

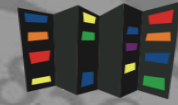
# Hands-on introduction to Open OnDemand

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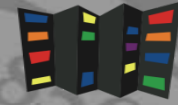
- What is Open OnDemand
- File operations
- Job management
- Interactive remote desktop
- Interactive applications
- Future outlook



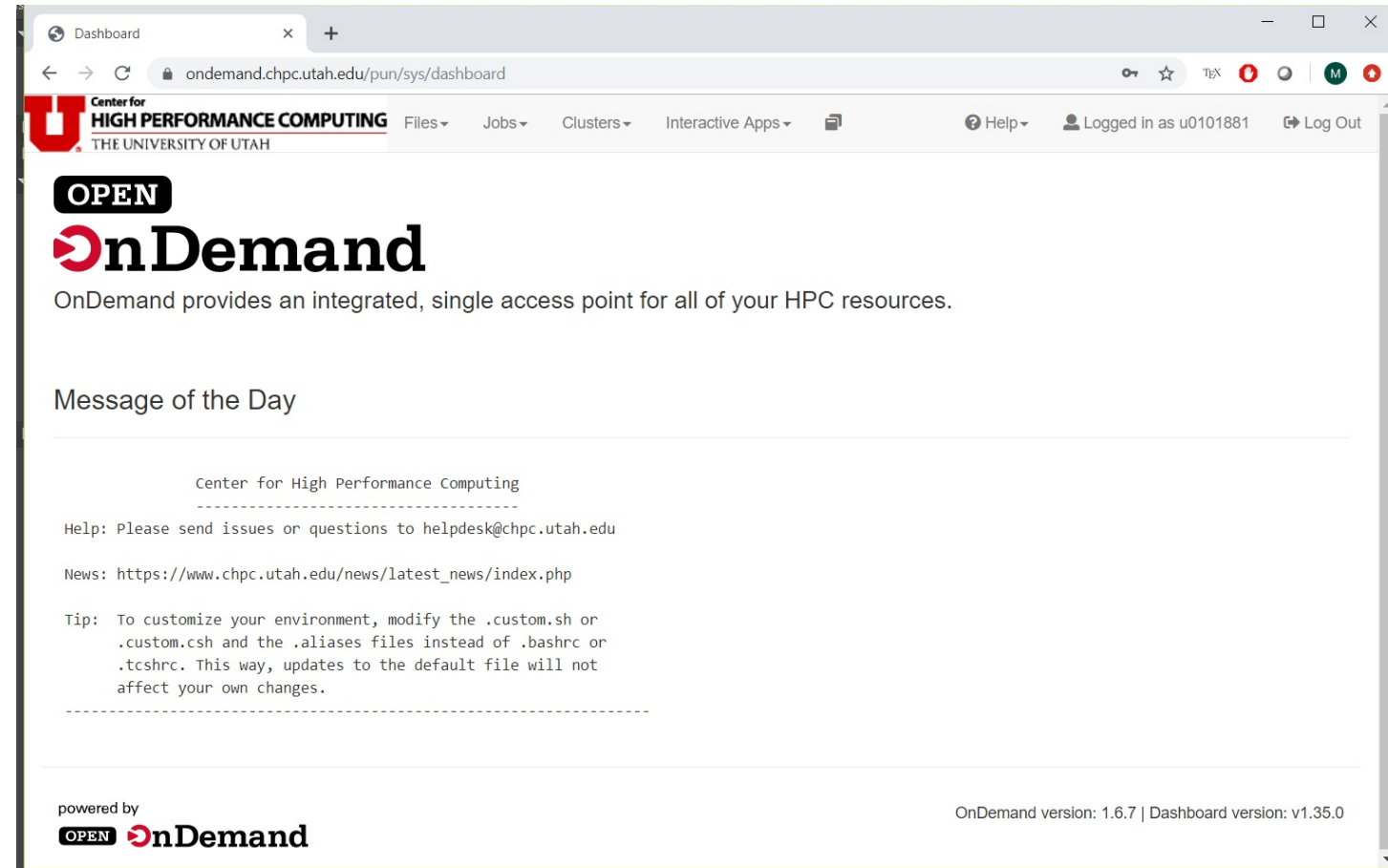
1. Internet access
2. Web browser
3. CHPC account



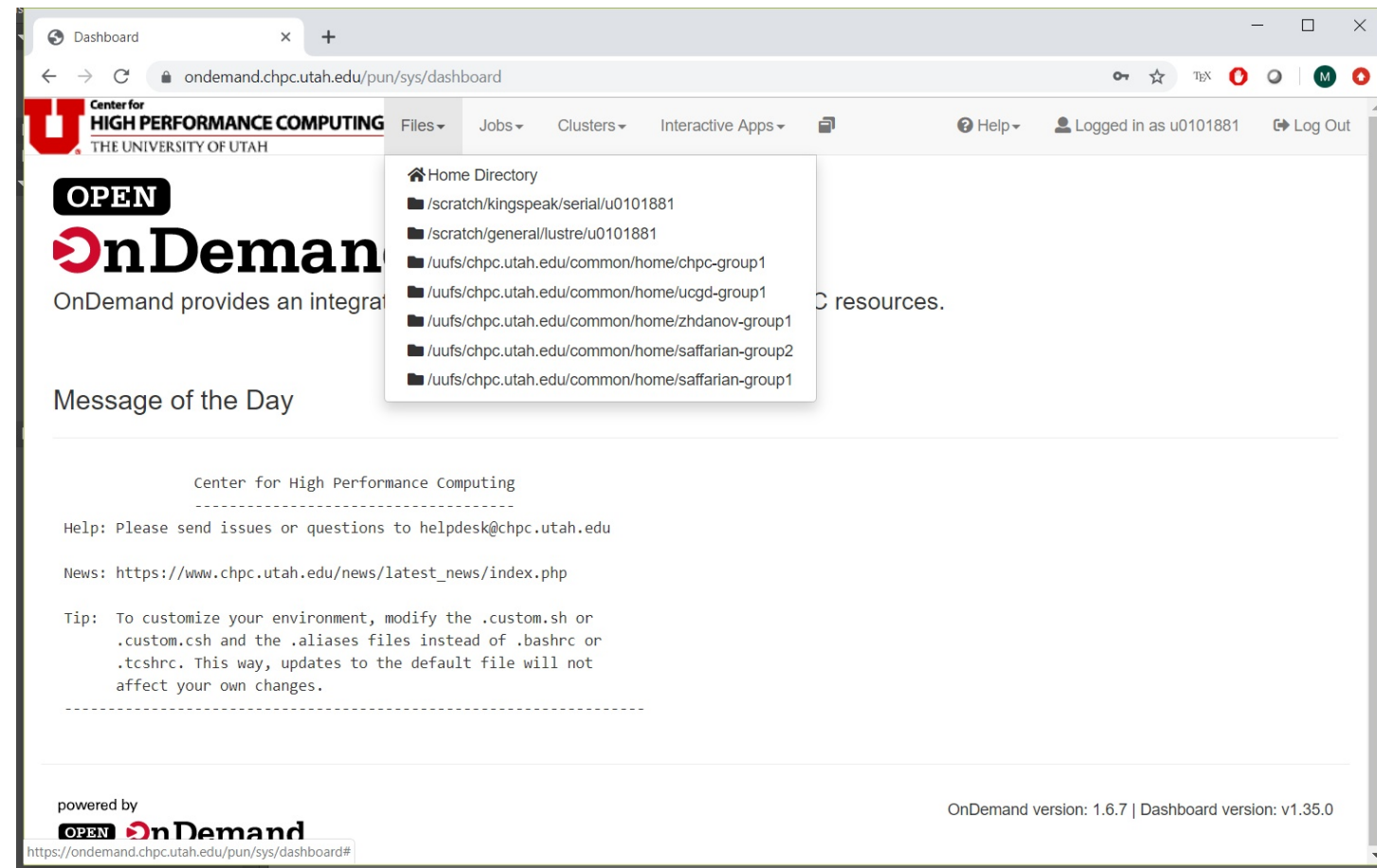
- Web portal to HPC resources - [openondemand.org](https://openondemand.org)
- Easier, command line free, use of HPC resources
- File management module
- Job submission and monitoring module
- Interactive desktop and applications
  - e.g. MATLAB, ANSYS, Jupyter Notebook, R Studio Server
- Actively developed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



