

Tech Talk - Open OnDemand Demo

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February 27, 2025

Open OnDemand



Connecting Computing Power With Powerful Minds

Open OnDemand empowers students, researchers, and industry professionals with remote web access to supercomputers.

- **Web interface to consume HPC resources**
- **Reduces barrier to entry**
- **Enables learning and collaboration**
- **Built-in applications**
 - Virtual Desktop
 - VS Code
 - Matlab
 - IDL
- **Tailored user experience**

HPC User Groups

CLI Commandos

Just give them a shell.

Newbies

There is a barrier to entry before they can do Science.

Explorers

They have been doing the same thing for a long time.

Wants to try something new because:

- Scale
- Recurring issues
- It's shiny

Tailored User Experience

CLI Commandos

- Continue as usual or used web ssh client
- Create/share working jobs as templates

Newbies

- Login with browser and access familiar apps
- Access virtual desktop “within” HPC environment

Explorers

- Preserve known-good jobs as-is or as templates
- Try new jobs/templates created by others
- Try new applications

Applications

Virtual Desktop

Run graphical applications
Access to HPC storage

Applications

Built-in applications

<https://openondemand.org/run-open-ondemand#enabled-applications>

Custom applications

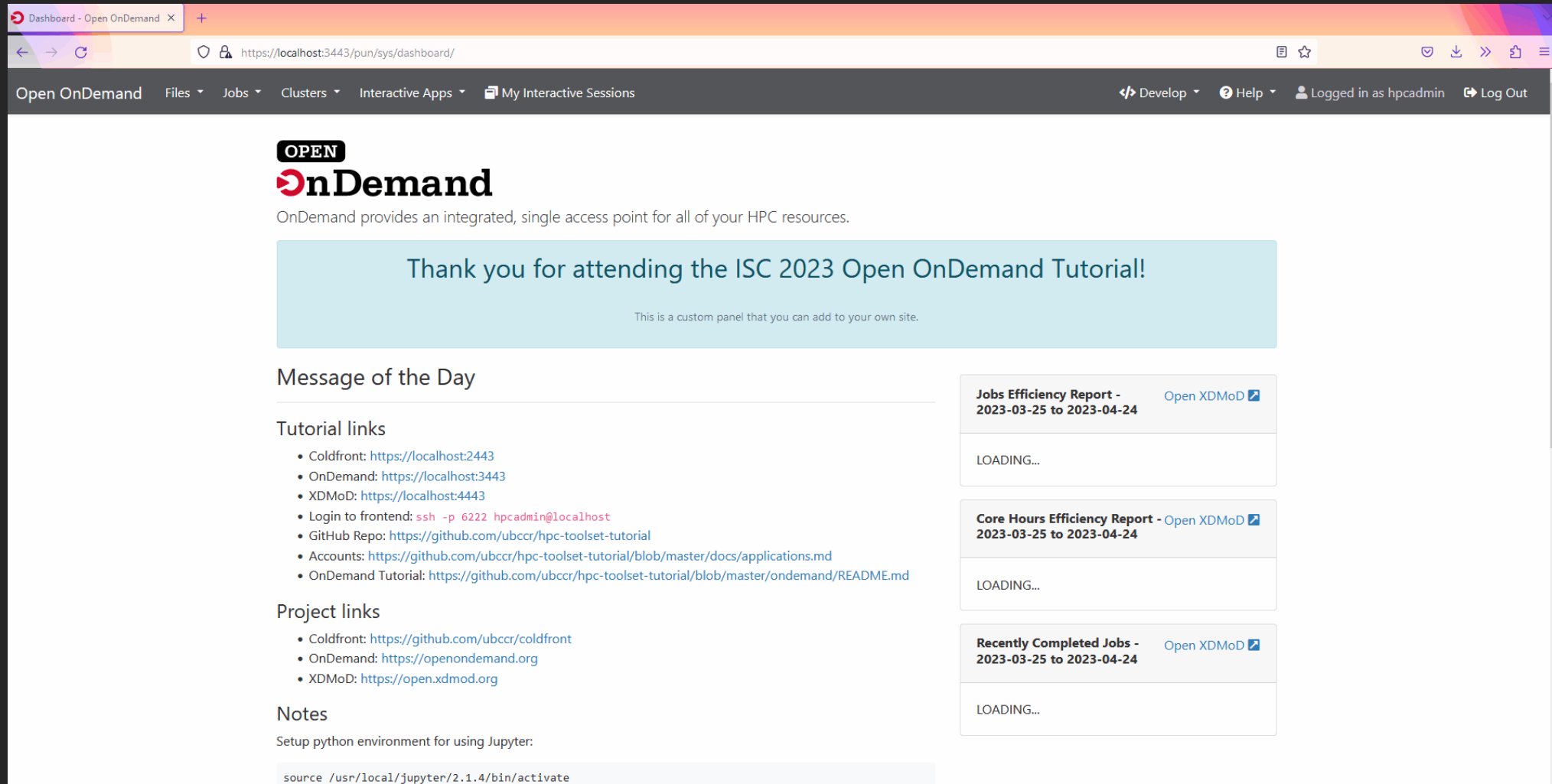
Rclone

Access remote/cloud file systems

Job Composer

WebUI to create jobs and templates

Applications – Virtual Desktop



The screenshot shows the Open OnDemand dashboard in a web browser. The browser's address bar displays `https://localhost:3443/pun/sys/dashboard/`. The dashboard header includes navigation links for Open OnDemand, Files, Jobs, Clusters, Interactive Apps, and My Interactive Sessions. On the right, it shows 'Develop', 'Help', 'Logged in as hpcadmin', and 'Log Out'.

