Full-time Open Source

November 3rd, Hactoberfest 2021 x Monsterlab Prague

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~$ whoami

Fridolín "*fridex*" Pokorný

 [@fridex](#)

- First open source contributions in ~2011
  - [GNU Hurd](#)
- Professionally in open source since 2013
- I like Linux/C/C++/Python, road cycling
- I used to be a goal keeper, now keeper of few open-source projects on GitHub
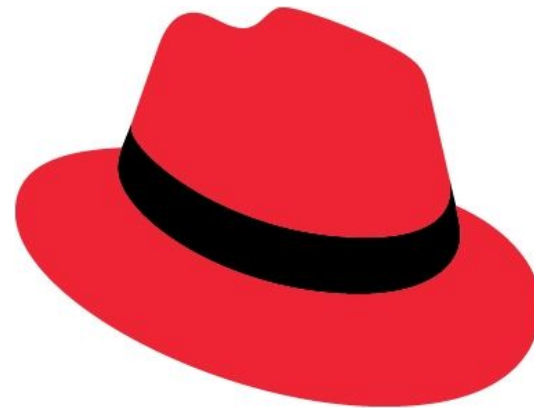   [@fridex](#)

Agenda

- Open Source Culture && Employer
  - *Get an open glimpse of the open culture*

- Open Source Projects
  - *TLDR; Show me your core*

Red Hat

Employer - Red Hat

Employer - Red Hat

Employer - Red Hat

Source: https://knowyourmeme.com/photos/25375-what-has-been-seen-cannot-be-unseen

Red Hat

- "Powered by open"
  - https://www.redhat.com/en/about/our-culture
- The Open Organization
  - Jim Whitehurst, ex-CEO of Red Hat
  - Ted talk: What I learned from giving up everything I knew as a leader
  - Book: https://www.redhat.com/en/explore/the-open-organization-book
- Open source spirit
  - Flat org chart
- Contributions to Hacktoberfest count

Red Hat

- Red Hat Enterprise Linux (RHEL)
- Fedora
- OpenStack
- OpenShift
- ...

Red Fedora

Red Hat

FAQ: Red Fedora

- … yes, new hires get a red fedora as they join us.

Current team

- Team: AI Center of Excellence, Office of the CTO
  - Emerging technologies and applying them
  - Research AI team
- Colleages from all around the world
  - Ex. Czech republic, US, Germany, India, Italy, England, Australia, Brazil, ...
  - Multicultural environment
- Spent 7+ years, been in ~5 teams
  - Do what you love, be open, be open minded
  - Find something to work on...

Red Hat

Open source projects

Red Hat

Open source projects

- Cherry-picked some open-source projects
- Most (all?) of them done during office hours
  - All open
  - Feel free to use it
  - Feel free to contribute back
  - Feel free to give feedback
  - All part of Hactoberfest

- Open source can have a global impact worldwide
  - *… and many times has!*

Red Hat

AF_KTLS: Linux Kernel TLS/DTLS module
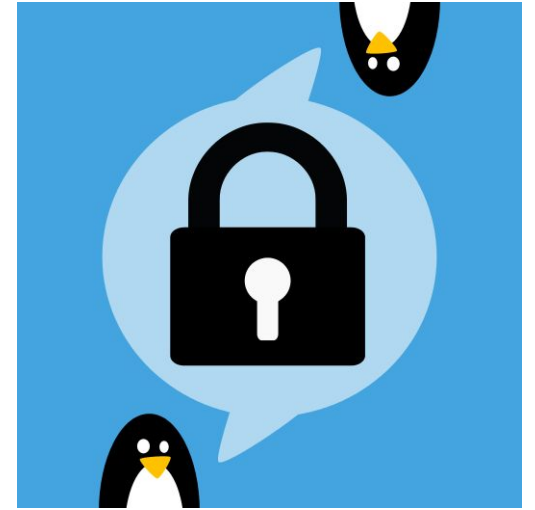
- AF_KTLS - Linux kernel TLS/DTLS socket
  - https://github.com/ktls/af_ktls
  - Started as a master thesis with Red Hat

- Browse static content on Facebook
  - Collaboration with Facebook
  - Kernel TLS now part of vanilla Linux kernel starting 4.13
  - https://www.kernel.org/doc/html/latest/networking/tls.html

- Used also by other companies worldwide
  - Global open source impact

Project Thoth

Resurrected ancient deities helping humans with software development.

