

Python packaging for busy people

Python packaging for busy people



Background

Some build eng for:

- TON
- Kaspersky OS
- Ouinet

Upshot: large annoying polyglot projects

Why: improve DX

tl;dr use uv

easy_install

pip

Conda

Mamba

setuptools



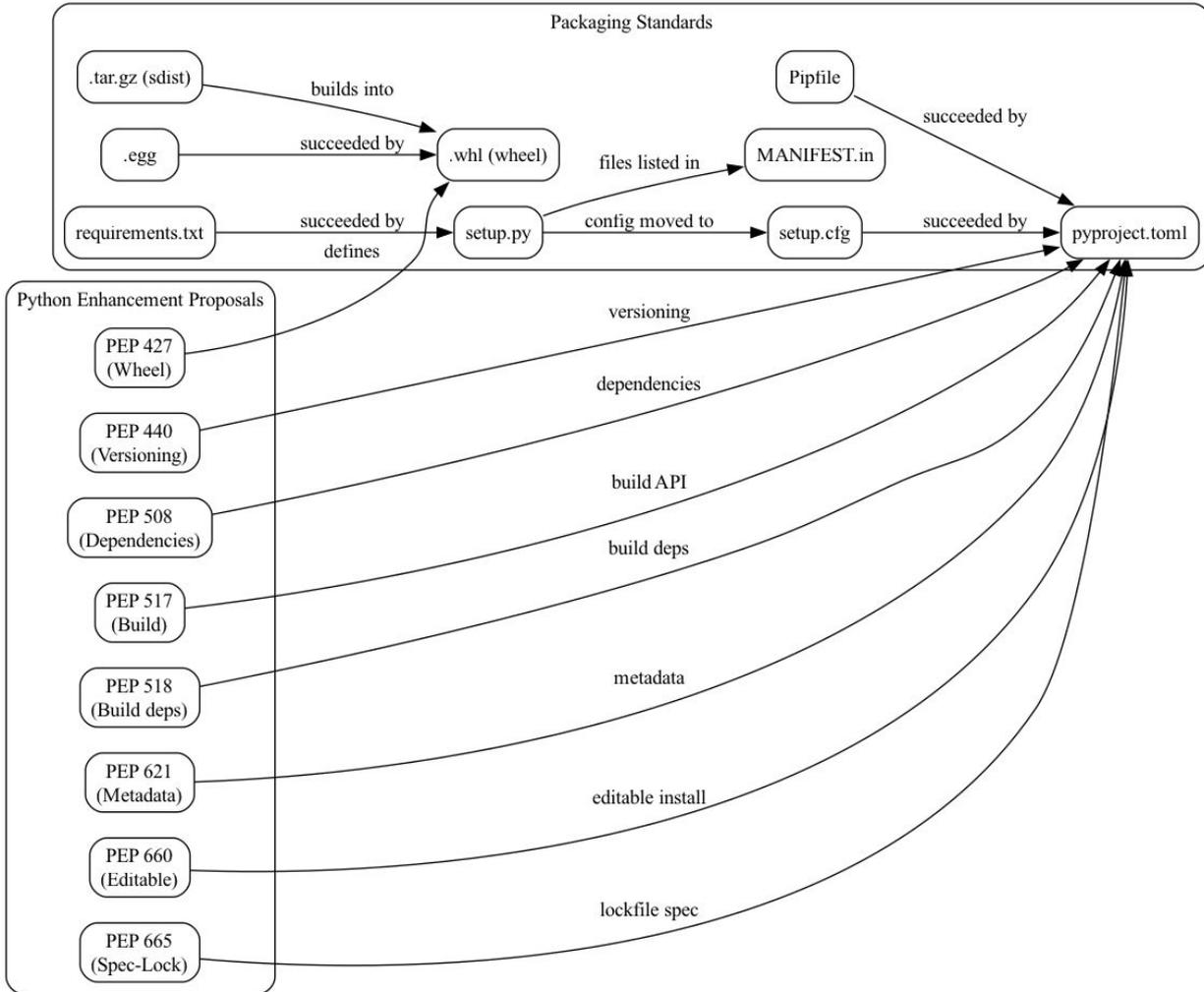
PDM

poetry

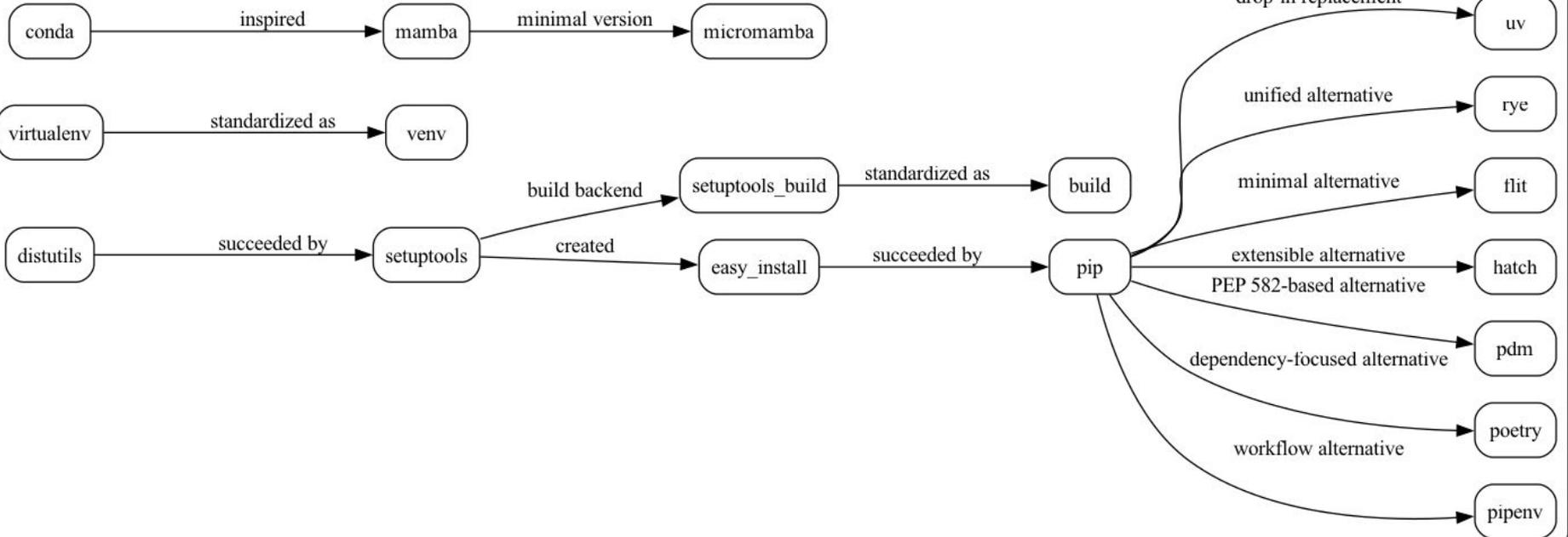
virtualenv

flit

hatch



Package Management Tools



Use cases

1. I want lib A: `pip install A` or `conda install A`
2. I want to share with friends: `requirements.txt` or `conda.yml`
3. I want reproducibility: `A==1.0.0`
4. I want env sync: `pipenv`

And life's good, right?

On reproducibility

- `A==1.0.0` only works with PyPI
- However, you often get stuff from elsewhere:
 - `pip3 install torch torchvision torchaudio --index-url https://download.pytorch.org/whl/cpu`
- So you should pin a hash:
 - `A == 1.0.0 --hash=sha256:2cf24dba5fb0a30e26e83b2ac5b9e29e1b161e5c1fa7425e73043362938b9824`
- `pip-tools`, `poetry`, `uv`, others and `conda-lock` do this

On reproducibility

- `A==1.0.0` only works with PyPI
- However, you often get stuff from elsewhere:
 - `pip3 install torch torchvision torchaudio --index-url https://download.pytorch.org/whl/cpu`
- So you should pin a hash:
 - `A == 1.0.0 --hash=sha256:2cf24dba5fb0a30e26e83b2ac5b9e29e1b161e5c1fa7425e73043362938b9824`
- **pip-tools, poetry, uv, others and conda-lock do this**

Pip + pip-tools have gotchas

- Pre-2020 (<20.3) resolver would just install incompatible packages
- The endorsed way to lock is “generate lock file on each platform manually”
<https://github.com/jazzband/pip-tools/tree/7.4.1#cross-environment-usage-of-requirementsinrequirements.txt-and-pip-compile>
- Pip calls out to `setuptools`, `setuptools` runs ain't reproducible
<https://pip.pypa.io/en/stable/topics/secure-installs/>

pip documentation
v25.0

Search

Getting Started

Installation

User Guide

Topic Guides

Authentication

Caching

Configuration

Dependency Resolution

More on Dependency
Resolution

HTTPS Certificates

Local project installs

Repeatable Installs

Secure installs

These will happily go out and download, unchecked, anything you missed in your requirements file and it's easy to miss things as your project evolves. To be safe, install your project using pip and `--no-deps`.

