Open OnDemand

Information Technology Services
Cyberinfrastructure
University of Hawai'i

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UNIVERSITY OF HAWAI'I

Overview

Part I – Background

1. What is it?
2. What can it do for me at UH?

Part II – Connecting & Tour

1. Prerequisite & Connecting
2. Tour
3. User Support

Part III – Customization:

1. Rstudio Server
2. Jupyter Environments

Part I

Background

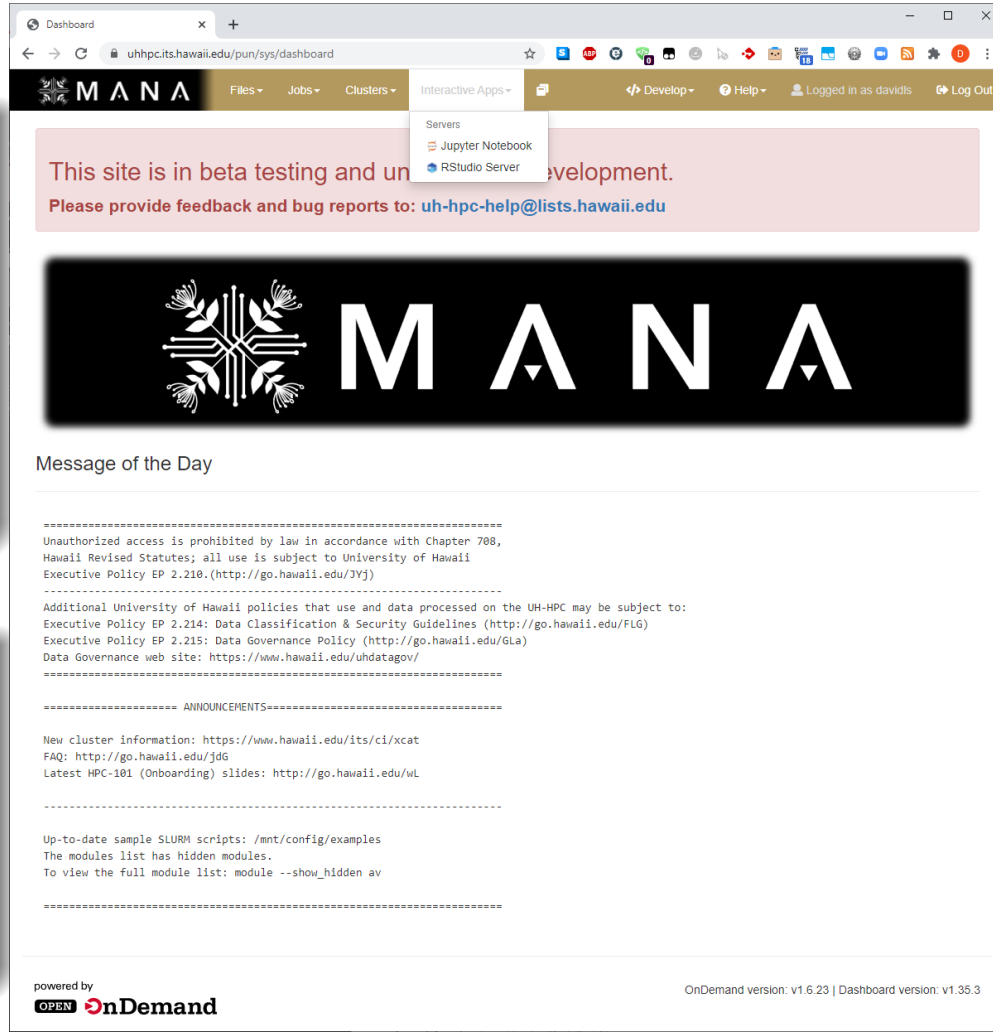
What is Open OnDemand & who is using it?

What is it?

Open OnDemand, is a National Science Foundation (NSF) funded science gateway project (OAC1534949, OAC183575) from the Ohio Supercomputer Center, with the goal of making access to HPC resources simpler through a web browser.[1]

Who is using it?

- Universities
- The Federal Reserve Bank
- Super computing centers



[1] https://openondemand.org/

What can it do for me at UH?

