

JupyterFlow

Jupyter Notebooks at Scale

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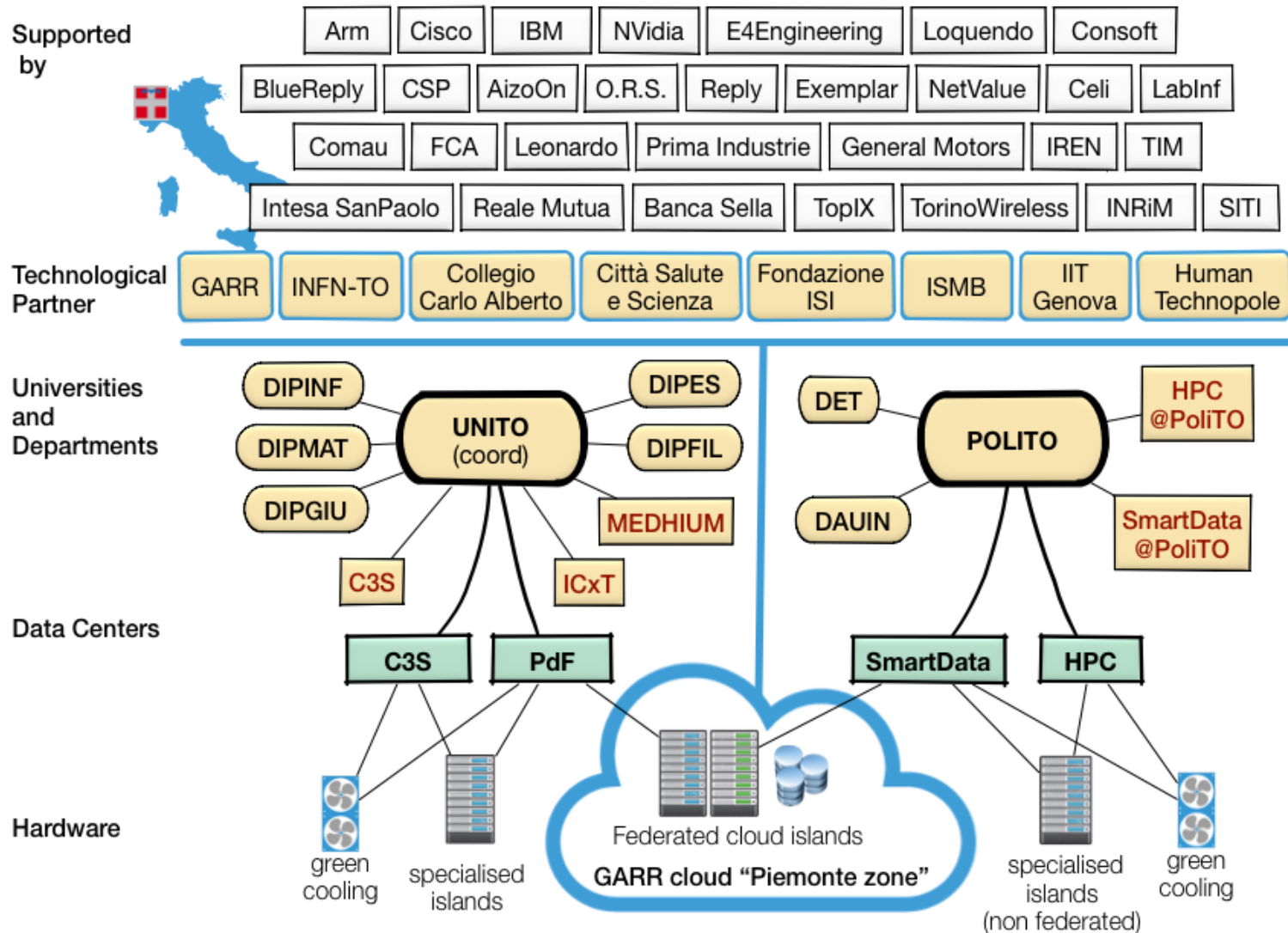
Università di Torino, Computer Science Dept.