Twitter: @ThothStation

YouTube: Thoth Station

Red Hat
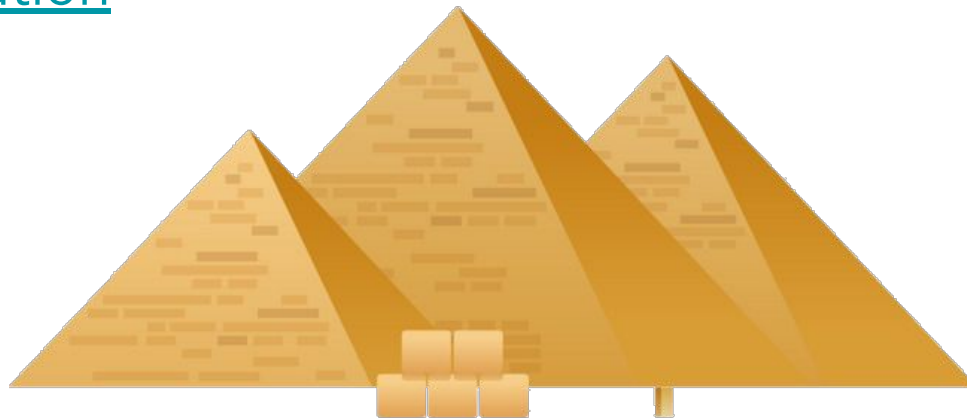
Project Thoth

Resurrected ancient deities helping humans with software development.

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With great multicultural environment comes great pronunciation.

Project Thoth
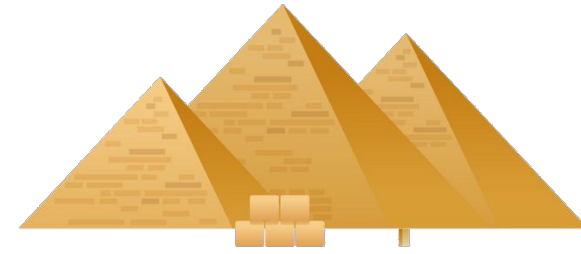
- Source code available on GitHub
  - https://github.com/thoth-station
- Documentation and more info
  - https://thoth-station.ninja
- One of the main offerings: cloud Python resolver
  - Resolver based on reinforcement learning
- Knowledge about dependencies and runtime environments
  - https://github.com/thoth-station/prescriptions/
  - Open data, feel free to contribute
- Resolver will tell you which versions you should use for your application
  - https://github.com/thoth-station/adviser

Thoth: Python cloud resolver

Requirements
Constraints
Information about software in runtime environment
 - OS, Python version, base image, CUDA, …
Information about hardware in runtime environment
 - CPU, GPU, …
Static source-code analysis
Recommendation type