The main content area features the Open OnDemand logo and a welcome message: 'OnDemand provides an integrated, single access point for all of your HPC resources.' Below this is a light blue banner that reads: 'Thank you for attending the ISC 2023 Open OnDemand Tutorial!' with a note: 'This is a custom panel that you can add to your own site.'

The dashboard is organized into three main sections:

- Message of the Day**: A section for daily updates.
- Tutorial links**: A list of links for getting started:
 - Coldfront: <https://localhost:2443>
 - OnDemand: <https://localhost:3443>
 - XDMoD: <https://localhost:4443>
 - Login to frontend: `ssh -p 6222 hpcadmin@localhost`
 - GitHub Repo: <https://github.com/ubccr/hpc-toolset-tutorial>
 - Accounts: <https://github.com/ubccr/hpc-toolset-tutorial/blob/master/docs/applications.md>
 - OnDemand Tutorial: <https://github.com/ubccr/hpc-toolset-tutorial/blob/master/ondemand/README.md>
- Project links**: A list of links for project resources:
 - Coldfront: <https://github.com/ubccr/coldfront>
 - OnDemand: <https://openondemand.org>
 - XDMoD: <https://open.xdmod.org>

On the right side, there are three panels for reports, each with a 'LOADING...' status and an 'Open XDMoD' link:

- Jobs Efficiency Report - 2023-03-25 to 2023-04-24**
- Core Hours Efficiency Report - 2023-03-25 to 2023-04-24**
- Recently Completed Jobs - 2023-03-25 to 2023-04-24**

At the bottom, the 'Notes' section provides instructions for setting up a Python environment for Jupyter, with a terminal snippet: `source /usr/local/jupyter/2.1.4/bin/activate`.

Applications – File manager

Dashboard - Open OnDemand X

https://localhost:3443/pun/sys/dashboard/

Open OnDemand Files Jobs Clusters Interactive Apps My Interactive Sessions

Develop Help Logged in as hpcadmin Log Out

OPEN OnDemand

OnDemand provides an integrated, single access point for all of your HPC resources.

