



Thoth

Helping Python developers to
create healthy applications

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Senior Software Engineer



\$ whoami

- ▶ Fridolin "fridex" Pokorny



@fridex



@fridex

- ▶ Started as an intern back in 2013
 - Maintaining low level libraries (tcsh, less, ...), Golang packaging
 - Linux kernel TLS/DTLS module
 - Developer Tools
 - Office of the CTO AICoE - Project Thoth
- ▶ 🚴 Road cycling & 🌲 Nature lover



Project Thoth

- ▶ A team of engineers trying to make Python better place to code in
- ▶ AICoE, Office of the CTO
- ▶ Creating a service Python community can use
- ▶ Homepage:
 - thoth-station.ninja



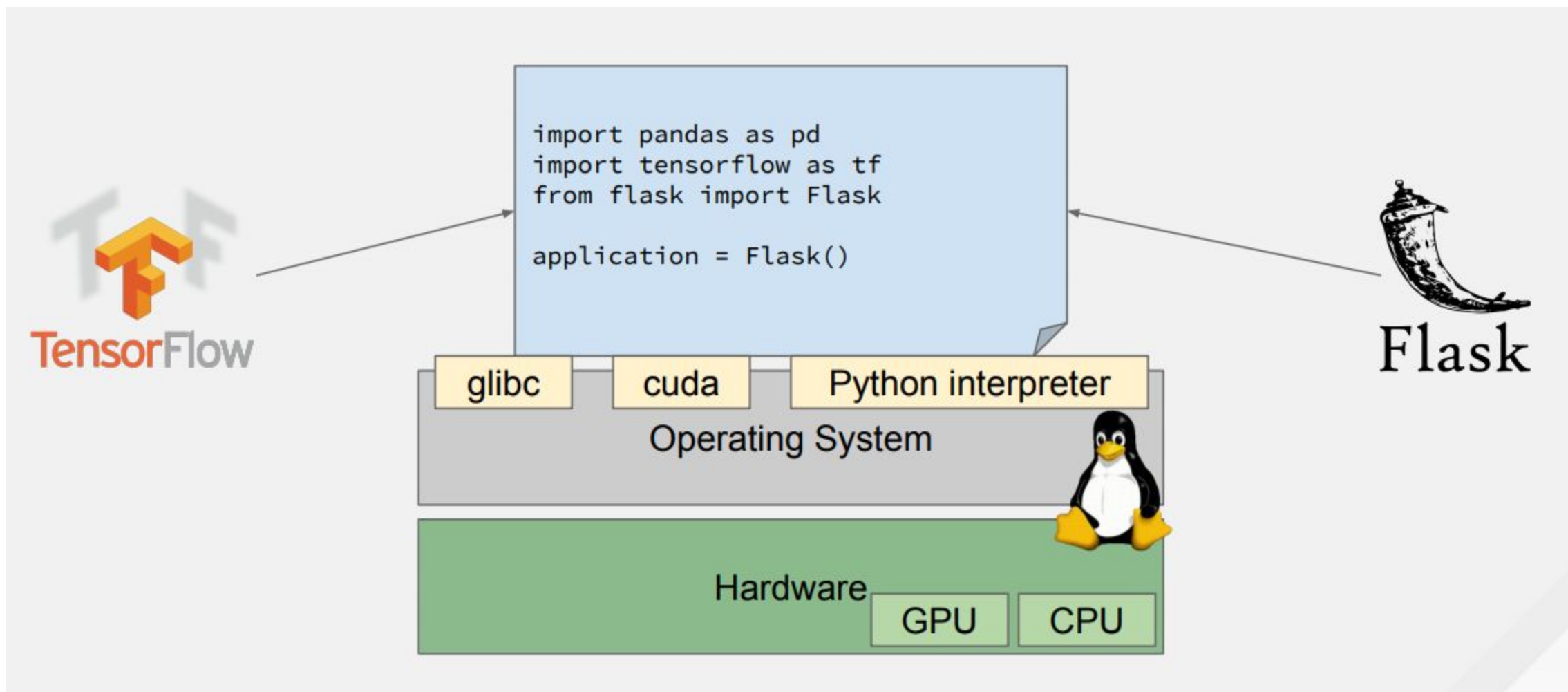
Our mission is to make Python better place to code in