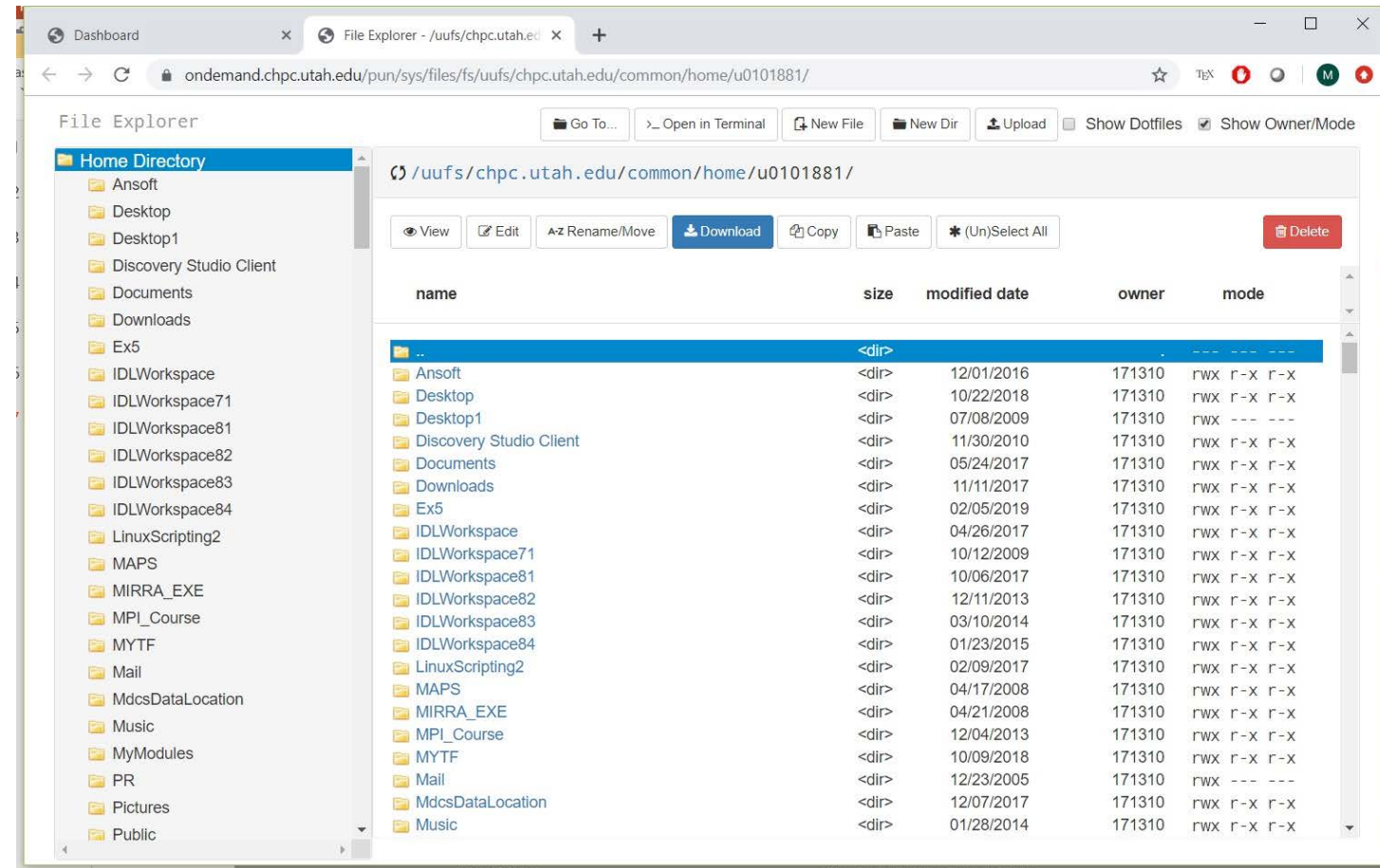
- [ondemand.chpc.utah.edu](https://ondemand.chpc.utah.edu)
- Log in with your uNID and password



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

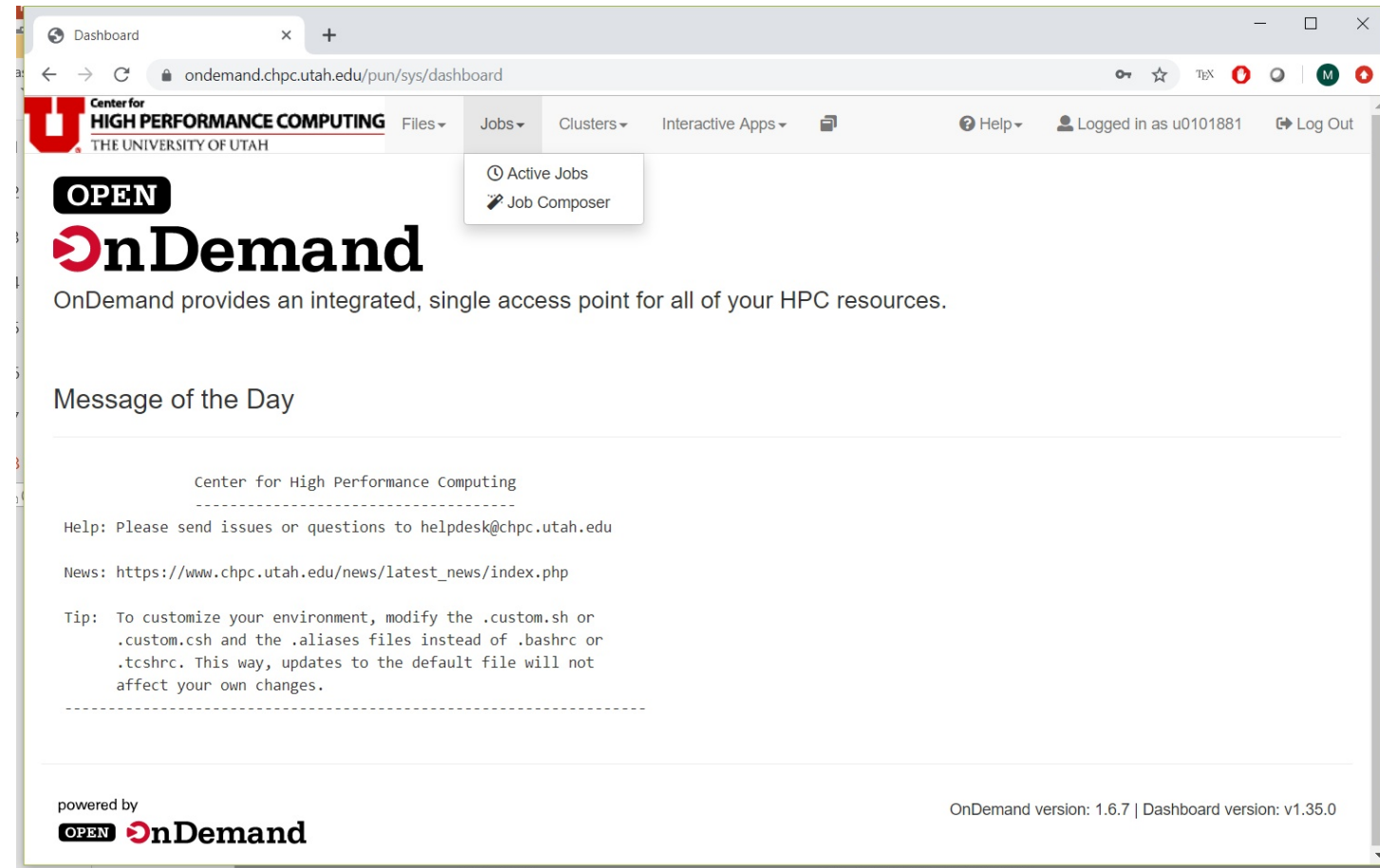


- Drag and drop copying, renaming
- File viewing and editing
- Open in terminal
- Upload and Download



