

Open OnDemand - OpenHPC Integration



Ohio Supercomputer Center



NOR-TECH

People Friendly Technology

OPEN  **nDemand**

Alan Chalker, Dominic Daninger, Kyle Gross

Webinar Agenda



Ohio Supercomputer Center



1. About Open OnDemand
2. About Nor-Tech
3. Open OnDemand – OpenHPC integration
4. Questions

OPEN

 **nDemand**

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

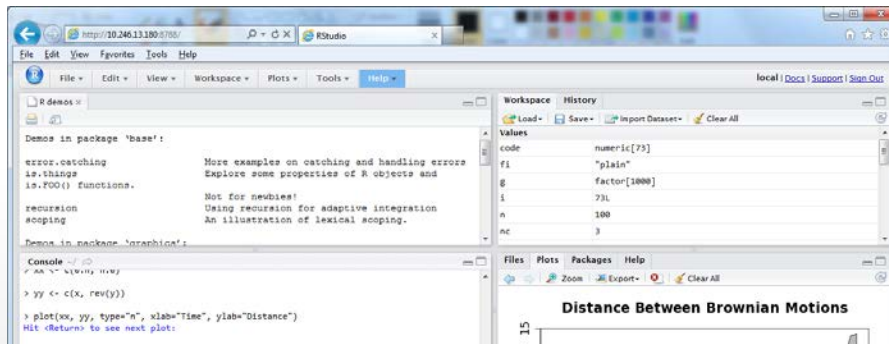


