



nDemand

Alan Chalker

Director of Strategic Programs, OSC

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.

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

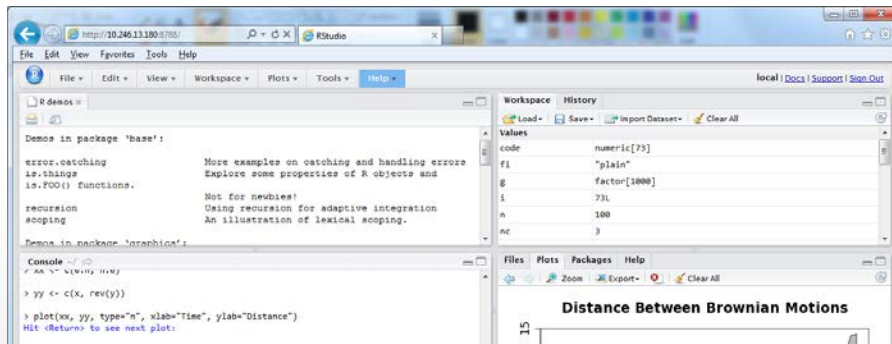


Interactive Apps

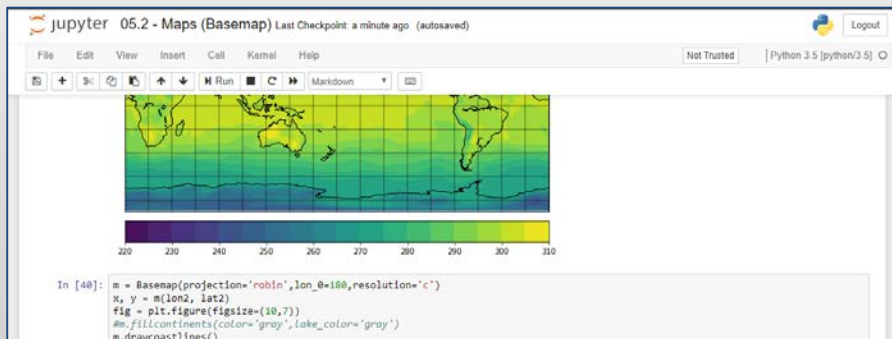
&

Cluster Access

RStudio Server – R IDE

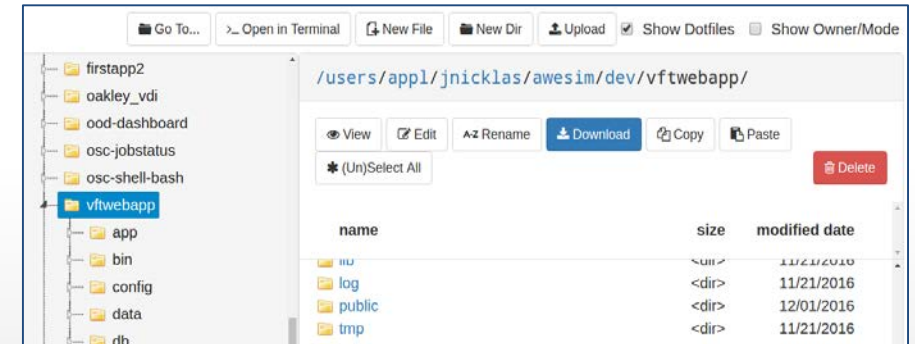


Jupyter Notebook – Python IDE



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

File Access (browse, edit, etc)