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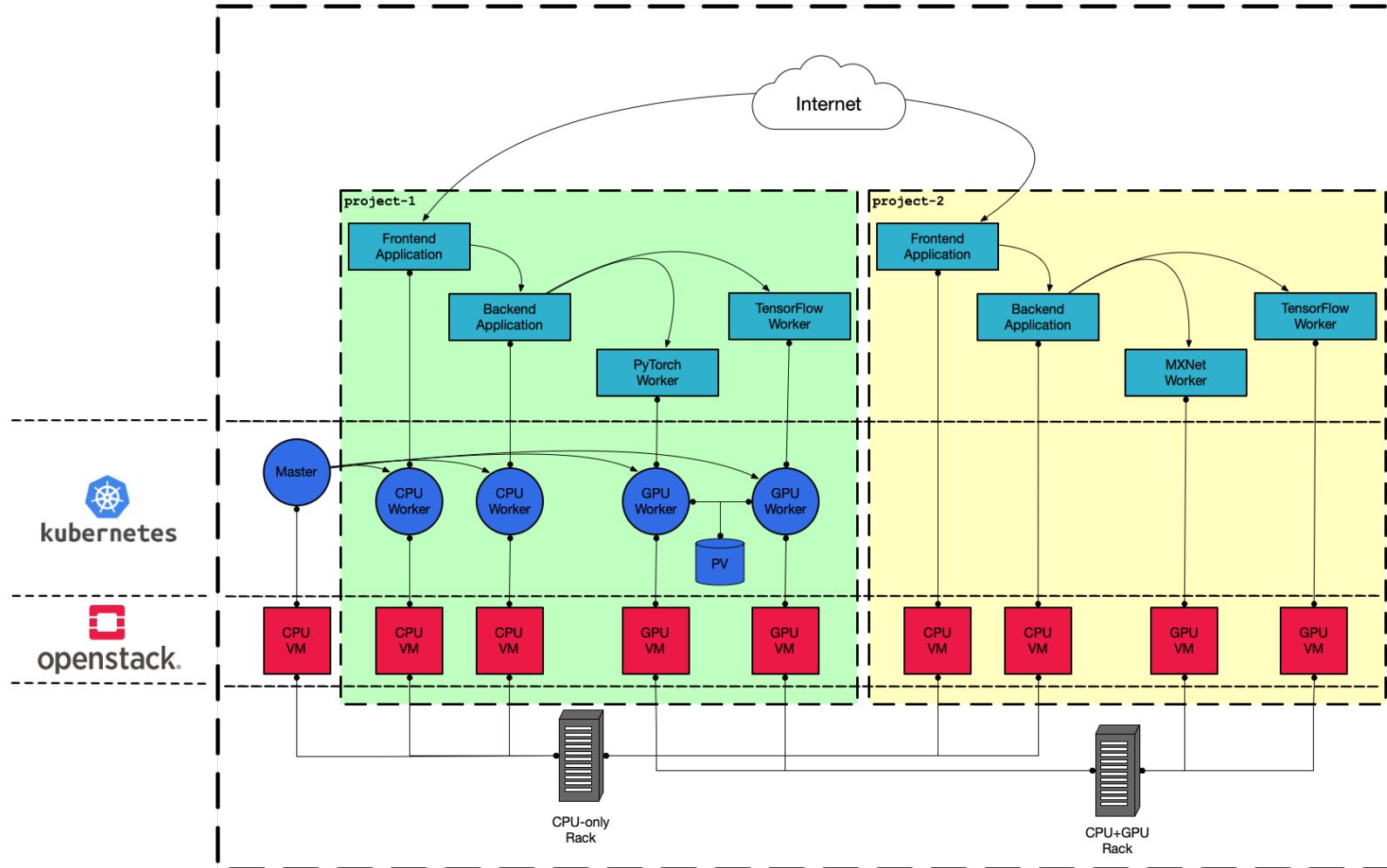
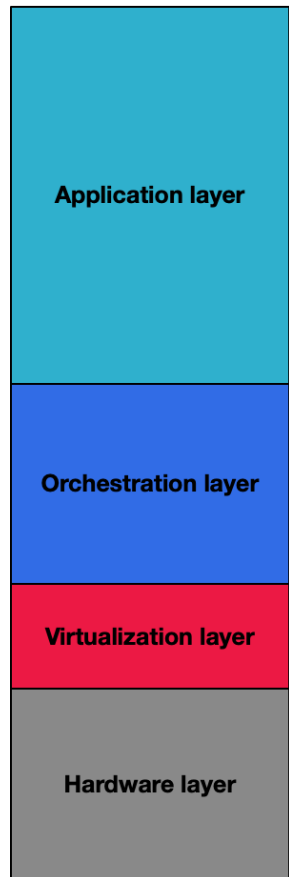
HPC4AI: federated GARR cloud at UniTO