Interactive Apps

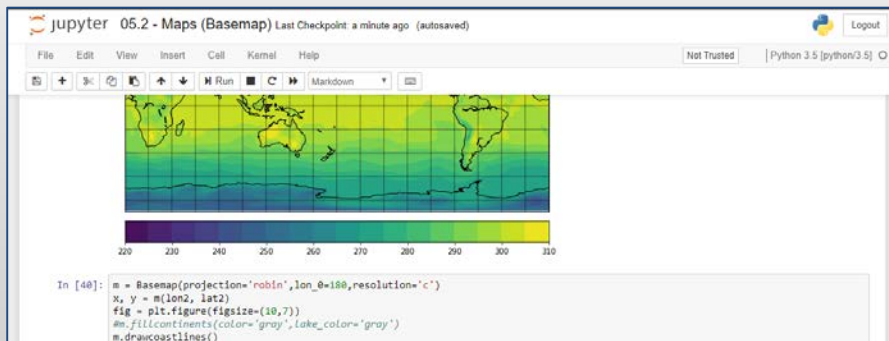
&

Cluster Access

RStudio Server – R IDE

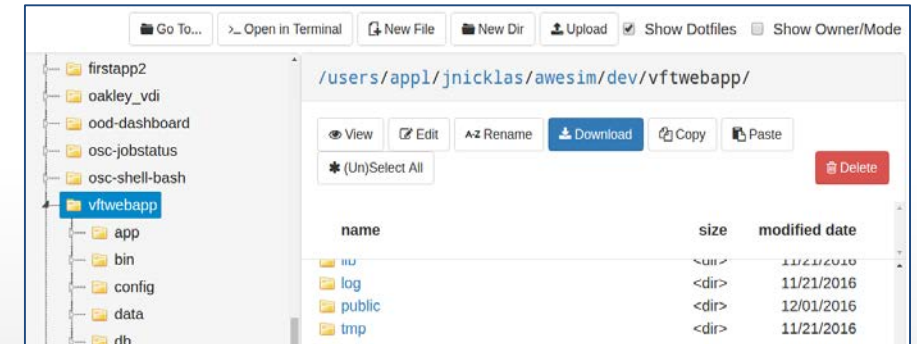


Jupyter Notebook – Python IDE

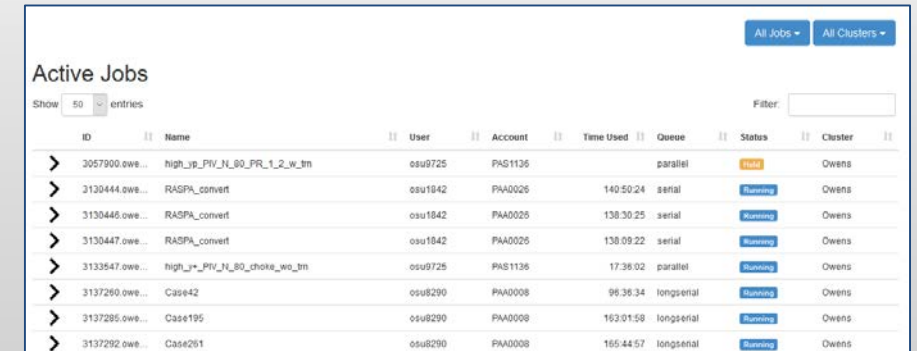


And many more, such as ANSYS Workbench, Abaqus/CAE, MATLAB, Paraview, COMSOL Multiphysics

File Access (browse, edit, etc)



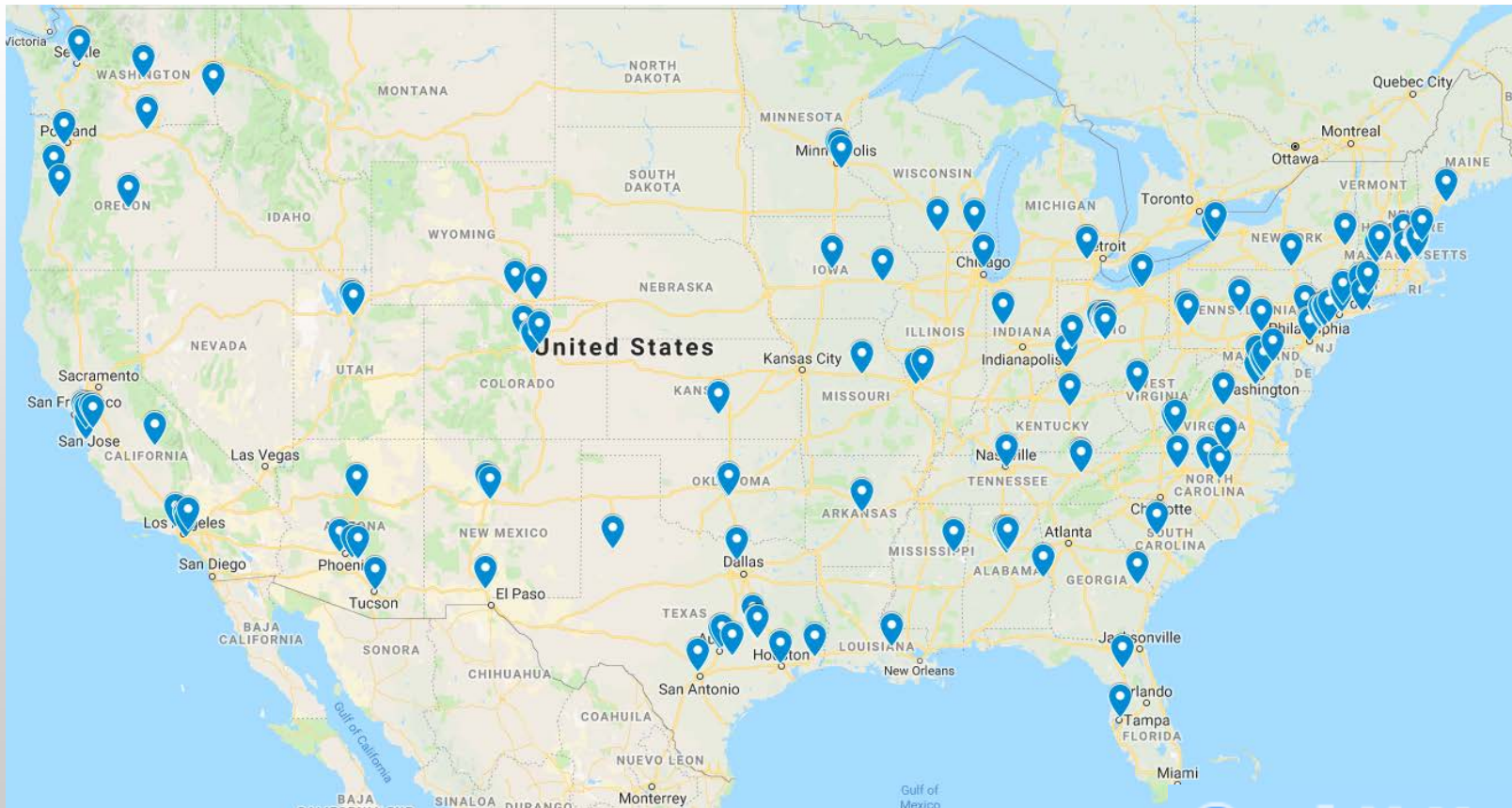
Manage Jobs (view, submit, etc)