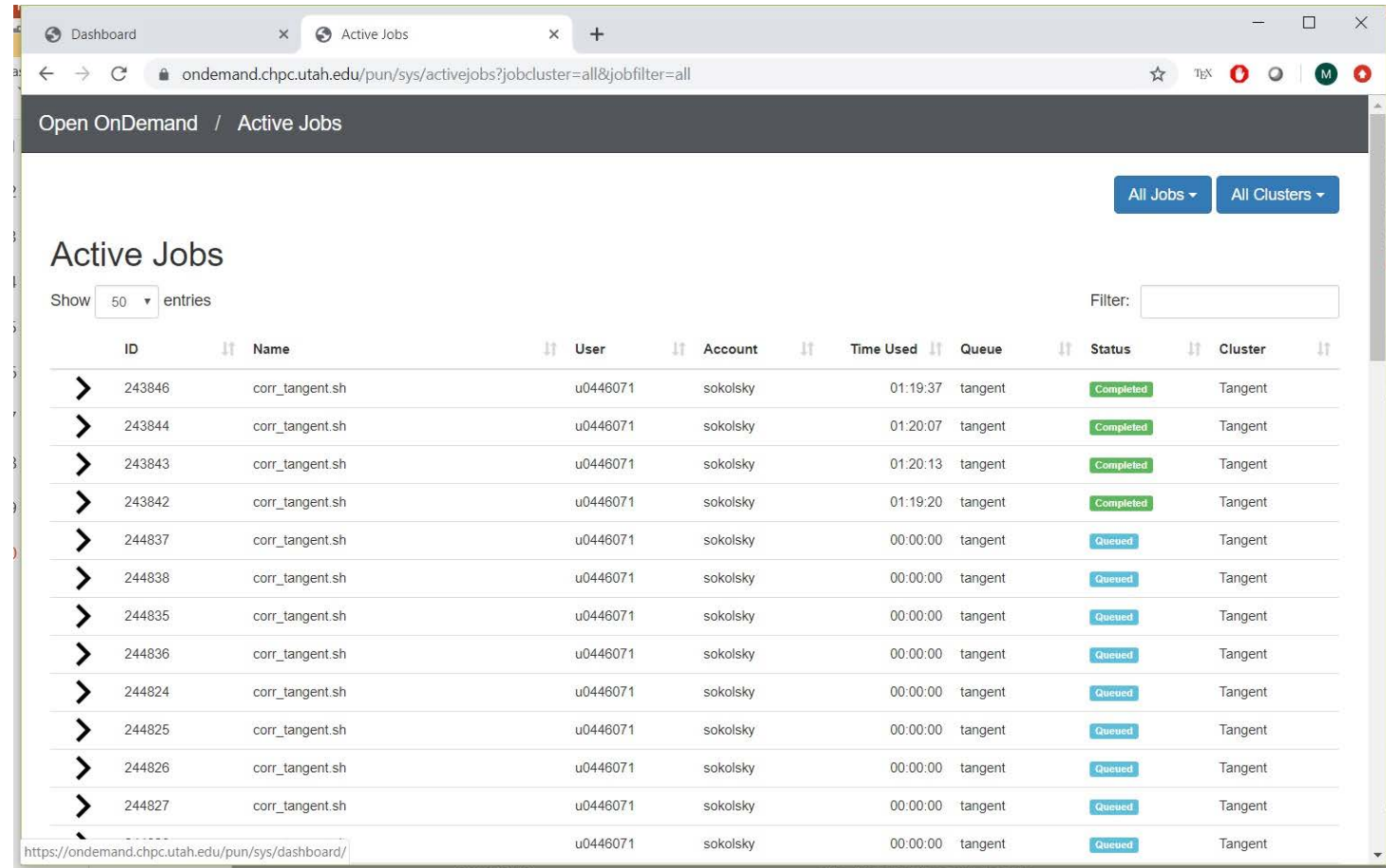


- Listing of active jobs
- Creating and submitting new jobs





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



Open OnDemand / Active Jobs

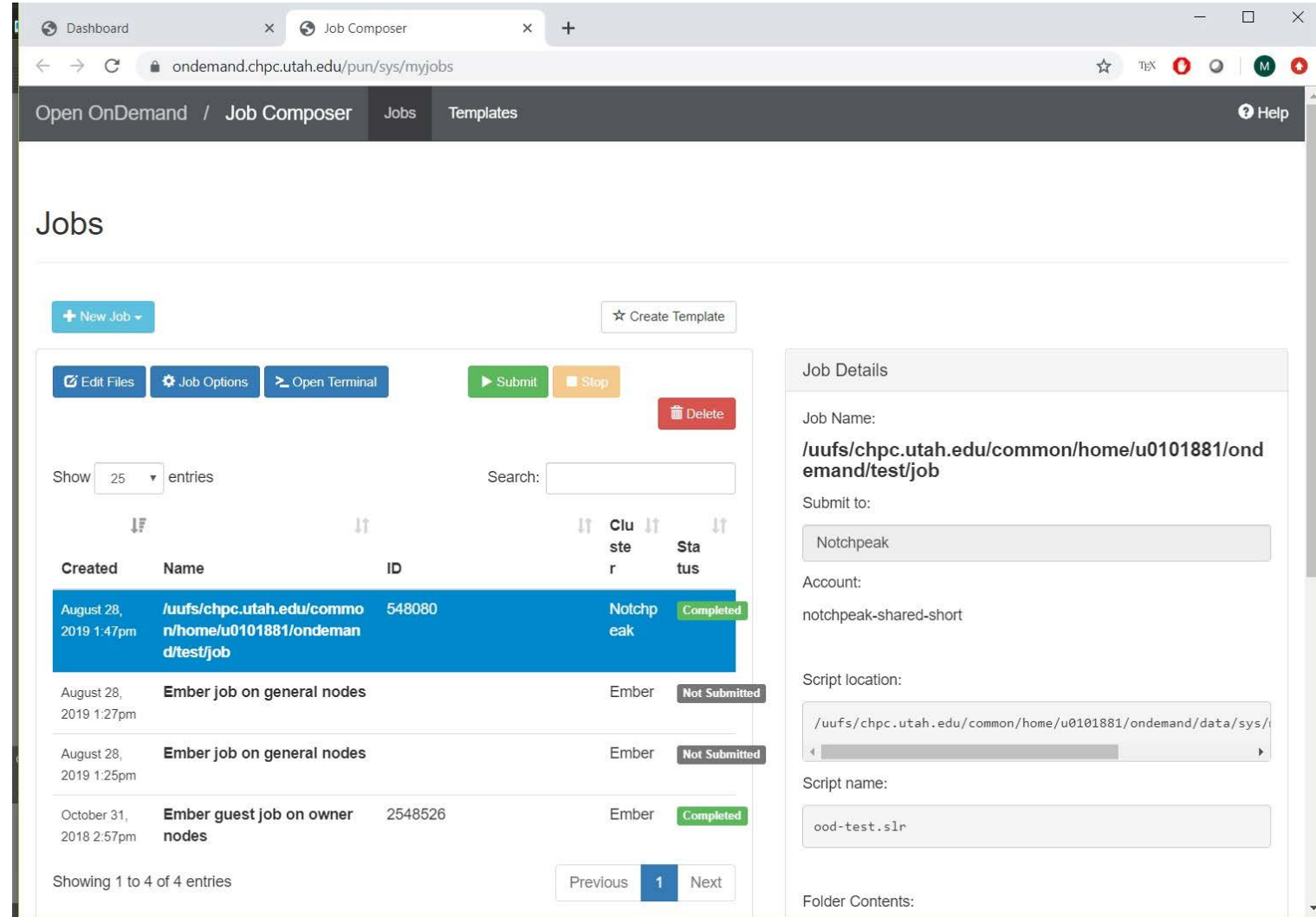
Active Jobs

Show 50 entries

Filter:

ID	Name	User	Account	Time Used	Queue	Status	Cluster
> 243846	corr_tangent.sh	u0446071	sokolsky	01:19:37	tangent	Completed	Tangent
> 243844	corr_tangent.sh	u0446071	sokolsky	01:20:07	tangent	Completed	Tangent
> 243843	corr_tangent.sh	u0446071	sokolsky	01:20:13	tangent	Completed	Tangent
> 243842	corr_tangent.sh	u0446071	sokolsky	01:19:20	tangent	Completed	Tangent
> 244837	corr_tangent.sh	u0446071	sokolsky	00:00:00	tangent	Queued	Tangent
> 244838	corr_tangent.sh	u0446071	sokolsky	00:00:00	tangent	Queued	Tangent
> 244835	corr_tangent.sh	u0446071	sokolsky	00:00:00	tangent	Queued	Tangent
> 244836	corr_tangent.sh	u0446071	sokolsky	00:00:00	tangent	Queued	Tangent
> 244824	corr_tangent.sh	u0446071	sokolsky	00:00:00	tangent	Queued	Tangent
> 244825	corr_tangent.sh	u0446071	sokolsky	00:00:00	tangent	Queued	Tangent
> 244826	corr_tangent.sh	u0446071	sokolsky	00:00:00	tangent	Queued	Tangent
> 244827	corr_tangent.sh	u0446071	sokolsky	00:00:00	tangent	Queued	Tangent
> 244828	corr_tangent.sh	u0446071	sokolsky	00:00:00	tangent	Queued	Tangent

- 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`



The screenshot shows the Job Composer web interface. The top navigation bar includes links for Dashboard, Job Composer, Jobs, and Templates. The main content area is titled 'Jobs' and features a table of job entries. The table has columns for Created, Name, ID, Cluster, and Status. The first job is 'Notchpeak' with ID 548080, status 'Completed'. The second job is 'Ember job on general nodes' with ID 2548526, status 'Not Submitted'. The third job is 'Ember guest job on owner nodes' with ID 2548526, status 'Completed'. The fourth job is 'Ember job on general nodes' with ID 2548526, status 'Not Submitted'. The table also includes a search bar and a 'Show 25 entries' dropdown. On the right side, the 'Job Details' panel shows the job name, submit to, account, script location, script name, and folder contents.

Created	Name	ID	Cluster	Status
August 28, 2019 1:47pm	/uufs/chpc.utah.edu/common/home/u0101881/ondemand/test/job	548080	Notchpeak	Completed
August 28, 2019 1:27pm	Ember job on general nodes		Ember	Not Submitted
August 28, 2019 1:25pm	Ember job on general nodes		Ember	Not Submitted
October 31, 2018 2:57pm	Ember guest job on owner nodes	2548526	Ember	Completed

Showing 1 to 4 of 4 entries

Job Details

Job Name: /uufs/chpc.utah.edu/common/home/u0101881/ondemand/test/job

Submit to: Notchpeak

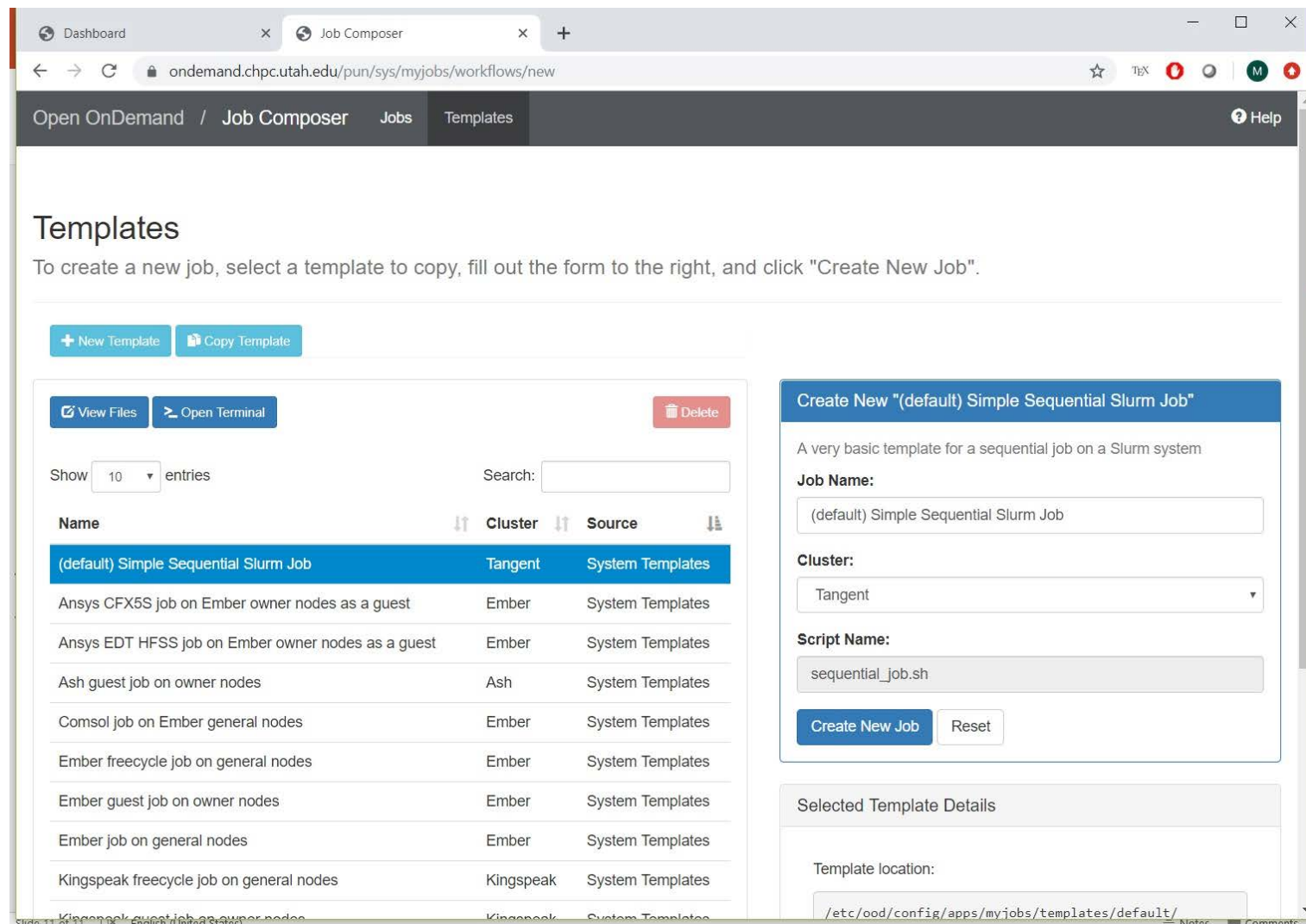
Account: notchpeak-shared-short

Script location: /uufs/chpc.utah.edu/common/home/u0101881/ondemand/data/sys/

Script name: ood-test.slr

Folder Contents:

