University at Buffalo
Center for Computational Research

Ohio Supercomputer Center

VIRGINIA TECH

OSC has a job opening on the Open OnDemand team!

Full details are available here:

https://www.oh-tech.org/employment#ohio-supercomputer-center

This work is supported by the National Science Foundation of the United States under the awards NSF SI2-SSE-1534949 and CSSI-Software-Frameworks-1835725.

User Group BoF Agenda

University at Buffalo Center for Computational Research | Ohio Supercomputer Center | Virginia Tech

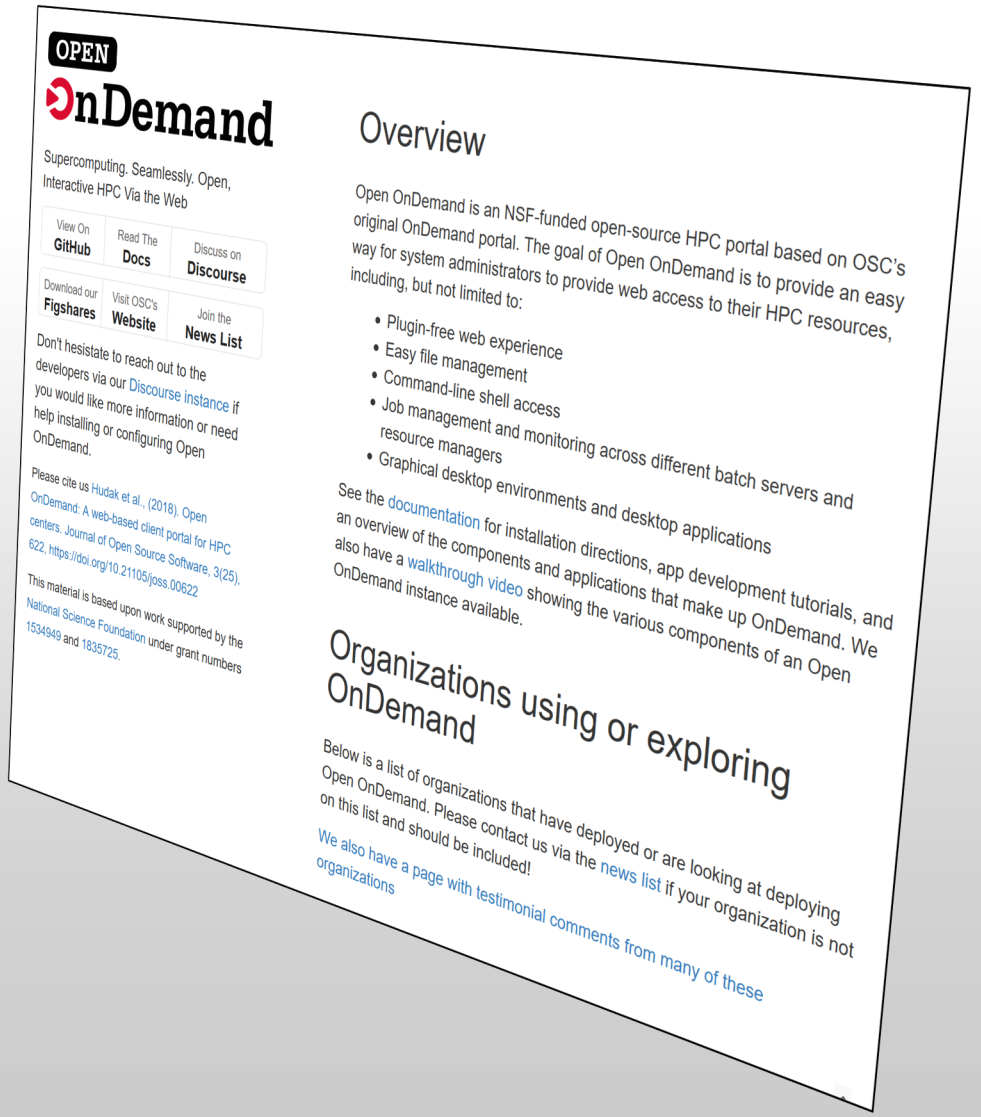
1. **About Open OnDemand**
2. Open OnDemand 2.0 Project Roadmap
3. Key Items of Note
4. Open Floor Discussion

OPEN OnDemand

Find Out More!

openondemand.org

- Use our Discourse instance for help
- Join our mailing list for updates
- Our webinars are roughly quarterly



Supercomputing. Seamlessly.

