Hands-on introduction to Open OnDemand

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Overview

- What is Open OnDemand
- File operations
- Job management
- Interactive remote desktop
- Interactive applications
- Future outlook

Hands on requirements

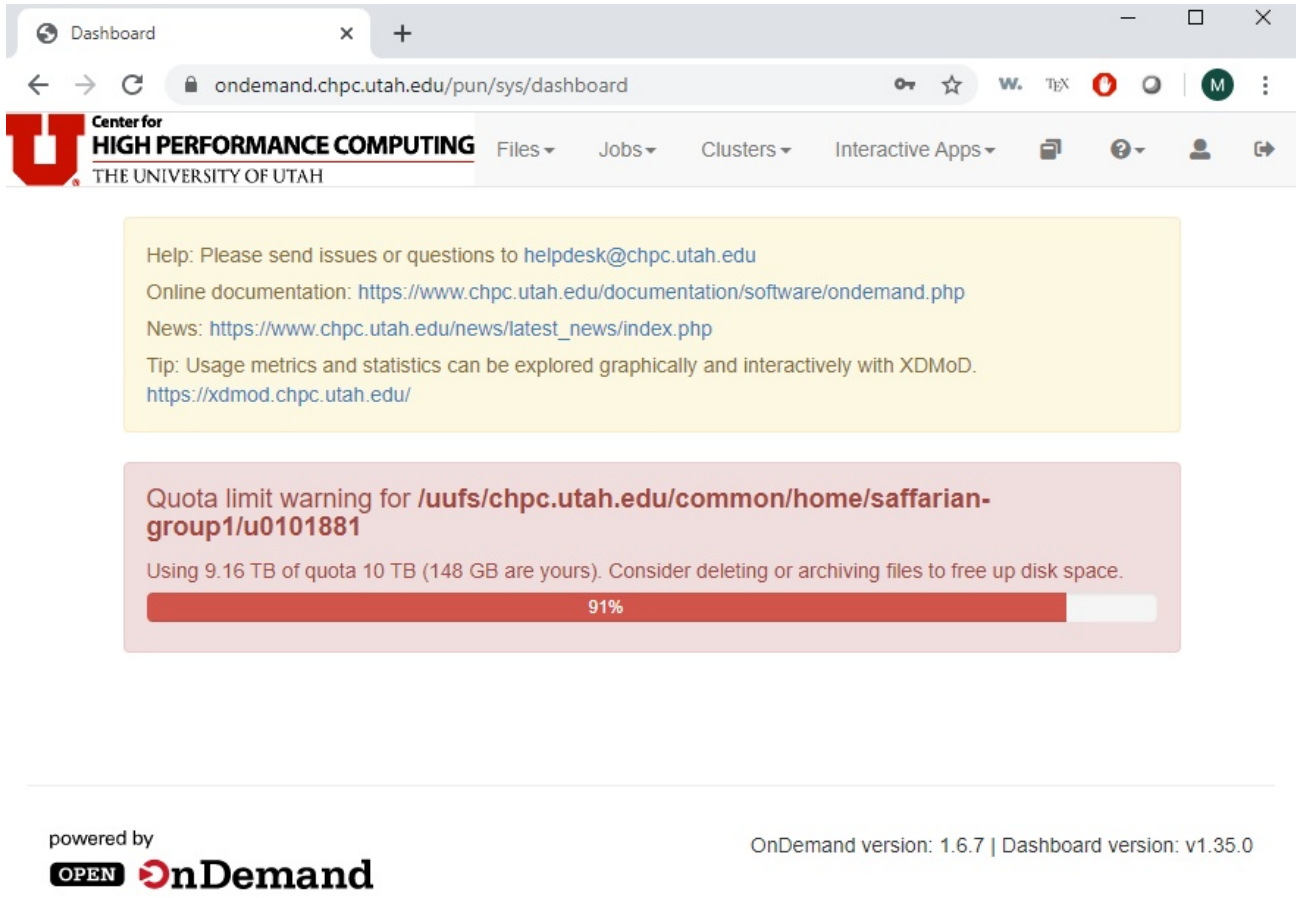
1. Internet access
2. Web browser
3. CHPC account

What is Open OnDemand

- Web portal to HPC resources - openondemand.org
- Easier, command line free, use of HPC resources
- File management module
- Job submission and monitoring module
- Interactive desktop and applications
  - e.g. MATLAB, ANSYS, Jupyter Notebook, R Studio Server
- Actively developed and supported by NSF

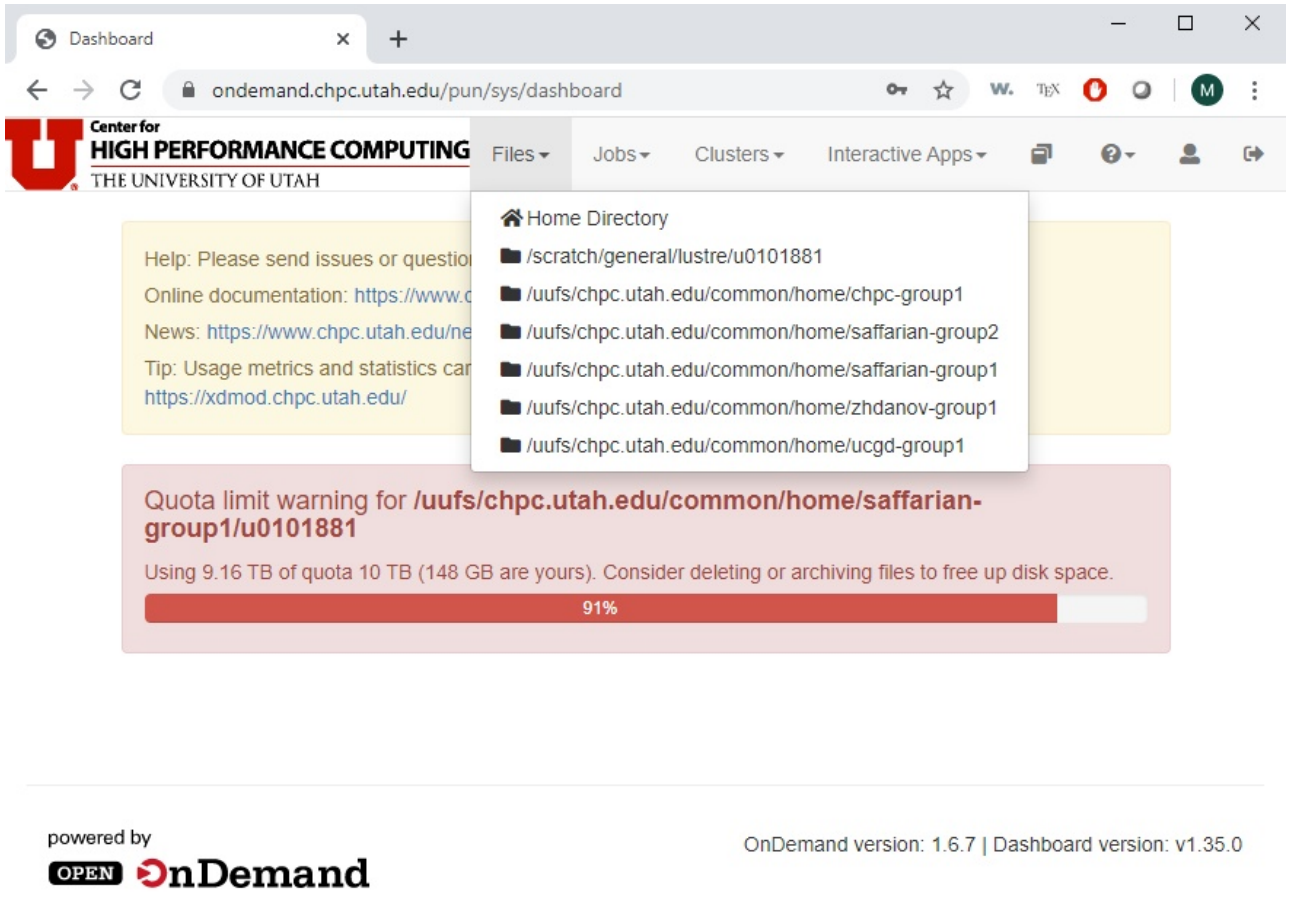
CHPC's Open OnDemand

- ondemand.chpc.utah.edu
- Log in with your uNID and password
- Will display disk quota warnings if at >= 90%