- 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>



The screenshot shows the Job Composer web interface. The top navigation bar includes "Open OnDemand / Job Composer Jobs Templates". The main heading is "Templates" with a subtext: "To create a new job, select a template to copy, fill out the form to the right, and click 'Create New Job'".

Below the heading, there are two buttons: "+ New Template" and "Copy Template". Below these are "View Files" and "Open Terminal" buttons, and a "Delete" button.

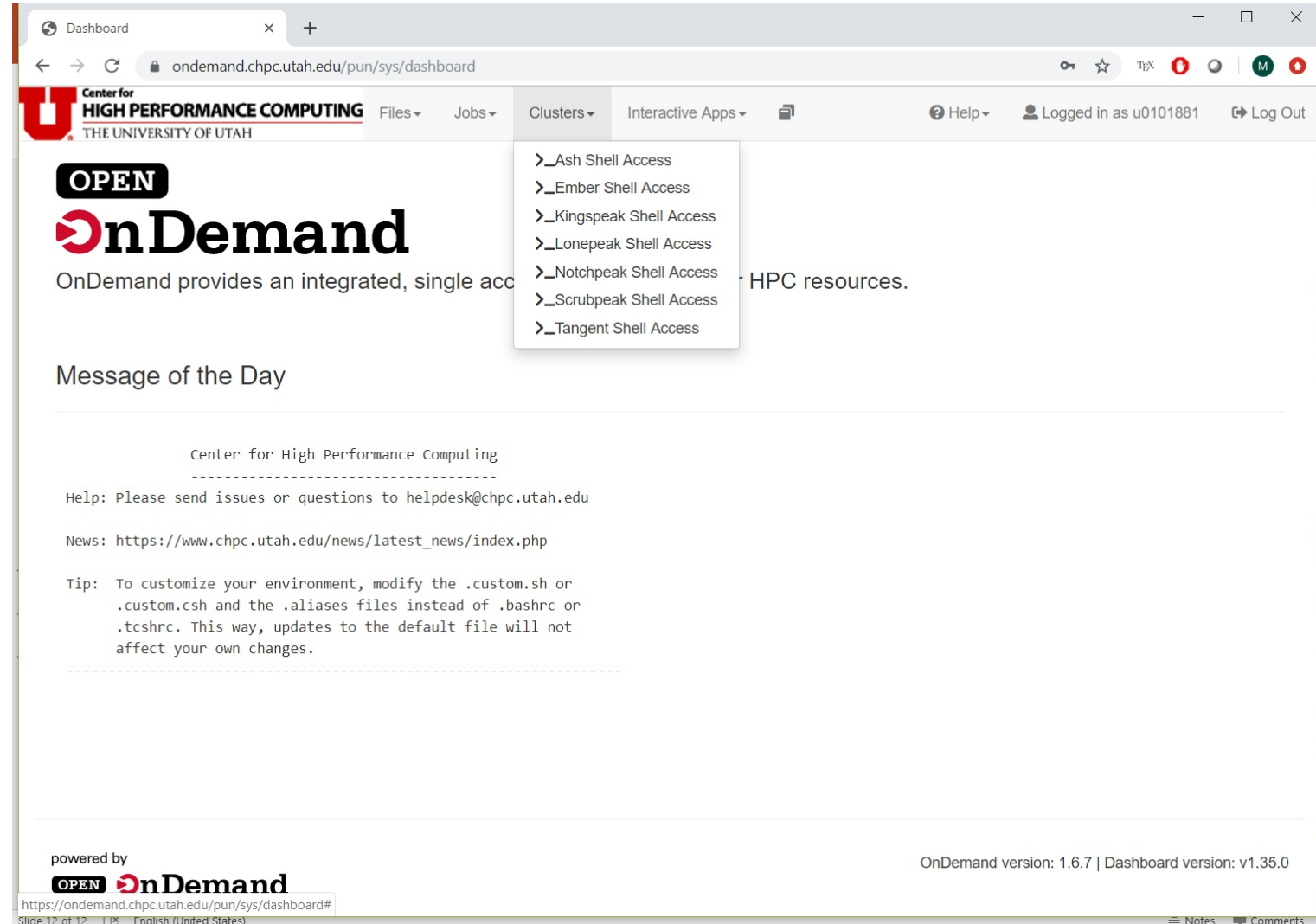
A table lists available templates. The first template, "(default) Simple Sequential Slurm Job", is highlighted. The table has columns for Name, Cluster, and Source.

Name	Cluster	Source
(default) Simple Sequential Slurm Job	Tangent	System Templates
Ansys CFX5S job on Ember owner nodes as a guest	Ember	System Templates
Ansys EDT HFSS job on Ember owner nodes as a guest	Ember	System Templates
Ash guest job on owner nodes	Ash	System Templates
Comsol job on Ember general nodes	Ember	System Templates
Ember freecycle job on general nodes	Ember	System Templates
Ember guest job on owner nodes	Ember	System Templates
Ember job on general nodes	Ember	System Templates
Kingspeak freecycle job on general nodes	Kingspeak	System Templates

To the right of the table is a form titled "Create New '(default) Simple Sequential Slurm Job'". It contains fields for "Job Name" (with a default value of "(default) Simple Sequential Slurm Job"), "Cluster" (a dropdown menu with "Tangent" selected), and "Script Name" (with a default value of "sequential\_job.sh"). There are "Create New Job" and "Reset" buttons.

Below the form is a section titled "Selected Template Details" which shows the "Template location" as "/etc/ood/config/apps/myjobs/templates/default/".

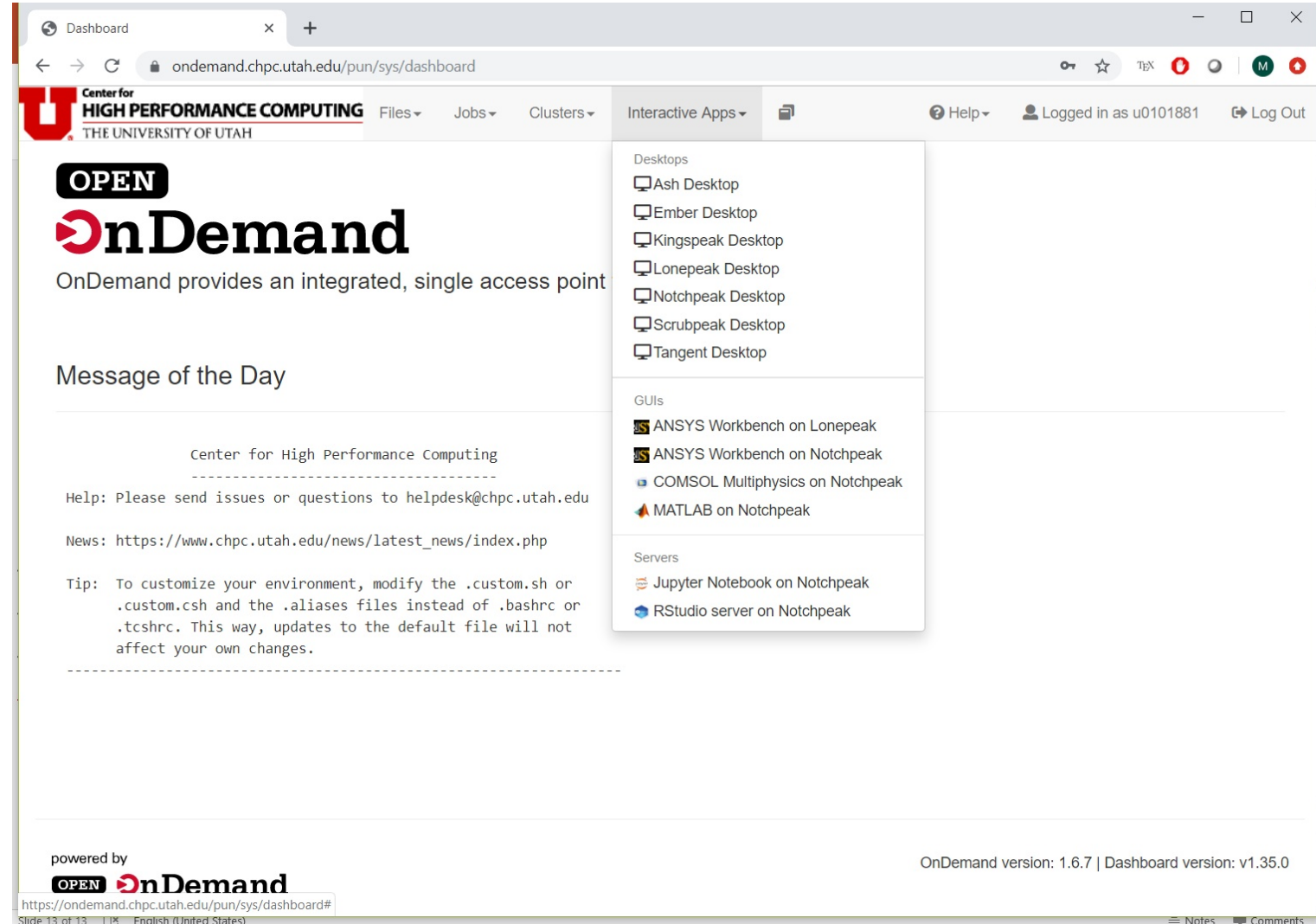
- Shell terminal access to each cluster
- Opens a new browser tab with terminal



The screenshot shows the OnDemand dashboard in a web browser. The URL is [ondemand.chpc.utah.edu/pun/sys/dashboard](https://ondemand.chpc.utah.edu/pun/sys/dashboard). The page features a navigation bar with links for Files, Jobs, Clusters, and Interactive Apps. A dropdown menu for Clusters is open, listing shell access options: >\_Ash Shell Access, >\_Ember Shell Access, >\_Kingspeak Shell Access, >\_Lonepeak Shell Access, >\_Notchpeak Shell Access, >\_Scrubpeak Shell Access, and >\_Tangent Shell Access. The main content area includes a large 'OPEN OnDemand' button, a message of the day, and a footer with version information (OnDemand version: 1.6.7 | Dashboard version: v1.35.0).

