Dynamic Brain Circuits in Health and Disease + Advanced Research Computing

Ashutosh Bhudia (Co-op Student, Psychiatry)

Getting to know the crowd

- How many people have used Python before?
- How many people are comfortable with NumPy, Matplotlib, Scipy?
- How many have used Jupyter before?
- How many have used Jupyter as tool for publication?

Features

- Customizable
  - Create a variety of different environments
  - Supports multiple kernels: Different Python versions, R, Julia
  - Supports different User interfaces: Notebook, Lab, RStudio
- Shared Filesystem for Quick Collaboration
- Get access to more powerful computational resources
- Work from anywhere on any device
- Plus everything you get from Notebook/Lab, including:
  - Text Editor
  - Command Line Interface
  - Notebook goodies: Include Media, LaTeX, Markdown

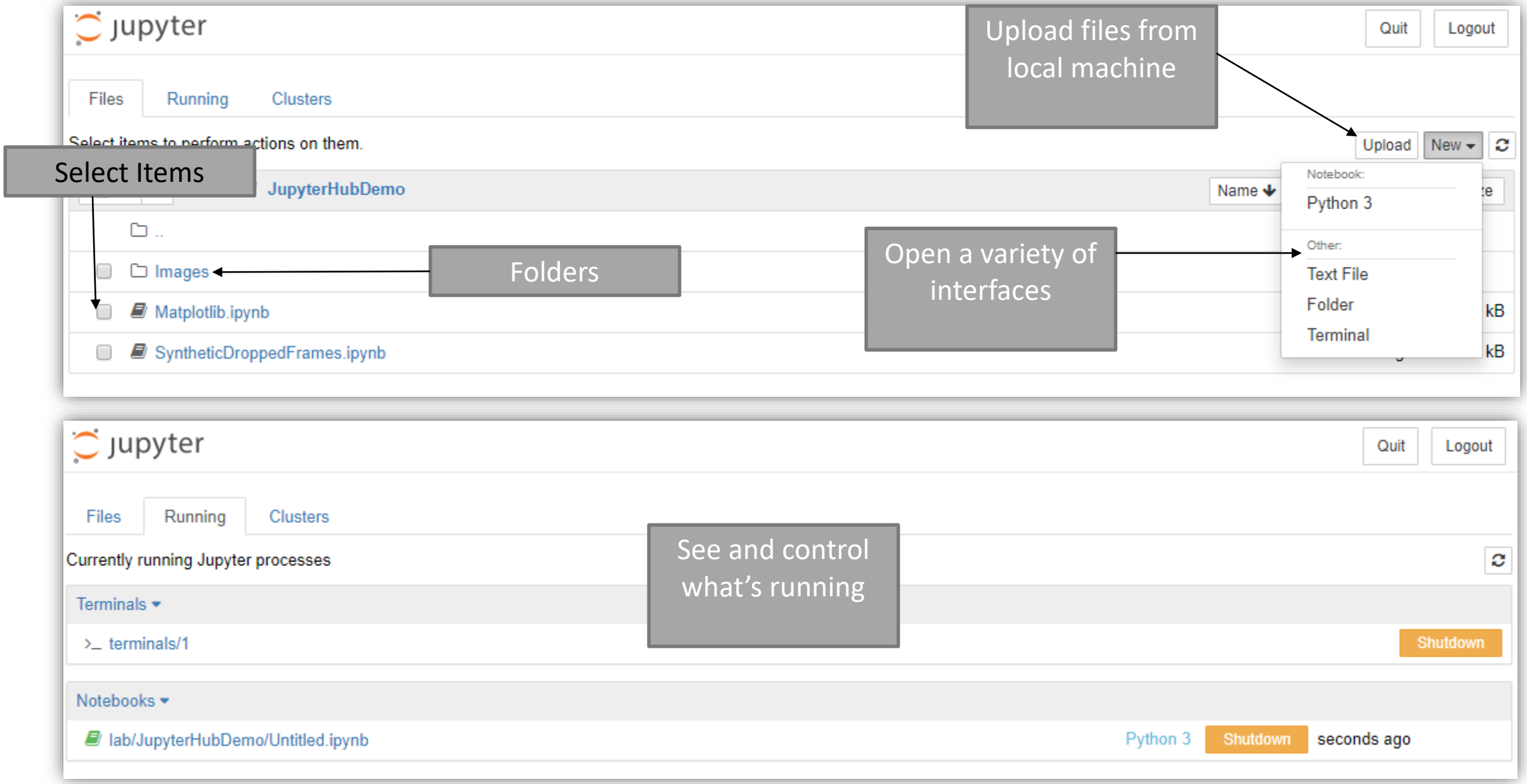
Our Deployment

- Deployed on Alder
- Each user gets 4 CPUs, 16 GB RAM
- Scratch Space with 500 TB storage (PS, this is **not** backup space!)
- Built on top of slurm job scheduler
- Request resources when you begin a session
- Software: Includes Numpy, Scipy, Matplotlib, Pandas.
  - Pip install
  - List can be queried with pip list

Setting a new password

- Open up a terminal
- `$ ssh <username>@alder.arc.ubc.ca`
- `$ passwd`
- Your temporary password is Please use a secure password.
- Log on to `jupyter.alder.arc.ubc.ca` and use your username and new password

Just like a Notebook!



Demo

- A brief demo of the interface
- Copying data onto the JupyterHub
- Running an example notebook

Profiling Resource Usage

Multiple resources available online like

https://www.pluralsight.com/blog/tutorials/how-to-profile-memory-usage-in-python

Use batch spawner to graph num cpus vs time (real and core hours, as needed) to find the minimum or most reasonable resource requirements. Pure python/threaded python will not benefit from multiple CPUS. Libraries like numpy, scipy, multiprocess python will.

Open Session

- Run your own code!