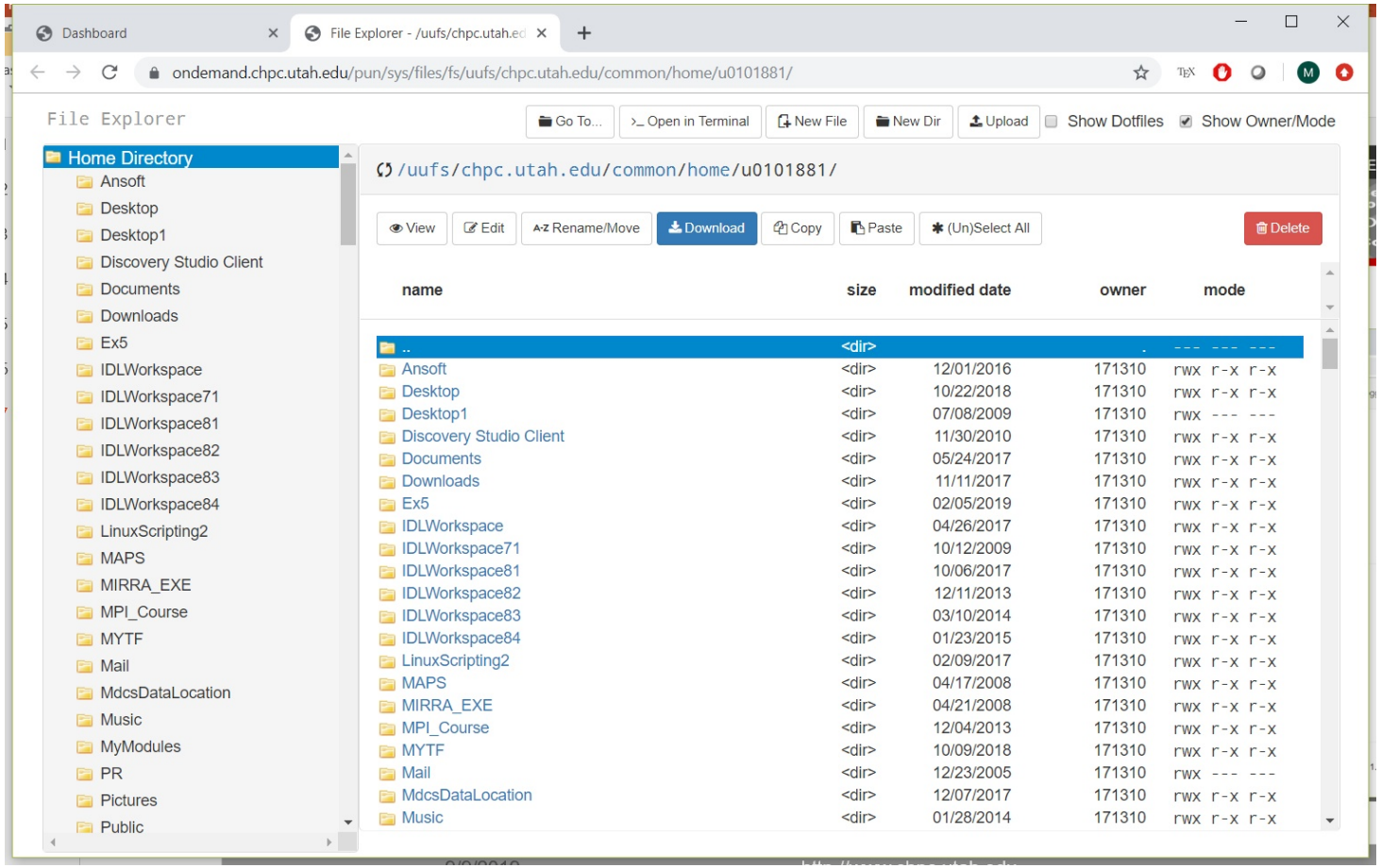
File explorer

- Sees all file systems where user has access
- Allows various file operations, including editing



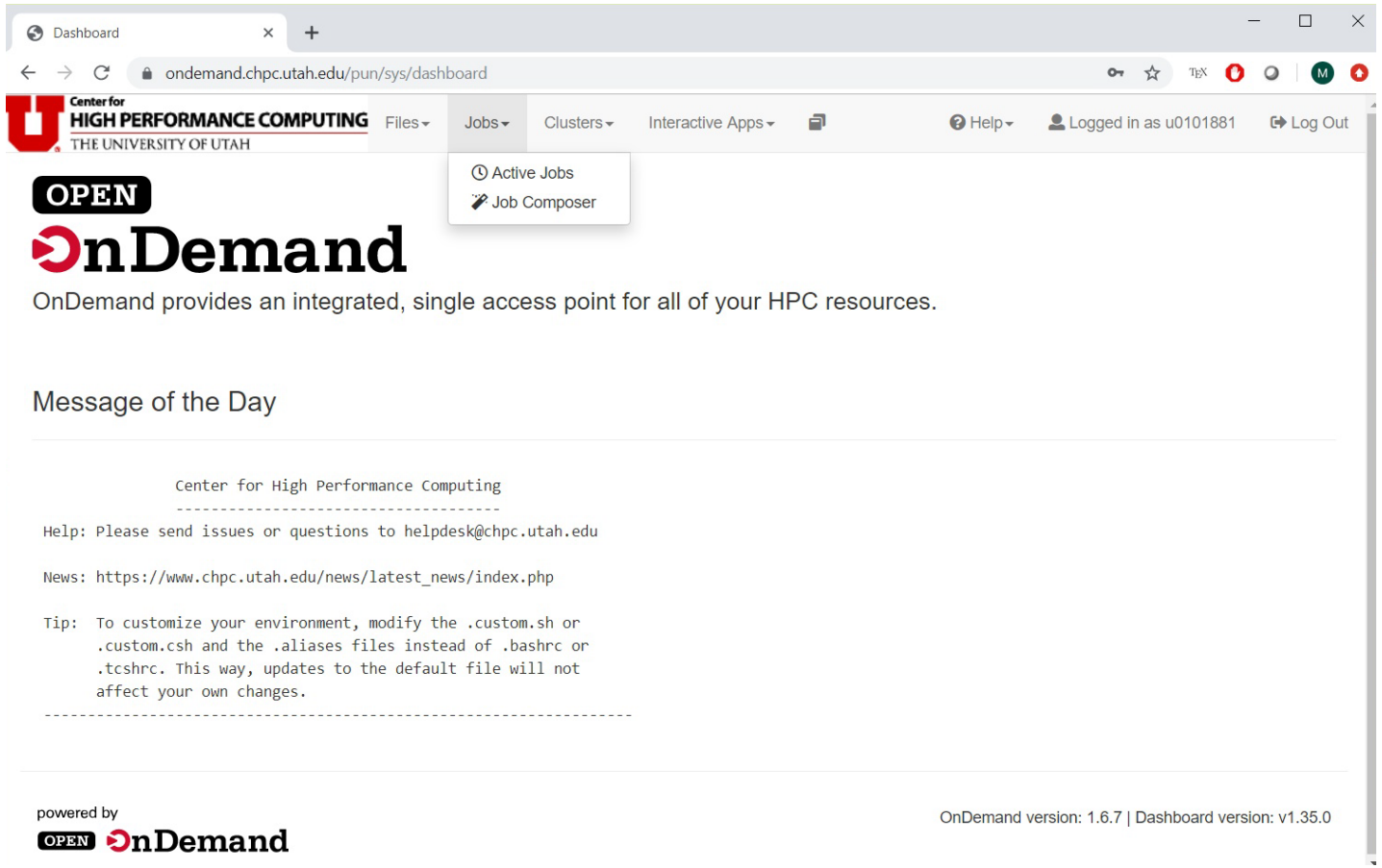
File explorer

- Drag and drop copying, renaming
- File viewing and editing
- Open in terminal
- Upload and Download