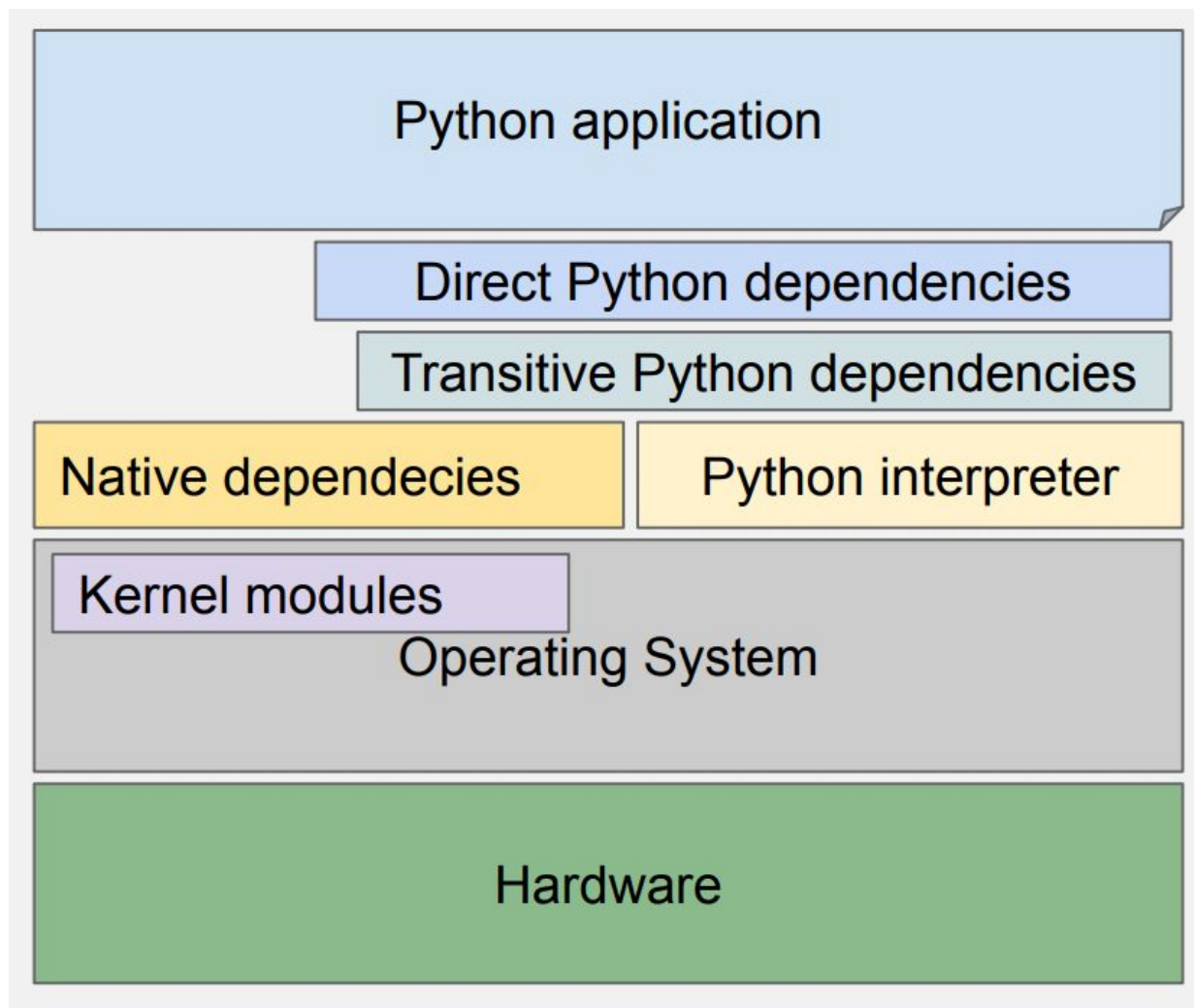
- ▶ Python is one of the most popular programming languages
 - Intuitive programming, simple to use
 - Used in data science, machine learning
 - Fast application development
- ▶ Growing popularity