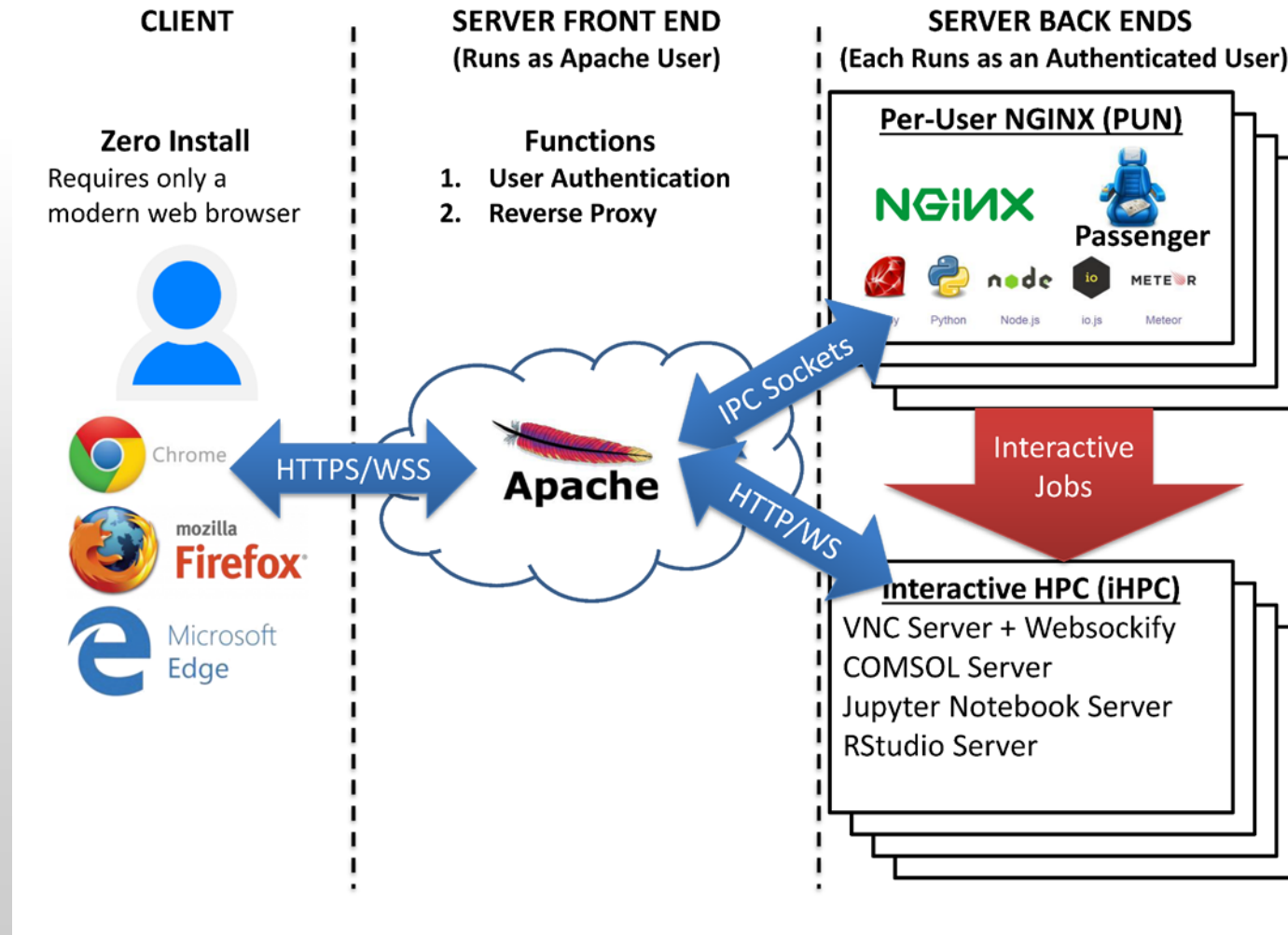


Manage Jobs (view, submit, etc)

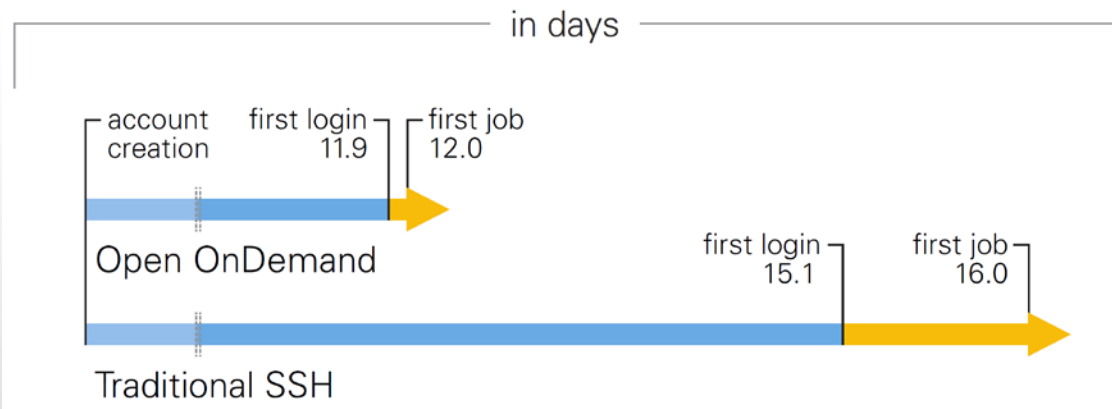
Active Jobs									
ID	Name	User	Account	Time Used	Queue	Status	Cluster		
> 2057900.owe...	high_jp_PIV_N_80_PR_1_2_w_tm	osu9725	PAS1136		parallel	Running	Owens		
> 3130444.owe...	RASPA_convert	osu1842	PAA0026	140:50:24	serial	Running	Owens		
> 3130446.owe...	RASPA_convert	osu1842	PAA0026	138:30:25	serial	Running	Owens		
> 3130447.owe...	RASPA_convert	osu1842	PAA0026	138:09:22	serial	Running	Owens		
> 3133647.owe...	high_jp_PIV_N_80_choke_wa_tm	osu9725	PAS1136	17:36:02	parallel	Running	Owens		
> 3137260.owe...	Case42	osu8290	PAA0008	96:36:34	longserial	Running	Owens		
> 3137285.owe...	Case195	osu8290	PAA0008	163:01:59	longserial	Running	Owens		
> 3137292.owe...	Case261	osu8290	PAA0008	165:44:57	longserial	Running	Owens		