And many more, such as in-browser SSH terminal, job constructors, VNC desktops

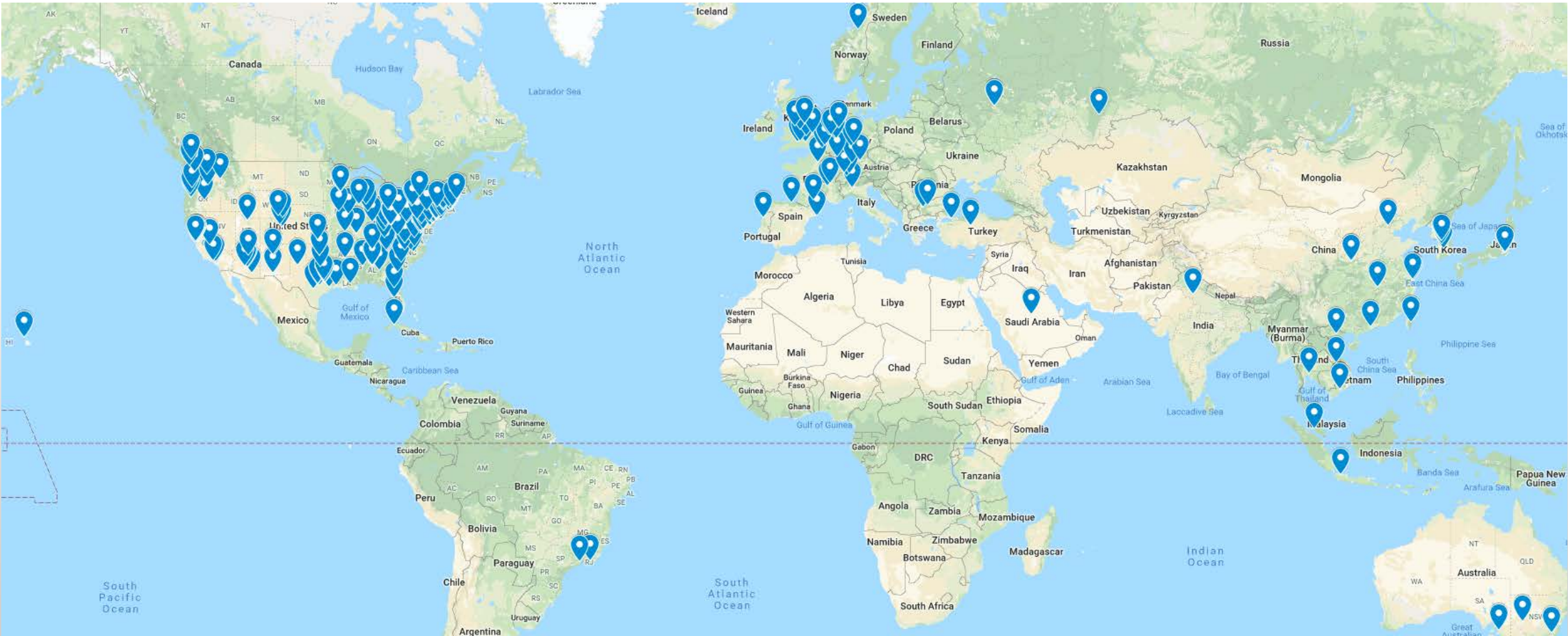
Approx Number of Institutions based on RPM logs

- 136 unique US locations
- 70 unique international locations



- Map data @2019 Google, INEGI, ORION-ME

Approx Number of Institutions based on RPM logs



- Map data @2019 Google, INEGI, ORION-ME



Webinar Agenda



Ohio Supercomputer Center



NOR-TECH

People Friendly Technology

- ~~1. About Open OnDemand~~
- 2. About Nor-Tech**
3. Open OnDemand – OpenHPC integration
4. Questions

OPEN



nDemand

— PROFILE —

Who is Nor-Tech?