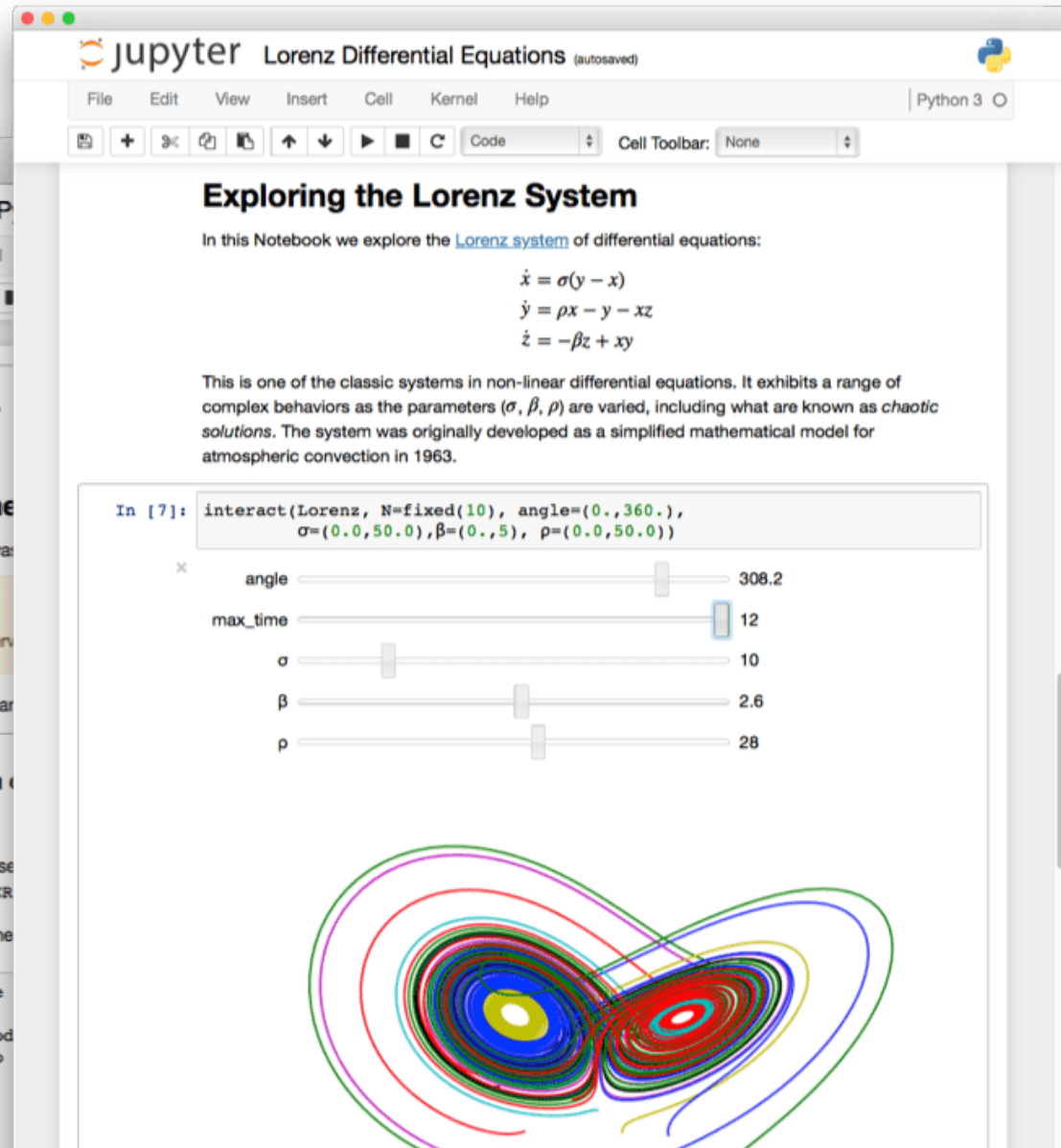
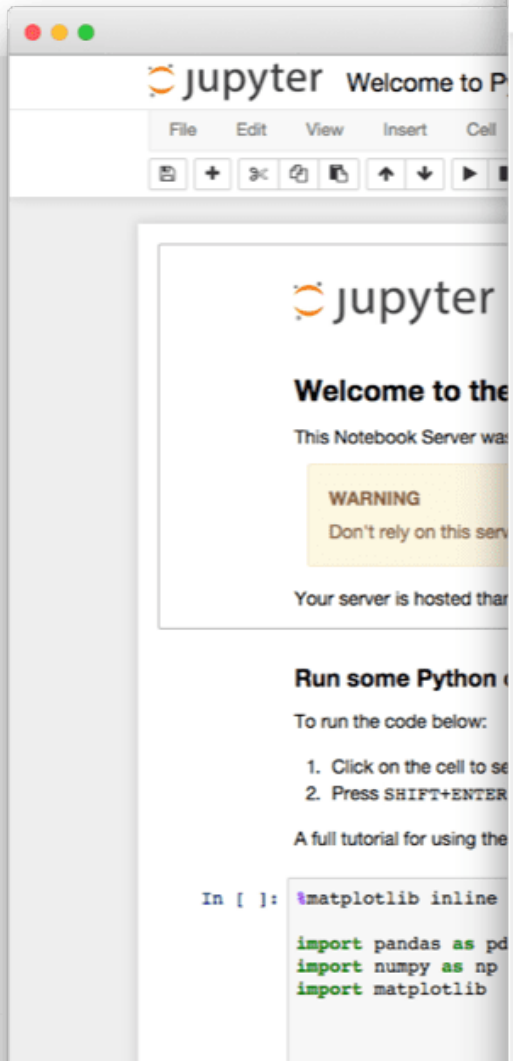
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