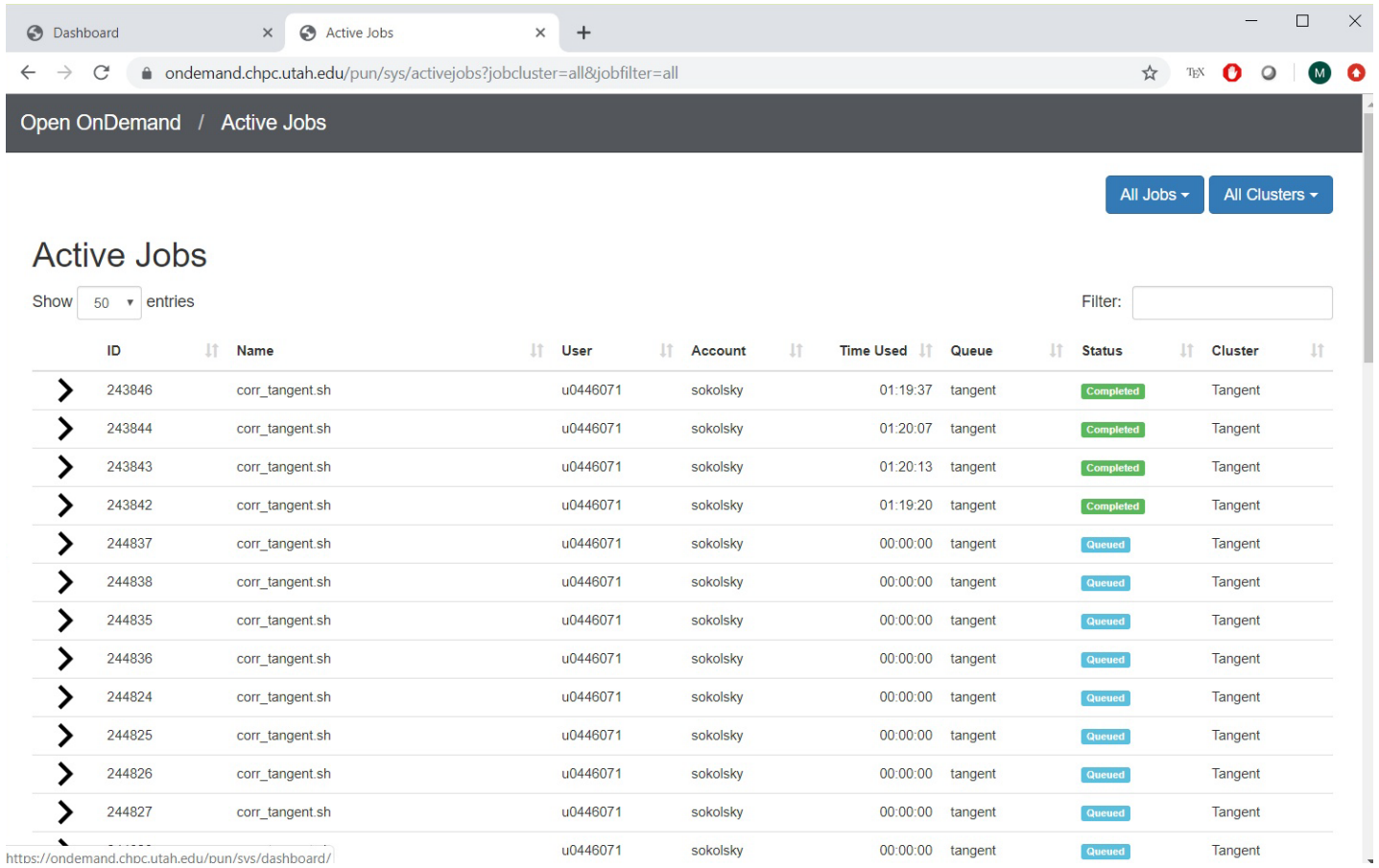
Jobs

- Listing of active jobs
- Creating and submitting new jobs



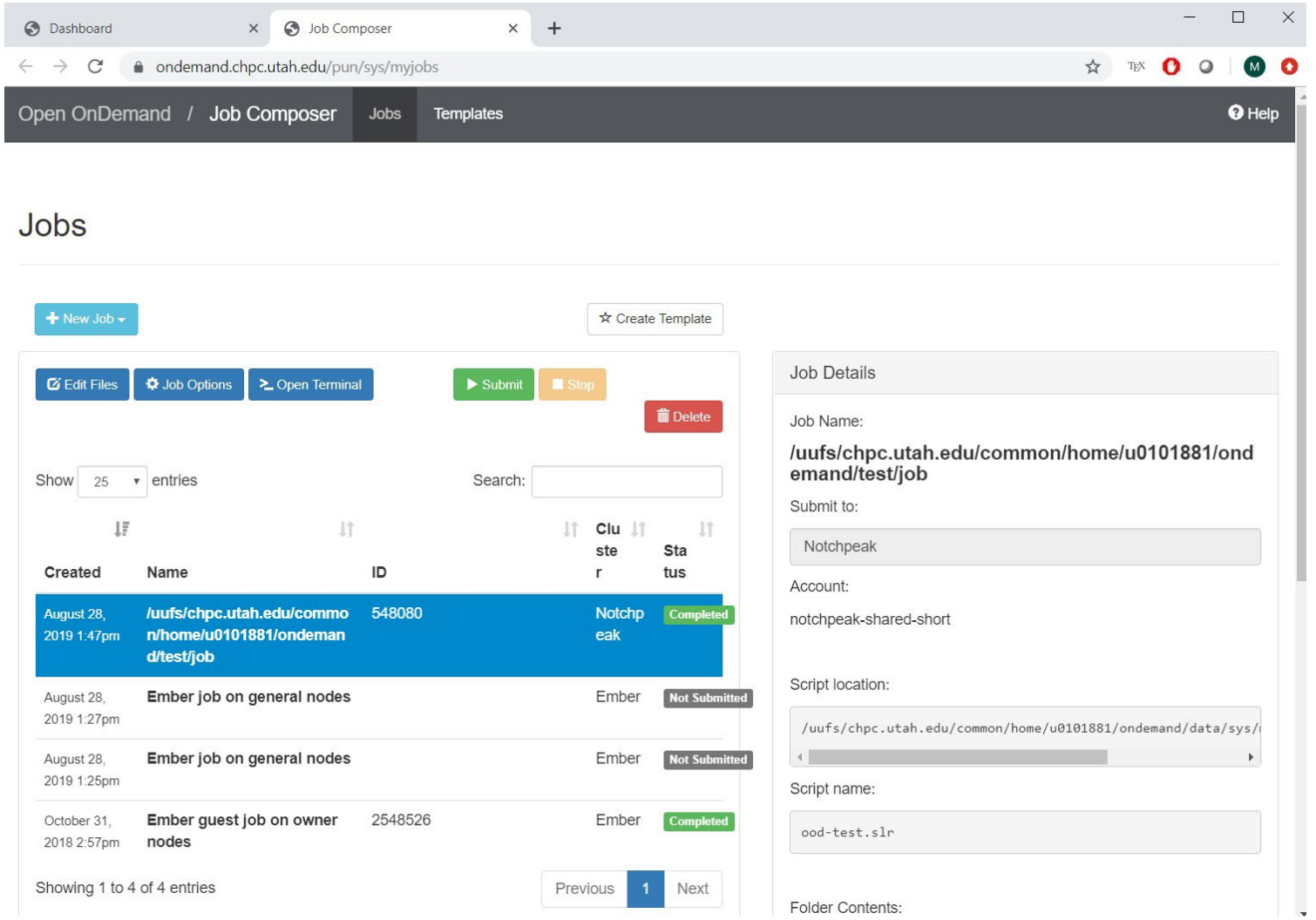
Active jobs

- Filter by all or user only jobs
- Filter by all clusters or specific cluster
- Expanding shows job details
- Use filter to search for jobs



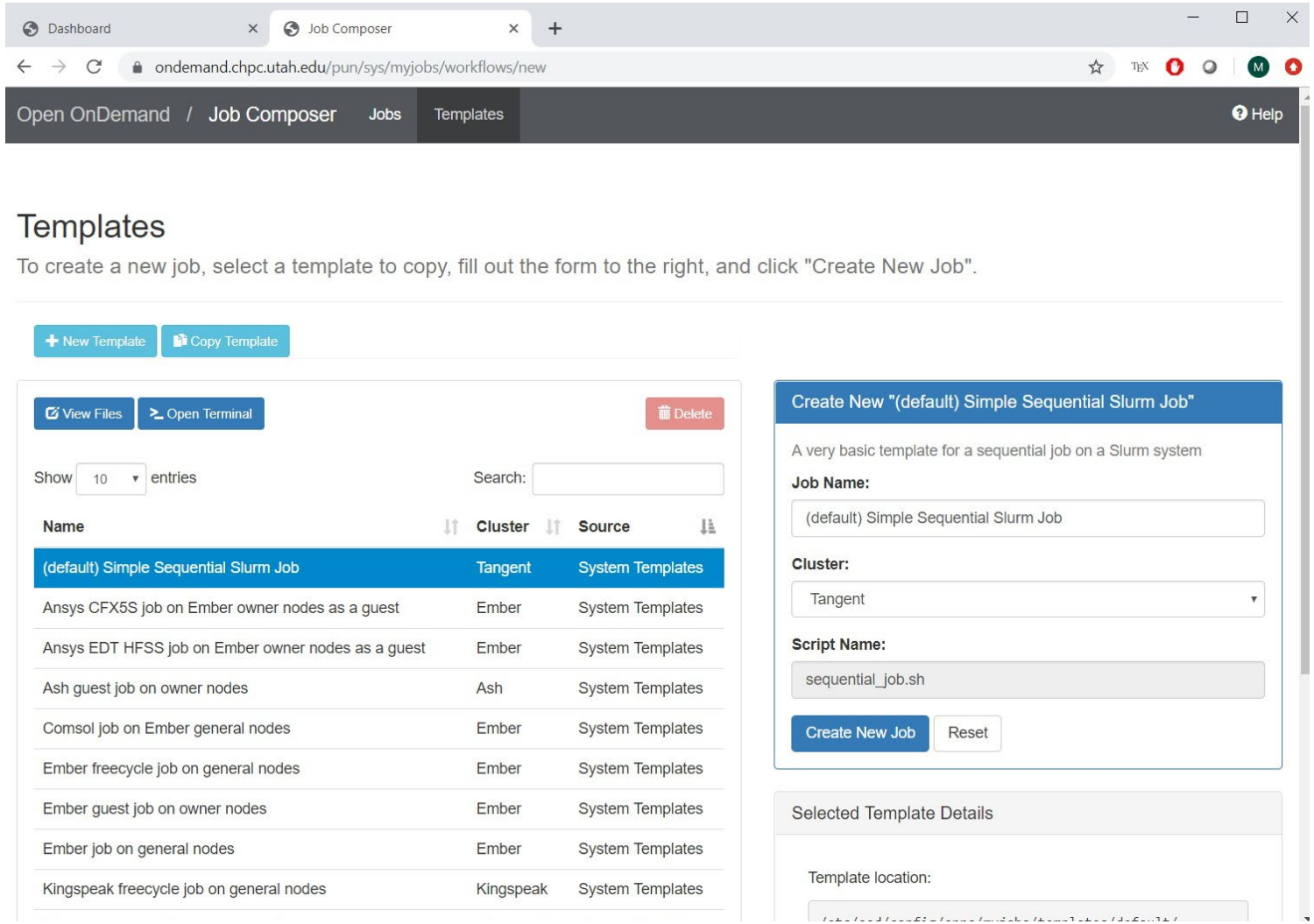
Job composer - jobs

- Create and edit job scripts
- Edit job input files (in File Explorer)
- Submit/cancel jobs
- See job status
- Caveat - OOD copies all job files to ~/ondemand/data/sys/myjobs/projects/default