Open OnDemand: Open, Interactive HPC Via the Web

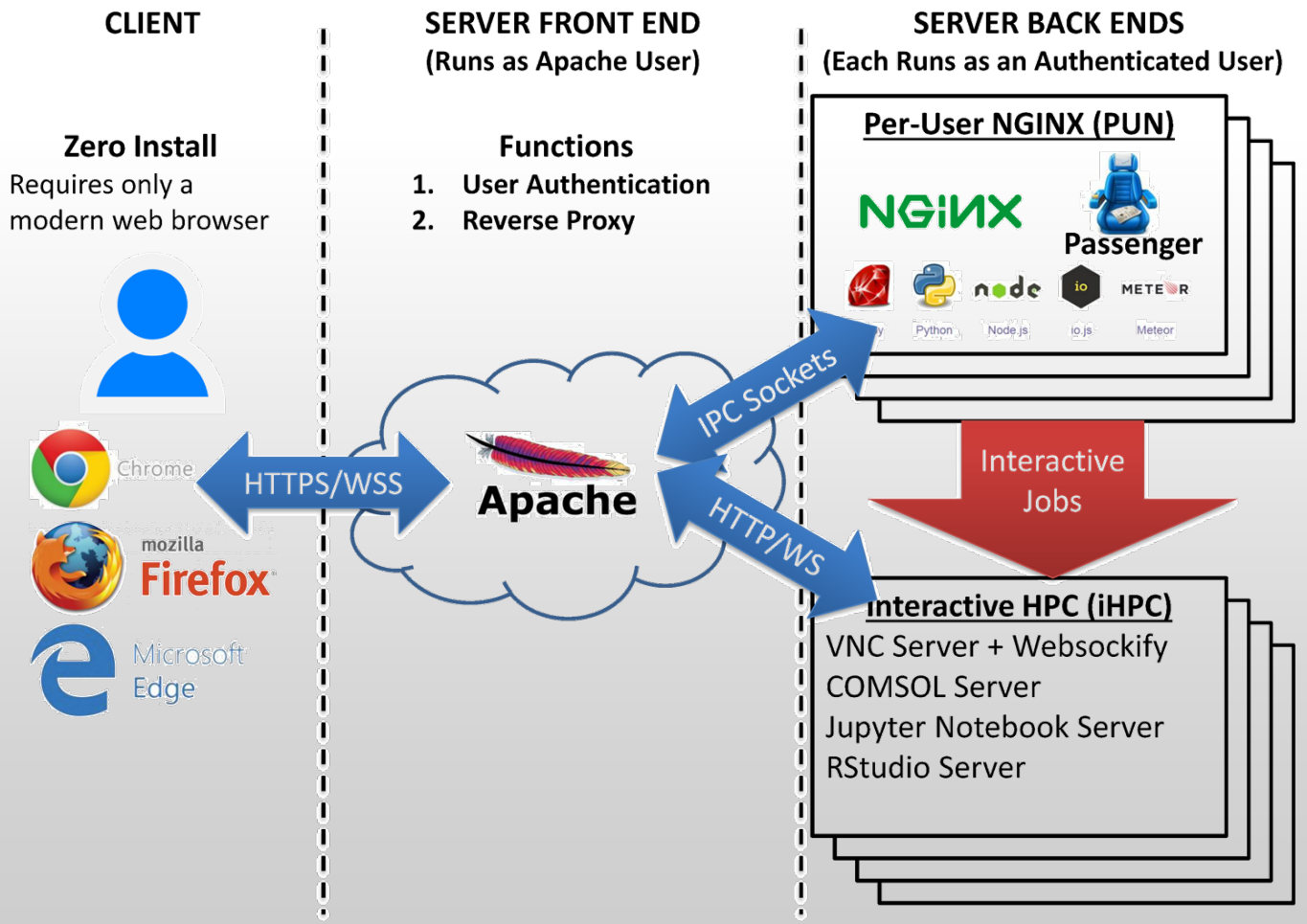
Provides an easy to install and use, web-based access to supercomputers, resulting in intuitive, innovative support for interactive supercomputing.