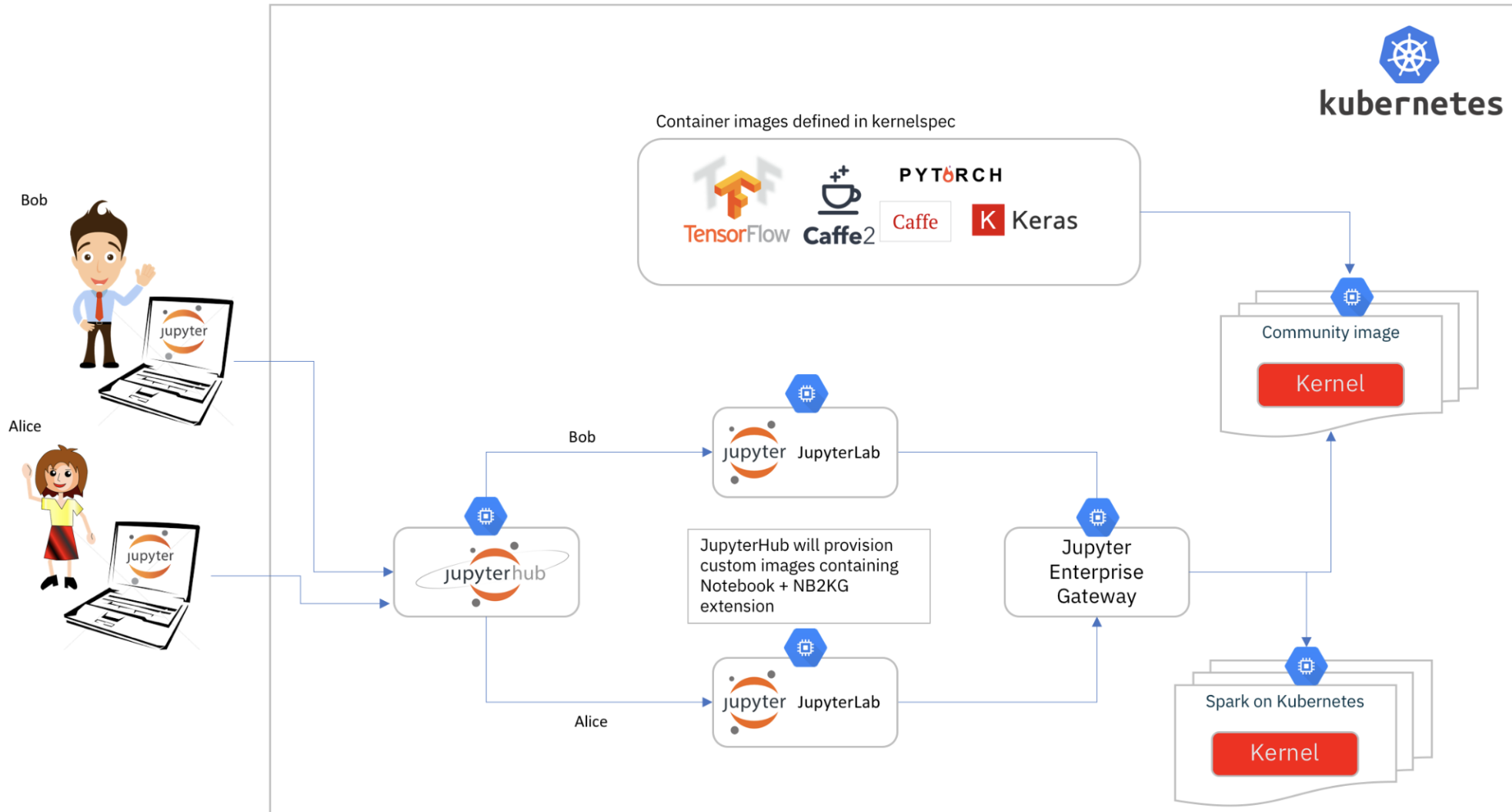
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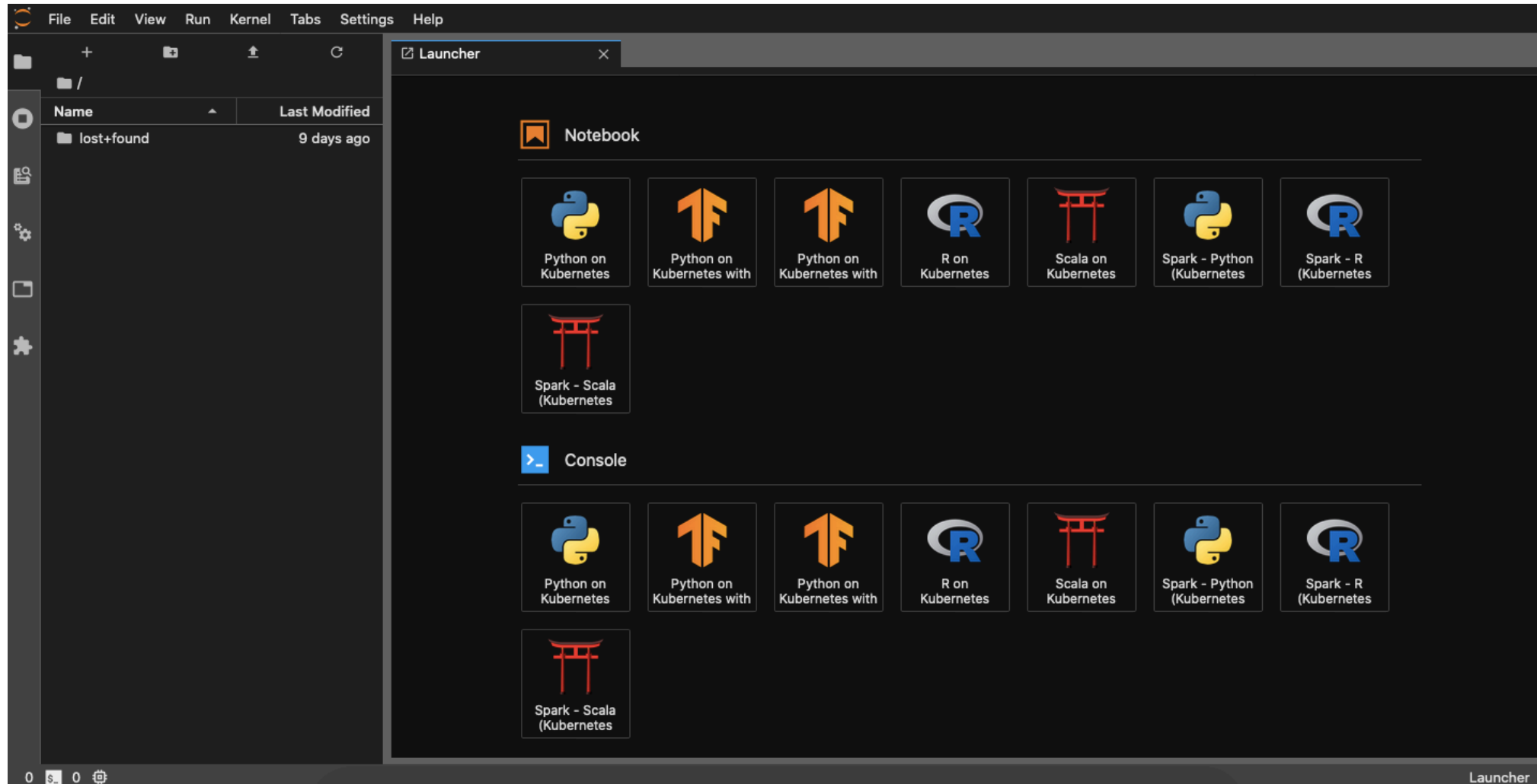
Jupyter Notebooks



