* (class in `conda.core.prefix_data`), 447
- PrefixGraph* (class in `conda.models.prefix_graph`), 521
- PrefixPathAction* (class in `conda.core.path_actions`), 441
- PrefixRecord* (class in `conda.models.records`), 528
- PrefixReplaceLinkAction* (class in `conda.core.path_actions`), 442
- PrefixSetup* (class in `conda.core.link`), 435
- `prepare()` (*ProgressiveFetchExtract* method), 439
- `prepare()` (*UnlinkLinkTransaction* method), 436
- `pretty_content()` (in module `conda.history`), 498
- `pretty_diff()` (in module `conda.history`), 498
- `pretty_json()` (*Entity* method), 338
- `pretty_list()` (in module `conda.common.configuration`), 390
- `pretty_map()` (in module `conda.common.configuration`), 390
- `pretty_package()` (in module `conda.cli.main_info`), 374
- `pretty_record()` (in module `conda.cli.main_search`), 379
- `prevent` (*PathConflict* attribute), 351
- `Prevent()` (*Clauses* method), 384, 406
- primitive_types* (in module `conda.auxlib.compat`), 324
- primitive_types* (in module `conda.common.compat`), 388
- PrimitiveLoadedParameter* (class in `conda.common.configuration`), 393
- PrimitiveParameter* (class in `conda.common.configuration`), 395
- PRINT* (in module `conda.instructions`), 500
- `print_activate()` (in module `conda.cli.install`), 369
- PRINT_CMD* (in module `conda.instructions`), 501
- `print_conda_exception()` (in module

`conda.exceptions`), 462
`print_config_item()` (in module `conda.cli.main_config`), 373
`print_dists()` (in module `conda.plan`), 541
`print_envs_list()` (in module `conda.cli.common`), 362
`print_expected_error_report()` (*ExceptionHandler method*), 455
`print_explicit()` (in module `conda.cli.main_list`), 375
`print_export_header()` (in module `conda.cli.main_list`), 375
`print_instrumentation_data()` (in module `conda.common.io`), 404
`print_log()` (*History method*), 499
`print_more_notices_message()` (in module `conda.notices.views`), 539
`print_notice_message()` (in module `conda.notices.views`), 539
`print_notices()` (in module `conda.notices.views`), 539
`print_package_info()` (in module `conda.cli.main_info`), 374
`print_packages()` (in module `conda.cli.main_list`), 375
`print_plan_results()` (in module `conda.core.initialize`), 433
`print_result()` (in module `conda_env.cli.common`), 578
`print_transaction_summary()` (*UnlinkLinkTransaction method*), 437
`print_unexpected_error_report()` (*ExceptionHandler method*), 455
`prioritize_channels()` (in module `conda.models.channel`), 506
`process_jlap_response()` (in module `conda.gateways.repodata.jlap.fetch`), 487
`process_solution()` (*_PycoSatSolver method*), 383
`process_solution()` (*_PyCryptoSatSolver method*), 383
`process_solution()` (*_PySatSolver method*), 384
`process_solution()` (*_SatSolver method*), 383
`PROGRESS` (in module `conda.instructions`), 500
`PROGRESS_COMMANDS` (in module `conda.instructions`), 501
`progress_update()` (*ProgressFileWrapper method*), 475
`ProgressBar` (class in `conda.common.io`), 402
`ProgressFileWrapper` (class in `conda.gateways.disk.create`), 475
`ProgressiveFetchExtract` (class in `conda.core.package_cache_data`), 439
`ProgressiveFetchExtract` (in module `conda.core.package_cache`), 437
`PROGRESSIVEFETCHEXTRACT` (in module `conda.instructions`), 501
`PROGRESSIVEFETCHEXTRACT_CMD()` (in module `conda.instructions`), 501
`proxy_servers` (*Context attribute*), 357
`ProxyError`, 458, 492
`prune()` (*PrefixGraph method*), 521
`push()` (*ContextStack method*), 360
`push_MatchSpec()` (*Resolve method*), 556
`PY3` (in module `conda._vendor.appdirs`), 232
`PY3` (in module `conda._vendor.toolz.compatibility`), 268
`PY3` (in module `conda.exports`), 465
`PY34` (in module `conda._vendor.toolz.compatibility`), 268
`PY_FILE_RE` (in module `conda.common.pkg_formats.python`), 412
`pyc_file` (*PathType attribute*), 511
`pyc_path()` (in module `conda.common.path`), 409
`PYCOSAT` (*SatSolverChoice attribute*), 352
`PycoSatSolver` (in module `conda.common.logic`), 405
`PYCRYPTOSAT` (*SatSolverChoice attribute*), 352
`PyCryptoSatSolver` (in module `conda.common.logic`), 405
`PYPI_CONDA_DEPS` (in module `conda.common.pkg_formats.python`), 412
`pypi_name_to_conda_name()` (in module `conda.common.pkg_formats.python`), 418
`PYPI_TO_CONDA` (in module `conda.common.pkg_formats.python`), 412
`PYPY` (in module `conda._vendor.toolz.compatibility`), 268
`PYSAT` (*SatSolverChoice attribute*), 352
`PySatSolver` (in module `conda.common.logic`), 405
`PySpec` (in module `conda.common.pkg_formats.python`), 412
`python` (*NoarchType attribute*), 512
`PYTHON_BINARY` (in module `conda.testing.integration`), 564
`python_entry_point_template` (in module `conda.gateways.disk.create`), 475
`python_implementation_name_version()` (*Context method*), 359
`PythonDistribution` (class in `conda.common.pkg_formats.python`), 412
`PythonDistributionMetadata` (class in `conda.common.pkg_formats.python`), 414
`PythonEggInfoDistribution` (class in `conda.common.pkg_formats.python`), 414
`PythonEggLinkDistribution` (class in `conda.common.pkg_formats.python`), 414
`PythonInstalledDistribution` (class in `conda.common.pkg_formats.python`), 413

Q

`quad` (*Dist property*), 508
`query()` (*PackageCacheData method*), 320, 438, 491
`query()` (*PrefixData method*), 322, 447
`query()` (*SubdirData method*), 319, 452