Thank you for attending the Open OnDemand Tutorial!

This is a custom panel that you can add to your own site.

Message of the Day

Tutorial links

- Coldfront: <https://localhost:2443>
- OnDemand: <https://localhost:3443>
- XDMoD: <https://localhost:4443>
- Login to frontend: `ssh -p 6222 hpcadmin@localhost`
- GitHub Repo: <https://github.com/ubccr/hpc-toolset-tutorial>
- Accounts: <https://github.com/ubccr/hpc-toolset-tutorial/blob/master/docs/applications.md>
- OnDemand Tutorial: <https://github.com/ubccr/hpc-toolset-tutorial/blob/master/ondemand/README.md>

Project links

- Coldfront: <https://github.com/ubccr/coldfront>
- OnDemand: <https://openondemand.org>
- XDMoD: <https://open.xdmod.org>

Notes

Setup python environment for using Jupyter:

```
source /usr/local/jupyter/2.1.4/bin/activate
```

Jobs Efficiency Report - 2023-04-04 to 2023-05-04 [Open XDMoD](#)

No data available.

Core Hours Efficiency Report - 2023-04-04 to 2023-05-04 [Open XDMoD](#)

No data available.

Recently Completed Jobs - 2023-04-04 to 2023-05-04 [Open XDMoD](#)

ID	Name	Date	CPU
No data available.			

Applications – Job Composer

Dashboard - Open OnDemand

https://localhost:3443/pun/sys/dashboard/files/fs//home/hpcadmin/demo_dir

Open OnDemand Files Jobs Clusters Interactive Apps My Interactive Sessions

Develop Help Logged in as hpcadmin Log Out

Open in Terminal Refresh New File New Directory Upload Download Copy/Move Delete

Home Directory

OOD Config

/ home / hpcadmin / demo_dir / Change directory Copy path

Show Owner/Mode Show Dotfiles Filter:

Showing 1 rows - 0 rows selected

Type	Name	Size	Modified at
	demo_file.txt	0 Bytes	4/24/2023 1:09:44 PM

powered by OPEN OnDemand

OnDemand version: 3.0.0

Architecture

HPC Isolation

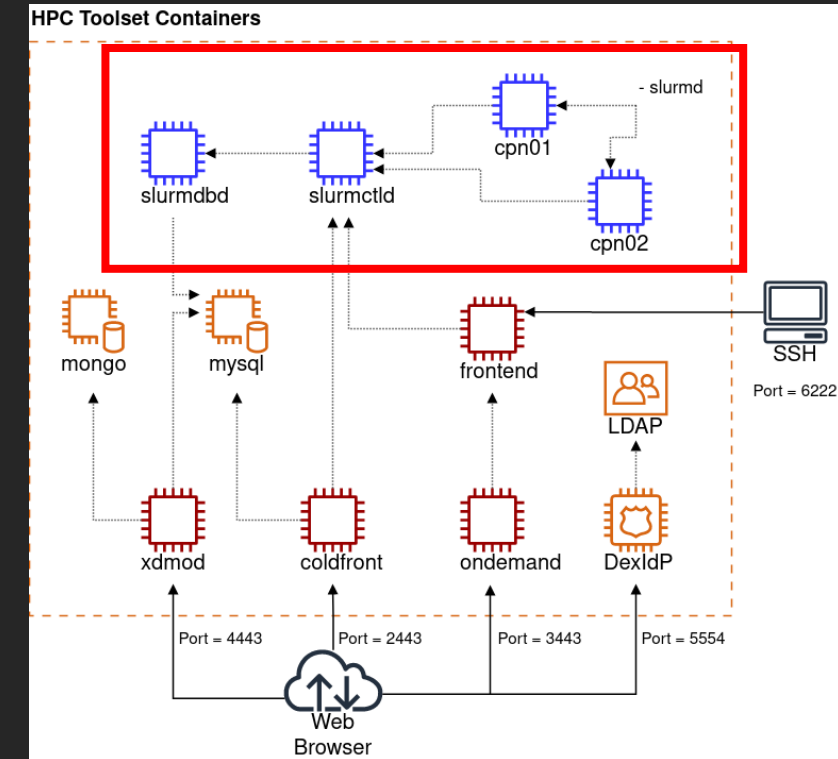
The reference architecture follows our jump box design with a frontend node