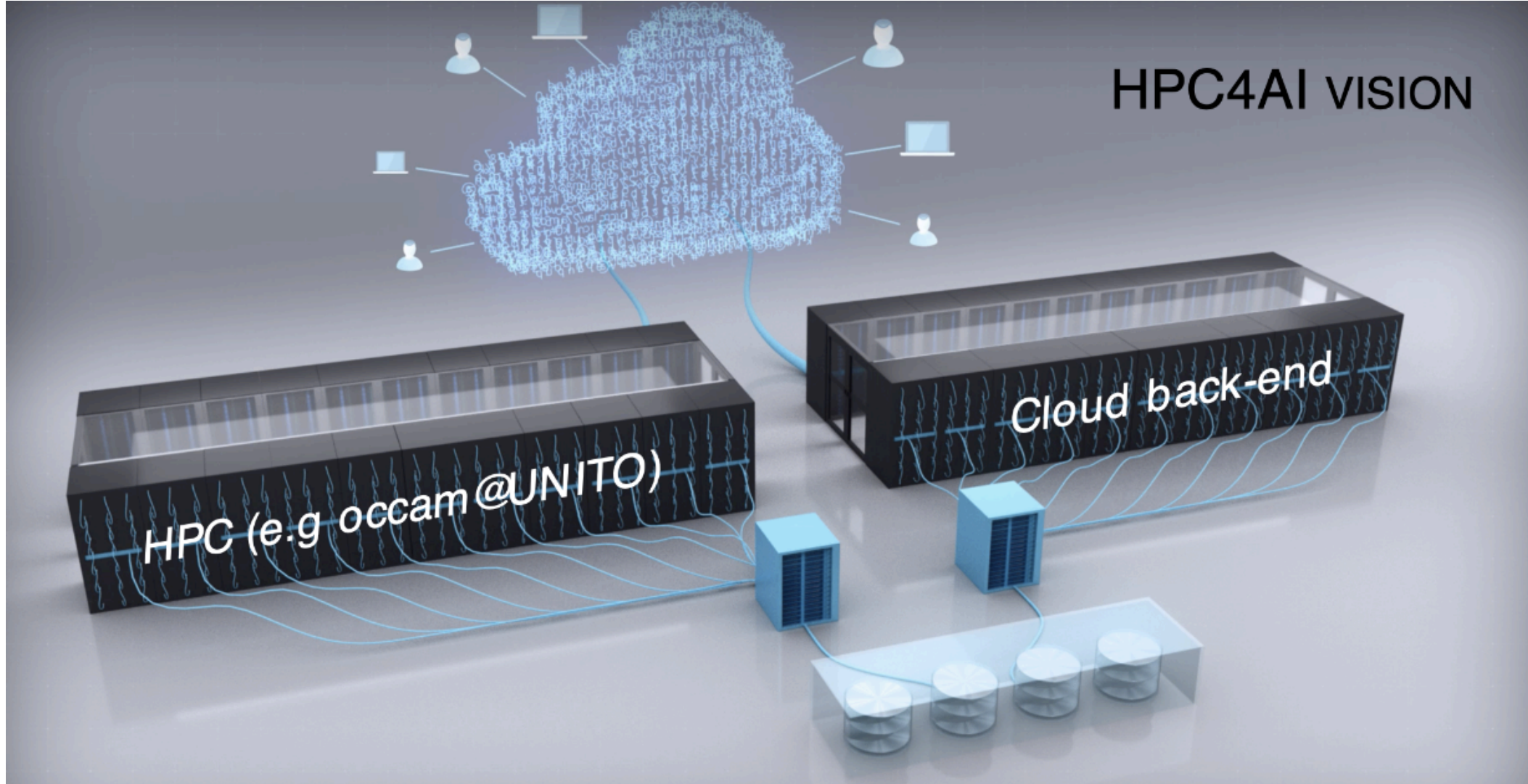
Jupyter Notebooks as a Service on HPC4AI