- Provide a uniform environment which can help simplify instruction in a classroom setting
- Built-in file browser with in browser download/upload capabilities
  - Max upload file size is currently limited to 5GB
- In browser SSH terminal
- Job management and monitoring
- The ability run interactive applications like Juypter lab/notebook, Rstudio Server and remote desktop on a node in Mana

Part II

Connecting & Tour

Prerequisite

- An active Mana (UH-HPC) account
  - Accounts provisioned for a class are active until the end of the semester
- Registered for MFA/DUO
- A web browser

Supported Browsers

- Chrome[1][2], Firefox, Edge are all supported

Unsupported Browsers

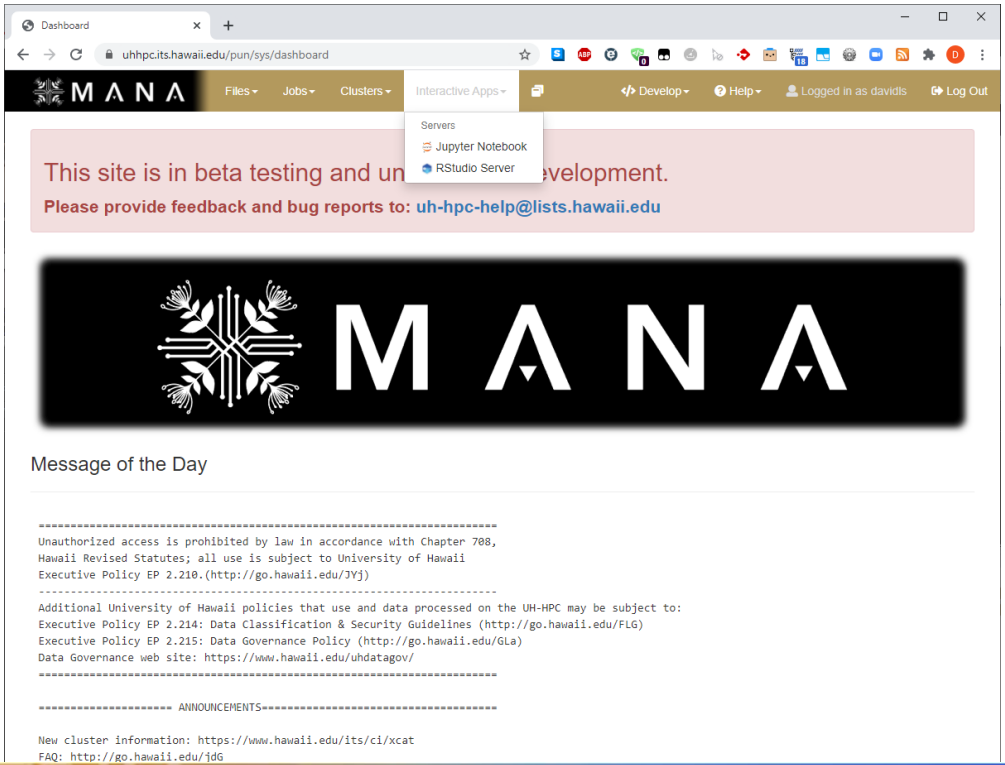
- Internet Explorer 11

[1] Chrome is the recommended browser

[2] https://osc.github.io/ood-documentation/latest/requirements.html#browser-requirements

Connecting

- Open up a browser window in incognito mode
  - Optional but recommended for security upon logout
- Direct your browser to `https://uhhpc.its.hawaii.edu` or `https://mana.its.hawaii.edu`
- Should be prompted for your UH credentials by the UH gold screen
- If successful, should be directed to a page with the Mana logo



Tour

User Support

Contact Information

For help, please contact us at: UH-HPC-Help@lists.hawaii.edu

Online documents & FAQ

- Information & policies
- FAQ
- Video Tutorials

Part III

Customization

Rstudio - Defaults and Quirks

Defaults

- Rstudio Server will utilize the default R module unless told otherwise
  - Current default is R 4.0.0
- Only the dependencies the R module provides are loaded

Quirks

- The terminal in Rstudio does not start up knowing the modules command
  - User can correct this by doing the following commands in the terminal
  - Changes in this terminals environment (modules loaded/purged) do not change what the R environment sees
  - . ~/.bash_profile
  - . /opt/ohpc/admin/lmod/lmod/init/sh