- [query_all\(\)](#) (*PackageCacheData* class method), 438, 491
[query_all\(\)](#) (*PackageCacheData* static method), 320
[query_all\(\)](#) (*SubdirData* static method), 319, 452
[query_all_prefixes\(\)](#) (in module *conda.core.envs_manager*), 427
[quiet](#) (*Context* attribute), 358
[quote_for_shell\(\)](#) (in module *conda.utils*), 575
- ## R
- [Raise\(\)](#) (in module *conda.auxlib.exceptions*), 339
[raise_errors\(\)](#) (in module *conda.common.configuration*), 391
[raises\(\)](#) (in module *conda._vendor.toolz.utils*), 284
[raises\(\)](#) (in module *conda.testing.helpers*), 561
[random_sample\(\)](#) (in module *conda._vendor.toolz.itertoolz*), 282
[raw_parameters_from_single_source\(\)](#) (*ParameterLoader* static method), 397
[raw_value](#) (*BaseSpec* property), 533
[raw_value](#) (*MatchInterface* property), 517
[RawParameter](#) (class in *conda.common.configuration*), 391
[RE_ANSI](#) (in module *conda._vendor.tqdm.utils*), 304
[reactivate\(\)](#) (*_Activator* method), 313
[read\(\)](#) (*ProgressFileWrapper* method), 475
[read_binstar_tokens\(\)](#) (in module *conda.gateways.anaconda_client*), 467
[read_cache\(\)](#) (*RepodataFetch* method), 496
[read_has_prefix\(\)](#) (in module *conda.gateways.disk.read*), 479
[read_icondata\(\)](#) (in module *conda.gateways.disk.read*), 479
[read_index_json\(\)](#) (in module *conda.gateways.disk.read*), 479
[read_index_json_from_tarball\(\)](#) (in module *conda.gateways.disk.read*), 479
[read_mod_and_etag\(\)](#) (in module *conda.core.subdir_data*), 452
[read_no_link\(\)](#) (in module *conda.gateways.disk.read*), 479
[read_only_caches\(\)](#) (*PackageCacheData* class method), 438, 491
[read_package_info\(\)](#) (in module *conda.gateways.disk.read*), 479
[read_package_metadata\(\)](#) (in module *conda.gateways.disk.read*), 479
[read_paths_json\(\)](#) (in module *conda.gateways.disk.read*), 479
[read_python_record\(\)](#) (in module *conda.gateways.disk.read*), 479
[read_repodata_json\(\)](#) (in module *conda.gateways.disk.read*), 479
[read_soft_links\(\)](#) (in module *conda.gateways.disk.read*), 479
[RECOGNIZED_URL_SCHEMES](#) (in module *conda.base.constants*), 350
[record\(\)](#) (in module *conda.testing.helpers*), 562
[record_file](#) (*time_recorder* attribute), 404
[record_id\(\)](#) (*PackageRecord* method), 527
[records](#) (*PrefixGraph* property), 521
[recursive_make_writable\(\)](#) (in module *conda.gateways.disk.permissions*), 477
[reduceby\(\)](#) (in module *conda._vendor.toolz.itertoolz*), 277
[refresh\(\)](#) (*ProgressBar* method), 402
[refresh\(\)](#) (*RepodataCache* method), 495
[refresh\(\)](#) (*tqdm* method), 289, 295, 301, 310
[regex_match\(\)](#) (*BaseSpec* method), 533
[regex_split_re](#) (in module *conda.models.version*), 533
[register_action_groups](#) (*PrefixActionGroup* attribute), 435
[register_env\(\)](#) (in module *conda.core.envs_manager*), 427
[register_reset_callback\(\)](#) (*Configuration* method), 398
[RegisterEnvironmentLocationAction](#) (class in *conda.core.path_actions*), 443
[rel_path\(\)](#) (in module *conda.misc*), 503
[relative_time\(\)](#) (in module *conda._vendor.boltons.timeutils*), 242
[reload\(\)](#) (*PackageCacheData* method), 321, 438, 491
[reload\(\)](#) (*PrefixData* method), 322, 447
[reload\(\)](#) (*SubdirData* method), 320, 452
[reload_config\(\)](#) (in module *conda.testing.integration*), 565
[remote_backoff_factor](#) (*Context* attribute), 357
[remote_connect_timeout_secs](#) (*Context* attribute), 357
[remote_max_retries](#) (*Context* attribute), 357
[remote_read_timeout_secs](#) (*Context* attribute), 357
[REMOVE](#) (*Commands* attribute), 380, 565
[remove\(\)](#) (in module *conda._vendor.toolz.itertoolz*), 273
[remove\(\)](#) (in module *conda.cli.main_package*), 376
[remove\(\)](#) (*IndexedSet* method), 236
[remove\(\)](#) (*PackageCacheData* method), 438, 491
[remove\(\)](#) (*PrefixData* method), 447
[remove\(\)](#) (*Resolve* method), 557
[remove\(\)](#) (*SimpleEnvironment* method), 568
[remove_auth\(\)](#) (in module *conda.common.url*), 426
[remove_binstar_token\(\)](#) (in module *conda.gateways.anaconda_client*), 467
[remove_channels\(\)](#) (*Environment* method), 587
[remove_conda_in_sp_dir\(\)](#) (in module *conda.core.initialize*), 434
[remove_empty_parent_paths\(\)](#) (in module *conda.gateways.disk.delete*), 476

- `remove_menu_action_groups` (*PrefixActionGroup* attribute), 435
- `remove_spec()` (*PrefixGraph* method), 521
- `remove_specs` (*PrefixSetup* attribute), 435
- `remove_specs()` (*Resolve* method), 557
- `remove_youngest_descendant_nodes_with_specs()` (*PrefixGraph* method), 521
- `removed_precs` (*ChangeReport* attribute), 436
- `RemoveError`, 460
- `RemoveFromPrefixPathAction` (class in *conda.core.path_actions*), 443
- `RemoveLinkedPackageRecordAction` (class in *conda.core.path_actions*), 444
- `RemoveMenuAction` (class in *conda.core.path_actions*), 444
- `rename()` (in module *conda.gateways.disk.update*), 480
- `rename_context()` (in module *conda.gateways.disk.update*), 480
- `replace()` (*ContextStack* method), 360
- `replace()` (*RepodataCache* method), 495
- `replace()` (*Url* method), 424
- `replace_context()` (in module *conda.base.context*), 360
- `replace_context_default()` (in module *conda.base.context*), 360
- `replace_first_api_with_conda()` (in module *conda.gateways.anaconda_client*), 467
- `replace_long_shebang()` (in module *conda.core.portability*), 446
- `replace_prefix()` (in module *conda.core.portability*), 446
- `replace_pyzzter_entry_point_shebang()` (in module *conda.core.portability*), 446
- `repo_cache` (*RepodataFetch* property), 495
- `repo_cache` (*SubdirData* property), 452
- `REPO_DATA_KEYS` (*SimpleEnvironment* attribute), 568
- `repo_fetch` (*SubdirData* property), 452
- `repo_interface_cls` (*RepodataFetch* attribute), 496
- `repodata()` (*CondaRepoInterface* method), 494
- `repodata()` (*JlapRepoInterface* method), 488
- `repodata()` (*RepoInterface* method), 494
- `REPODATA_FN` (in module *conda.base.constants*), 351
- `REPODATA_FN` (in module *conda.gateways.repodata*), 490
- `repodata_fn` (*RepodataFetch* attribute), 495
- `repodata_fns` (*Context* attribute), 358
- `REPODATA_HEADER_RE` (in module *conda.core.subdir_data*), 451
- `repodata_parsed()` (*JlapRepoInterface* method), 488
- `REPODATA_PICKLE_VERSION` (in module *conda.core.subdir_data*), 451
- `repodata_record` (*PackageInfo* attribute), 520
- `repodata_threads` (*Context* property), 355
- `RepodataCache` (class in *conda.gateways.repodata*), 495
- `RepodataFetch` (class in *conda.gateways.repodata*), 495
- `RepodataIsEmpty`, 493
- `RepodataOnDisk`, 493
- `RepodataState` (class in *conda.gateways.repodata*), 494
- `RepoInterface` (class in *conda.gateways.repodata*), 493
- `report()` (*TMonitor* method), 285, 306
- `report_errors` (*Context* attribute), 358
- `reportable` (*CondaError* attribute), 490, 576
- `REPR_IGNORE_KWARGS` (in module *conda.core.path_actions*), 441
- `request_header_sort_dict` (in module *conda.auxlib.logz*), 342
- `request_header_sort_key()` (in module *conda.auxlib.logz*), 342
- `request_jlap()` (in module *conda.gateways.repodata.jlap.fetch*), 487
- `request_url_jlap_state()` (in module *conda.gateways.repodata.jlap.fetch*), 487
- `requested_spec` (*PrefixRecord* attribute), 528
- `requests_version()` (*Context* method), 359
- `Require()` (*Clauses* method), 384, 406
- `required` (*Field* property), 334
- `RequirementsSpec` (class in *conda_env.specs*), 593
- `RequirementsSpec` (class in *conda_env.specs.requirements*), 591
- `REQUIRES_FILES` (*PythonDistribution* attribute), 413
- `REQUIRES_FILES` (*PythonEggInfoDistribution* attribute), 414
- `REQUIRES_FILES` (*PythonInstalledDistribution* attribute), 414
- `reset()` (*tqdm* method), 289, 296, 301, 311
- `reset_conda_context()` (in module *conda.testing.fixtures*), 558
- `reset_context()` (in module *conda.base.context*), 359
- `reset_context()` (in module *conda.testing*), 571
- `Resolve` (class in *conda.resolve*), 554
- `ResolvePackageNotFound`, 456
- `ResolvePackageNotFound` (in module *conda.resolve*), 554
- `Response` (in module *conda.auxlib.packaging*), 344
- `Response` (in module *conda.gateways.subprocess*), 497
- `Response304ContentUnchanged`, 494
- `response_header_sort_dict` (in module *conda.auxlib.logz*), 342
- `response_header_sort_key()` (in module *conda.auxlib.logz*), 342
- `RESTORE` (*SW* attribute), 386
- `restore_bad()` (*Resolve* method), 557
- `restore_free_channel` (*Context* attribute), 358
- `restore_state()` (*_ClauseArray* method), 382
- `restore_state()` (*_ClauseList* method), 382
- `restore_state()` (*_SatSolver* method), 383
- `Result` (class in *conda.core.initialize*), 432
- `retr()` (*FTPAdapter* method), 468