Nor-Tech's headquarters in
Burnsville, Minnesota.

- Nor-Tech is a Leading Provider of Turnkey Cluster Solutions
- Nor-Tech has been a leader in HPC Clusters solutions for more than **20 years**

CONTRACTS



Contract Holder
Contract GS-35F-0030V

Public / Private Educational Institutions and Government agencies may purchase directly from Nor-Tech utilizing our GSA Contract # GS-35F-133CA.

- Contract with the University of Wisconsin since 2003 CONTRACT #15-2308
- Contract with state of Minnesota
CONTRACT #160318
- Only HPC company invited by NASA to exhibit at NASA Expo 2019 in D.C.



NOR-TECH

People Friendly Technology

A Spectrum of Cluster Sizes



- Rackmount HPC Clusters
- Portable HPC Clusters
- Modular Servers / Blades
- NAS, SAN & iSCSI Storage Servers

Also

- Voyager Desktop PCs
- Small-Form Factor PCs
- Notebooks & Netbooks
- Mini & Mountable PCs
- and much, much more...

Achieve Better ROI with Nor-Tech's Simulation & Modeling HPC

- Intel & AMD Demo Clusters Available
- Run your jobs, build your ROI case
- Test on latest Hardware & Applications
- HPC Integration Partner with Sim/Mod Major ISV's
- Average of 20 years of Linux Experience



NOR-TECH

People Friendly Technology

Webinar Agenda



Ohio Supercomputer Center



NOR-TECH

People Friendly Technology

- ~~1. About Open OnDemand~~
- ~~2. About Nor-Tech~~
- 3. Open OnDemand – OpenHPC integration**
4. Questions

OPEN



nDemand

— Why GUI —

Why Open OnDemand with OpenHPC

- Many CAE users are Moving from Windows Workstations to HPC Solvers
- Many users are uncomfortable with Command Line Interface (CLI)
- Many users are uncomfortable with the Linux OS
- Many users are uncomfortable with CLI file upload and download utilities
- Most users are very comfortable with GUI Browser Interfaces



NOR-TECH

People Friendly Technology

— OpenHPC —

What is OpenHPC

OpenHPC provides collection of Open-Source HPC software components, to lower barriers to deployment of modern HPC methods and tools.

See link: <https://github.com/openhpc/ohpc/wiki/Papers,--Presentations,-and-Tutorials>

See pdf [schulz-openhpc-hpckp-2019.pdf](#) pages 3 - 13



NOR-TECH

People Friendly Technology

— Keep Cost Low —

The Cost Factor

- Prior to OHPC and OOD Commercial Cluster Managers had GUI
- Commercial Cluster Managers have Significant License Cost
- OHPC & OOD can Reduce \$\$\$ shock of moving from Wkst to HPC solvers



NOR-TECH

People Friendly Technology

—How to Keep Cost Low —

The Cost Factor

- No Extra Hardware Cost to add Open OnDemand (OOD) to OHPC
- OOD Web Server Runs on Cluster Head Node as a KVM Virtual Machine