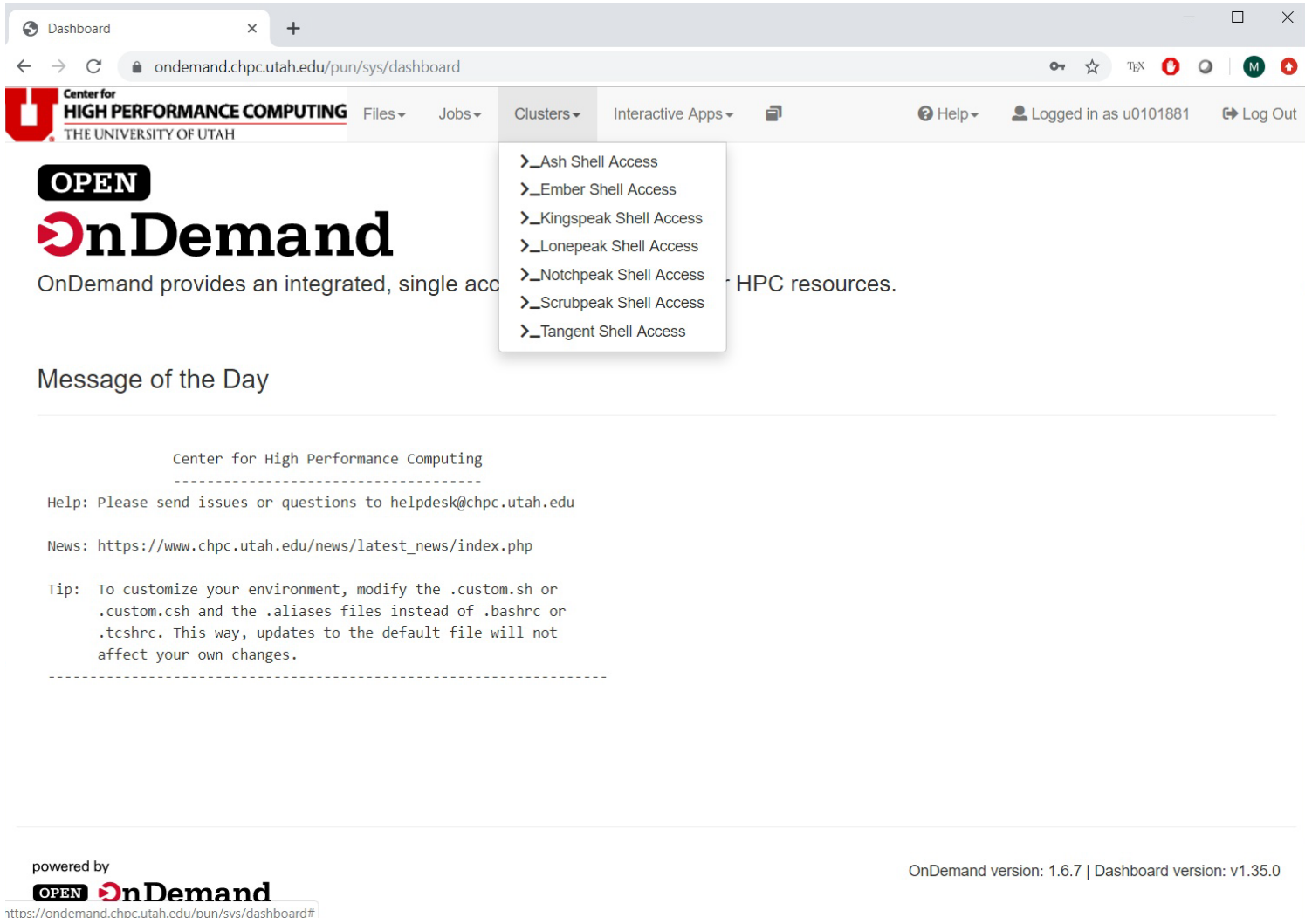
Job composer - templates

- SLURM job script templates
- Create new jobs based on these templates
- Modify these jobs based on specific needs
- https://github.com/CHPC-UofU/chpc-myjobs-templates