Lockfile + justification

adviser

Knowledge
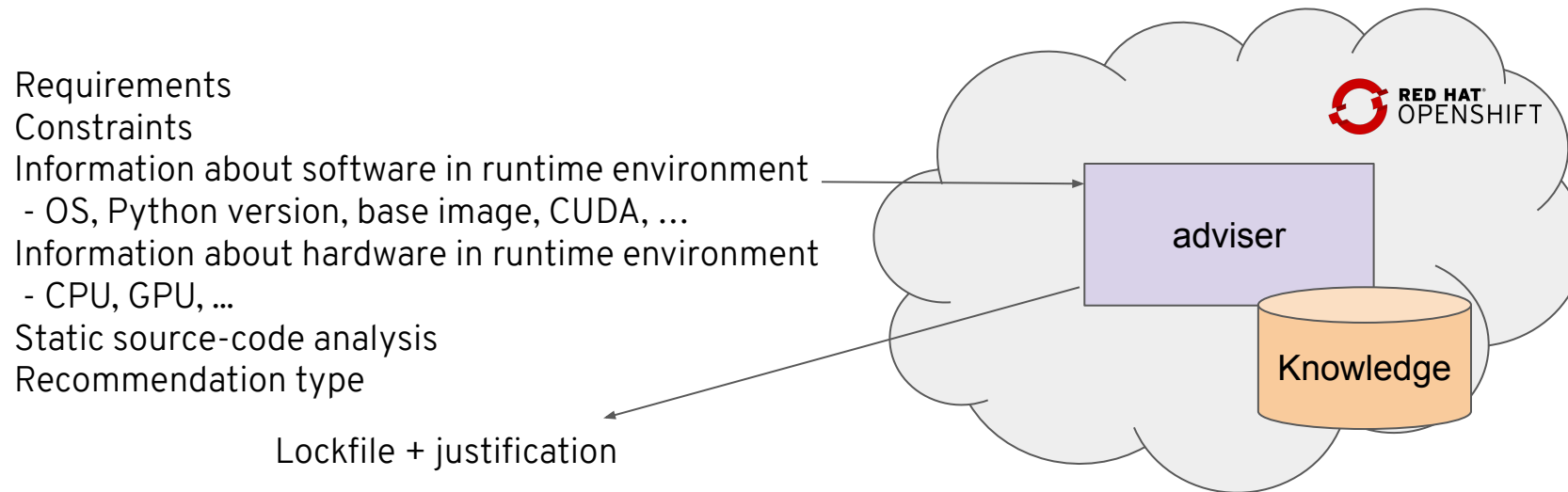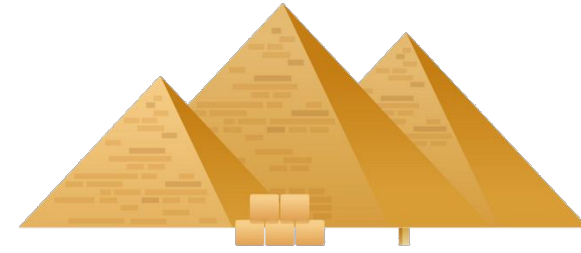
```
$ pip install thamos
$ thamos config
$ thamos advise
```

Prescriptions for the resolution process

- Pillow in version 8.3.0 does not work with NumPy

  https://github.com/python-pillow/Pillow/issues/5571

```
with PIL.Image.open(filepath) as img:
        numpy.array(img, dtype=numpy.float32)
```

```
>       frame_paletted = np.array(im, np.uint8)
E       TypeError: __array__() takes 1 positional argument but 2 were given
```

/lib/python3.9/site-packages/imageio/plugins/pillow.py:745: TypeError

```yaml
units:
  steps:
  - name: Pillow830TypeErrorStep
    type: step
    should_include:
      adviser_pipeline: true
    match:
      package_version:
        name: pillow
        version: ==8.3.0
        index_url: https://pypi.org/simple
      state:
        resolved_dependencies:
        - name: numpy
    run:
      not_acceptable: Pillow in version 8.3.0 does not work with NumPy
      stack_info:
      - type: WARNING
        message: Pillow in version 8.3.0 does not work with NumPy
        link: https://github.com/python-pillow/Pillow/issues/5571
```
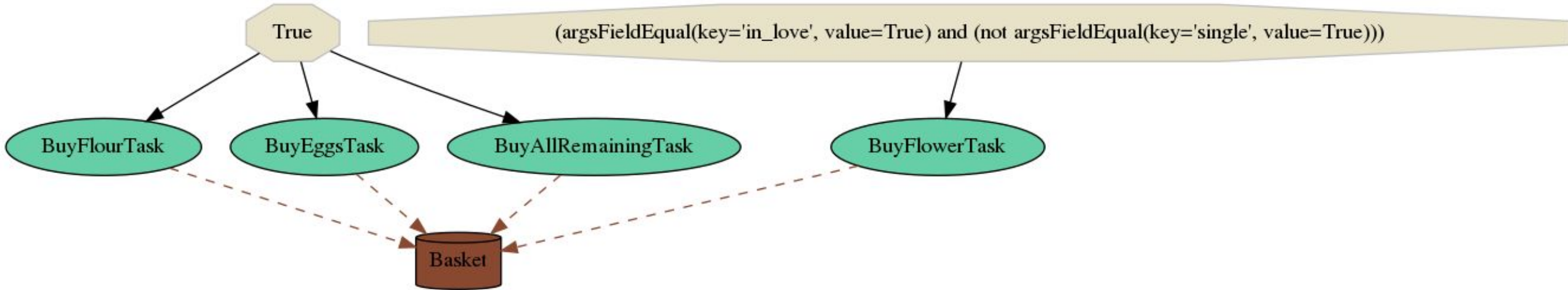
Prescriptions for the resolution process