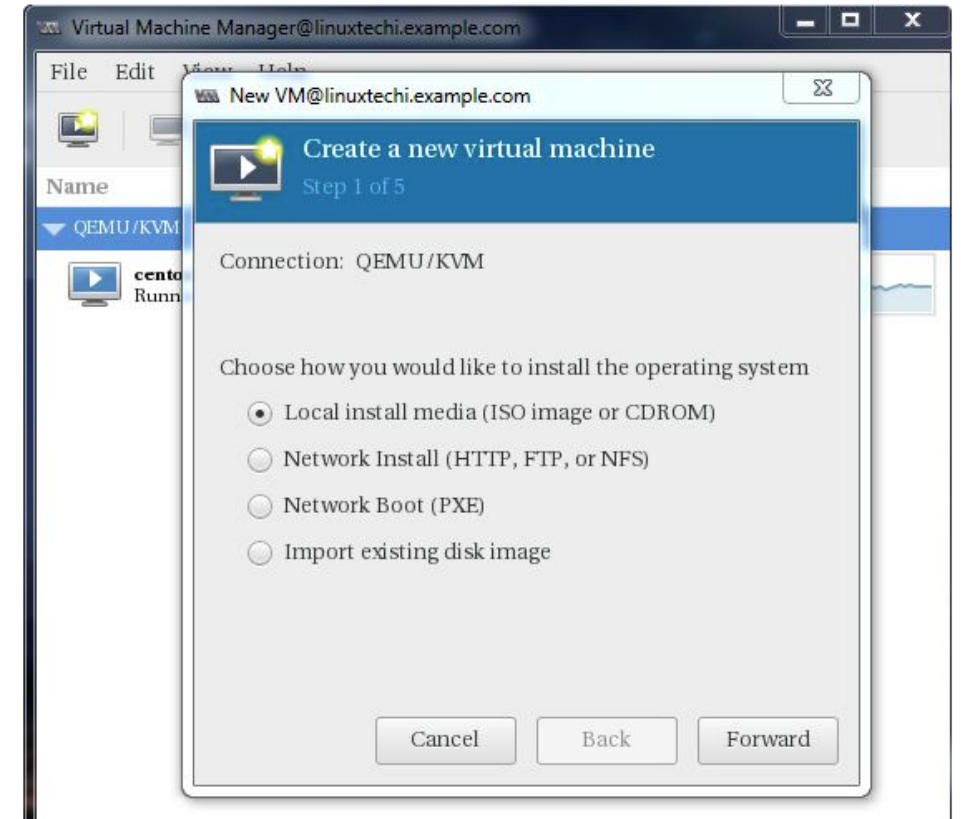
NOR-TECH

People Friendly Technology

— Easy to Use —

User Friendly HPC

- KVM Virtual Machine is Managed by GUI virt-manager
<https://www.linuxtechi.com/install-kvm-hypervisor-on-centos-7-and-rhel-7/>
- OOD Image is Just Another VNFS Image on Head Node
VNFS (Virtual Node File System)



—Easy to Use —

User Friendly HPC

- OOD is Managed with same OHPC tools that Manage Compute Nodes
- VM OOD Boots and Loads Every Time Head Boots Up
- Cluster Users & OOD Users are Automatically Sync'd

www.nor-tech.com/leading-edge/open_ondemand/

Webinar Agenda



Ohio Supercomputer Center



NOR-TECH

People Friendly Technology

- ~~1. About Open OnDemand~~
- ~~2. About Nor-Tech~~
- ~~3. Open OnDemand – OpenHPC integration~~
- 4. Questions**

OPEN



nDemand

Staying in Touch

- Visit our websites
 - <http://openondemand.org>
 - <https://www.nor-tech.com/contact-2018/>
- Use our Discourse
 - <https://discourse.osc.edu/c/open-ondemand>
- Join our mailing list
 - <https://lists.osu.edu/mailman/listinfo/ood-users>
- Our webinars are planned roughly quarterly
 - Let us know what you'd like to learn about next

OPEN OnDemand

Open-source project based on the Ohio Supercomputer Center's OnDemand platform

[View On GitHub](#) [Read The Docs](#) [Join the Mailing List](#)

Open OnDemand is an NSF-funded open-source HPC portal based on OSC's original OnDemand portal. The goal of Open OnDemand is to provide an easy way for system administrators to provide web access to their HPC resources, including, but not limited to:

- Plugin-free web experience
- Easy file management
- Command-line shell access
- Job management and monitoring across different batch servers and resource managers
- Graphical desktop environments and desktop applications

See the [documentation](#) for installation directions, app development tutorials, and an overview of the components and applications that make up OnDemand.

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

This project is maintained by the Ohio Supercomputer Center (OSC), a member of the Ohio Technology Consortium, the technology and information division of the Ohio Department of Higher Education.

This material is based upon work supported by the National Science Foundation under grant numbers 1534949.

Further reading after reading the documentation:

- OSC App Deployment Strategy
- OSC CILogon Authentication Strategy