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

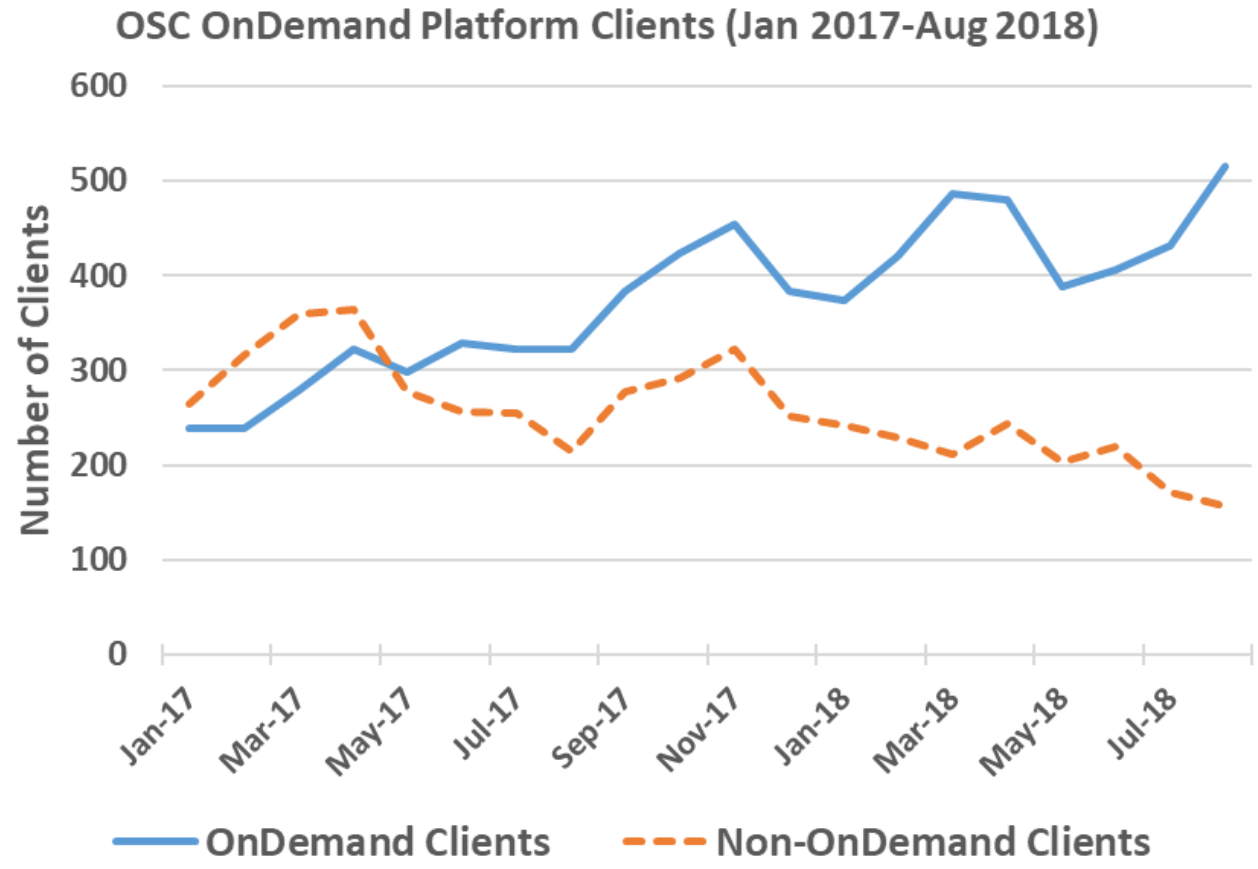
Architecture



Impact at OSC



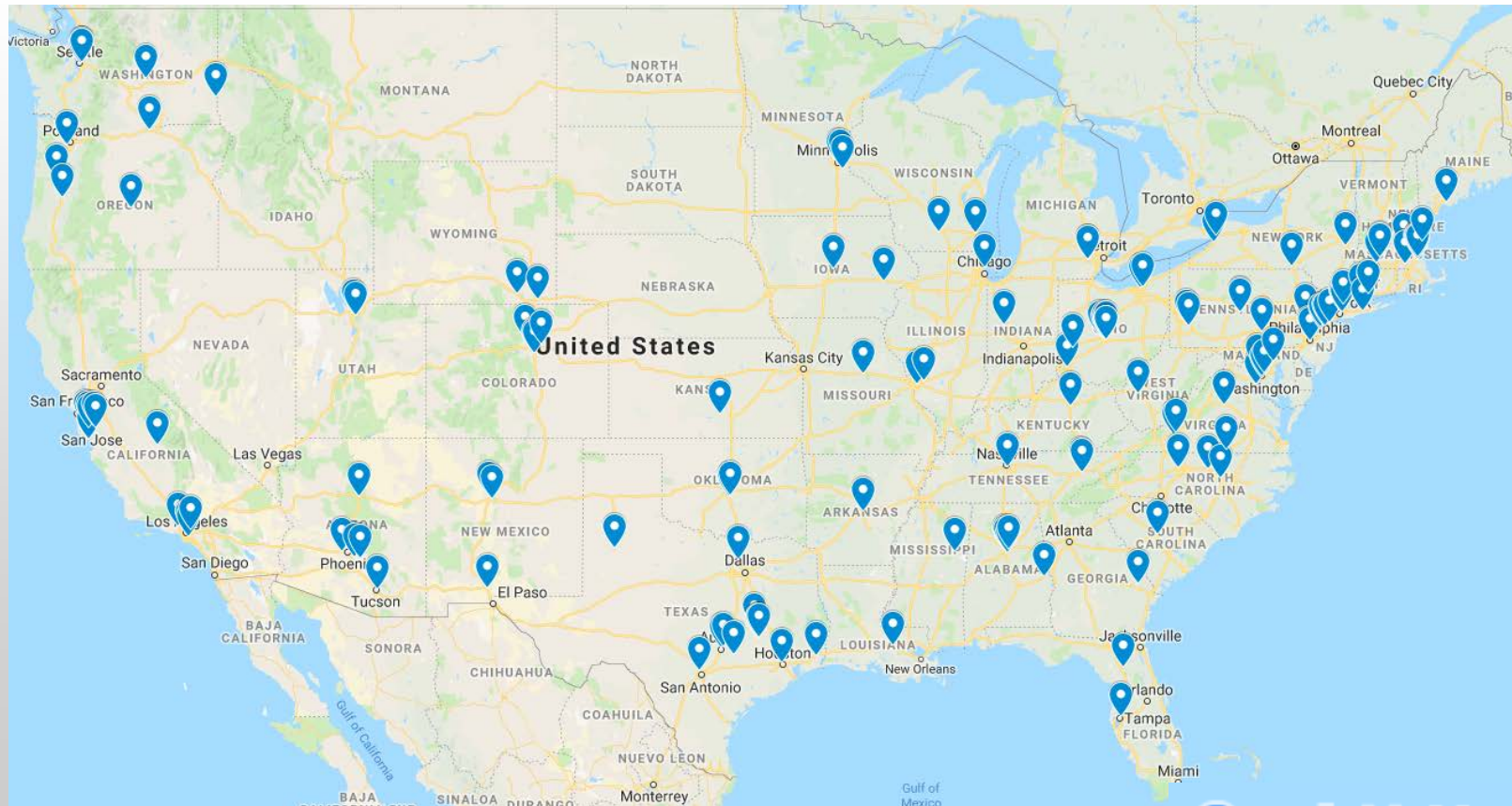
OnDemand users start work faster than traditional users, both in terms of first login and job submission



Launched Sep. 2016, % users has steadily increased since launch

Approx Number of Institutions based on RPM logs

- 136 unique US locations
- 70 unique international locations



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

Example Current Engagements and Deployments

Production Deployments



In Process of Installing



Customizing OnDemand: Branding

- Institution logo
- Navbar color
- Portal name
- Display MOTD
- Display announcements