- RETRIES (in module *conda.gateways.connection.session*), 472
- retrieve_notices() (in module *conda.notices.core*), 536
- return_code (ArgumentError attribute), 456
- return_code (CondaError attribute), 490, 576
- return_code (CondaExitZero attribute), 577
- reverse() (*_Action* method), 441
- reverse() (*CacheUrlAction* method), 444
- reverse() (*CompileMultiPycAction* method), 443
- reverse() (*CreateNonadminAction* method), 442
- reverse() (*CreatePrefixRecordAction* method), 443
- reverse() (*CreatePythonEntryPointAction* method), 443
- reverse() (*ExtractPackageAction* method), 445
- reverse() (*IndexedSet* method), 237
- reverse() (*LinkPathAction* method), 442
- reverse() (*MakeMenuAction* method), 442
- reverse() (*RegisterEnvironmentLocationAction* method), 443
- reverse() (*RemoveLinkedPackageRecordAction* method), 444
- reverse() (*RemoveMenuAction* method), 444
- reverse() (*UnlinkPathAction* method), 444
- reverse() (*UnregisterEnvironmentLocationAction* method), 444
- reverse() (*UpdateHistoryAction* method), 443
- revert_actions() (in module *conda.plan*), 541
- right_pad_os_sep() (in module *conda.common.path*), 410
- riscv64 (Arch attribute), 509
- RM_EXTRACTED (in module *conda.instructions*), 500
- RM_FETCHED (in module *conda.instructions*), 500
- rm_fetched() (in module *conda.core.package_cache_data*), 440
- rm_items() (in module *conda.cli.main_clean*), 371
- rm_pkgs() (in module *conda.cli.main_clean*), 371
- rm_rf() (in module *conda.exports*), 465
- rm_rf() (in module *conda.gateways.disk.delete*), 476
- rmtree() (in module *conda.gateways.disk.delete*), 476
- rollback_enabled (Context attribute), 357
- root_dir (Context property), 355
- root_dir (in module *conda.exports*), 465
- ROOT_ENV_NAME (in module *conda.base.constants*), 350
- root_log (in module *conda.auxlib.logz*), 341
- ROOT_NO_RM (in module *conda.base.constants*), 350
- root_prefix() (Context method), 359
- root_writable (Context property), 355
- root_writable (in module *conda.exports*), 465
- rsplit() (*Dist* method), 509
- RUN (Commands attribute), 380, 565
- run() (*_SatSolver* method), 383
- run() (ASM method), 250, 256
- run() (*BuildPyCommand* method), 344
- run() (*TMonitor* method), 285, 306
- run_as_admin() (in module *conda.common.os.windows*), 387
- run_command() (in module *conda.cli.python_api*), 380
- run_command() (in module *conda.testing.integration*), 565
- run_for (CondaPostCommand attribute), 224, 549, 552
- run_for (CondaPreCommand attribute), 224, 549, 553
- run_inprocess_conda_command() (in module *conda.testing.helpers*), 561
- run_plan() (in module *conda.core.initialize*), 433
- run_plan_elevated() (in module *conda.core.initialize*), 433
- run_plan_from_stdin() (in module *conda.core.initialize*), 433
- run_plan_from_temp_file() (in module *conda.core.initialize*), 433
- run_script() (in module *conda.core.link*), 437
- run_script_tmpl (*_Activator* attribute), 313
- run_script_tmpl (*CmdExeActivator* attribute), 316
- run_script_tmpl (*CshActivator* attribute), 315
- run_script_tmpl (*FishActivator* attribute), 316
- run_script_tmpl (*PosixActivator* attribute), 315
- run_script_tmpl (*PowerShellActivator* attribute), 316
- run_script_tmpl (*XonshActivator* attribute), 315
- running_a_python_capable_of_unicode_subprocessing() (in module *conda.testing.integration*), 564
- ## S
- s390x (Arch attribute), 509
- S3Adapter (class in *conda.gateways.connection.adapters.s3*), 471
- safe_open() (in module *conda.utils*), 575
- safety_checks (Context attribute), 357
- SafetyChecks (class in *conda.base.constants*), 351
- SafetyError, 460
- sat() (*Clauses* method), 384, 406
- sat_solver (Context attribute), 358
- SatSolverChoice (class in *conda.base.constants*), 352
- save() (*Environment* method), 587
- save() (*RepodataCache* method), 495
- save() (*RepodataState* method), 494
- save_state() (*_ClauseArray* method), 382
- save_state() (*_ClauseList* method), 382
- save_state() (*_SatSolver* method), 383
- schannel (*PackageRecord* property), 526
- script_extension (*_Activator* attribute), 313
- script_extension (*CmdExeActivator* attribute), 316
- script_extension (*CshActivator* attribute), 315
- script_extension (*FishActivator* attribute), 316
- script_extension (*PosixActivator* attribute), 314
- script_extension (*PowerShellActivator* attribute), 316
- script_extension (*XonshActivator* attribute), 315
- SDistCommand (class in *conda.auxlib.packaging*), 344