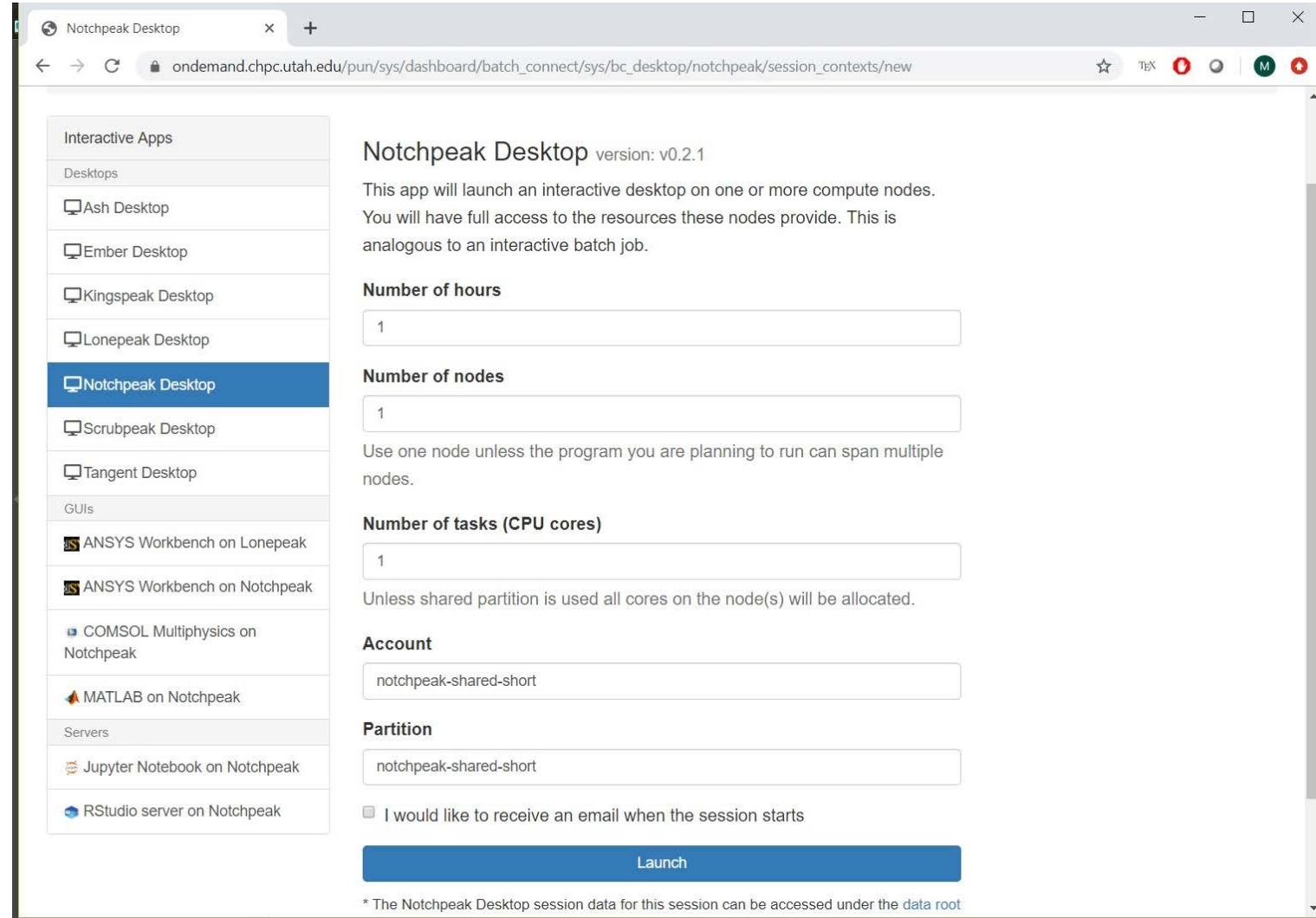


- Interactive jobs
- The most unique feature of OOD
- Session on a compute node inside interactive SLURM job
- Either remote desktop or application



The screenshot shows the OnDemand dashboard in a web browser. The URL is [ondemand.chpc.utah.edu/pun/sys/dashboard](https://ondemand.chpc.utah.edu/pun/sys/dashboard). The page features a navigation bar with links for Files, Jobs, Clusters, and Interactive Apps. The main content area includes an "OPEN OnDemand" logo, a "Message of the Day" section with contact information and a tip, and a sidebar menu. The sidebar menu lists various desktops (Ash, Ember, Kingspeak, Lonepeak, Notchpeak, Scrubpeak, Tangent) and GUIs (ANSYS Workbench on Lonepeak/Notchpeak, COMSOL Multiphysics on Notchpeak, MATLAB on Notchpeak). The footer indicates the dashboard is powered by OnDemand version 1.6.7 and the dashboard version is v1.35.0.

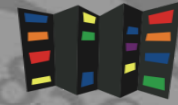
- Specific for each cluster
- To start the desktop job ASAP use notchpeak-shared-short
- Wait time may be longer on other clusters unless group has owner nodes



The screenshot shows the 'Notchpeak Desktop' web interface. On the left is a sidebar menu with categories: Interactive Apps, Desktops, GUIs, and Servers. Under Desktops, 'Notchpeak Desktop' is selected. The main content area shows the 'Notchpeak Desktop' configuration page for version v0.2.1. It includes a description, input fields for 'Number of hours' (1), 'Number of nodes' (1), and 'Number of tasks (CPU cores)' (1), each with a brief explanation. There are also fields for 'Account' (notchpeak-shared-short) and 'Partition' (notchpeak-shared-short). A checkbox for receiving an email is checked. A blue 'Launch' button is at the bottom. A footer note states: '\* The Notchpeak Desktop session data for this session can be accessed under the data root'.



- 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
- `sbatch -n 1 -N 1 -A notchpeak-shared-short -p notchpeak-shared-short -t 8:00:00 --pty /bin/bash -l`



- 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)

**Notchpeak Desktop (565316)** Queued

**Created at:** 2019-09-09 13:43:26 MDT  
**Time Requested:** 1 hour  
**Session ID:** [99aa817b-e0d3-4e23-823b-928307cb71e1](#)

[Delete](#)


Please be patient as your job currently sits in queue. The wait time depends on the number of cores as well as time requested.


**Notchpeak Desktop (565316)** 1 node | 1 core | Running

**Host:** [>\\_notch081.ipuib.int.chpc.utah.edu](#)

**Created at:** 2019-09-09 13:43:26 MDT  
**Time Remaining:** 59 minutes  
**Session ID:** [99aa817b-e0d3-4e23-823b-928307cb71e1](#)

[Delete](#)