The screenshot displays the Open OnDemand portal interface, demonstrating branding customization. The top navigation bar is dark gray with the text "Open OnDemand" on the left and links for "Develop", "Help", "efranz", and "Log Out" on the right. Below this, the "OPEN OnDemand" logo is prominently displayed, followed by the text "OnDemand provides an integrated, single access point for all of your HPC resources." The main content area features a dark gray navigation bar with links for "Bridges OnDemand", "Files", "Jobs", "Clusters", and "Interactive Apps". A red banner below the navigation bar reads "A PITTSBURGH SUPERCOMPUTING CENTER RESOURCE". The main content area is divided into two sections. The left section shows a row of server racks with the text "Open OnDer" below them. The right section is titled "Welcome to Bridges" and features a red navigation bar with links for "OSC OnDemand", "Files", "Jobs", "Clusters", and "Interactive Apps". Below this, the "Ohio Supercomputer Center" logo is displayed, along with the text "An OH-TECH Consortium Member" and "OnDemand provides an integrated, single access point for all of your HPC resources." The bottom section is titled "Message of the Day" and contains two announcements: "2017-05-04 - NEW SCRATCH STORAGE POLICY IN EFFECT JUNE 1" and "2017-04-03 - GPUS NOW AVAILABLE ON OWENS".

Open OnDemand

</> Develop ▾ ? Help ▾ efranz ↗ Log Out

OPEN
OnDemand

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

Bridges OnDemand Files ▾ Jobs ▾ Clusters ▾ Interactive Apps ▾ </> Develop ▾ ? Help ▾ efranz ↗ Log Out

A PITTSBURGH SUPERCOMPUTING CENTER RESOURCE

Welcome to Bridges

OSC OnDemand Files ▾ Jobs ▾ Clusters ▾ Interactive Apps ▾ </> Develop ▾ ? Help ▾

Ohio Supercomputer Center
An OH-TECH Consortium Member

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

Open OnDer

Message of the Day

2017-05-04 - NEW SCRATCH STORAGE POLICY IN EFFECT JUNE 1
The new scratch storage policy will take effect Thursday, June 1, 2017. We will shorten our file deletion period to 120 days. More information can be found [here](#).

2017-04-03 - GPUS NOW AVAILABLE ON OWENS
160 GPU nodes on Owens are available and now include the Nvidia P100. For more information on how to use the GPUs, check out our [documentation](#). Please contact oschelp@osc.edu if you have any questions.

Walkthrough

Review Features:

- File Explorer – transfer, edit, copy & paste
- Cluster – shell access & system status
- Apps – GUIs, VDI, and interactive jobs (show the difference)
- Jobs – Composer: submit from template, create own template & Active Jobs: queues


Open OnDemand

Files ▾

Jobs ▾

Clusters ▾

Interactive Apps ▾

 My Interactive Sessions

Walkthrough – File Explorer

OSC OnDemand

Files ▾

Jobs ▾

Clusters ▾

Interactive Apps ▾

My Interactive Sessions

Home Directory

/fs/project/PZS0712

/fs/scratch/PZS0712

Ohio Supercomputer Cen

An OH-TECH Consortium Member

File Explorer

Go To...