- SEARCH (*Commands attribute*), 380, 565
 SEARCH_PATH (*in module conda.base.constants*), 350
 second() (*in module conda._vendor.toolz.itertoolz*), 276
 send() (*EnforceUnusedAdapter method*), 472
 send() (*FTPAdapter method*), 468
 send() (*LocalFSAdapter method*), 470
 send() (*S3Adapter method*), 471
 send() (*tqdm_asyncio method*), 291
 SenderError, 339
 sep (*_Activator attribute*), 313
 sep (*CmdExeActivator attribute*), 315
 sep (*CshActivator attribute*), 315
 sep (*FishActivator attribute*), 316
 sep (*PosixActivator attribute*), 314
 sep (*PowerShellActivator attribute*), 316
 sep (*XonshActivator attribute*), 315
 separate_format_cache (*Context attribute*), 357
 SequenceLoadedParameter (*class in conda.common.configuration*), 394
 SequenceParameter (*class in conda.common.configuration*), 396
 session (*_SignatureVerification property*), 573
 sestatus_b() (*DataSource static method*), 249, 255
 set_active_prefix() (*in module conda.testing.helpers*), 561
 set_all_logger_level() (*in module conda.gateways.logging*), 483
 set_binstar_token() (*in module conda.gateways.anaconda_client*), 467
 set_conda_log_level() (*in module conda.gateways.logging*), 483
 set_description (*in module conda_env.cli.main_vars*), 585
 set_description() (*tqdm method*), 289, 296, 301, 311
 set_description_str() (*tqdm method*), 289, 296, 301, 311
 set_environment_env_vars() (*PrefixData method*), 448
 set_example (*in module conda_env.cli.main_vars*), 585
 set_file_logging() (*in module conda.gateways.logging*), 483
 set_has_format() (*RepodataState method*), 494
 set_lock() (*tqdm class method*), 288, 294, 300, 309
 set_name() (*Field method*), 334
 set_postfix() (*tqdm method*), 289, 296, 301, 311
 set_postfix_str() (*tqdm method*), 289, 296, 302, 311
 set_repository_metadata() (*SolverStateContainer method*), 450
 set_root_level() (*in module conda.auxlib.logz*), 341
 set_tmpdir() (*in module conda.testing.integration*), 564
 set_value() (*ContextStackObject method*), 359
 set_var_tmpl (*_Activator attribute*), 313
 set_var_tmpl (*CmdExeActivator attribute*), 316
 set_var_tmpl (*CshActivator attribute*), 315
 set_var_tmpl (*FishActivator attribute*), 316
 set_var_tmpl (*PosixActivator attribute*), 314
 set_var_tmpl (*PowerShellActivator attribute*), 316
 set_var_tmpl (*XonshActivator attribute*), 315
 set_verbosity() (*in module conda.gateways.logging*), 483
 setter() (*classproperty method*), 328
 setup() (*_PycoSatSolver method*), 383
 setup() (*_PyCryptoSatSolver method*), 383
 setup() (*_PySatSolver method*), 383
 setup() (*_SatSolver method*), 383
 sha256 (*PackageRecord attribute*), 527
 sha256 (*PathDataV1 attribute*), 526
 sha256_in_prefix (*PathDataV1 attribute*), 526
 SHARE (*ERROR attribute*), 386
 SharedLinkPathClobberError, 457
 shebang_pat (*in module conda.cli.main_package*), 376
 SHEBANG_REGEX (*in module conda.core.portability*), 445
 SHEBANG_REGEX (*in module conda.gateways.disk.update*), 480
 shells (*in module conda.utils*), 575
 shlex_split_unicode() (*in module conda.auxlib.compat*), 325
 shlvl (*Context property*), 356
 shortcuts (*Context attribute*), 358
 should_check_format() (*RepodataState method*), 494
 SHOW (*SW attribute*), 386
 show_channel_urls (*Context attribute*), 358
 show_help_on_empty_command() (*in module conda_env.cli.main*), 578
 SHOWDEFAULT (*SW attribute*), 386
 SHOWMAXIMIZED (*SW attribute*), 386
 SHOWMINIMIZED (*SW attribute*), 386
 SHOWMINNOACTIVE (*SW attribute*), 386
 SHOWNNA (*SW attribute*), 386
 SHOWNOACTIVATE (*SW attribute*), 386
 SHOWNORMAL (*SW attribute*), 386
 shutdown() (*DummyExecutor method*), 403
 signal_handler() (*in module conda.common.signals*), 421
 signature_verification (*in module conda.trust.signature_verification*), 573
 SignatureError, 573
 signing_metadata_url_base (*Context property*), 356
 SimpleEnvironment (*class in conda.testing.solver_helpers*), 568
 SimpleTextIOWrapper (*class in conda._vendor.tqdm.utils*), 305
 SINGLE_USE_KEYS (*PythonDistributionMetadata attribute*), 415
 SingleStrArgCachingType (*class in conda.models.version*), 530
 site_data_dir (*AppDirs property*), 234

- site_data_dir (*EnvAppDirs* property), 467
- site_data_dir() (in module *conda._vendor.appdirs*), 233
- six_with_metaclass() (in module *conda.common.compat*), 388
- size (*PackageRecord* attribute), 527
- size_in_bytes (*PathDataV1* attribute), 526
- SKIP_FIELDS (in module *conda.cli.main_info*), 374
- skip_tests() (*SolverTests* method), 568
- sliding_window() (in module *conda._vendor.toolz.itertoolz*), 279
- softlink (*LinkType* attribute), 510
- softlink (*PathType* attribute), 511
- softlink_paths (*PreferredEnv* attribute), 520
- softlink_supported() (in module *conda.gateways.disk.test*), 480
- solve() (*Resolve* method), 557
- solve_final_state() (*Solver* method), 318, 449
- solve_for_diff() (*Solver* method), 318, 449
- solve_for_transaction() (*Solver* method), 319, 448
- Solver (class in *conda.api*), 318
- Solver (class in *conda.core.solve*), 448
- solver (*Context* attribute), 358
- solver() (*SimpleEnvironment* method), 568
- solver_class (*SolverTests* property), 568
- solver_class() (in module *conda.testing.helpers*), 562
- solver_ignore_timestamps (*Context* attribute), 358
- solver_transaction() (*SimpleEnvironment* method), 568
- SolverStateContainer (class in *conda.core.solve*), 450
- SolverTests (class in *conda.testing.solver_helpers*), 568
- sort() (*IndexedSet* method), 237
- source (*ArgParseRawParameter* attribute), 392
- source (*EnvRawParameter* attribute), 391
- source (*Link* attribute), 524
- source_full_path (*CreateInPrefixPathAction* property), 442
- source_full_paths (*CompileMultiPycAction* property), 442
- SPACER_CHARACTER (in module *conda.testing.integration*), 564
- spec (*BaseSpec* property), 533
- spec (*MatchSpec* property), 515
- spec_from_line() (in module *conda.cli.common*), 362
- spec_name (in module *conda.plugins.hookspec*), 542
- spec_pat (*History* attribute), 498
- spec_pat (in module *conda.cli.common*), 362
- SpecNotFound, 462
- specs_from_args() (in module *conda.cli.common*), 362
- specs_from_history_map() (*SolverStateContainer* method), 450
- specs_from_url() (in module *conda.cli.common*), 362
- SPECS_SATISFIED_SKIP_SOLVE (*UpdateModifier* attribute), 352
- specs_to_add (*ChangeReport* attribute), 436
- specs_to_remove (*ChangeReport* attribute), 436
- SpecsConfigurationConflictError, 460
- SpecTypes (in module *conda_env.specs*), 593
- Spinner (class in *conda.common.io*), 402
- spinner_cycle (*Spinner* attribute), 402
- split() (*Dist* method), 509
- split_anaconda_token() (in module *conda.common.url*), 425
- split_conda_url_easy_parts() (in module *conda.common.url*), 426
- split_extension() (in module *conda.models.dist*), 507
- split_filename() (in module *conda.common.path*), 410
- split_platform() (in module *conda.common.url*), 425
- split_scheme_auth_token() (in module *conda.common.url*), 426
- split_spec() (in module *conda.common.pkg_formats.python*), 418
- SplitStrMatch (class in *conda.models.match_spec*), 518
- ssl_verify (*Context* attribute), 357
- ssl_verify_validation() (in module *conda.base.context*), 355
- stack_context() (in module *conda.base.context*), 360
- stack_context_default() (in module *conda.base.context*), 360
- stale() (*RepodataCache* method), 495
- start() (*Spinner* method), 402
- start_time (*time_recorder* attribute), 404
- startswith() (*Dist* method), 509
- startswith() (*VersionOrder* method), 532
- status_code (*UnavailableInvalidChannel* attribute), 459, 492
- status_printer() (*tqdm* static method), 286, 293, 298, 308
- stderr_log_level() (in module *conda.common.io*), 402
- stderrlog (in module *conda.cli.install*), 369
- stderrlog (in module *conda.gateways.connection.adapters.s3*), 470
- stderrlog (in module *conda.gateways.repodata*), 493
- STDOUT (*CaptureTarget* attribute), 401
- STDOUT (in module *conda.cli.python_api*), 380
- stdout_json() (in module *conda.cli.common*), 362
- stdout_json() (in module *conda_env.cli.common*), 578
- stdout_json_success() (in module *conda.cli.common*), 362
- stdoutlog (in module *conda.gateways.disk.create*), 475