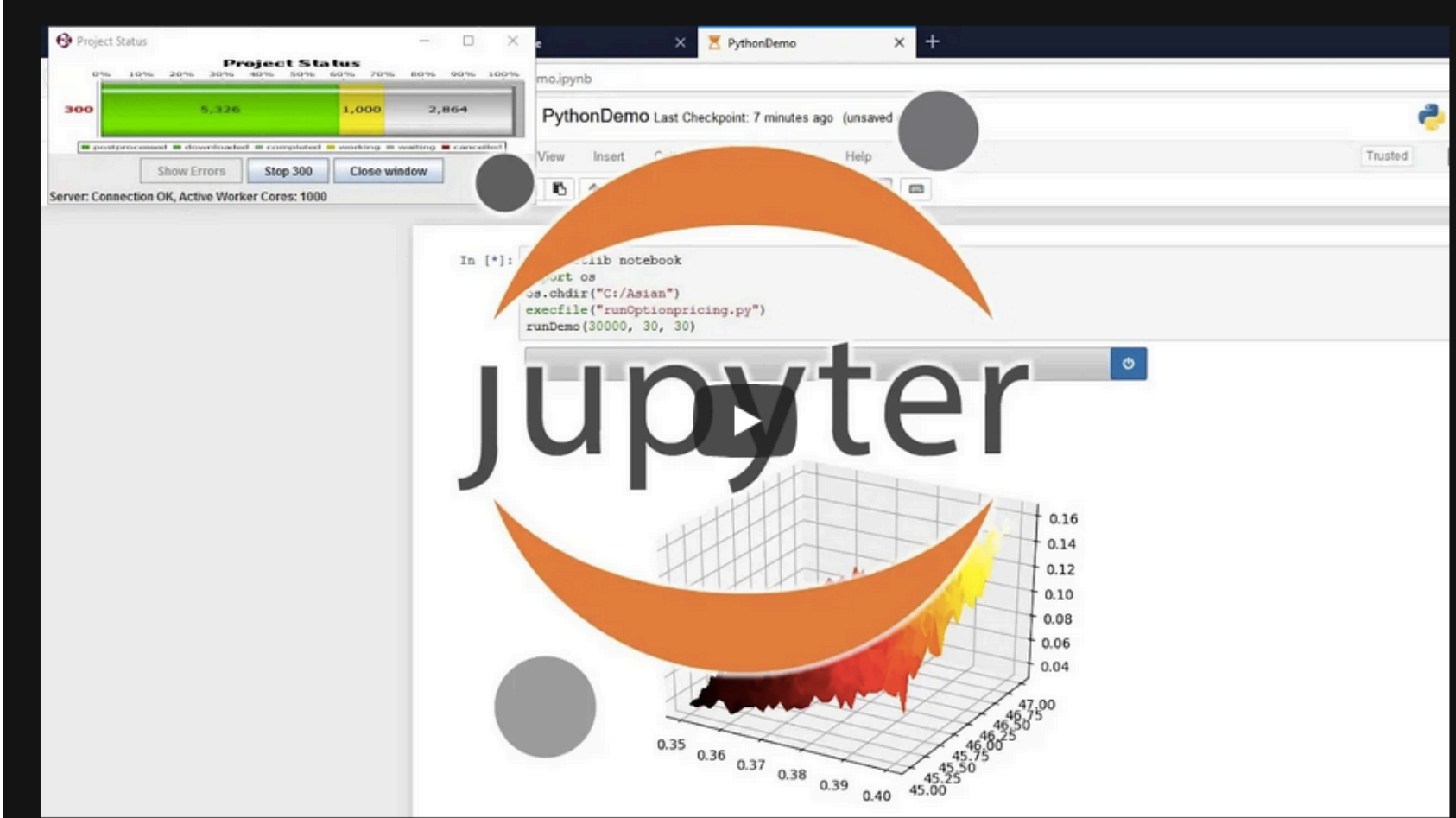
Jupyter Notebooks as a Service on HPC4AI