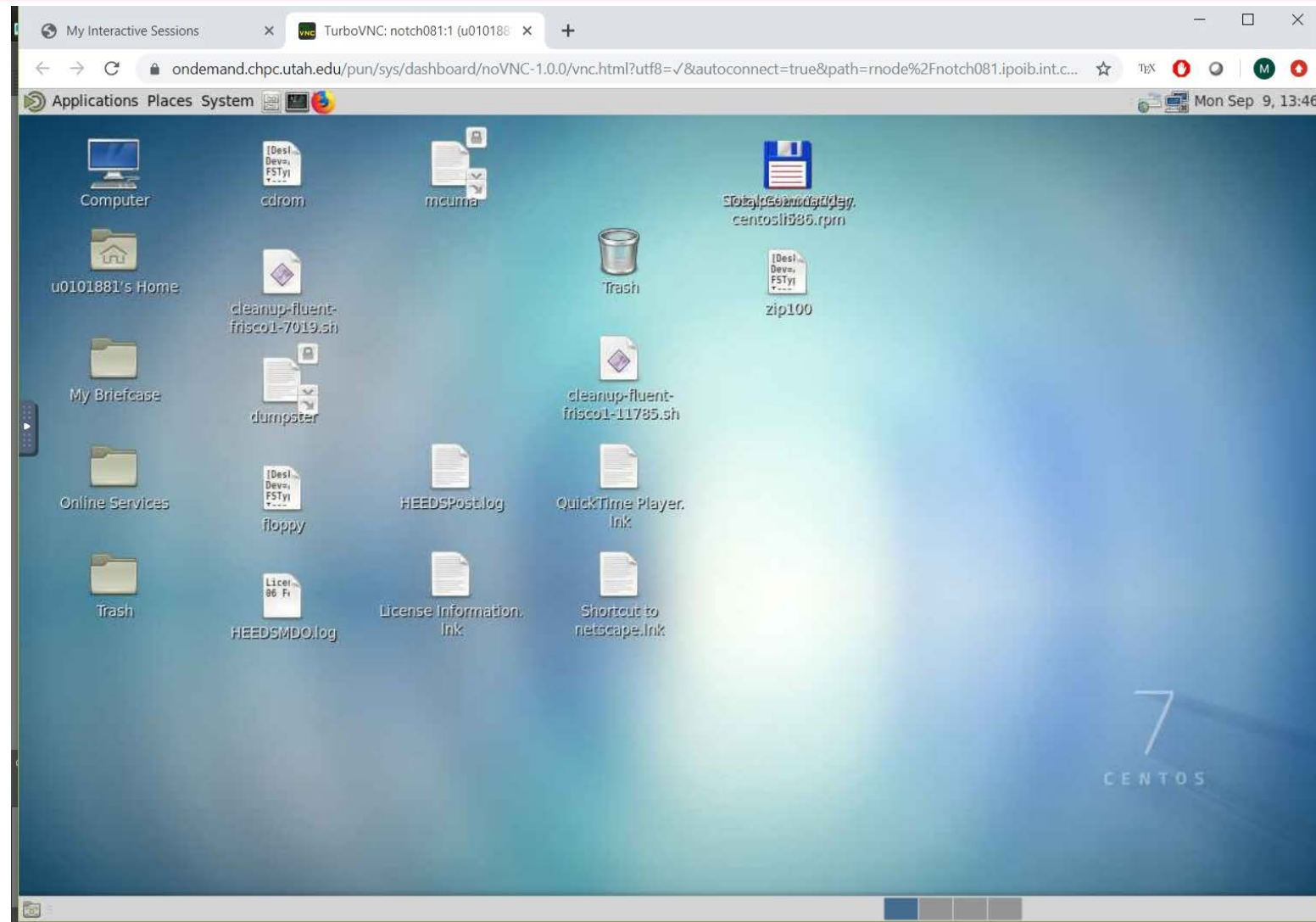
**Compression**  
  
0 (low) to 9 (high)

**Image Quality**  
  
0 (low) to 9 (high)

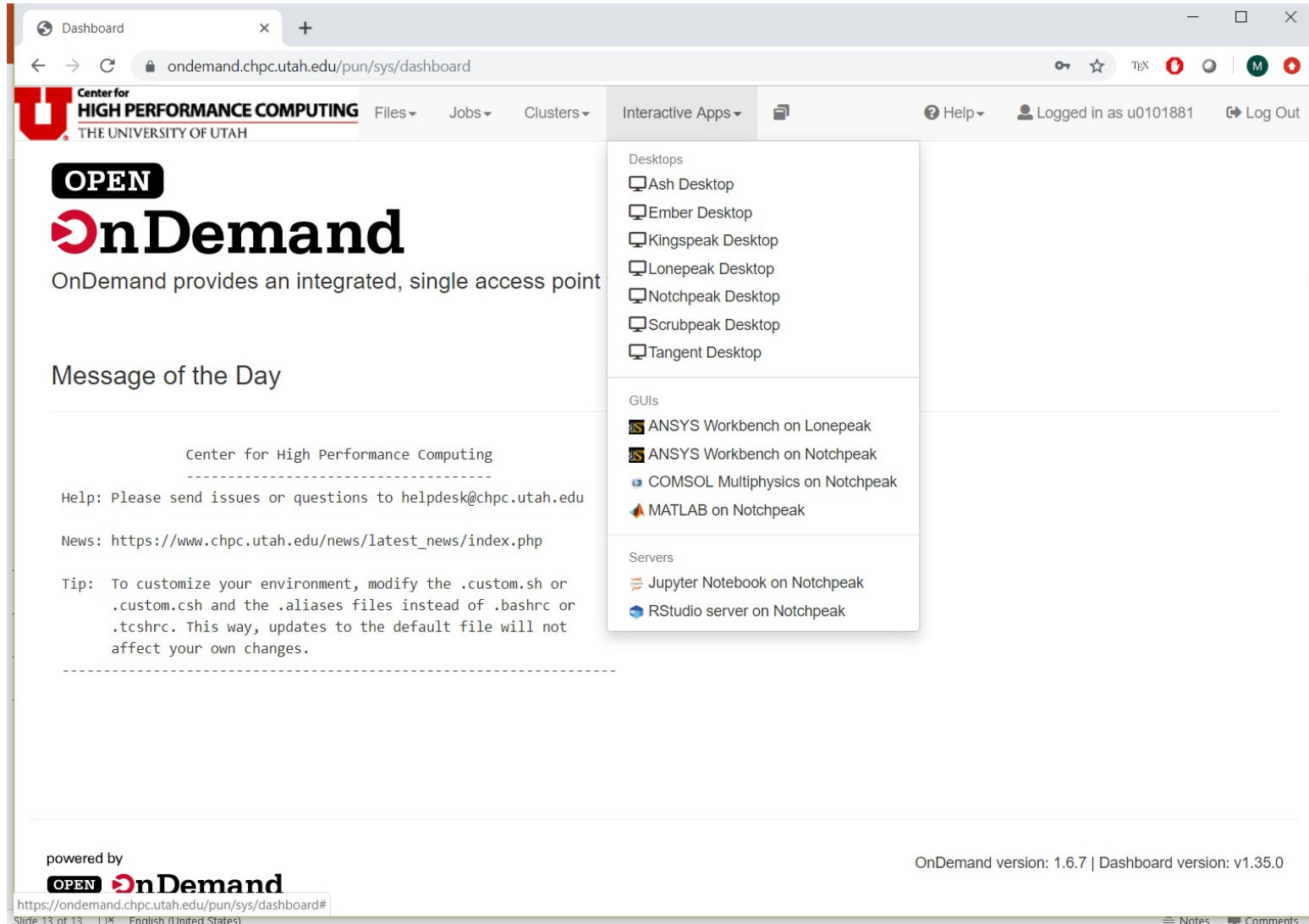
[Launch Notchpeak Desktop](#)

[View Only \(Share-able Link\)](#)

- 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



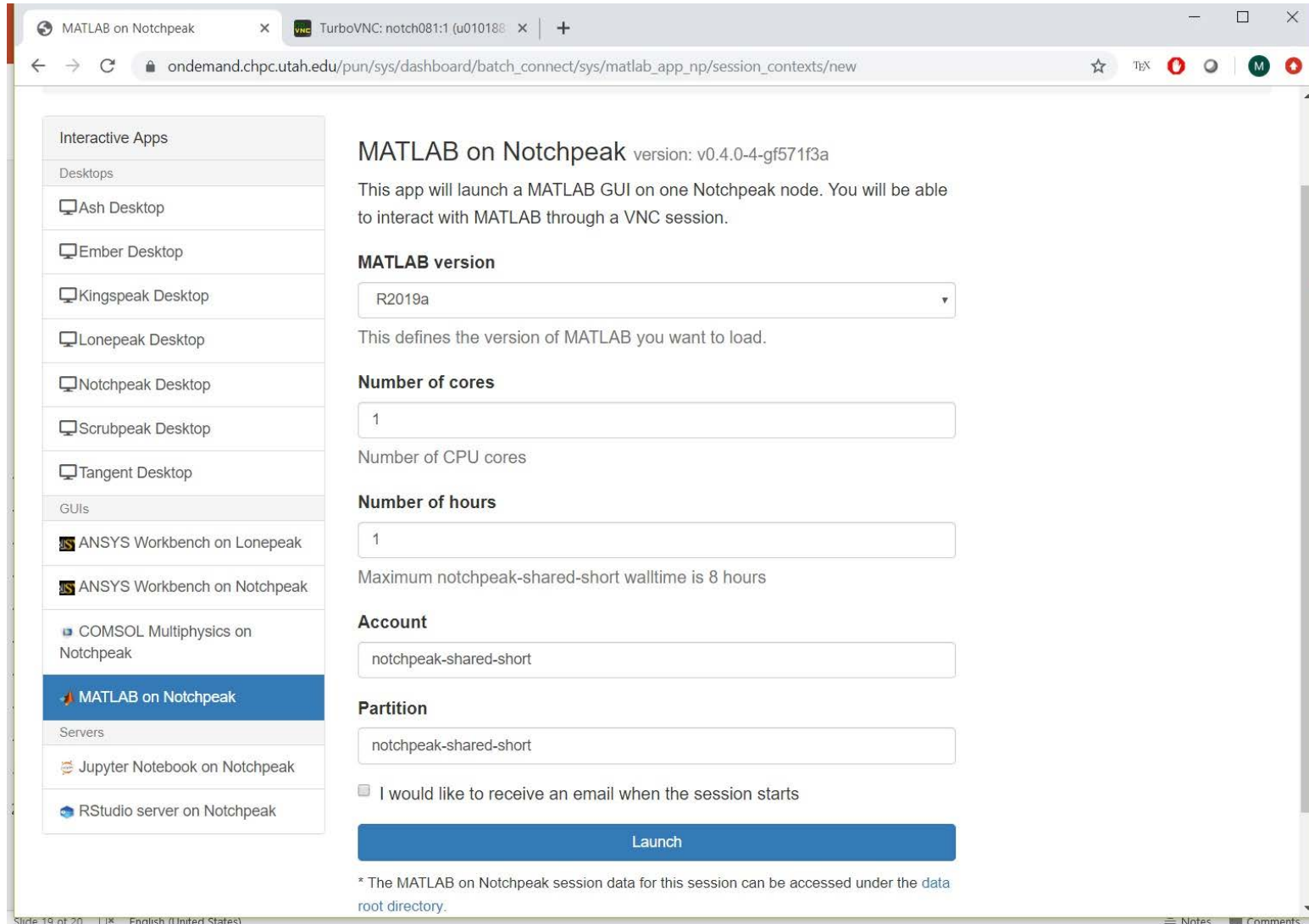
- Direct launch of a given application
- ANSYS, COMSOL, MATLAB
- Jupyter Notebook
- RStudio server
- Can set up others if needed



The screenshot shows the OnDemand dashboard for the Center for High Performance Computing at the University of Utah. The browser address bar shows `ondemand.chpc.utah.edu/pun/sys/dashboard`. The dashboard includes a navigation bar with links for Files, Jobs, Clusters, and Interactive Apps. A dropdown menu for Interactive Apps is open, showing categories: Desktops (Ash, Ember, Kingspeak, Lonepeak, Notchpeak, Scrubpeak, Tangent), GUIs (ANSYS Workbench on Lonepeak/Notchpeak, COMSOL Multiphysics on Notchpeak, MATLAB on Notchpeak), and Servers (Jupyter Notebook on Notchpeak, RStudio server on Notchpeak). The main content area features an "OPEN OnDemand" button, a "Message of the Day" section with contact information and a tip, and a footer with the OnDemand version (1.6.7) and dashboard version (v1.35.0).