- `stdoutlog` (in module `conda.lock`), 502
 - `stdoutlog` (in module `conda.resolve`), 554
 - `StdStreamHandler` (class in `conda.gateways.logging`), 482
 - `stop()` (*Spinner method*), 402
 - `stor()` (*FTPAdapter method*), 468
 - `STORE_HEADERS` (in module `conda.gateways.repodata.jlap.fetch`), 486
 - `STRICT` (*ChannelPriority attribute*), 352
 - `strictness` (*MatchSpec property*), 515
 - `STRING` (*CaptureTarget attribute*), 401
 - `STRING` (in module `conda.cli.python_api`), 380
 - `STRING_CHUNK` (in module `conda.common.pkg_formats.python`), 419
 - `string_types` (in module `conda.exports`), 465
 - `StringField` (class in `conda.auxlib.entity`), 335
 - `stringify()` (in module `conda.auxlib.logz`), 342
 - `stringify()` (in module `conda.gateways.repodata`), 490
 - `strip_comment()` (in module `conda.cli.common`), 362
 - `strip_expected()` (in module `conda.testing.helpers`), 561
 - `strip_extension()` (in module `conda.models.dist`), 507
 - `strip_pkg_extension()` (in module `conda.common.path`), 410
 - `strip_scheme()` (in module `conda.common.url`), 425
 - `strptime()` (in module `conda._vendor.boltons.timeutils`), 243
 - `subdir` (*Channel property*), 492, 505
 - `subdir` (*Context property*), 355
 - `subdir` (*Dist property*), 508
 - `subdir` (in module `conda.exports`), 465
 - `subdir` (*PackageRecord attribute*), 527
 - `subdir_url` (*Channel property*), 492, 505
 - `SubdirData` (class in `conda.api`), 319
 - `SubdirData` (class in `conda.core.subdir_data`), 452
 - `SubdirDataType` (class in `conda.core.subdir_data`), 451
 - `SubdirField` (class in `conda.models.records`), 525
 - `subdirs` (*Context property*), 355
 - `submit()` (*DummyExecutor method*), 402
 - `submit()` (*ThreadLimitedThreadPoolExecutor method*), 403
 - `subprocess_call()` (in module `conda.gateways.subprocess`), 497
 - `subprocess_call_with_clean_env()` (in module `conda.gateways.subprocess`), 497
 - `success()` (*Trace method*), 248, 254
 - `summary` (*CondaSubcommand attribute*), 226, 548, 553
 - `superseded_precs` (*ChangeReport attribute*), 436
 - `supplement_index_with_repodata()` (in module `conda.testing.helpers`), 561
 - `suppress_resource_warning()` (in module `conda.testing.fixtures`), 558
 - `SW` (class in `conda.common._os.windows`), 386
 - `swallow_broken_pipe` (in module `conda.common.io`), 401
 - `SwallowBrokenPipe` (class in `conda.common.io`), 401
 - `SYMLINK_CONDA` (in module `conda.instructions`), 500
 - `symlink_conda()` (in module `conda.exports`), 465
 - `symmetric_difference()` (*IndexedSet method*), 237
 - `symmetric_difference_update()` (*IndexedSet method*), 237
 - `sys_prefix_unfollowed()` (in module `conda.utils`), 575
 - `sys_rc_path` (in module `conda.base.context`), 355
 - `sysctl_machdep_cpu_hw_cpufrequency()` (*Data-Source static method*), 249, 255
 - `sysinfo_cpu()` (*DataSource static method*), 249, 255
- ## T
- `tail()` (in module `conda._vendor.toolz.itertoolz`), 275
 - `take()` (in module `conda._vendor.toolz.itertoolz`), 275
 - `take_nth()` (in module `conda._vendor.toolz.itertoolz`), 275
 - `tarange()` (in module `conda._vendor.tqdm.asyncio`), 291
 - `tarball_basename` (*PackageCacheRecord property*), 528
 - `tarball_file_in_cache()` (*PackageCacheData class method*), 438, 491
 - `tarball_file_in_this_cache()` (*PackageCache-Data method*), 439, 491
 - `target` (*MatchSpec property*), 515
 - `target_dir` (in module `conda.auxlib.packaging`), 345
 - `target_full_path` (*CacheUrlAction property*), 444
 - `target_full_path` (*ExtractPackageAction property*), 444
 - `target_full_path` (*PathAction property*), 441
 - `target_full_path` (*PrefixPathAction property*), 441
 - `target_full_path` (*RegisterEnvironmentLocationAction property*), 443
 - `target_full_path` (*UnregisterEnvironmentLocationAction property*), 444
 - `target_full_paths` (*CompileMultiPycAction property*), 442
 - `target_full_paths` (*MultiPathAction property*), 441
 - `target_path` (*LeasedPathEntry attribute*), 512
 - `target_prefix` (*ActionGroup attribute*), 435
 - `target_prefix` (*Context property*), 356
 - `target_prefix` (*LeasedPathEntry attribute*), 512
 - `target_prefix` (*PrefixSetup attribute*), 435
 - `target_prefix_override` (*Context attribute*), 359
 - `target_short_paths` (*PrefixPathAction property*), 441
 - `temp_chdir()` (in module `conda.testing.integration`), 565
 - `temp_package_cache()` (in module `conda.testing.fixtures`), 558
 - `temp_path` (in module `conda.core.initialize`), 434