Hybrid HPC+Cloud Workloads



Hybrid HPC+Cloud Workloads



The screenshot displays a Jupyter Notebook environment. A 'Project Status' window is open in the top left, showing a progress bar with 300 active worker cores and a total of 5,326 cores. The notebook code cell contains the following Python code:

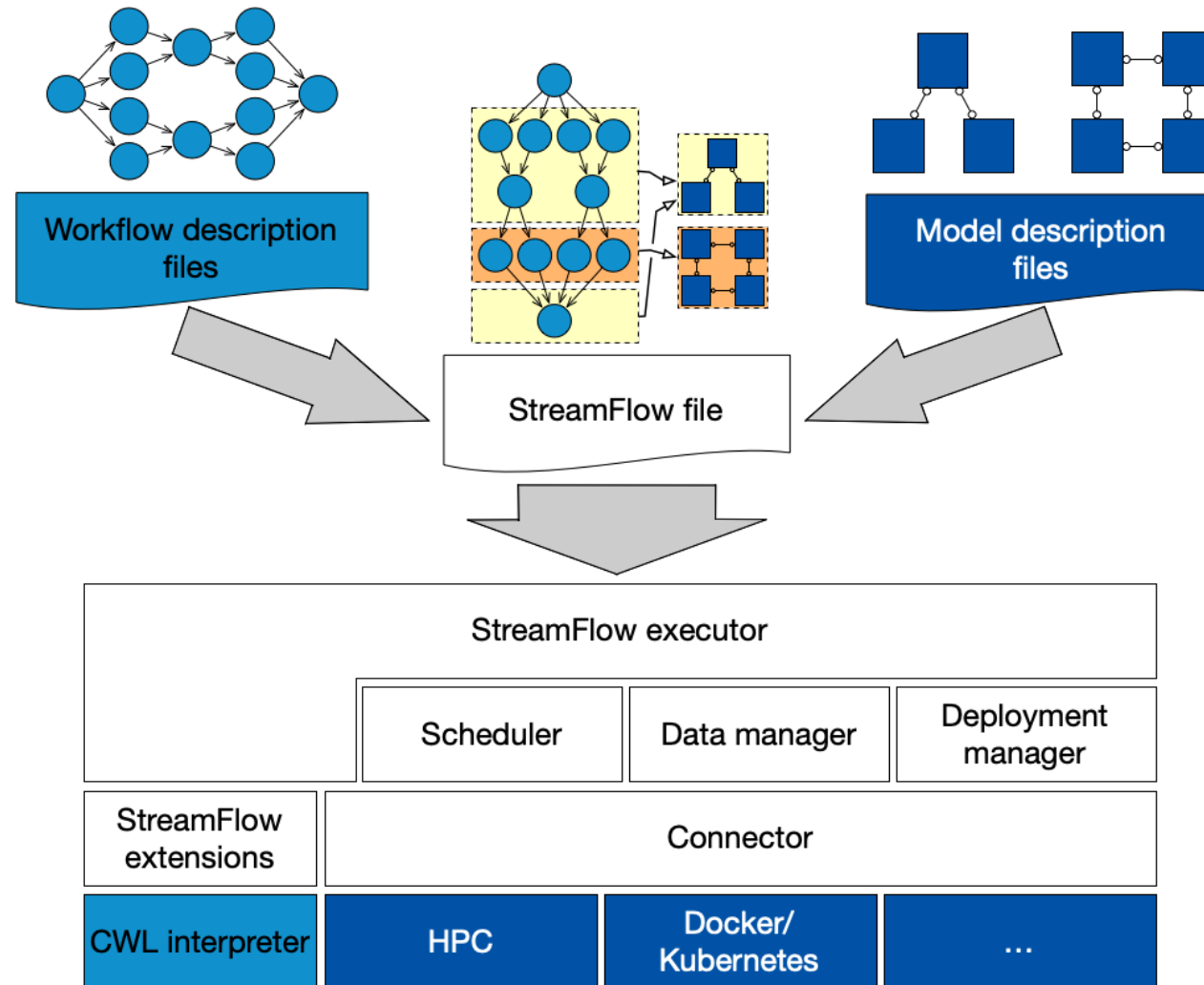
```
In [*]: %load_ext notebook
import os
os.chdir("C:/Asian")
execfile("runOptionpricing.py")
runDemo(30000, 30, 30)
```

Below the code cell is a 3D surface plot with axes ranging from 0.35 to 0.40 on the x-axis, 45.00 to 47.00 on the y-axis, and 0.04 to 0.16 on the z-axis. The plot shows a surface with a color gradient from dark red to yellow. The Jupyter logo is overlaid on the plot.