SLURM database access

Sharing
Replication

Many pieces exist today

We already use a frontend server, internal LDAP, and mysql/mariadb



Architecture

Security

Per-user Nginx (PUN) Architecture

File access: Open OnDemand, OS permissions, external authentication

Resource Allocation

Customized allocation management

“Self-serve” allocation requests

Many pieces exist today

We already use many of these pieces today:

- Login/frontend
- Internal LDAP
- mysql/mariadb

You can do it to! TM

HPC Toolset Tutorial

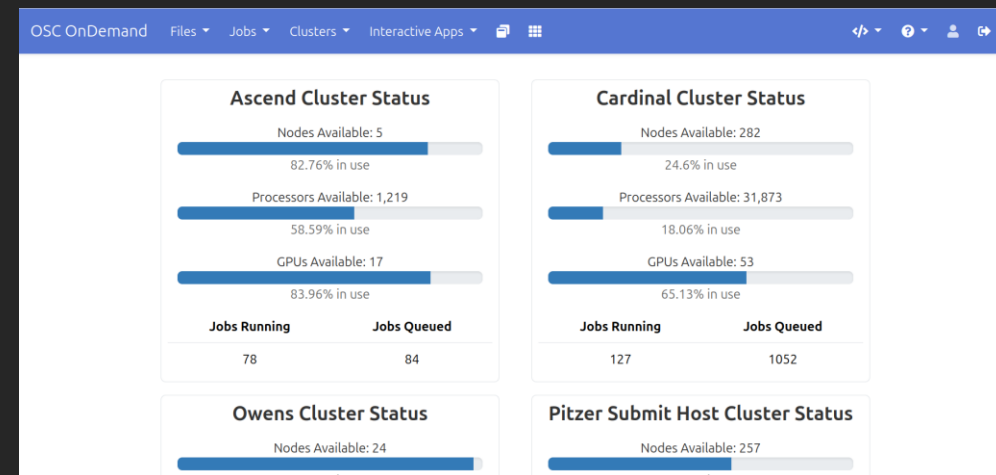
https://github.com/ubccr/hpc-toolset-tutorial/blob/master/docs/getting_started.md

```
$ git clone https://github.com/ubccr/hpc-toolset-tutorial.git
$ cd hpc-toolset-tutorial
$ ./hpcts start
Fetching latest HPC Toolset Images..
```

```
[+] Running 12/12
- base Pulled
- ondemand Pulled
- cpn01 Pulled
- cpn02 Pulled
- mongodb Pulled
- xdmmod Pulled
```

New features from SC24

- User mapping to UIDs instead usernames
- Upgraded File Editor in webUI
- Removed dependency on RHEL software collections



- Native system status (still has external XDMOD)
- Announcements vs Required announcements (ie: motd vs warning banner)
- Desktop quality and compression enhancements

Who uses Open OnDemand?

- **U.S. National Science Foundation**
 - <https://support.access-ci.org/tools/ondemand>
- **Universities and Research Organizations**
 - <https://openondemand.org/community>
- **Vendors**
 - AWS/Azure/GCP
 - Dell
 - Intel
 - Nvidia
- **Government Organizations**
 - NIH, USDA, Naval Nuclear Lab

Questions?

Open OnDemand website

<https://openondemand.org>

Demo/Tutorial repo

<https://github.com/ubccr/hpc-toolset-tutorial>

Demo/Tutorial video

<https://www.youtube.com/watch?v=9Nf1GucaVc0>