temp_simple_env() (in module *conda.testing.solver_helpers*), 568
 tempdir() (in module *conda.testing.helpers*), 561
 tempdir() (in module *conda.testing.integration*), 565
 tempfile_extension(Activator attribute), 313
 tempfile_extension(CmdExeActivator attribute), 316
 tempfile_extension(CshActivator attribute), 315
 tempfile_extension(FishActivator attribute), 316
 tempfile_extension(JSONFormatMixin attribute), 317
 tempfile_extension(PosixActivator attribute), 314
 tempfile_extension(PowerShellActivator attribute), 316
 tempfile_extension(XonshActivator attribute), 315
 temporary_content_in_file() (in module *conda.common.disk*), 399
 TemporaryDirectory (class in *conda.gateways.disk.create*), 475
 terminate() (JLAP method), 485
 terminator(StdStreamHandler attribute), 482
 test_accelerate() (SolverTests method), 569
 test_anaconda_nomkl() (SolverTests method), 569
 test_arch_preferred_over_noarch_when_otherwise_equal() (SolverTests method), 570
 test_channel_priority_1() (SolverTests method), 569
 test_circular_dependencies() (SolverTests method), 569
 TEST_DATA_DIR (in module *conda.testing.helpers*), 561
 test_empty() (SolverTests method), 569
 test_get_dists() (SolverTests method), 569
 test_get_reduced_index_broadening_preferred_solver() (SolverTests method), 570
 test_get_reduced_index_broadening_with_unsatisfiable() (SolverTests method), 570
 test_install_package_with_feature() (SolverTests method), 569
 test_iopro_nomkl() (SolverTests method), 569
 test_iopro_nomkl() (SolverTests method), 569
 test_irrational_version() (SolverTests method), 569
 TEST_LOG_LEVEL (in module *conda.testing.integration*), 564
 test_mkl() (SolverTests method), 569
 test_no_features() (SolverTests method), 569
 test_noarch_preferred_over_arch_when_build_greater() (SolverTests method), 570
 test_noarch_preferred_over_arch_when_build_greater_or_equal() (SolverTests method), 570
 test_noarch_preferred_over_arch_when_version_greater() (SolverTests method), 570
 test_noarch_preferred_over_arch_when_version_greater_or_equal() (SolverTests method), 570
 test_nonexistent() (SolverTests method), 569
 test_nonexistent_deps() (SolverTests method), 569
 test_pseudo_boolean() (SolverTests method), 569
 test_remove() (SolverTests method), 569
 test_scipy_mkl() (SolverTests method), 569
 test_surplus_features_1() (SolverTests method), 569
 test_surplus_features_2() (SolverTests method), 570
 test_timestamps_and_deps() (SolverTests method), 569
 test_unintentional_feature_downgrade() (SolverTests method), 569
 test_unsat_any_two_not_three() (SolverTests method), 569
 test_unsat_chain() (SolverTests method), 569
 test_unsat_channel_priority() (SolverTests method), 569
 test_unsat_expand_single() (SolverTests method), 569
 test_unsat_from_r1() (SolverTests method), 569
 test_unsat_missing_dep() (SolverTests method), 569
 test_unsat_shortest_chain_1() (SolverTests method), 569
 test_unsat_shortest_chain_2() (SolverTests method), 569
 test_unsat_shortest_chain_3() (SolverTests method), 569
 test_unsat_shortest_chain_4() (SolverTests method), 569
 test_unsat_simple() (SolverTests method), 569
 tests_to_skip (SolverTests property), 568
 text_type (in module *conda.exports*), 465
 FileNotFoundError (in module *conda.common.io*), 339
 ThreadLimitedThreadPoolExecutor (class in *conda.common.io*), 403
 THREADSAFE_EXTRACT (in module *conda.core.package_cache_data*), 438
 time_recorder (class in *conda.common.io*), 403
 timeenc() (in module *conda.gateways.repodata.jlap.fetch*), 487
 timeout() (in module *conda.common.io*), 402
 timeout() (RepodataCache method), 495
 timestamp (PackageRecord attribute), 527
 TimestampField (class in *conda.models.records*), 524
 TMonitor (class in *conda._vendor.tqdm*), 306
 TMonitor (class in *conda._vendor.tqdm._monitor*), 285
 tmp_path (PathFactoryFixture attribute), 571
 tmpdir() (in module *conda.testing.fixtures*), 558
 tmpdir_in_use (in module *conda.testing.integration*), 569
 TmpDownload (class in *conda.gateways.connection.download*), 472

- `TmpEnvFixture` (class in `conda.testing`), 572
 - `to_dict()` (Environment method), 587
 - `to_dict()` (Trace method), 248, 254
 - `to_feature_metric_id()` (Resolve static method), 556
 - `to_filename()` (Dist method), 508
 - `to_json()` (frozendict method), 267
 - `to_match_spec()` (Dist method), 508
 - `to_match_spec()` (PackageRecord method), 527
 - `to_matchespec()` (Dist method), 508
 - `to_package_ref()` (Dist method), 508
 - `to_sat_name()` (Resolve static method), 556
 - `to_simple_match_spec()` (PackageRecord method), 527
 - `to_url()` (Dist method), 508
 - `to_yaml()` (Environment method), 587
 - `TOKEN_REPLACE` (TokenURLFilter attribute), 482
 - `TOKEN_URL_PATTERN` (TokenURLFilter attribute), 482
 - `tokenized_conda_url_startswith()` (in module `conda.models.channel`), 506
 - `tokenized_startswith()` (in module `conda.common.path`), 409
 - `tokenized_startswith()` (in module `conda.models.channel`), 506
 - `TokenURLFilter` (class in `conda.gateways.logging`), 482
 - `TooManyArgumentsError`, 457
 - `top` (ParameterFlag attribute), 391
 - `topic()` (DeprecationHandler method), 454
 - `topk()` (in module `conda._vendor.toolz.itertoolz`), 281
 - `toposort()` (in module `conda.common.toposort`), 421
 - `total_call_num` (time_recorder attribute), 404
 - `total_number_channel_notices` (ChannelNoticeResultSet attribute), 539
 - `total_run_time` (time_recorder attribute), 404
 - `total_seconds()` (in module `conda._vendor.boltons.timeutils`), 240
 - `touch()` (in module `conda.gateways.disk.update`), 481
 - `touch()` (in module `conda.lock`), 502
 - `touch_nonadmin()` (in module `conda.misc`), 503
 - `tqdm` (class in `conda._vendor.tqdm`), 307
 - `tqdm` (class in `conda._vendor.tqdm._tqdm`), 286
 - `tqdm` (class in `conda._vendor.tqdm.auto`), 292
 - `tqdm` (class in `conda._vendor.tqdm.std`), 298
 - `tqdm` (in module `conda._vendor.tqdm.asyncio`), 291
 - `tqdm_asyncio` (class in `conda._vendor.tqdm.asyncio`), 291
 - `TqdmDeprecationWarning`, 290, 297, 307
 - `TqdmExperimentalWarning`, 290, 297, 307
 - `TqdmKeyError`, 290, 297, 307
 - `TqdmMonitorWarning`, 290, 298, 307
 - `TqdmSynchronisationWarning`, 285, 306
 - `TqdmTypeError`, 290, 297, 307
 - `TqdmWarning`, 290, 297, 307
 - `Trace` (class in `conda._vendor.cpuinfo`), 254
 - `Trace` (class in `conda._vendor.cpuinfo.cpuinfo`), 248
 - `TRACE` (in module `conda.gateways.logging`), 482
 - `trace()` (in module `conda.gateways.logging`), 483
 - `track_features` (Context attribute), 357
 - `track_features` (PackageRecord attribute), 527
 - `track_features_specs()` (SolverStateContainer method), 450
 - `trange` (in module `conda._vendor.tqdm.asyncio`), 291
 - `trange()` (in module `conda._vendor.tqdm`), 311
 - `trange()` (in module `conda._vendor.tqdm._tqdm`), 290
 - `trange()` (in module `conda._vendor.tqdm.auto`), 296
 - `trange()` (in module `conda._vendor.tqdm.std`), 302
 - `translate_stream()` (in module `conda.utils`), 574
 - `trash_dir()` (Context method), 359
 - `treeify()` (in module `conda.models.version`), 532
 - `TRUE` (in module `conda.common._logic`), 382
 - `TRUE` (in module `conda.common.logic`), 405
 - `trusted_root` (_SignatureVerification property), 573
 - `type` (ActionGroup attribute), 435
 - `type` (Field property), 334
 - `type` (Link attribute), 524
 - `type` (Noarch attribute), 519
 - `typify()` (in module `conda.auxlib.type_coercion`), 346
 - `typify()` (LoadedParameter method), 393
 - `typify()` (Parameter method), 395
 - `typify_parameter()` (Configuration method), 398
 - `tzname()` (ConstantTZInfo method), 244
 - `tzname()` (LocalTZInfo method), 245
 - `tzname()` (UTimeZone method), 245
- ## U
- `uname_string_raw` (DataSource attribute), 248, 254
 - `UnavailableInvalidChannel`, 459, 492
 - `unbox()` (Field method), 334
 - `unbox()` (ListField method), 337
 - `unicode` (in module `conda._vendor.appdirs`), 232
 - `UNICODE_CHARACTERS` (in module `conda.testing.integration`), 564
 - `UNICODE_CHARACTERS_RESTRICTED` (in module `conda.testing.integration`), 564
 - `union()` (BuildNumberMatch method), 534
 - `union()` (IndexedSet method), 236
 - `union()` (MatchInterface method), 517
 - `union()` (MatchSpec class method), 516
 - `union()` (VersionSpec method), 534
 - `unique()` (in module `conda._vendor.toolz.itertoolz`), 274
 - `unique()` (in module `conda.common.iterators`), 404
 - `unix_path_to_win()` (in module `conda.utils`), 574
 - `unix_python_entry_point` (PathType attribute), 511
 - `unix_shell_base` (in module `conda.utils`), 575
 - `UNKNOWN_CHANNEL` (in module `conda.base.constants`), 351
 - `UnknownPackageClobberError`, 457
 - `UNLINK` (in module `conda.instructions`), 501