Instead of `python setup.py install`, use:

Linux MacOS Windows

```
$ python -m pip install --no-deps .
```

Poetry has gotchas

- No command to upgrade dependencies
<https://github.com/python-poetry/poetry/issues/461>
- Different install behavior than pip
<https://github.com/python-poetry/poetry/issues/8899>
- For about a year, if you
 - (a) SIGINT poetry install (<https://github.com/python-poetry/poetry/pull/6471>)
 - (b) run two parallel poetry installs (<https://github.com/python-poetry/poetry/pull/6186>)
 - you get corrupted cache and installs don't work anymore.

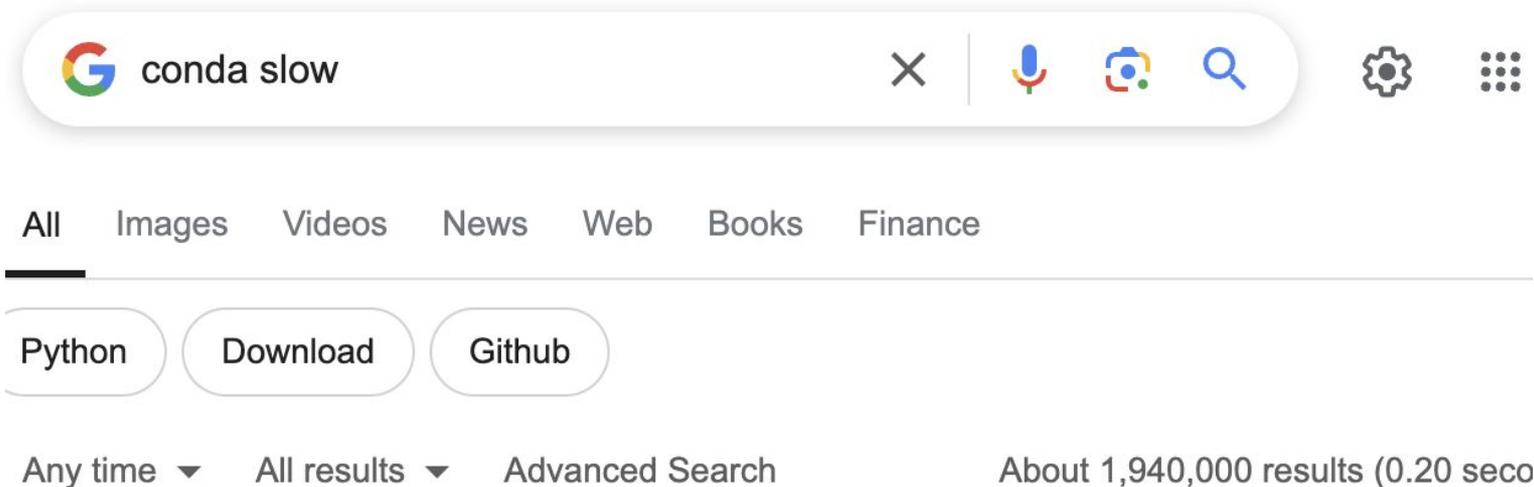
Conda has gotchas

What is conda?

Initially started as a multi-platform package management tool, the term "conda" has since evolved to encompass an entire **open-source packaging ecosystem and philosophy**. This ecosystem is supported by many

management ecosystem for projects of any size and complexity.

Conda has gotchas



A screenshot of a Google search interface. The search bar contains the text "conda slow". To the right of the search bar are icons for voice search, image search, and a magnifying glass. Further right are icons for settings and an app drawer. Below the search bar, the "All" filter is selected and underlined. Other filters include "Images", "Videos", "News", "Web", "Books", and "Finance". Below these filters are three buttons: "Python", "Download", and "Github". At the bottom of the search bar area, there are options for "Any time", "All results", and "Advanced Search". On the right side, it says "About 1,940,000 results (0.20 seco".