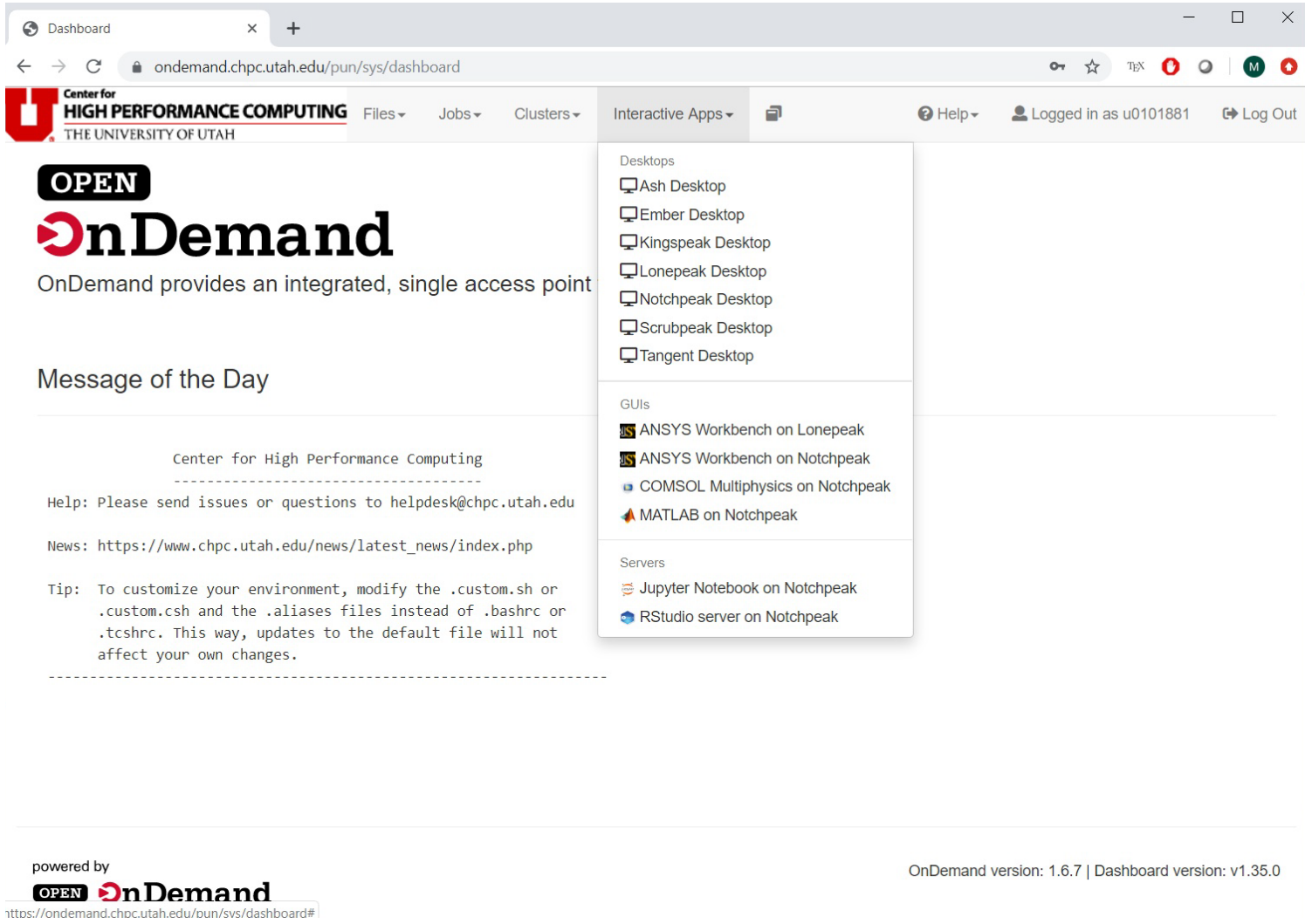
Clusters terminal access

- Shell terminal access to each cluster
- Opens a new browser tab with terminal



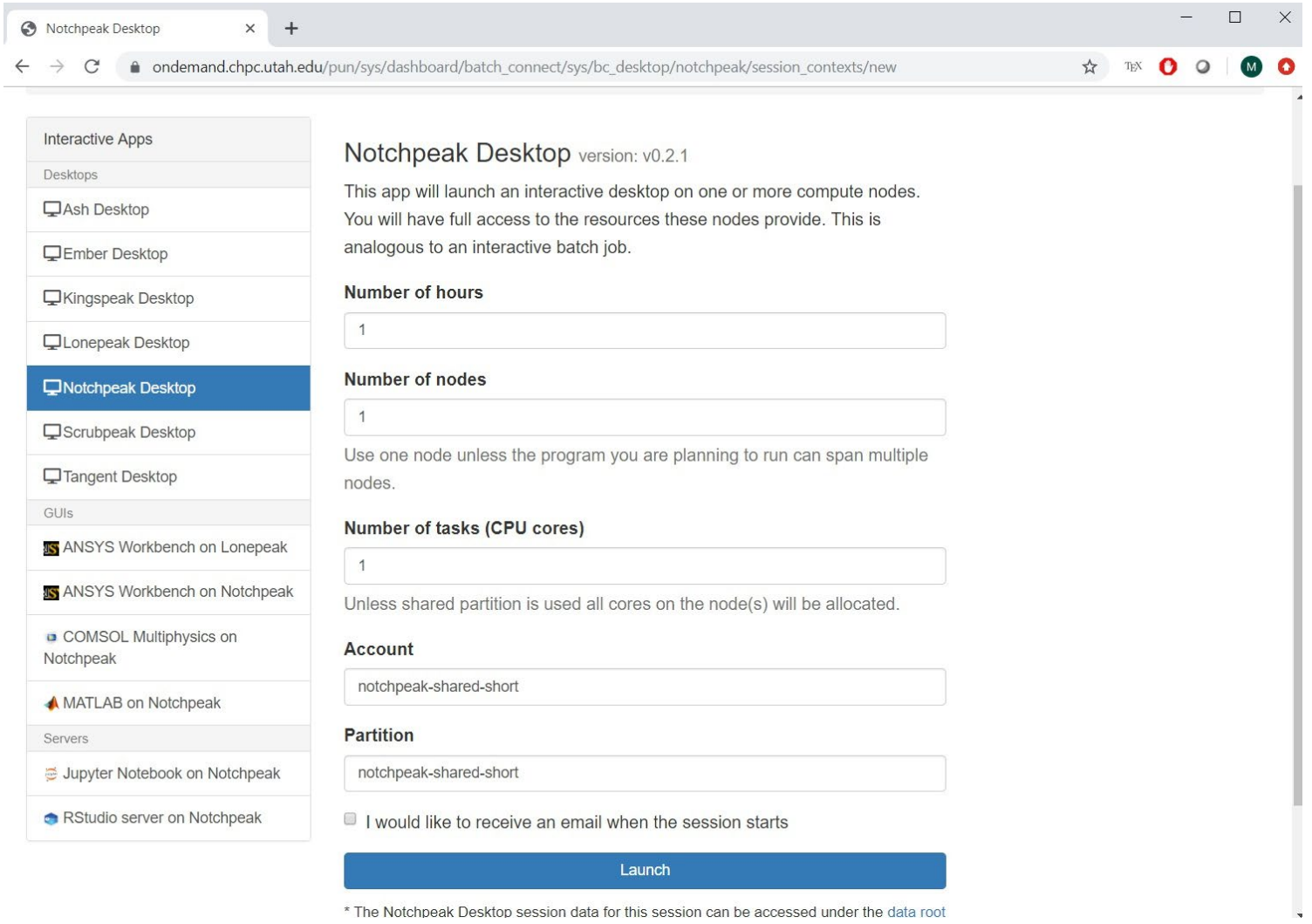
Interactive apps

- Interactive jobs
- The most unique feature of OOD
- Session on a compute node inside interactive SLURM job
- Either remote desktop or application



Interactive apps - desktop

- Specific for each cluster
- To start the desktop job ASAP use notchpeak-shared-short
- Wait time may be longer on other clusters unless group has owner nodes

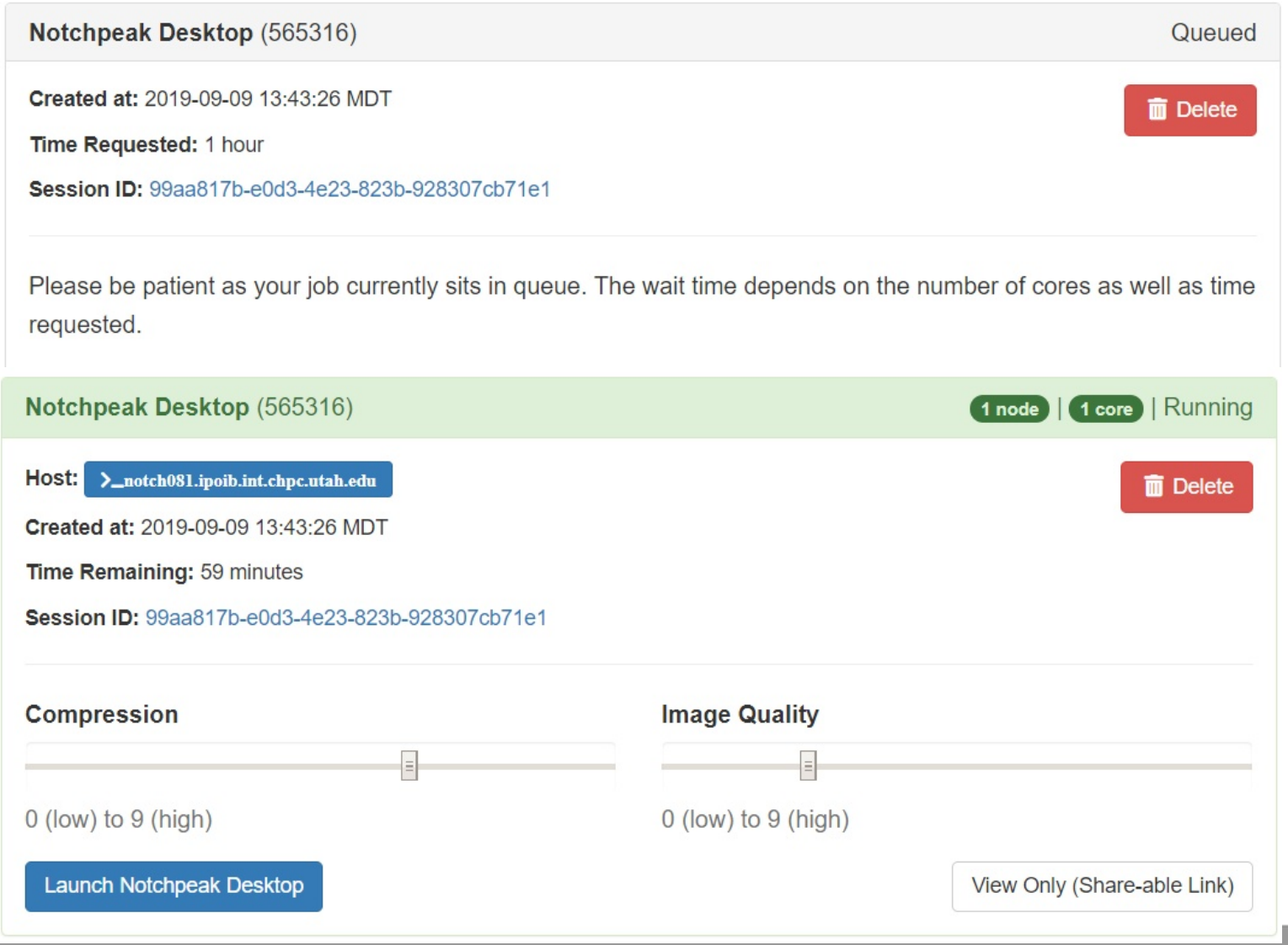


notchpeak-shared-short

- Account/partition devoted to interactive jobs
- Two 64 core, 256 GB AMD Zen CPU based nodes
- Max walltime 8 hours
- Max 32 tasks, 64 GB RAM per user
- Instant job allocation = interactivity of the job
- Good for OOD interactive apps, testing, debugging, etc
- `srun -n 1 -N 1 -A notchpeak-shared-short -p notchpeak-shared-short -t 8:00:00 --pty /bin/bash -l`