- `unlink_action_groups` (*PrefixActionGroup* attribute), 435
- `unlink_or_rename_to_trash()` (in module *conda.gateways.disk.delete*), 476
- `unlink_precs` (*PrefixSetup* attribute), 435
- `UnlinkLinkTransaction` (class in *conda.core.link*), 436
- `UNLINKLINKTRANSACTION` (in module *conda.instructions*), 501
- `UNLINKLINKTRANSACTION_CMD()` (in module *conda.instructions*), 501
- `UnlinkPathAction` (class in *conda.core.path_actions*), 444
- `unmanageable_package_types()` (*PackageType* static method), 511
- `unpause()` (*tqdm* method), 289, 296, 301, 311
- `unregister_action_groups` (*PrefixActionGroup* attribute), 435
- `unregister_env()` (in module *conda.core.envs_manager*), 427
- `UnregisterEnvironmentLocationAction` (class in *conda.core.path_actions*), 444
- `unsat` (*Clauses* property), 405
- `Unsatisfiable` (in module *conda.resolve*), 554
- `unsatisfiable_hints` (*Context* attribute), 359
- `unsatisfiable_hints_check_depth` (*Context* attribute), 359
- `UnsatisfiableError`, 459
- `unset_description` (in module *conda_env.cli.main_vars*), 585
- `unset_environment_env_vars()` (*PrefixData* method), 448
- `unset_example` (in module *conda_env.cli.main_vars*), 585
- `unset_var_tmpl` (*_Activator* attribute), 313
- `unset_var_tmpl` (*CmdExeActivator* attribute), 316
- `unset_var_tmpl` (*CshActivator* attribute), 315
- `unset_var_tmpl` (*FishActivator* attribute), 316
- `unset_var_tmpl` (*PosixActivator* attribute), 314
- `unset_var_tmpl` (*PowerShellActivator* attribute), 316
- `unset_var_tmpl` (*XonshActivator* attribute), 315
- `untracked()` (in module *conda.misc*), 503
- `untreeify()` (in module *conda.models.version*), 533
- `UPDATE` (*Commands* attribute), 380, 565
- `update()` (*History* method), 498
- `update()` (*IndexedSet* method), 237
- `update()` (*tqdm* method), 288, 295, 301, 310
- `UPDATE_ALL` (*UpdateModifier* attribute), 352
- `UPDATE_DEPS` (*UpdateModifier* attribute), 352
- `update_file_in_place_as_binary()` (in module *conda.gateways.disk.update*), 480
- `update_in()` (in module *conda._vendor.toolz.dicttoolz*), 271
- `update_modifier` (*Context* attribute), 358
- `update_prefix()` (in module *conda.core.portability*), 445
- `update_specs` (*PrefixSetup* attribute), 435
- `UPDATE_SPECS` (*UpdateModifier* attribute), 352
- `update_to()` (*ProgressBar* method), 402
- `updated_precs` (*ChangeReport* attribute), 436
- `UpdateHistoryAction` (class in *conda.core.path_actions*), 443
- `UpdateModifier` (class in *conda.base.constants*), 351
- `UpdateModifier` (in module *conda.api*), 318
- `url` (*ChannelNoticeResponse* attribute), 539
- `Url` (class in *conda.common.url*), 423
- `url` (*PackageInfo* attribute), 520
- `url` (*PackageRecord* attribute), 527
- `url()` (*Channel* method), 492, 505
- `url()` (*MultiChannel* method), 506
- `url_attrs` (in module *conda.common.url*), 423
- `url_channel_wtf` (*Channel* property), 492, 505
- `URL_KEY` (in module *conda.gateways.repodata*), 493
- `url_pat` (in module *conda.misc*), 503
- `url_to_path()` (in module *conda.common.path*), 409
- `url_to_s3_info()` (in module *conda.common.url*), 424
- `url_w_credentials` (*RepodataFetch* attribute), 496
- `url_w_repodata_fn` (*RepodataFetch* property), 495
- `url_w_repodata_fn` (*SubdirData* property), 452
- `url_w_subdir` (*RepodataFetch* attribute), 495
- `urlparse()` (in module *conda.common.url*), 424
- `urls()` (*Channel* method), 492, 505
- `urls()` (*MultiChannel* method), 506
- `UrlsData` (class in *conda.core.package_cache_data*), 439
- `use_index_cache` (*Context* attribute), 357
- `use_local` (*Context* attribute), 358
- `use_only_tar_bz2` (*Context* property), 356
- `user_agent` (*ExceptionHandler* property), 455
- `user_agent()` (*Context* method), 359
- `user_cache_dir` (*AppDirs* property), 234
- `user_cache_dir` (*EnvAppDirs* property), 467
- `user_cache_dir()` (in module *conda._vendor.appdirs*), 233
- `user_data_dir` (*AppDirs* property), 234
- `user_data_dir` (*EnvAppDirs* property), 467
- `user_data_dir()` (in module *conda._vendor.appdirs*), 232
- `user_log_dir` (*AppDirs* property), 234
- `user_log_dir` (*EnvAppDirs* property), 467
- `user_log_dir()` (in module *conda._vendor.appdirs*), 234
- `user_rc_path` (in module *conda.base.context*), 355
- `user_rc_path` (in module *conda.cli.conda_argparse*), 364
- `username()` (*BinStarSpec* method), 591, 593
- `USTimeZone` (class in *conda._vendor.bolttons.timeutils*), 245

UTC (in module *conda._vendor.boltons.timeutils*), 244
 utcoffset() (*ConstantTZInfo* method), 244
 utcoffset() (*LocalTZInfo* method), 245
 utcoffset() (*USTimeZone* method), 245
 utcoffset_hours (*ConstantTZInfo* property), 244
 utf8_writer() (in module *conda.auxlib.compat*), 325
 Utf8NamedTemporaryFile() (in module *conda.auxlib.compat*), 325