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... but sometimes tricky





Which libraries to use?

- ▶ Different versions of libraries have different software quality aspects
 - Does the library install correctly?
 - Has the installed library any bugs?
 - How does it perform in my runtime environment?
 - Can I use another libraries that can utilize GPU?
 - ...
- ▶ Picking the right set of libraries and their versions can require additional knowledge about software

Which libraries to use?

- ▶ [Releasing pip 20.3, featuring new dependency resolver](#)
 - Better resolution of Python dependencies
 - Resolves the most recent versions of libraries
- ▶ Latest release is not always the greatest choice
 - Which libraries should I use?

Thoth advising software

- ▶ Based on the aggregated knowledge about software, let's recommend what software should be installed and how
- ▶ Building “brain” that knows which libraries to install considering
 - Requirements on dependencies
 - Hardware and software environment
 - Intention with the application (e.g. model training, ...)

Thoth advising software


- ▶ Smart picking of libraries to meet desired quality
 - Resolution based on reinforcement learning
- ▶ Server side resolution
 - Recommending greatest software based on Thoth knowledge
 - pypi.org/project/thamos

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

Thoth prescriptions

- ▶ Do you have an issue with Python applications?
 - Use Thoth's resolution algorithm to have advises
- ▶ Still have an issue with your Python applications?
 - Report the issue, we will make Python a better place to work in

Thoth prescriptions

- ▶  Prescriptions to heal Python applications
 - See [documentation for more information](#)
- ▶ Prescriptions form a declarative interface to the resolution engine

```
units:

  wraps:

    - name: TensorFlowMultipleProcessesGPUBug

      type: wrap

      should_include:

        adviser_pipeline: true

      match:

        state:

          resolved_dependencies:

            - name: tensorflow-gpu

              version: "~=2.3.0"

      run:


        justification:

          - type: WARNING

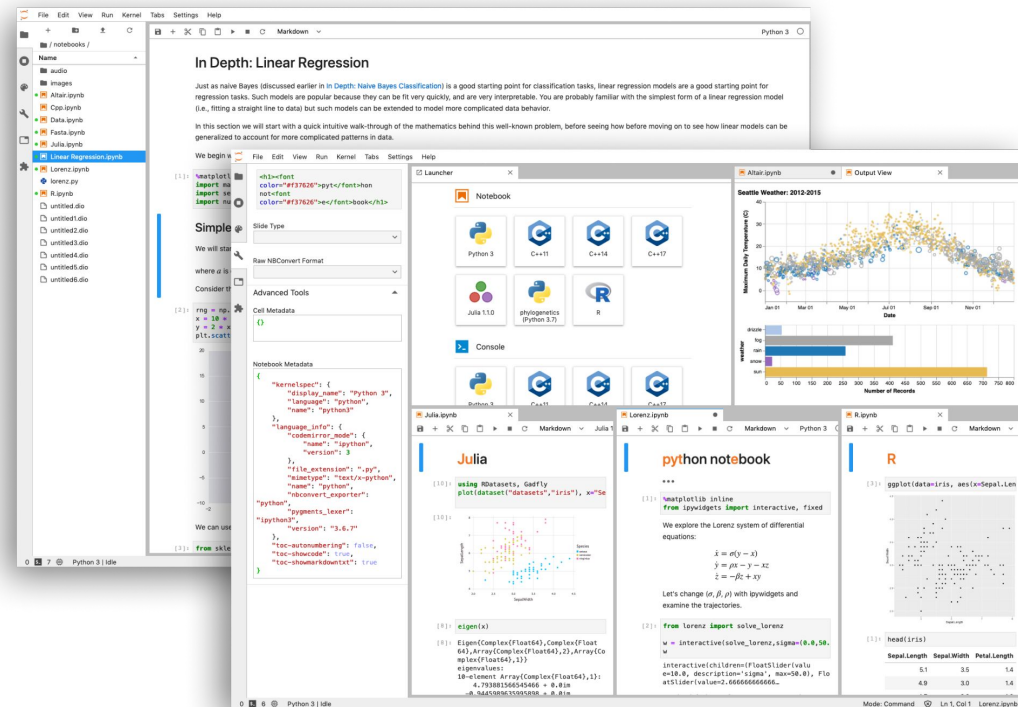
            message: "tensorflow in version 2.3 has a bug that prevents from running if multiple TensorFlow
processes are running"

            link: tf_38518
```

```
$ thamos advise
```