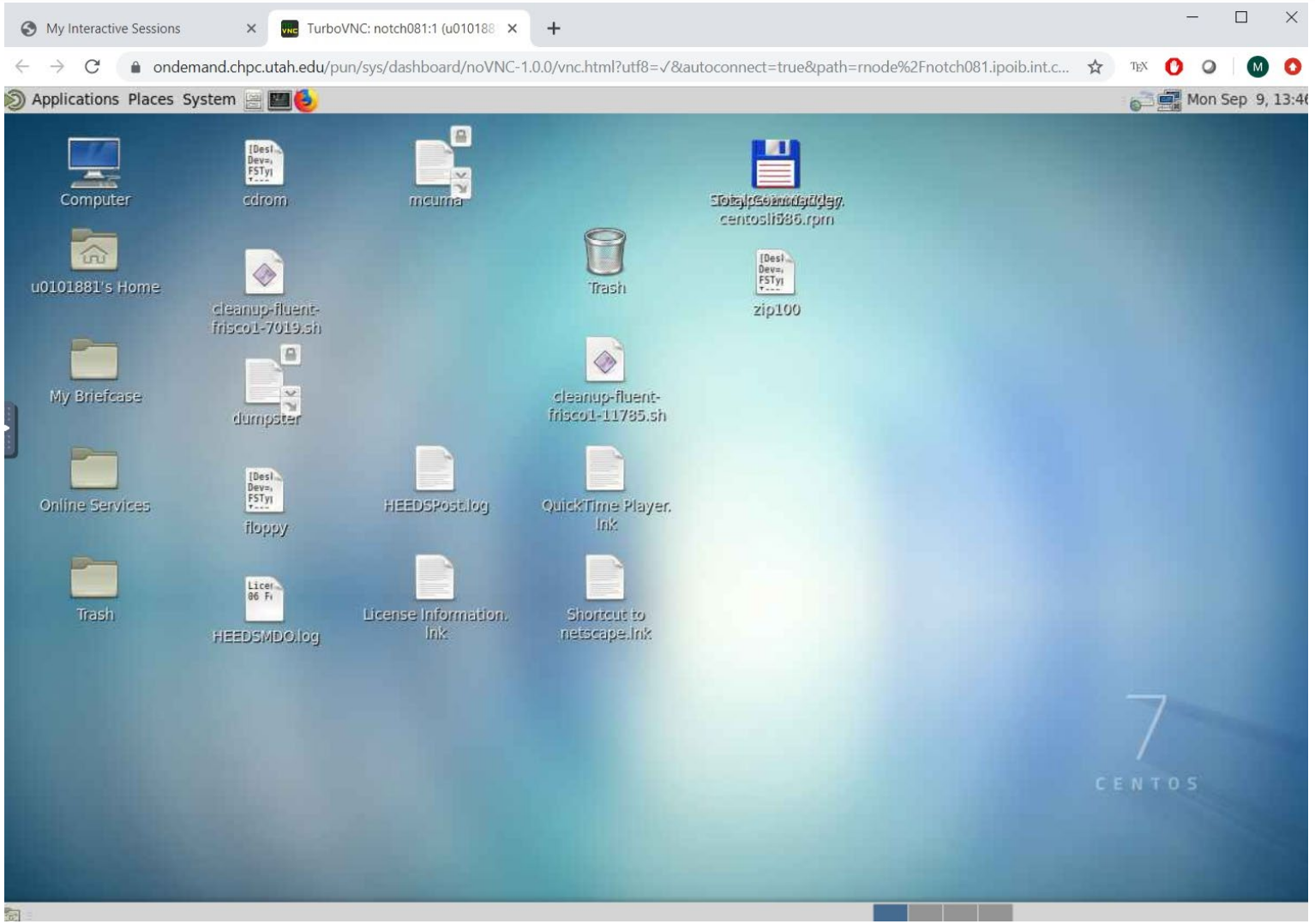
Interactive desktop launch

- First job is queued
- Once job starts, Launch button appears
- Can modify the viewing quality
- Also can share the link for others to view (but not do anything else)



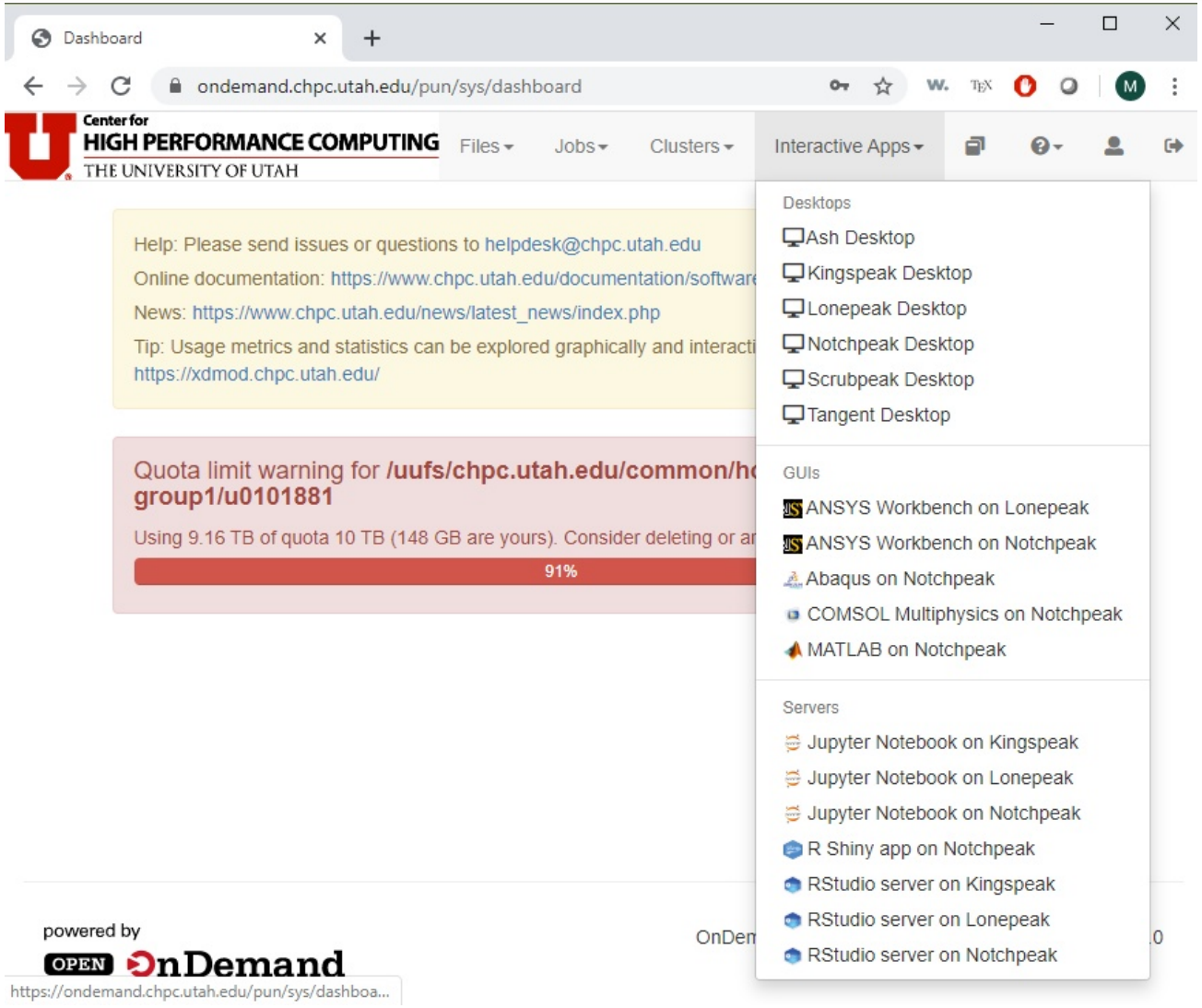
Interactive desktop launch

- Interactive job's remote desktop is launched in a separate browser tab
- Closing the tab does not delete the job (persistent connection)
- Must hit Delete to delete the job