Features include:

- Plugin-free web experience
- Easy file management
- Command-line shell access
- Job management and monitoring
- Graphical desktop environments and applications

OPEN OnDemand

Architecture



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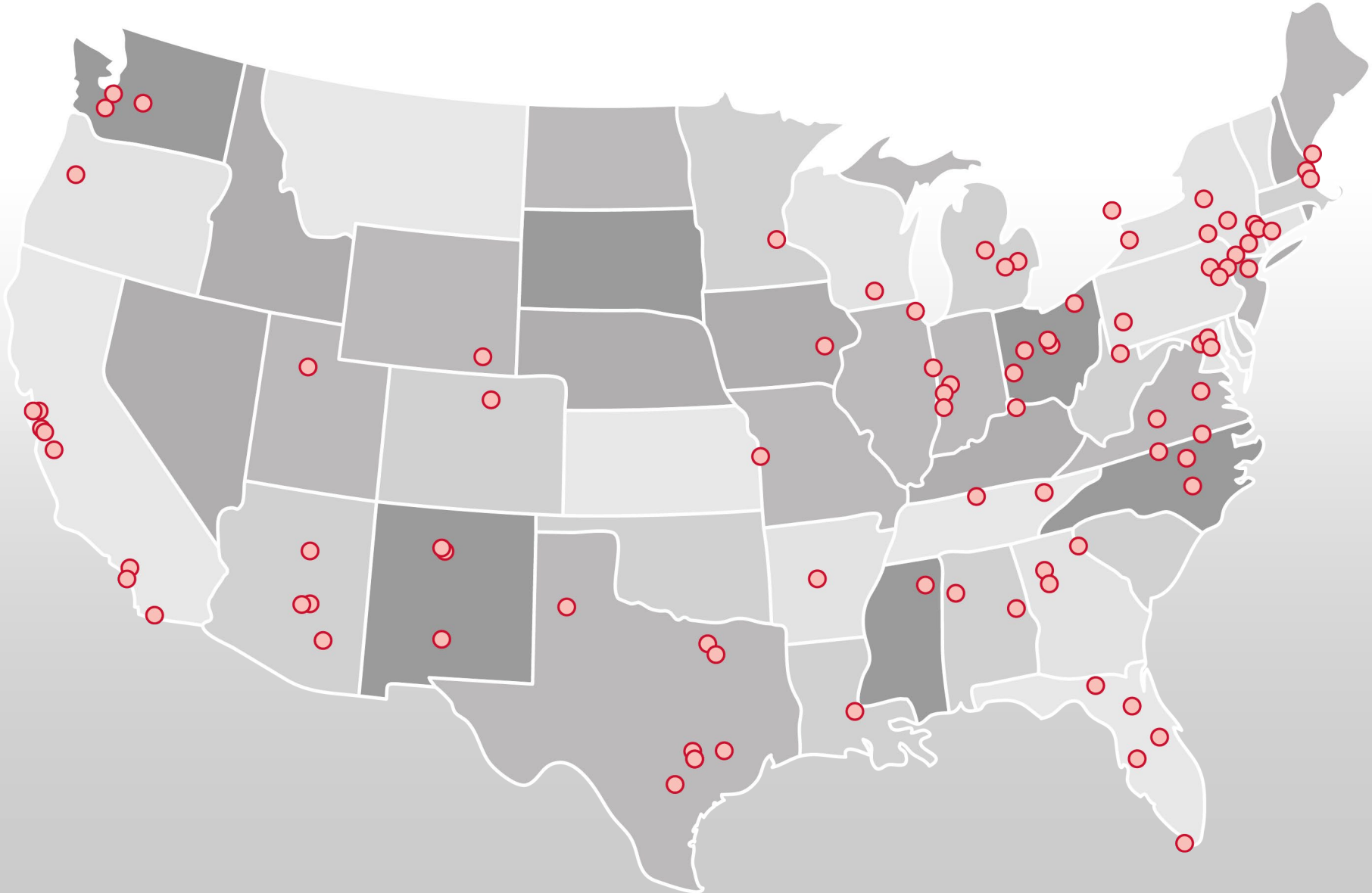
Approx Number of Institutions based on RPM logs



- 133 unique US locations
- 83 unique international locations

OPEN OnDemand

Example Current Engagements and Deployments

Production Deployments

In Process of Installing

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Open OnDemand 2.0 Project Overview