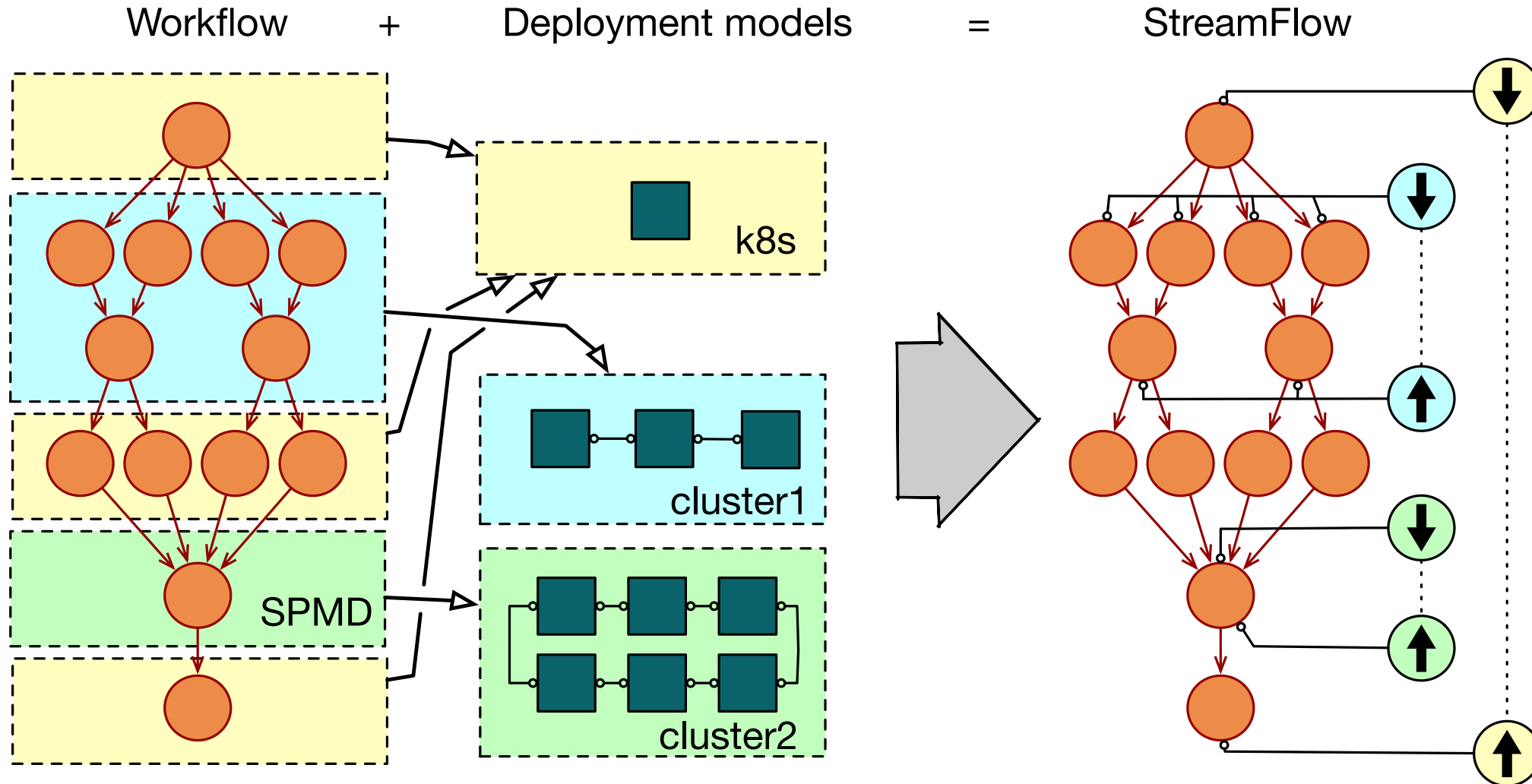
1000x speed to Jupyter Notebook using Techila Distributed Computing Engine
24,500 views · 11 Feb 2019

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StreamFlow: Towards Cloud-HPC Continuum



StreamFlow: Towards Cloud-HPC Continuum



JupyterFlow: Jupyter Notebook at Scale

Notebook Metadata

```
{
  "anaconda-cloud": {},
  "kernelspec": {
    "name": "python_kubernetes",
    "display_name": "Python on Kubernetes",
    "language": "python"
  },
  "language_info": {
    "name": "python",
    "version": "3.7.6",
    "mimetype": "text/x-python",
    "codemirror_mode": {
      "name": "ipython",
      "version": 3
    },
    "pygments_lexer": "ipython3",
    "nbconvert_exporter": "python",
    "file_extension": ".py"
  },
  "streamflow": {
    "model": {
      "type": "occam",
      "config": {
        "file": "./environment/occam/occamfile.yml",
        "sshKey": "./.ssh/keys/occam_rsa",
        "username": "icolonne"
      }
    },
    "service": "tensorflow",
    "resources": 2
  }
}
```

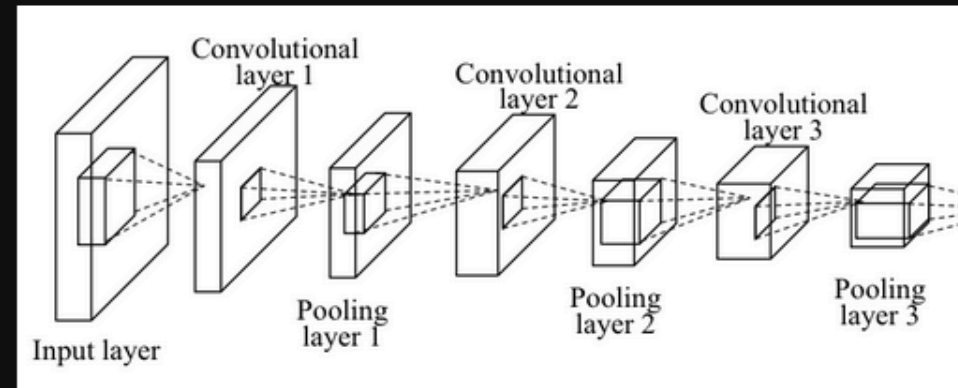
Convolutional Neural Network Example

Build a convolutional neural network with TensorFlow.

This example is using TensorFlow layers API, see 'convolutional_network_raw' e implementation with variables.

- Author: Aymeric Damien
- Project: <https://github.com/aymericdamien/TensorFlow-Examples/>

CNN Overview



MNIST Dataset Overview

This example is using MNIST handwritten digits. The dataset contains 60,000

HPC4AI website: <https://hpc4ai.unito.it>

StreamFlow website: <https://streamflow.di.unito.it>

StreamFlow code: <https://github.com/alpha-unito/streamflow>



Thank you

Any Questions?



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