V

valfilter() (in module *conda._vendor.toolz.dicttoolz*), 269
 valid() (*Resolve* method), 555
 valid2() (*Resolve* method), 555
 VALID_KEYS (in module *conda_env.env*), 586
 valid_name() (*BinstarSpec* method), 591, 592
 valid_package() (*BinstarSpec* method), 591, 593
 validate() (*Entity* method), 338
 validate() (*Field* method), 334
 validate() (*ListField* method), 337
 validate_all() (*Configuration* method), 398
 validate_configuration() (*Configuration* method), 398
 validate_destination() (in module *conda.cli.main_rename*), 378
 validate_keys() (in module *conda_env.env*), 586
 validate_prefix() (in module *conda.cli.common*), 362
 validate_prefix_name() (in module *conda.base.context*), 360
 validate_src() (in module *conda.cli.main_rename*), 378
 ValidationError, 339, 390
 valmap() (in module *conda._vendor.toolz.dicttoolz*), 269
 value() (*ArgParseRawParameter* method), 392
 value() (*DefaultValueRawParameter* method), 392
 value() (*EnvRawParameter* method), 391
 value() (*RawParameter* method), 391
 value() (*YamlRawParameter* method), 392
 ValueEnum (class in *conda.base.constants*), 352
 valueflags() (*ArgParseRawParameter* method), 392
 valueflags() (*DefaultValueRawParameter* method), 392
 valueflags() (*EnvRawParameter* method), 391
 valueflags() (*RawParameter* method), 391
 valueflags() (*YamlRawParameter* method), 392
 values() (*PackageCacheData* method), 439, 491
 var_description (in module *conda_env.cli.main_vars*), 585
 var_example (in module *conda_env.cli.main_vars*), 585
 ver_eval() (in module *conda.models.version*), 530
 verbosity (*Context* property), 356
 VERBOSITY_LEVELS (in module *conda.gateways.logging*), 482

verified (*_Action* property), 441
 verify() (*_Action* method), 441
 verify() (*CacheUrlAction* method), 444
 verify() (*CompileMultiPycAction* method), 443
 verify() (*CreateInPrefixPathAction* method), 442
 verify() (*ExtractPackageAction* method), 445
 verify() (in module *conda.exports*), 465
 verify() (*LinkPathAction* method), 442
 verify() (*PrefixReplaceLinkAction* method), 442
 verify() (*RegisterEnvironmentLocationAction* method), 443
 verify() (*RemoveFromPrefixPathAction* method), 443
 verify() (*UnlinkLinkTransaction* method), 436
 verify() (*UnregisterEnvironmentLocationAction* method), 444
 verify_specs() (*Resolve* method), 555
 verify_threads (*Context* property), 355
 version (*CondaVirtualPackage* attribute), 227, 548, 554
 version (*Dist* attribute), 508
 version (*DistDetails* attribute), 507
 version (*MatchSpec* property), 515
 version (*PackageInfo* property), 520
 version (*PackageRecord* attribute), 527
 version (*PythonDistribution* property), 413
 version (*PythonDistributionMetadata* property), 415
 version() (in module *conda._vendor.distro*), 261
 version() (*LinuxDistribution* method), 264
 version_cache (in module *conda.models.version*), 530
 version_check_re (in module *conda.models.version*), 530
 VERSION_IDENTIFIER (in module *conda.common.pkg_formats.python*), 418
 version_key() (*Resolve* method), 556
 version_parts() (in module *conda._vendor.distro*), 261
 version_parts() (*LinuxDistribution* method), 264
 version_relation_re (in module *conda.models.version*), 533
 version_split_re (in module *conda.models.version*), 530
 VersionMatch (in module *conda.models.version*), 534
 VersionOrder (class in *conda.models.version*), 530
 VersionSpec (class in *conda.models.version*), 534
 viewed_channel_notices (*ChannelNoticeResultSet* attribute), 539
 VIRTUAL_PRIVATE_ENV (*PackageType* attribute), 511
 VIRTUAL_PYTHON_EGG_LINK (*PackageType* attribute), 511
 VIRTUAL_PYTHON_EGG_MANAGEABLE (*PackageType* attribute), 511
 VIRTUAL_PYTHON_EGG_UNMANAGEABLE (*PackageType* attribute), 511
 VIRTUAL_PYTHON_WHEEL (*PackageType* attribute), 511
 VIRTUAL_SYSTEM (*PackageType* attribute), 511

VSPEC_TOKENS (in module *conda.models.version*), 532

W

walk_prefix() (in module *conda.misc*), 503

warn (*PathConflict* attribute), 351

warn (*SafetyChecks* attribute), 351

WARNING (*NoticeLevel* attribute), 353

which() (in module *conda.common.path*), 410

which_or_where (in module *conda.testing.integration*), 564

which_package() (in module *conda.cli.main_package*), 377

which_prefix() (in module *conda.cli.main_package*), 377

win (*Platform* attribute), 510

win_conda_bat_redirect() (in module *conda.exports*), 466

win_path_backout() (in module *conda.common.path*), 409

win_path_double_escape() (in module *conda.common.path*), 409

win_path_ok() (in module *conda.common.path*), 409

win_path_to_cygwin() (in module *conda.utils*), 574

win_path_to_unix() (in module *conda.common.path*), 410

windows_python_entry_point_exe (*PathType* attribute), 511

windows_python_entry_point_script (*PathType* attribute), 511

winreg_arch_string_raw() (*DataSource* static method), 249, 255

winreg_feature_bits() (*DataSource* static method), 249, 255

winreg_hz_actual() (*DataSource* static method), 249, 255

winreg_processor_brand() (*DataSource* static method), 249, 255

winreg_vendor_id_raw() (*DataSource* static method), 249, 255

witext() (in module *conda.gateways.repodata.jlap.fetch*), 487

wmic_cpu() (*DataSource* static method), 249, 255

working_state_reset() (*SolverStateContainer* method), 450

wrap_subprocess_call() (in module *conda.utils*), 575

wrapattr() (*tqdm* class method), 290, 296, 302, 311

wrapper_getattr() (*ObjectWrapper* method), 304

wrapper_setattr() (*ObjectWrapper* method), 305

writable_caches() (*PackageCacheData* class method), 438, 491

write() (*HashWriter* method), 487

write() (*JLAP* method), 485

write() (*SimpleTextIOWrapper* method), 305

write() (*tqdm* class method), 287, 294, 300, 309

write() (*Trace* method), 248, 254

write_as_json_to_file() (in module *conda.gateways.disk.create*), 475

write_changes() (*History* method), 499

write_head() (in module *conda.history*), 498

write_notice_response_to_cache() (in module *conda.notices.cache*), 535

write_out() (*ExceptionHandler* method), 455

write_specs() (*History* method), 499

write_version_file() (in module *conda.auxlib.packaging*), 344

write_version_into_init() (in module *conda.auxlib.packaging*), 344

X

x86 (*Arch* attribute), 509

x86_64 (*Arch* attribute), 509

XonshActivator (class in *conda.activate*), 315

Xor() (*Clauses* method), 384, 406

Y

YAML_EXTENSIONS (in module *conda.common.configuration*), 397

yaml_round_trip_dump() (in module *conda.common.serialize*), 420

yaml_round_trip_load() (in module *conda.common.serialize*), 420

yaml_safe_dump() (in module *conda.common.serialize*), 420

yaml_safe_load() (in module *conda.common.serialize*), 420

YamlFileSpec (class in *conda.env.specs*), 593

YamlFileSpec (class in *conda.env.specs.yaml_file*), 592

YamlRawParameter (class in *conda.common.configuration*), 392

yield_lines() (in module *conda.gateways.disk.read*), 478

Z

z (*Arch* attribute), 510

ZERO (*ERROR* attribute), 386

ZERO (in module *conda._vendor.boltions.timeutils*), 244

zos (*Platform* attribute), 510

ZSTD_UNAVAILABLE (in module *conda.gateways.repodata.jlap.fetch*), 486