>_ Open in Terminal

New File

New Dir

Upload

Show Dotfiles

Show Owner/Mode

Home Directory

7479989.oak-batch.osc.edu

7482682.oak-batch.osc.edu

7482705.oak-batch.osc.edu

Amber_GPU

Amber_test

Desktop

Documents

Downloads

July17-Bigdata

Mar0917-Bigdata

Music

/users/appl/kcahill/

View

Edit

A-Z Rename

Download

Copy

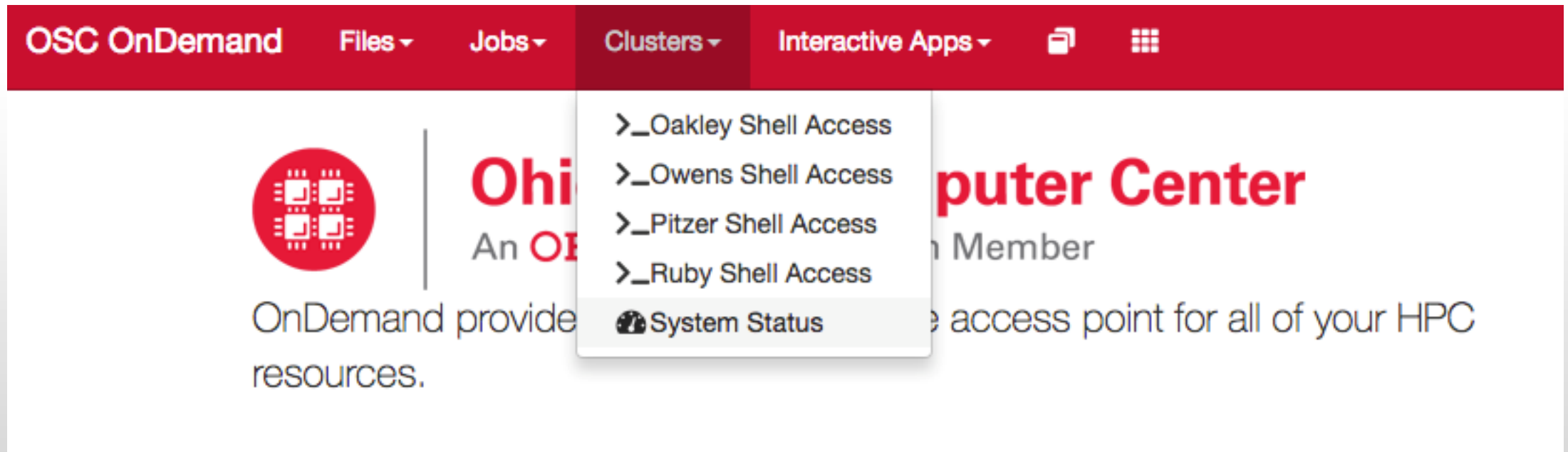
Paste

*(Un)Select All

Delete

name	size	modified date	owner	mode
..	<dir>	.	---	---
7479989.oak-batch.osc.edu	<dir>	09/12/2016	20238	rwX r-X r-X
7482682.oak-batch.osc.edu	<dir>	09/12/2016	20238	rwX r-X r-X
7482705.oak-batch.osc.edu	<dir>	09/12/2016	20238	rwX r-X r-X
Amber_GPU	<dir>	05/22/2017	20238	rwX r-X r-X
Amber_test	<dir>	02/06/2017	20238	rwX r-X r-X

Walkthrough – Clusters



The screenshot shows the OSC OnDemand web interface. The top navigation bar is red with white text for 'OSC OnDemand', 'Files', 'Jobs', 'Clusters', and 'Interactive Apps'. The 'Clusters' menu is open, showing a list of shell access options and a system status link. The background features the Ohio State University logo and the text 'Computer Center' and 'Member'.

OSC OnDemand Files Jobs Clusters Interactive Apps

- >_Oakley Shell Access
- >_Owens Shell Access
- >_Pitzer Shell Access
- >_Ruby Shell Access
- System Status

Ohio State University Computer Center

Member


OnDemand provides a single access point for all of your HPC resources.


Walkthrough – Apps

[Home](#) / [My Interactive Sessions](#) / ParaView


Interactive Apps

Desktops

 Oakley Desktop

 Owens Desktop

 Ruby Desktop


 Oakley VDI


 Owens VDI

 Ruby VDI

GUIs

 ANSYS Workbench

 Abaqus/CAE

 COMSOL Multiphysics

 MATLAB

 **ParaView**

ParaView

This app will launch a [ParaView](#) GUI on the [Owens Cluster](#) using a **shared node**. You will be able to interact with the ParaView GUI through a VNC session.

Project

You can leave this blank if **not** in multiple projects.

Number of hours

Resolution

width	<input type="text" value="1536"/>	px	height	<input type="text" value="864"/>	px
-------	-----------------------------------	----	--------	----------------------------------	----


[Reset Resolution](#)

[Launch](#)

* All ParaView session data is generated and stored under the user's home directory in the corresponding [data root directory](#).