- Open source
  - https://github.com/thoth-station/adviser
- Open data
  - https://github.com/thoth-station/prescriptions/
- Open deployment manifests
  - https://github.com/thoth-station/thoth-application
- Open tech talks
  - YouTube: Thoth Station
- Open to be used (API)
  - thoth-station.ninja

Selinon

- An advanced distrubuted task flows on top of Celery
- Celery
  - https://docs.celeryproject.org/
  - Distributed task queue

- Selinon is an extension that allows you to create complex task flows in distributed systems
  - YAML configuration states how tasks should be executed
  - https://github.com/selinon/selinon
  - https://selinon.readthedocs.io/

Selinon - buy ingredients tasks

True

(argsFieldEqual(key='in_love', value=True) and (not argsFieldEqual(key='single', value=True)))

BuyFlourTask

BuyEggsTask

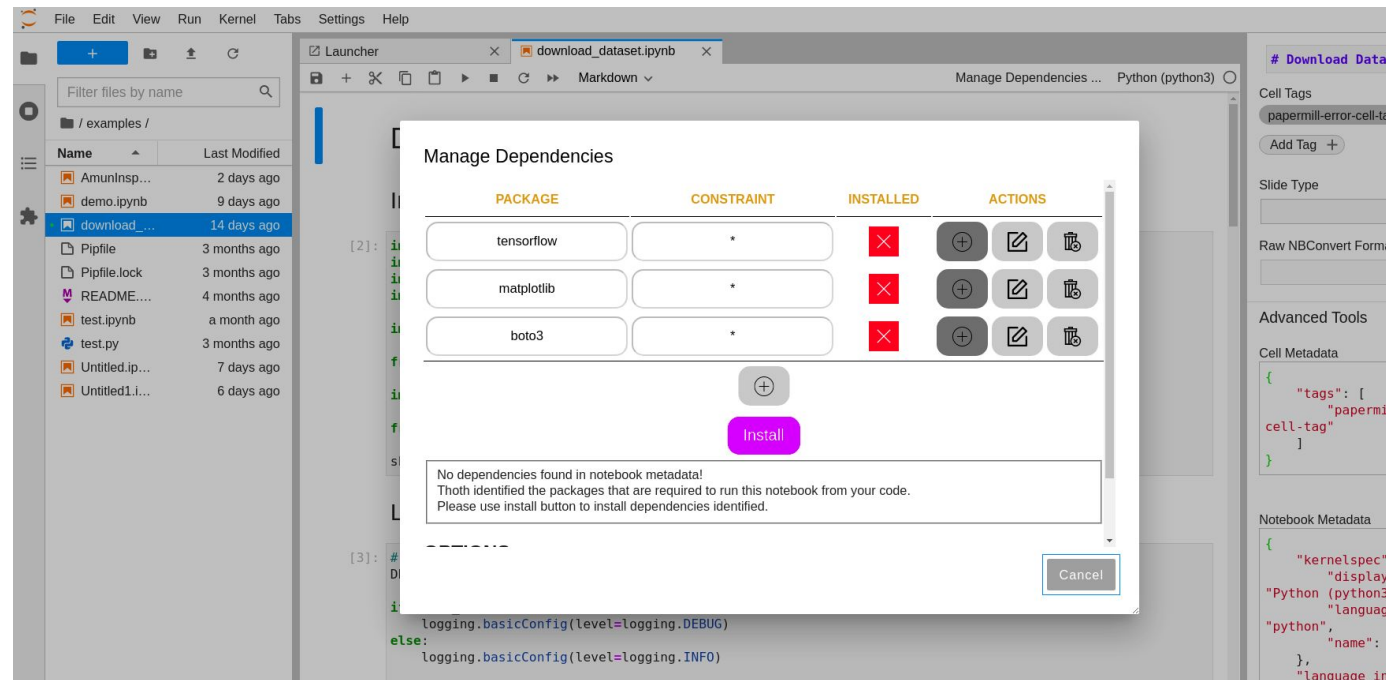BuyAllRemainingTask

BuyFlowerTask

Basket

Selinon
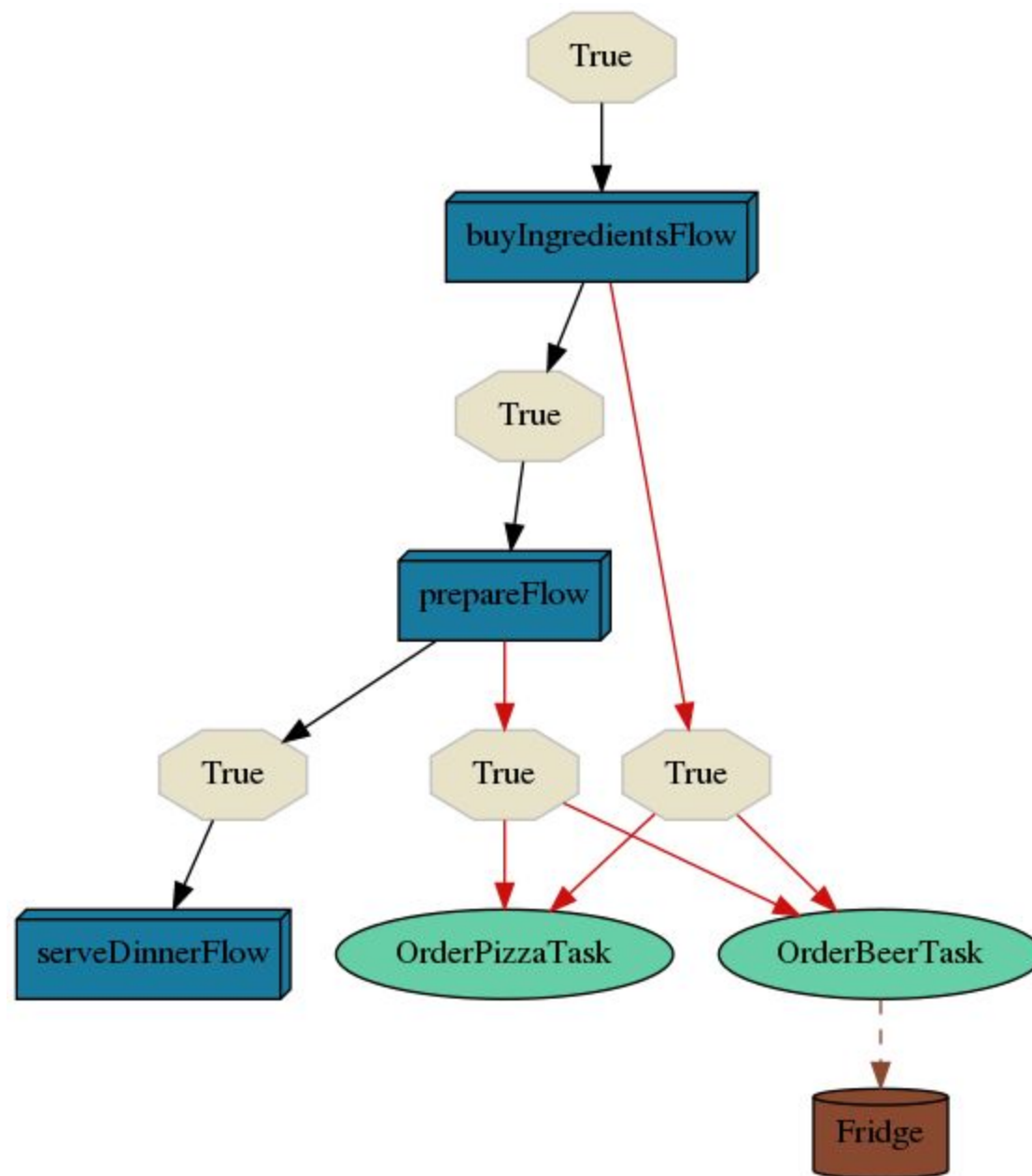
jupyterlab-requirements

- An extension to Jupyter Notebooks to manage dependencies
  - Dependencies are embedded, making the notebooks reproducible
  - https://github.com/thoth-station/jupyterlab-requirements

`micropipenv`

- Installing Python dependencies in containerized Python applications
  - https://github.com/thoth-station/micropipenv

- Reproducible installations
  - Unified installation logs

- All Python dependency formats supported
  - Poetry, Pipenv, requirements. pip-tools

Thank you

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