Jupyter notebooks



Jupyterlab extension

- ▶ GitHub repository
 - [thoth-station/jupyterlab-extension](https://github.com/thoth-station/jupyterlab-extension)
- ▶ Uses the recommendation engine to resolve software
- ▶ Manages lock file in notebooks for reproducibility
- ▶ Blog for dependency management in Jupyter Notebooks:
 - [Managing Python dependencies with Thoth JupyterLab extension](#)

Jupyterlab extension

The screenshot displays the JupyterLab interface with a 'Manage Dependencies' modal window open. The modal contains a table with the following data:

PACKAGE	CONSTRAINT	INSTALLED	ACTIONS
tensorflow	*	✗	⊕ ✎ 🗑
matplotlib	*	✗	⊕ ✎ 🗑
boto3	*	✗	⊕ ✎ 🗑

Below the table is a purple 'Install' button. At the bottom of the modal, a message box reads: 'No dependencies found in notebook metadata! Thoth identified the packages that are required to run this notebook from your code. Please use install button to install dependencies identified.' A 'Cancel' button is located at the bottom right of the modal.

Bots helping with application development

- ▶ Let's reduce mundane work and focus on delivering solutions
- ▶ Dependency management and managing lifecycle of the repository
 - Automatic updates of libraries
 - Automatic release management
 - Spotting issues with the application

Automatic update of dependencies by Kebechet #1894

Merged sesheta merged 1 commit into master from kebechet-automatic-update 16 days ago

Conversation 7 Commits 1 Checks 1 Files changed 1



khebhut bot commented 16 days ago

Contributor ...

Kebechet has updated the dependencies to the latest version 🚀
The direct dependencies updated in the pull request are -

Package Name	Old Version	Updated Version	Is Dev
thoth-storages	0.44.1	0.45.0	False
hypothesis	6.13.12	6.13.14	True

This Pull Request is based on a [Project Thoth GitHub App](#),
and [Kebechet](#) v1.2.4



khebhut bot requested review from fridex, goern and sesheta as code owners 16 days ago



khebhut bot added the bot label 16 days ago



sefkheth-abwy bot approved these changes 16 days ago

[View changes](#)

sefkheth-abwy bot left a comment

...

This is an auto-approve of an auto-PR.

New minor release #1923

 Closed fridex opened this issue 7 days ago · 1 comment




fridex commented 7 days ago

Member ...

Hey, Kebechet!

Create a new minor release, please.



fridex added  bot  labels 7 days ago




fridex assigned sesheta 7 days ago



khebhut  mentioned this issue 7 days ago


Release of version 0.34.0 #1924

 Merged



sesheta closed this in #1924 7 days ago



sefkheth-abwy  commented 7 days ago

...