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

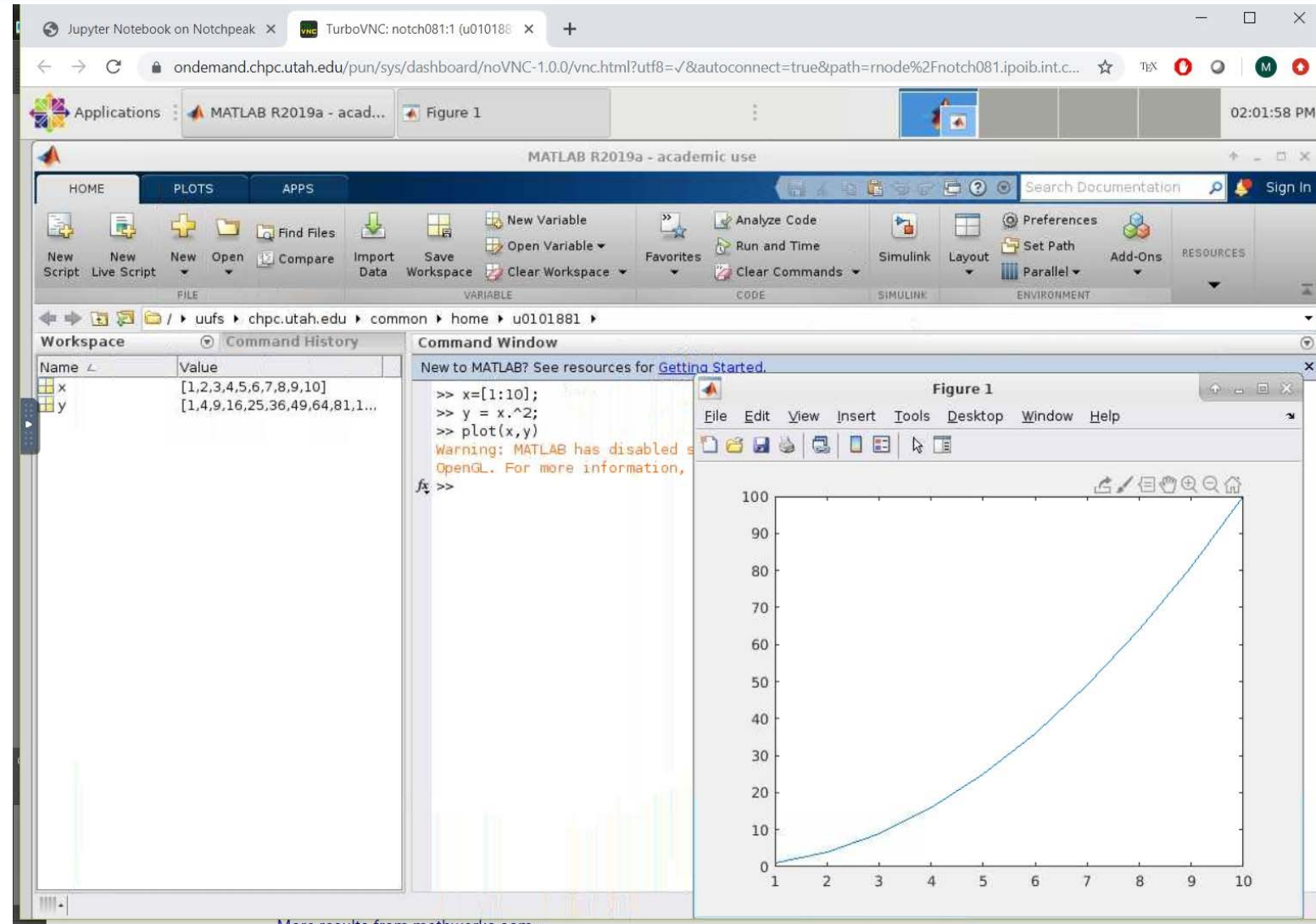


The screenshot shows a web browser window with the URL `ondemand.chpc.utah.edu/pun/sys/dashboard/batch_connect/sys/matlab_app_np/session_contexts/new`. The page is titled "MATLAB on Notchpeak" and displays a form for creating a new session. On the left, a sidebar lists various interactive apps and desktops, with "MATLAB on Notchpeak" selected. The main content area shows the following configuration options:

- MATLAB on Notchpeak** version: v0.4.0-4-gf571f3a
- Description: This app will launch a MATLAB GUI on one Notchpeak node. You will be able to interact with MATLAB through a VNC session.
- MATLAB version**: A dropdown menu set to "R2019a". Below it, a note states: "This defines the version of MATLAB you want to load."
- Number of cores**: A text input field set to "1". Below it, a label reads: "Number of CPU cores".
- Number of hours**: A text input field set to "1". Below it, a note states: "Maximum notchpeak-shared-short walltime is 8 hours".
- Account**: A text input field set to "notchpeak-shared-short".
- Partition**: A text input field set to "notchpeak-shared-short".
- A checkbox labeled "I would like to receive an email when the session starts" is checked.
- A large blue "Launch" button is at the bottom.
- A footnote at the bottom states: "\* The MATLAB on Notchpeak session data for this session can be accessed under the `data` root directory."

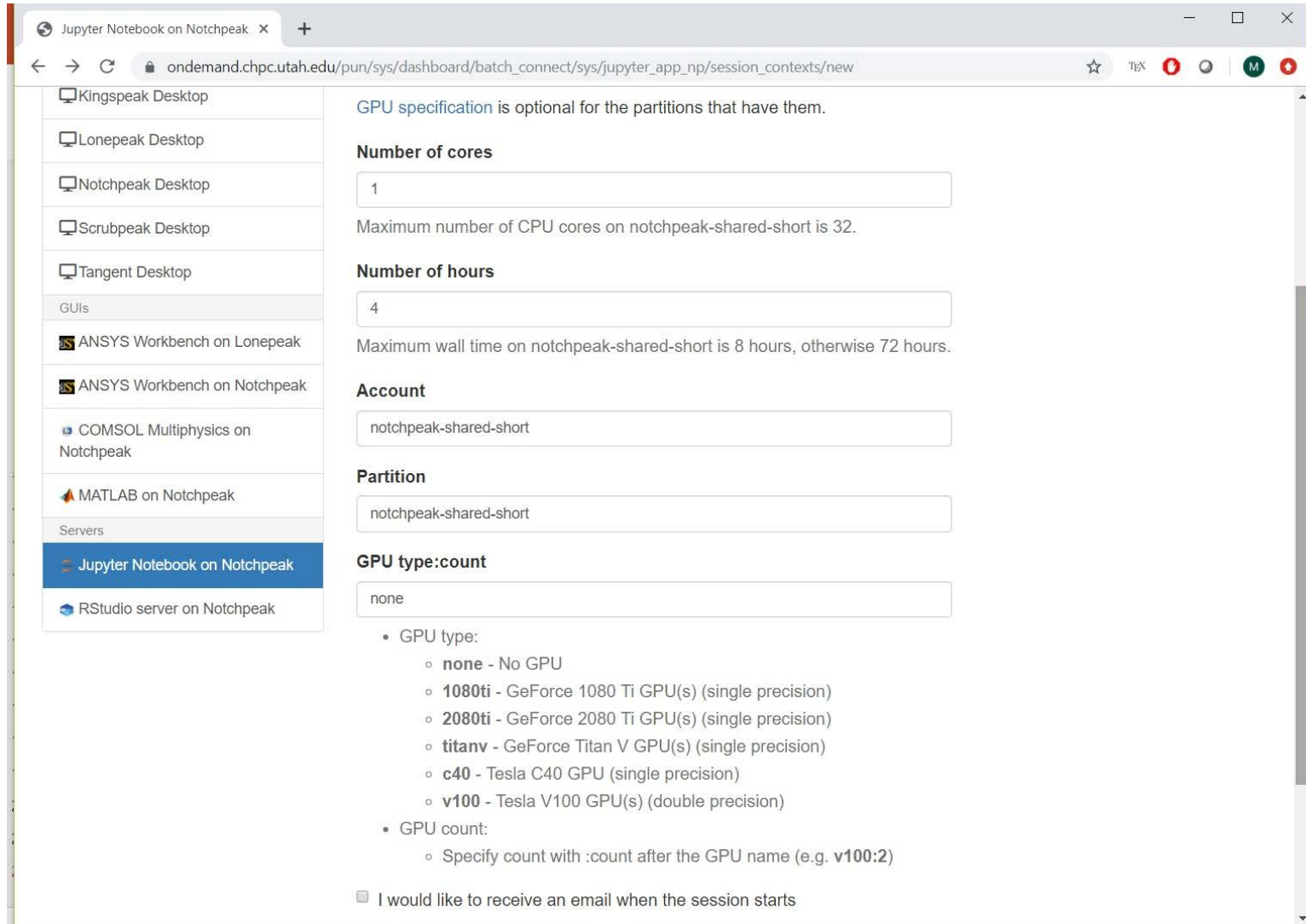
At the bottom of the browser window, a status bar shows "Slide 19 of 20" and "English (United States)".