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- Previous three year NSF SI2 award (#1534949) to develop OnDemand 1.x
- Awarded follow on NSF CSSI award (#1835725) to develop OnDemand 2.x
  - Project runs from Jan 2019 to Dec 2023
  - Collaborators include SUNY Buffalo and Virginia Tech

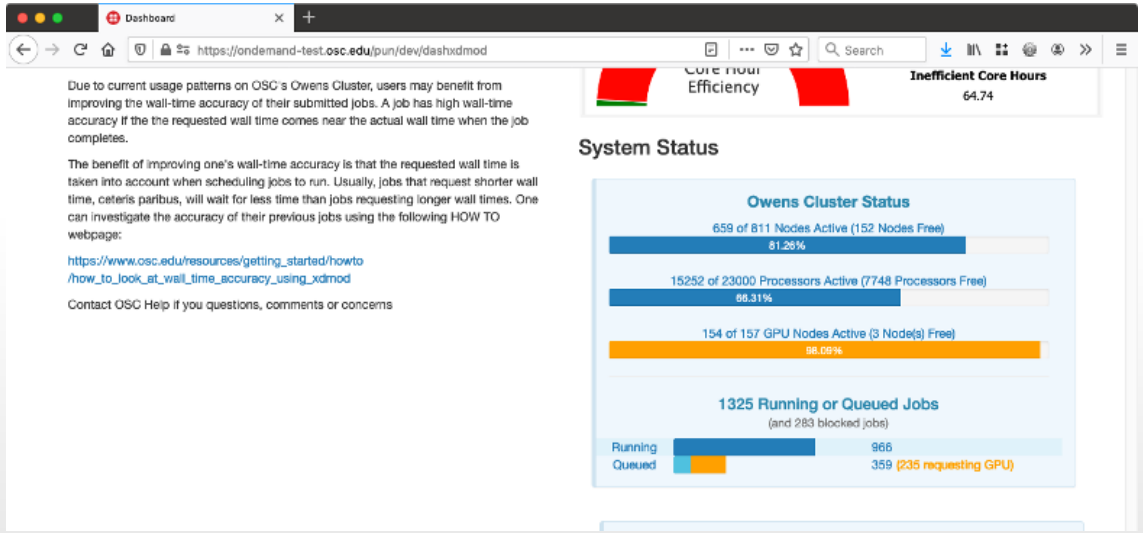
Open OnDemand 2.0 Project Overview

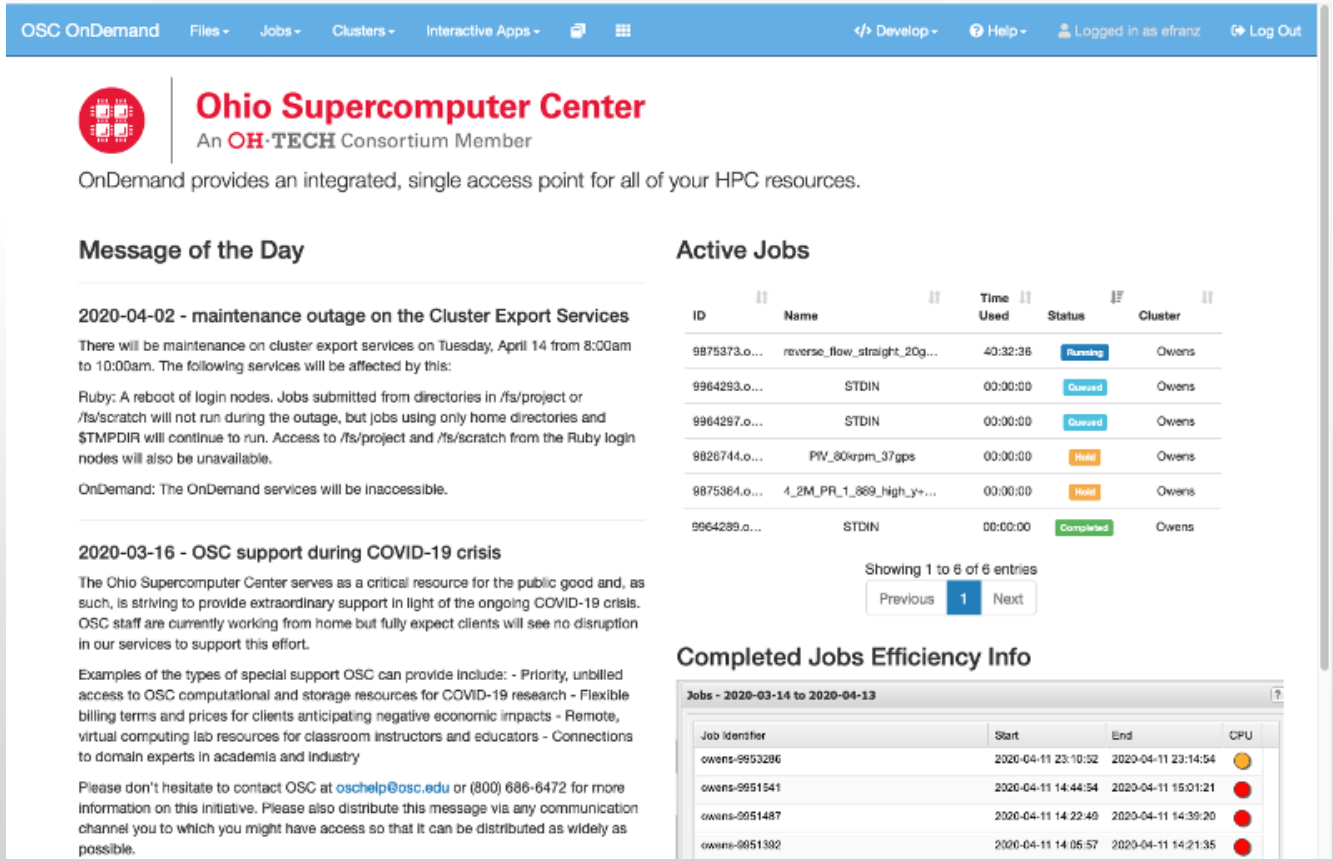
- Four areas
  - **Visibility:** Enhancing resource utilization visibility by integrating the existing Open XDMoD platform
  - **Scalability:** support more types of computing resources and software
  - **Accessibility:** appeal to more scientists in more fields of science
  - **Engagement:** establish community of departmental, campus and national HPC users and administrators

Open XDMoD

- XDMoD: XD Metrics on Demand
- On demand access to job accounting & performance data
- Optimize resource utilization & performance
  - Utilization metrics
  - Measure infrastructure QoS
  - Job and Cloud level performance data
- 200+ academic & industrial installations worldwide
- http://open.xdmod.org/

Visibility -- improving resource utilization





Info on where to submit

- Overviews of the system status
- Indication of specialty hardware availability

Info on job performance

- Jobs efficiencies
- Links to XDMoD for more info

Scalability – What resources can users hit?

- OpenHPC support
- Cloud
  - On **Prem** (OpenStack …)
  - Public (Cloudify)
- Kubernetes connector
- Improve resource utilization from the systems side
  - Interactive work without a batch scheduler
  - Scaling of NGINX process improvements
- App build out

Accessibility – Improve administrative load and user experience

- **Reduce Administrative Load (installation, configuration, debugging)**