Reddit · r/Python

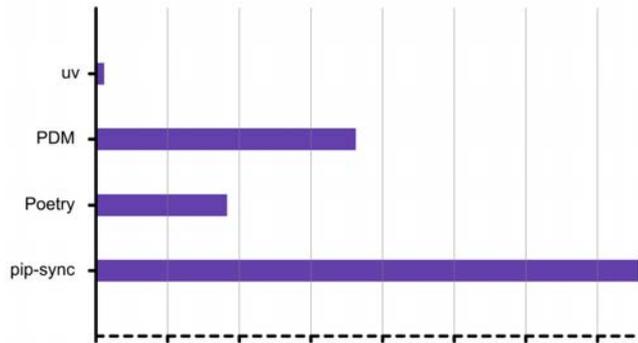
5 comments · 4 years ago

[Is it normal for conda to be 60 times slower than pip? What ...](#)

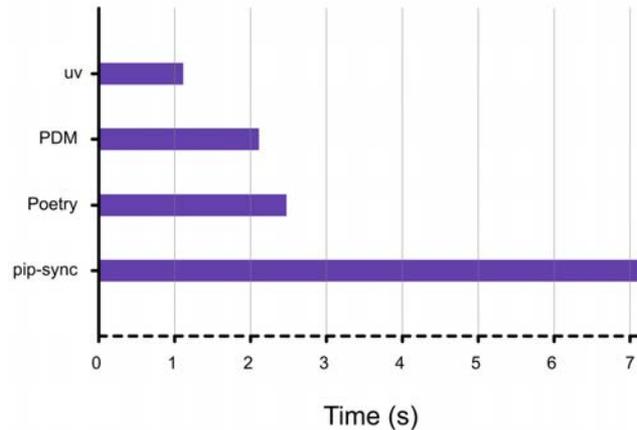
Conda-lock has gotchas

- Slow solves
- Ships a vendored Poetry
 - Which is old
 - <https://github.com/conda/conda-lock/pull/342>
- Poetry is not the same as pip
 - <https://github.com/conda/conda-lock/pull/476>

Warm Installation

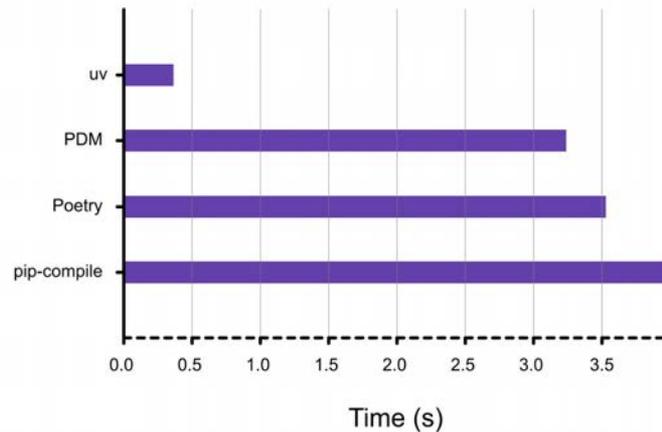
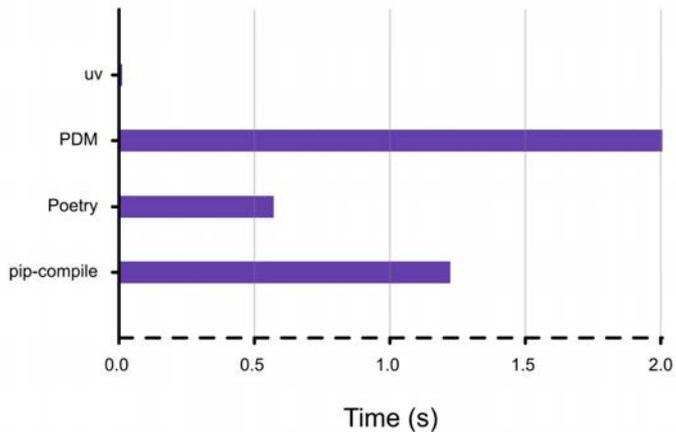


Cold Installation



uv is good

Cold Resolution



But breaks sometimes (<1.0)

```
error: Failed to parse `uv.lock`  
  Caused by: TOML parse error at line 314, column 35  
    |  
314 |     { name = "harmbench", extra = "api" },  
    |                                           ^^^^^  
invalid type: string "api", expected a sequence  
make: *** [Makefile:11: .venv] Error 2
```

but it does work for you right, maybe something wrong with my uv version?

pip => uv

conda => pixi?

(<https://github.com/conda/conda-lock/issues/615>)