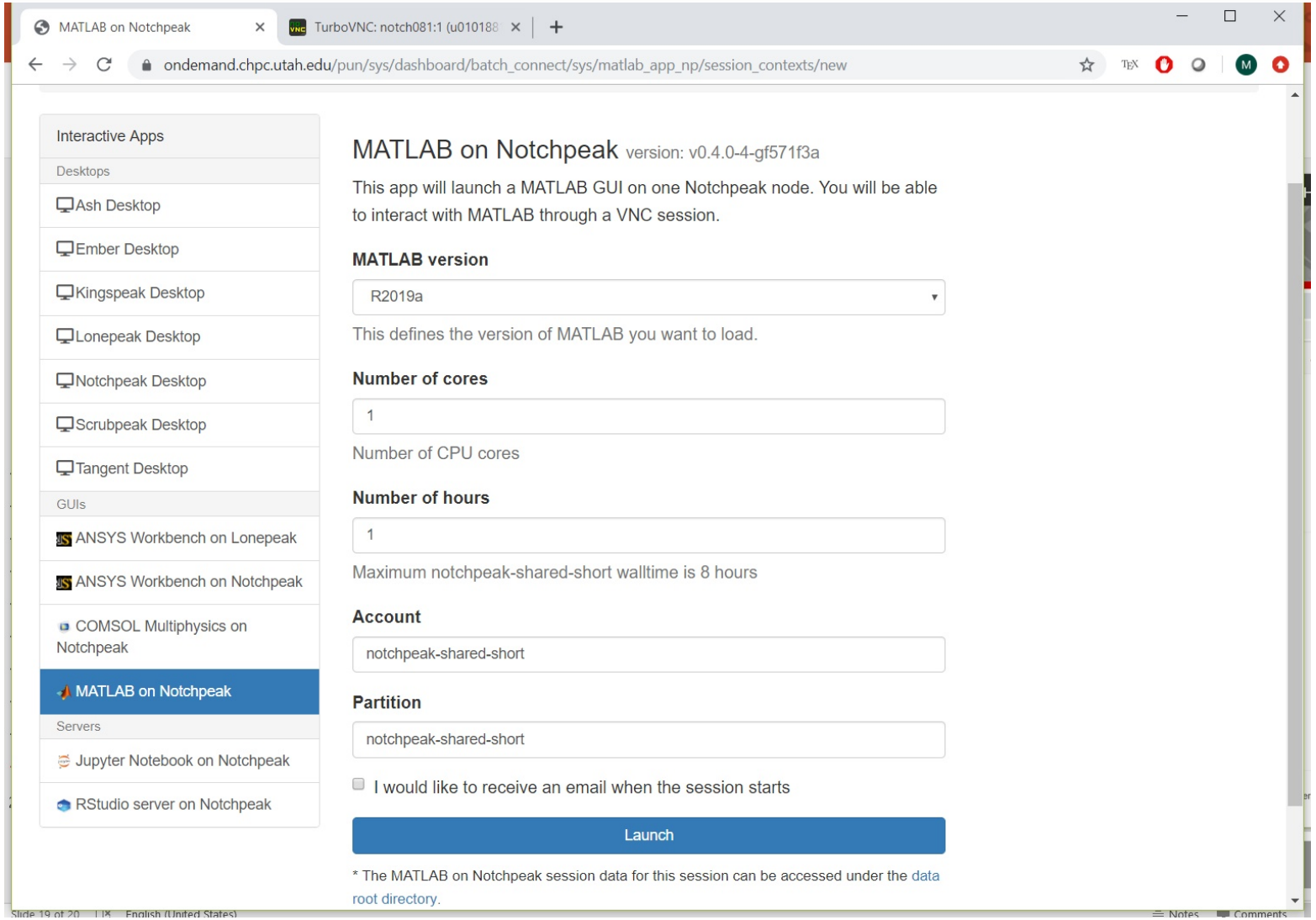
Interactive apps - GUIs and servers

- Direct launch of a given application
- Abaqus, ANSYS, COMSOL, MATLAB
- Jupyter Notebook
- RStudio server, R Shiny app
- Can set up others if needed



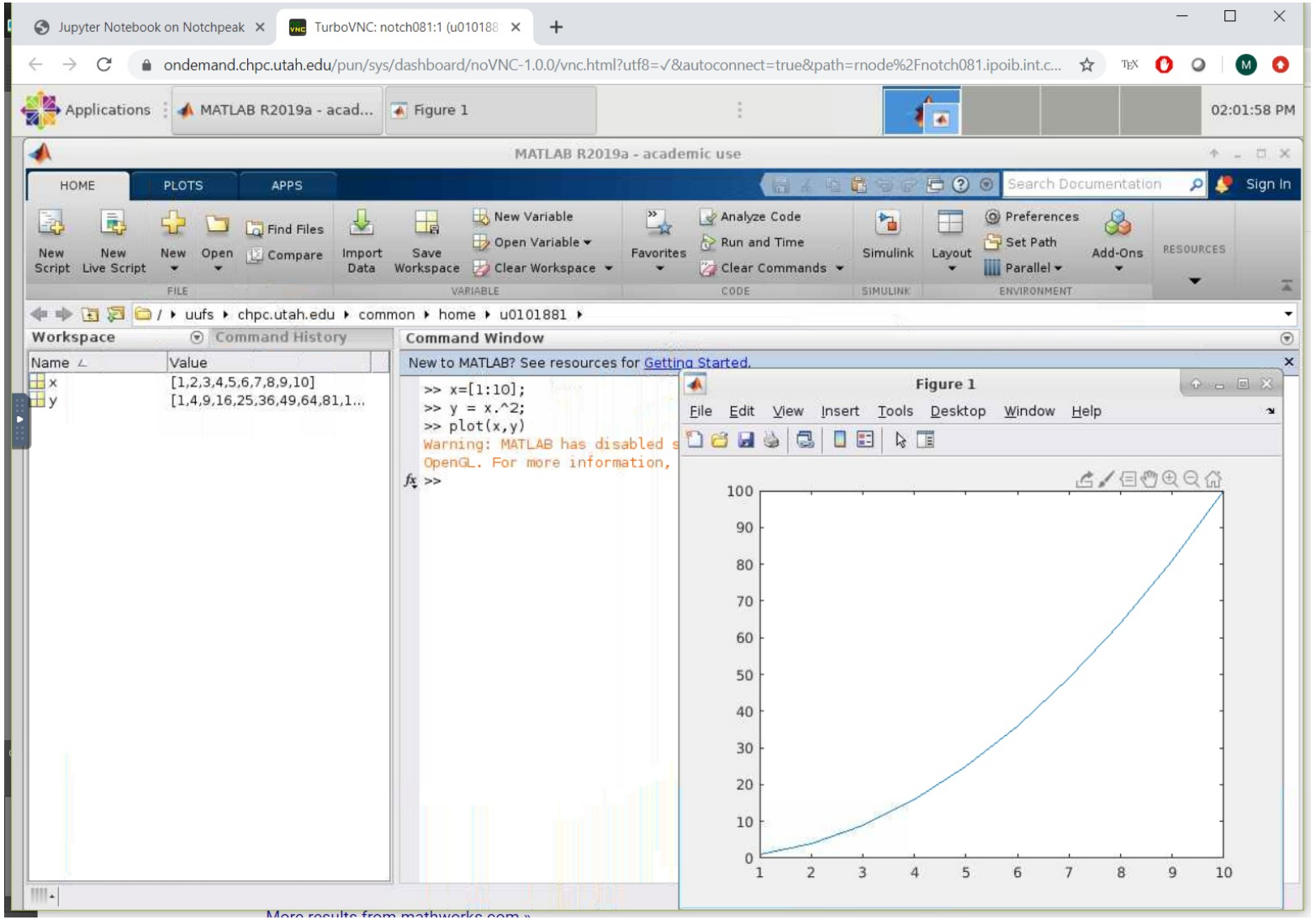
Interactive apps - MATLAB

- Same start parameters as in Interactive Desktop
- Plus option to choose MATLAB version
- Only on Notchpeak at the moment