  - Streamline the install
  - Reduce config time
  - Improve app building process (debugging, 1 app – multi clusters)
- **Streamlining interface (reduce steps to accomplish a task)**
  - Improve job management
  - Reduce clicks
  - Iconify the experience
  - App launch from desktop icon
  - Integrate apps (file/job/etc)
- **Support workflows**

Engagement: Goals

- Targeting non-traditional HPC disciplines
- Advocating for the beginner user
- Outreach
- Ensure the project is community guided

Webinars

Date	Title	Slides	Media
2017-03-08	Introducing Open OnDemand	Download	Video
2017-06-07	Open OnDemand: Supporting your HPC needs now more than ever	Download	Video
2017-09-06	Open OnDemand – Jupyter, iHPC, and Authentication	Download	Video - Missing 1st 9.5 min Audio – Complete
2018-01-29	Customizing and Extending Open OnDemand	Download	Video
2018-10-17	Using Open OnDemand for Training and Education	Download	Video
2019-4-17	Open OnDemand Project Recap and Roadmap	Download	Video
2019-8-20	Open OnDemand and OpenHPC	Download	Video
2020-1-17	Open OnDemand Live Demo	N/A	Video
2020-3-18	Open OnDemand Project Summary	Download	Video
2020-7-02	NVIDIA HPC Summit 2020 - Integrating Cloud Tools to HPC Workflows	Download	Video
2020-7-08	Supercomputing. Seamlessly. Interactive computing via Open OnDemand. Everywhere.	Download	Video

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UAB Article

Resources

Your browser is the supercomputer: On Demand is a no-tears shortcut to research-computing

Matt Windsor | UAB Reporter

June 24, 2019 | Print | Email

Here is the old way for new users to access Cheaha, UAB's supercomputer:

- Sign up for a Cheaha account.
- Open a Terminal window.
- Type in a list of commands.
- Send an email to Research Computing about the errors you get.