I have tagged commit [f20b6a1ad50ceabd232631aa6e7cbf4451a870f9](#) as release v0.34.0 🙌

Release of version 0.34.0 #1924

 Merged **sesheta** merged 1 commit into `master` from `v0.34.0` 7 days ago

 Conversation 4  Commits 1  Checks 1  Files changed 2



khebhut bot commented 7 days ago

Contributor ...

Hey, @fridex!

Opening this PR to create a release in a backwards compatible manner.

Closes: [#1923](#)

```
Changelog:
### Features
* add priority/critical-urgent label to all bot related issue templates
* :arrow_up: Automatic update of dependencies by Kebechet
* Adjust copyright notice in headers
* Add YouTube video for solver rules
* :arrow_up: updated labels of issue templates
### Improvements
* Load prescriptions from a directory structure
```

  Release of version 0.34.0

 5adad2c

  **khebhut** bot requested review from **fridex**, **goern** and **sesheta** as code owners 7 days ago

  **khebhut** bot added the `bot` label 7 days ago



 **sefkhet-abwy** bot approved these changes 7 days ago

[View changes](#)

sefkhet-abwy bot left a comment

...

This is an auto-approve of the releases.

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Project Thoth

Using Artificial Intelligence to analyse and recommend software stacks for Python applications.

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Thoth: helping Python developers to create healthy applications

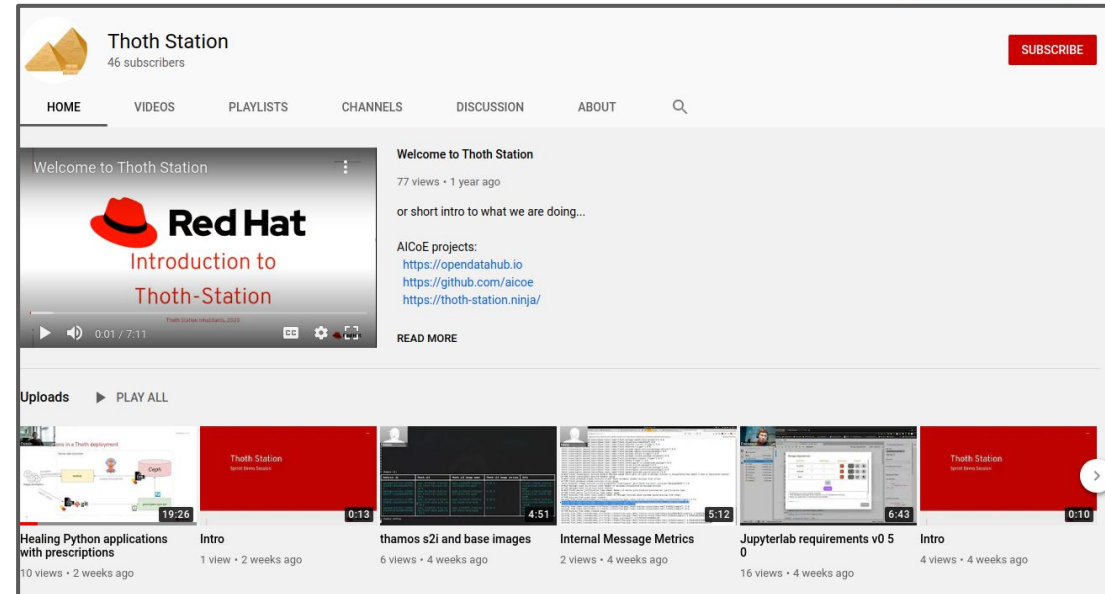
YouTube channel

bit.ly/thoth-on-youtube

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Useful references

- ▶ Homepage:
 - [Thoth-station.ninja](https://thoth-station.ninja)
- ▶ GitHub organization:
 - github.com/thoth-station
- ▶ Twitter:
 - twitter.com/ThothStation
- ▶ YouTube channel:
 - bit.ly/thoth-on-youtube

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