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





- Can also specify GPU - but make sure to list the right account/partition
- Uses CHPC's python/3.5.2
- User Python modules possible if PYTHONPATH is modified



The screenshot shows a web browser window with the URL `ondemand.chpc.utah.edu/pun/sys/dashboard/batch_connect/sys/jupyter_app_np/session_contexts/new`. The interface is divided into two main sections: a left sidebar with a list of desktop and server environments, and a main form area for configuring a new session.

**Left Sidebar:**

- Kingspeak Desktop
- Lonepeak Desktop
- Notchpeak Desktop
- Scrubpeak Desktop
- Tangent Desktop
- GUIs
- ANSYS Workbench on Lonepeak
- ANSYS Workbench on Notchpeak
- COMSOL Multiphysics on Notchpeak
- MATLAB on Notchpeak
- Servers
- Jupyter Notebook on Notchpeak** (highlighted)
- RStudio server on Notchpeak

**Main Form Area:**

GPU specification is optional for the partitions that have them.

**Number of cores:** 1  
Maximum number of CPU cores on notchpeak-shared-short is 32.

**Number of hours:** 4  
Maximum wall time on notchpeak-shared-short is 8 hours, otherwise 72 hours.

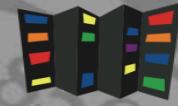
**Account:** notchpeak-shared-short

**Partition:** notchpeak-shared-short

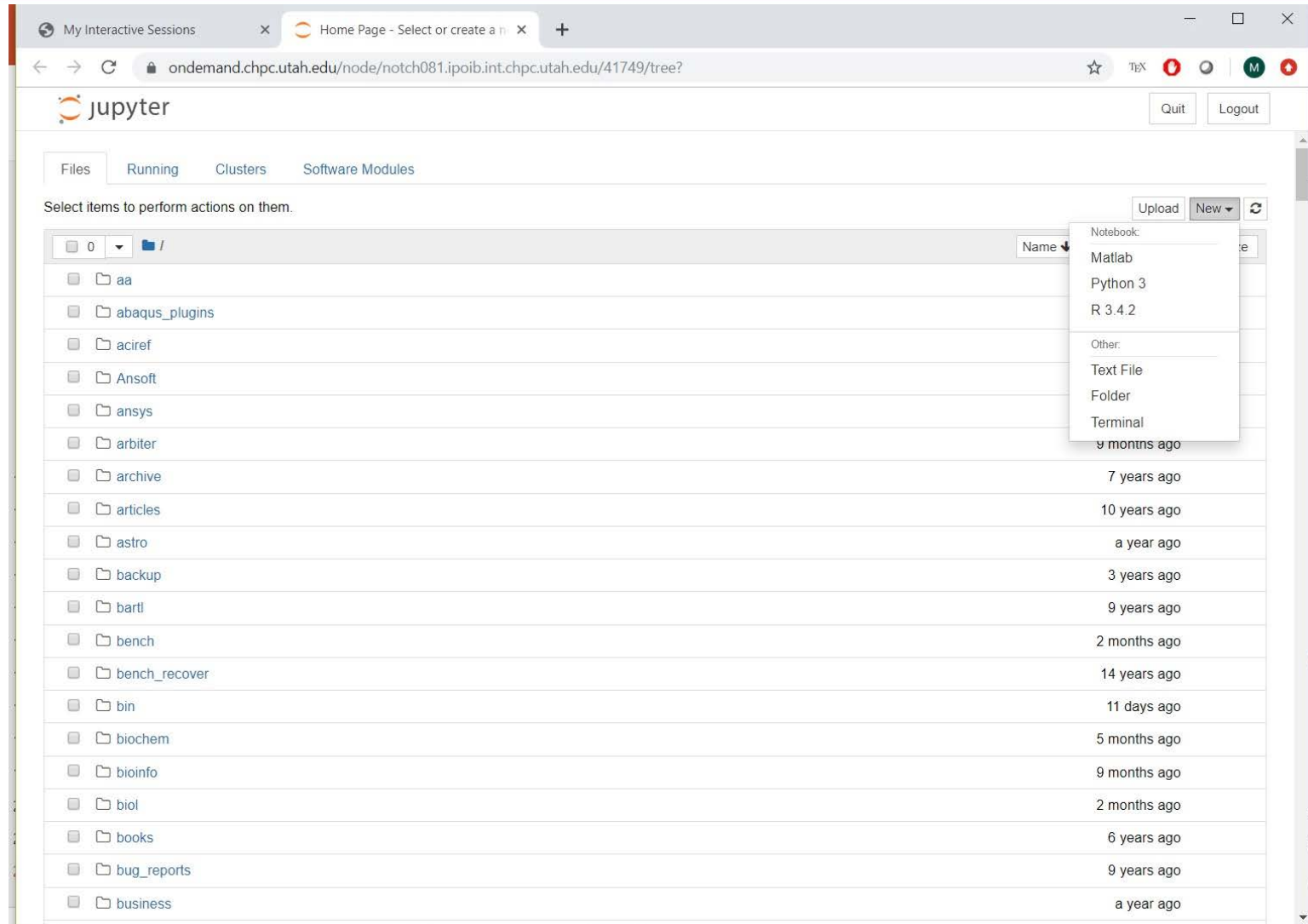
**GPU type:count**

- none
- GPU type:
  - none - No GPU
  - 1080ti - GeForce 1080 Ti GPU(s) (single precision)
  - 2080ti - GeForce 2080 Ti GPU(s) (single precision)
  - titanv - GeForce Titan V GPU(s) (single precision)
  - c40 - Tesla C40 GPU (single precision)
  - v100 - Tesla V100 GPU(s) (double precision)
- GPU count:
  - Specify count with :count after the GPU name (e.g. v100:2)

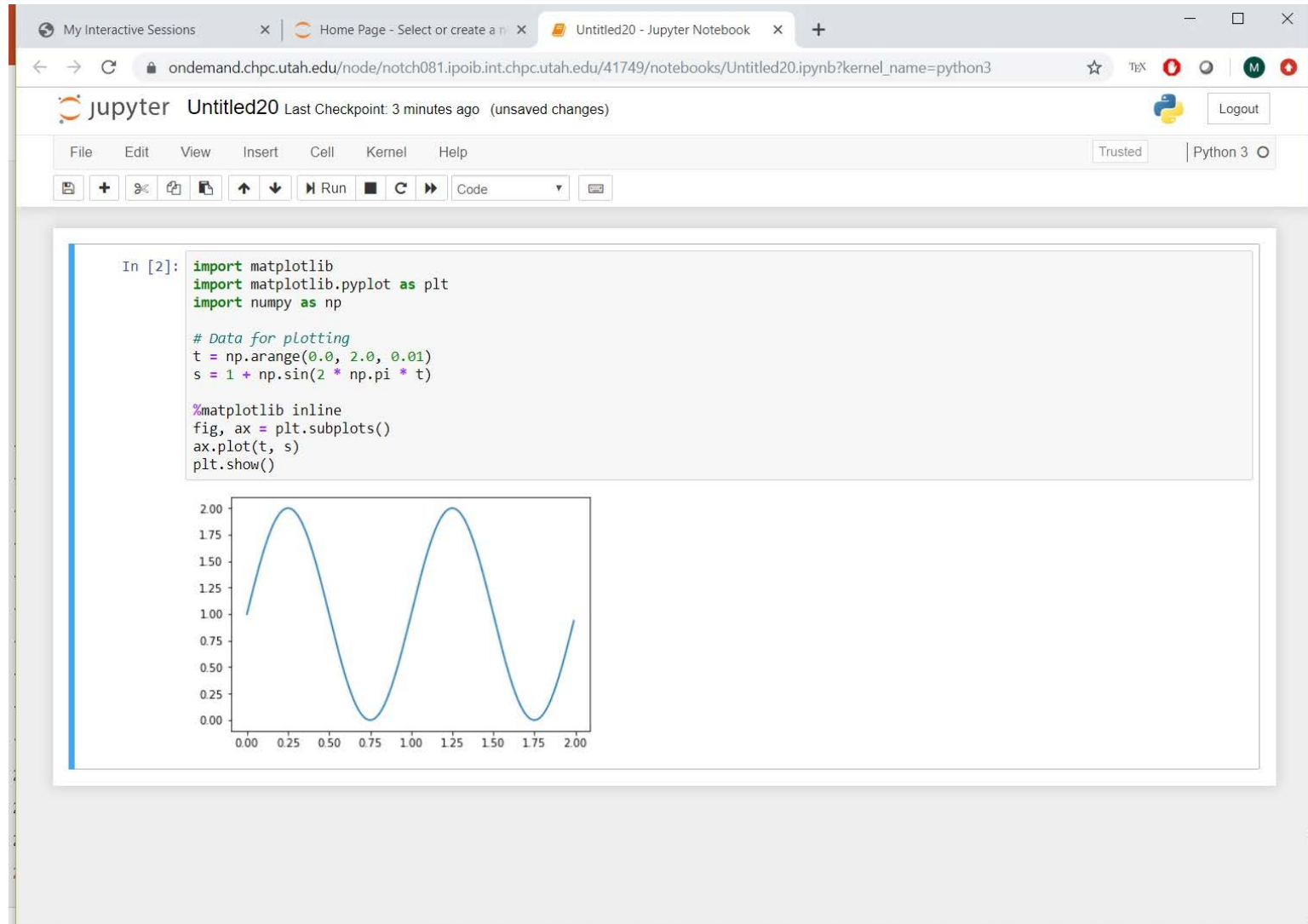
☐ I would like to receive an email when the session starts



- We hope to add functionality for other modules in the future
- Also has MATLAB and R notebooks
- Other languages can be installed if needed



- The notebook is launched in another browser tab



- 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

- <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](https://www.osc.edu/resources/online_portals/ondemand)