Walkthrough – Jobs

OSC OnDemandFilesJobsClustersInteractive Apps



Ohio Supercomputer Center

An OH-TECH Consortium Member

Active Jobs

Job Composer

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

Jobs

+ New Job

From Default Template

From Template

From Specified Path

From Selected Job

Create Template

Open Terminal

Submit

Stop

Delete

Search:

Created	Name	ID	Cluster	Status
September 26, 2018 10:45am	MPI Hello World		Owens	Not Submitted

Job Details

Job Name:
MPI Hello World

Submit to:
Owens

Account:
Not specified

Open OnDemand 2.0 Project Overview

- Just finished three year NSF SI2 award (#1534949) to develop OnDemand 1.x
- Awarded a 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
- 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/>

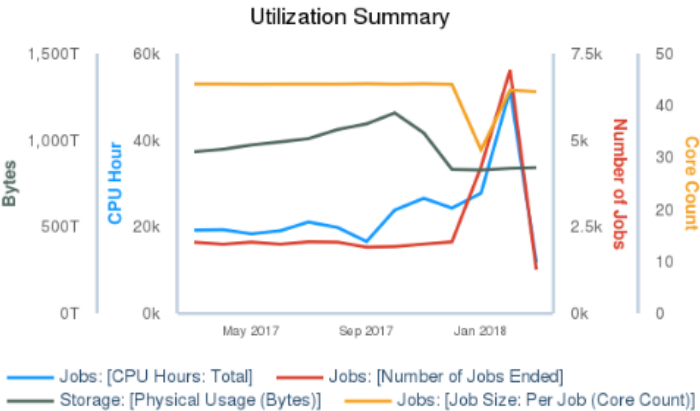
Open XDMoD and OnDemand Integration

OnDemand provides an integrated, single access point for CCR's HPC resources

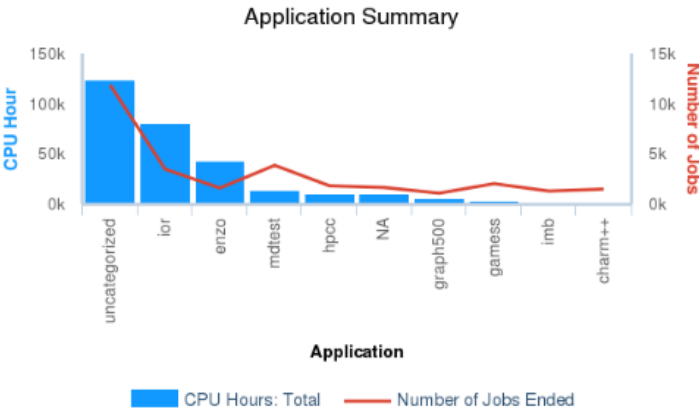
Users can transfer files, access a shell environment on the cluster front-end login server, launch interactive and remote visualization jobs, and monitor jobs all without installing any client software or web plug-ins. Access these features using the menus at the top of this page. Note that many of the apps will launch in a new tab or new browser window but the dashboard will remain open in the original window.

Utilization Summary

	Previous Month	Previous Quarter	Year To Date
Total CPU Hours	51,541	74,617	298,725
Number of Jobs	7,017	5,973	32,551
Average Job Size (Cores)	42.1	43.9	44.1
Storage (GB)	834	1,008	964,150



2017-03-01 to 2018-03-23 Src: HPCDB, File system storage logs. Powered by XDMoD/Highcharts



2017-03-01 to 2018-03-23 Src: SUPREMM. Powered by XDMoD/Highcharts

Open XDMoD and OnDemand Integration

- Active Jobs App links directly to Open XDMoD Job Viewer
- Detailed performance data
 - Per core CPU utilization
 - Network performance
 - Storage reads/writes