John-Paul Robinson, high-performance computing architect, displays On Demand in front of the Cheaha supercomputer.

The traditional method of logging on to the Cheaha cluster, the fastest in Alabama, was "like something out of 'Tron' or 'War Games,'" said William Monroe, the UAB IT Research Computing scientist who often was on the other end of those emails.

Today there is UAB Research Computing On Demand, a web portal — at rc.uab.edu — that brings Cheaha supercomputer access as close as the nearest web browser. "This helps people who are not 'command-line commandos,' who are used to a windowed interface," said Ralph Zottola, Ph.D., assistant vice president for research computing. (Learn more about Zottola and his plans for UAB Research Computing in this related story.) "It's opening access to a lot of new users. And we've already seen a benefit in reduced calls for support."

In addition to Cheaha access, the portal "includes all the popular applications that people are using here, including MATLAB, RStudio, SaS and Jupyter Notebooks," Zottola added. "You start them up on your browser, but they're not running on your computer. They're running on the supercomputer."

Twitter Account

OPEN OnDemand

Trello Board & Major Release Schedule

1.8 Release

- Dashboard with XDMoD widgets — 4 — DH MC WT
- Job Composer with XDMoD links — 1 — MC
- Kubernetes Adapter
- Dashboard with system status widgets — 1 — MC
- One app submit to multiple clusters — MC
- Retain interactive job card after job completes — 1
- Improve error reporting when testing interactive apps
- Better validation of cluster config files
- Use dex as default authenticator

2.0 Release

- Launch interface redesign — 1 — DH MC PC WT
- Files app replacement — 1 — DH MC WT
- Completed Jobs App (screenshot) — 1 — DH PC WT
- Unified Batch plugin — 1 — 4 — MC
- iHPC authentication abstraction with SSL — 1
- Improved Linux Host adapter — 1 — MC
- Make dashboard widgets configurable (undecided feature) — 1 — MC
- Globus Online Integration — 2 — MC

Other Dev projects/ideas

- Develop ability to string apps in a pipeline
- Integrate GIT
- tag apps with science domain for filtering and discovery
- XDMoD -- add the ability to add timing marks to code that appear in the performance graphs — 1
- 
  App Catalog — 1

Community requests from SGCI Survey & SC (TODO)

Visibility OOD-XDMoD integration

- Incorporate Job Accounting and Performance Summary
- Develop direct link capability XDMoD <- OOD
- Provide OOD usage metrics through XDMoD
- Link to XDMoD Job Viewer from Active Jobs app
- User report card
- support user customization of OOD dashboard
- DL/ML automated detection of job efficiency opportunities

Scalability

- Interactive work without a batch scheduler
- Increase supported app build/deploy languages
- improve OOD platform performance -- better response, lower start time, decrease mem usage
- support horizontal scaling of per user NGINX processes
- implement persistence options to support things like caching
- OpenStack
- OpenHPC integration
- Ansible role
- Open Nebula Integration

Accessibility

- improve job management
- reduce administrative load (installati config, etc)
- streamline interface (reduce clicks)
- integrate job/file management/app launching interfaces

Items ‘Coming Soon’ or Recently Added

Version	System Stuff	Apps
V1.7 (June 1)	Linux host adapter Keycloak identity brokering Ansible role OpenHPC integration	
V1.8 (August 17)	Dashboard with XDMoD DEX authentication Easier debugging apps (retain session card after job completes)	App submission to cluster set Job composer with XDMoD Visual Studio Code app (beta)
V2.0 (December 1)	Kubernetes adapter SSL+auth abstraction for apps	New launch interface UX Files app replacement Completed Jobs App Configurable Dashboard widgets
Current “OSC only” features	System status with GPUs OpenStack Globus Integration	Stata, Tensorboard, QGIS, Render, Galaxy, Visual Studio Code Server, R Shiny

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