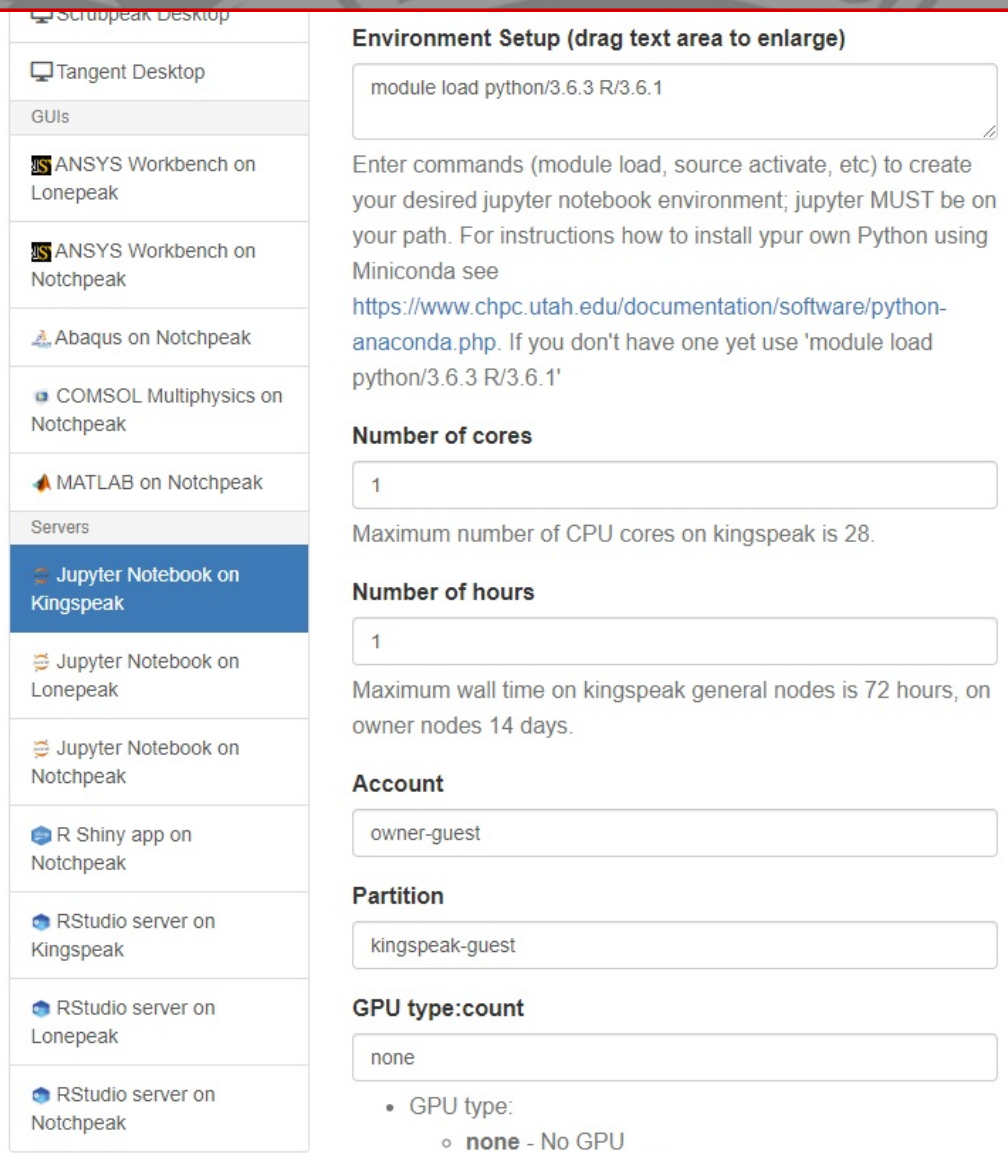
Interactive apps - MATLAB

- MATLAB GUI window
- Additional MATLAB windows appear over the GUI



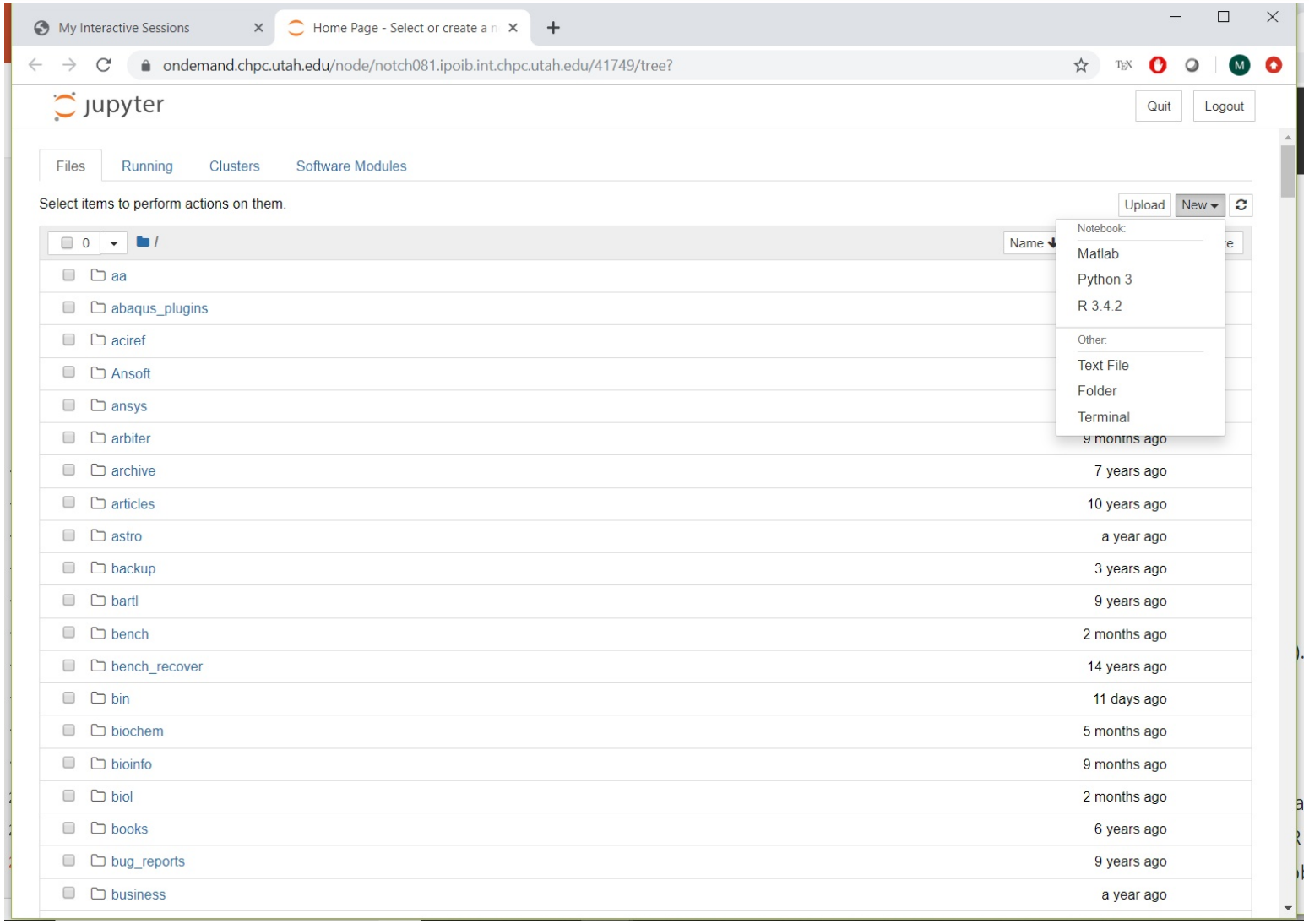
Interactive apps - Jupyter notebook

- Specify own or CHPC Python module
- Can also specify GPU - but make sure to list the right account/partition
- Available on Notchpeak, Kingspeak and Lonepeak



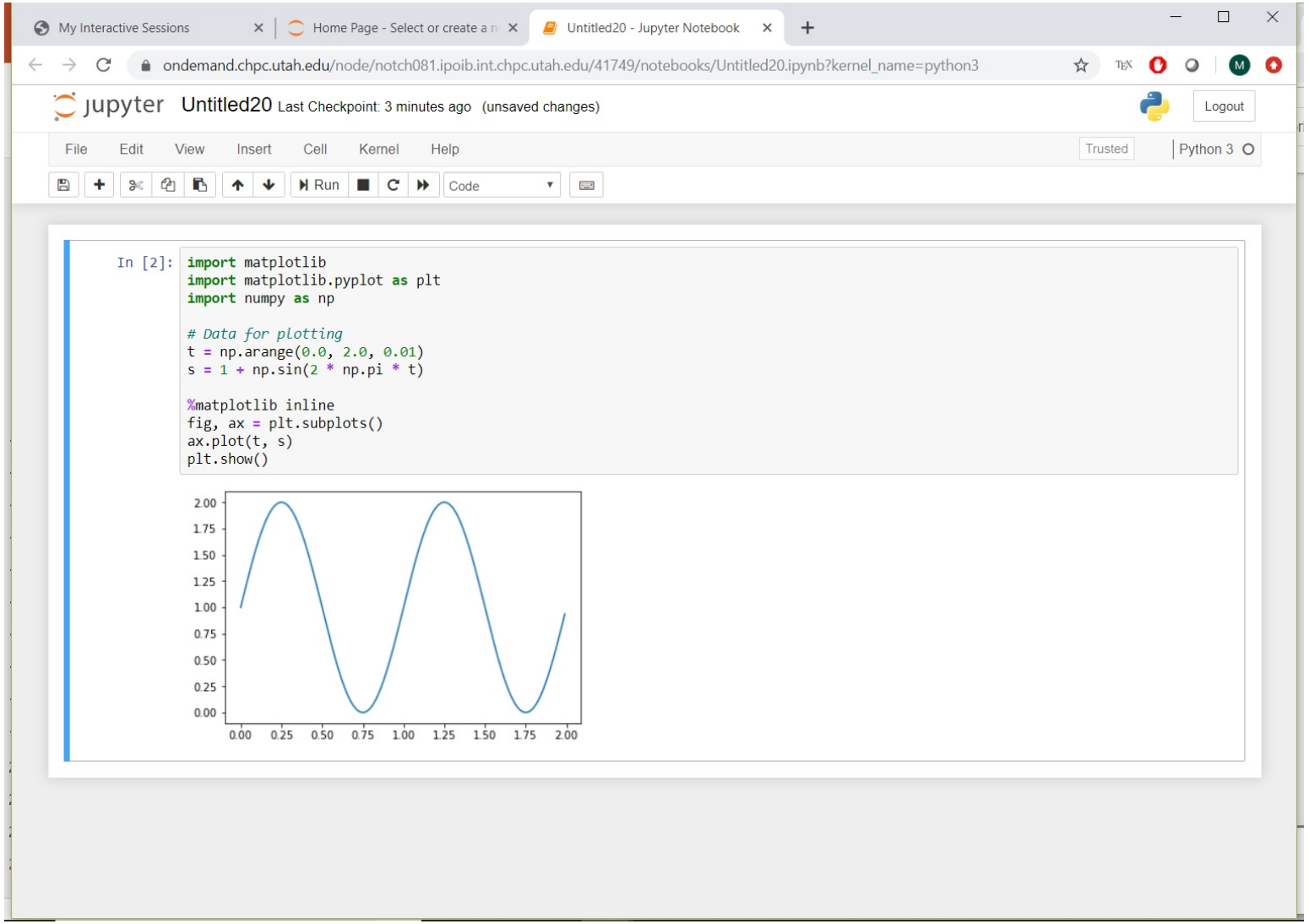
Interactive apps - Jupyter notebook

- Own Python needs to be installed via Anaconda, see CHPC webpage for instructions
- CHPC Python also has MATLAB and R notebooks
- Other languages can be installed if needed



Interactive apps - Jupyter notebook

- The notebook is launched in another browser tab



Future outlook

- Interface improvements
  - e.g. job submission from the File Explorer
- Other interactive apps based on user demand
- More flexible interactive targets (e.g. frisco nodes)
- Job accounting and metrics from XDMod
- Integration with other gateways

Further resources

- http://ondemand.chpc.utah.edu
- https://www.chpc.utah.edu/documentation/software/ondemand.php
- http://openondemand.org/
- https://www.osc.edu/resources/online_portals/ondemand