Rstudio - Lmod Collections

- Lmod has the ability to save/create a named environment (Collections) which can be restored when needed
  - For example, a user may create a build environment that loads multiple dependencies and they don't want to load them every single time or remember what they loaded and save it with a name
  - The user would save the collection by doing "module save build_enviro"
  - The user can then restore the collection by doing "module restore build_enviro"
- We utilize this mechanism to allow a user to customize their Rstudio environment when using Open OnDemand and allow for the user to:
  - Pin the R language version
  - Load additional dependencies that some of their R libraries require, e.g., netCDF, gdal, CUDA

Rstudio - Requirements & procedure

Requirements

- The Lmod collection must contain a working R environment
  - At a minimum it requires an R module to be loaded - lang/R
- The collection must be named "ood_rstudio"

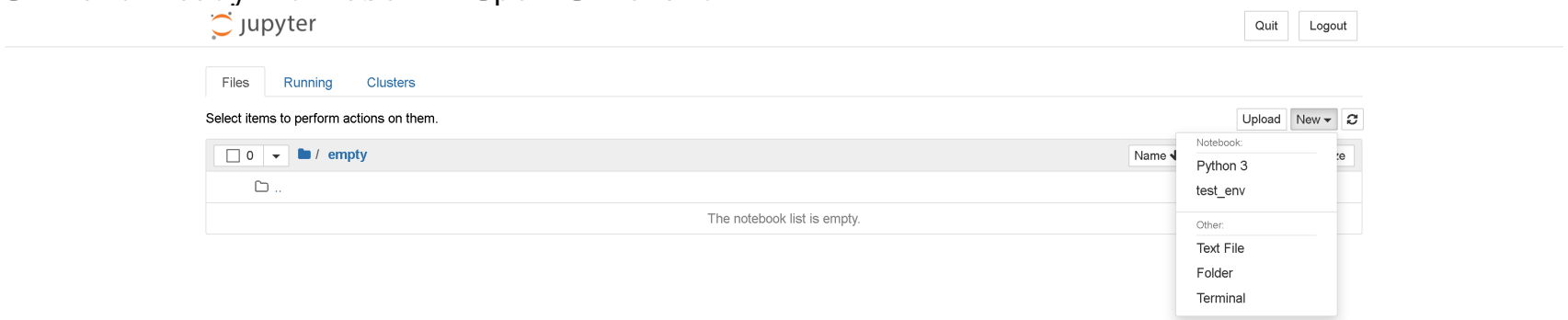
Procedure

1. Bring up a terminal on the cluster
2. purge your current module environment
   - module purge
3. Load modules you want to use with R studio
   - module load lang/R/3.5.1-intel-2018.5.274-Python-2.7.15
   - module load data/GDAL/2.2.3-intel-2018.5.274-Python-2.7.15
4. Save the module environment to the name "ood_rstudio"
   - module save ood_rstudio
5. Start up a new Rstudio instance and Rstudio should now have the additional libraries and be using the version of R you specified.

Jupyter- Custom Kernel Environment

The following steps were adapted from https://hpc.sites.caltech.edu/documentation/software-and-modules/jupyter-notebook.
The following commands should be executed from a compute node in an interactive session prior to starting up a Juypter Notebook in Open OnDemand.

```
[$] module load lang/Anaconda3
[$] conda create --name test_env python=3
[$] source activate test_env
### Install your required packages ###
# ...
### Finalize setup with this last package ###
[$(test_env)] conda install ipykernel
[$(test_env)] python -m ipykernel install --user --name test_env --display-name "test_env"
### DONE and ready for use in Open OnDemand ###
```



Jupyter - Custom version

Users can also install a custom version of Jupyter Lab/notebook by creating a custom collection with the name "'ood_jupyterlab"'

```
[$] srun -p sandbox -c 2 -mem=6 -t 60 -pty /bin/bash
[$] module load lang/Anaconda3
[$] conda create -n ood_jupyterlab -c conda-forge jupyterlab=3 xeus-python
[$] exit
# go to OOD and create an interactive session using the existing "jupyter
notebook app/server"
# check Jupyter notebook's about for version to verify.
```

Jupyter Quirks

Quirks

- jupyter applies all parameters from a global config file and those specified at run time https://jupyterlab.readthedocs.io/en/latest/user/directories.html#labconfig-directories.
- Users will need to remove or rename their global config file so as to not conflict with the Open OnDemand launcher. For example:
  .jupyter/jupyter_server_config.py -> .jupyter/jupyter_server_config_custom.py

Questions?