CCR OnDemand / Active Jobs

All Jobs ▾

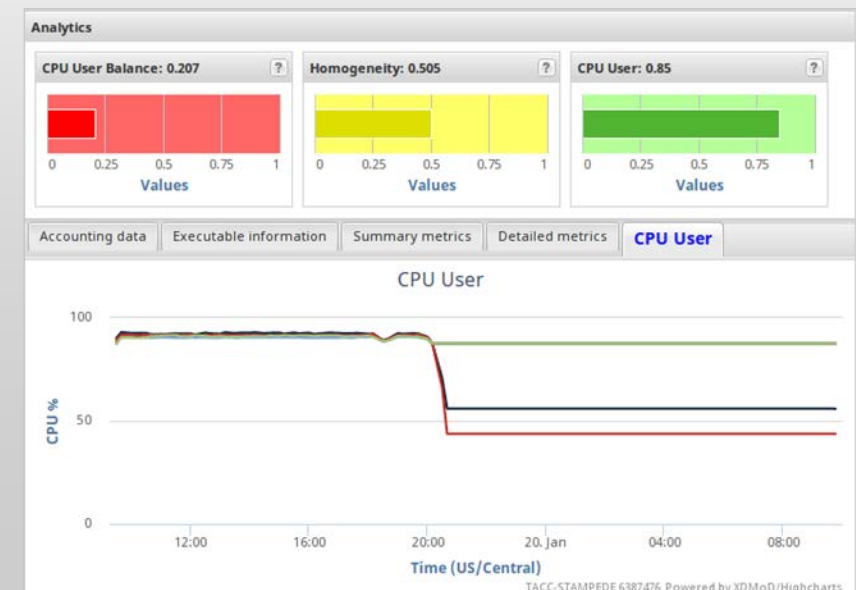
All Clusters ▾

Active Jobs

Show 50 entries

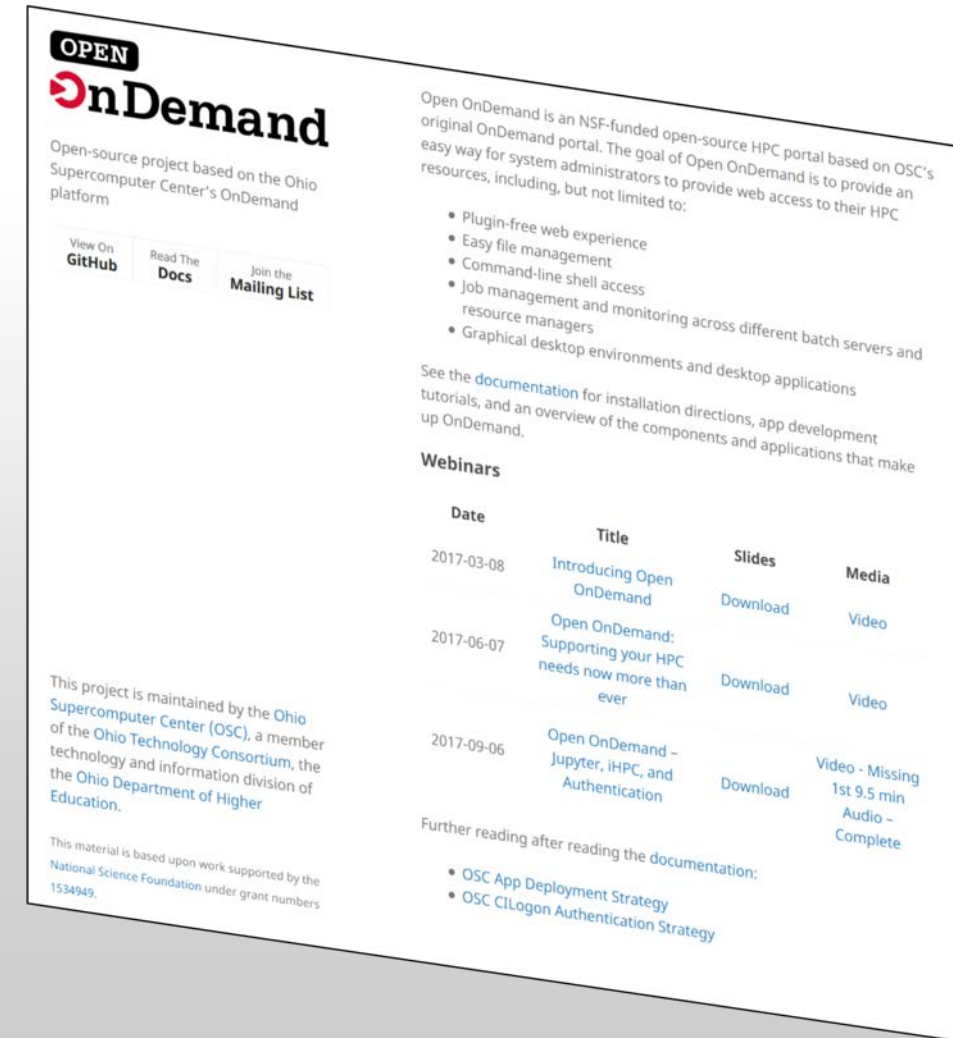
Filter:

ID	Name	User	Account	Time Used	Queue	Status	Cluster	Performance
8524227	GaVCF_ALL	jw24	big		general-com...	Queued	UB HPC	
8518896	JCG_chr1:36746293	jw24	big	44:12:05	general-com...	Running	UB HPC	
8518944	JCG_chr1:26849169	jw24	big	44:09:54	general-com...	Completed	UB HPC	XDMoD
8518965	JCG_chr1:37553840	jw24	big	44:09:54	general-com...	Completed	UB HPC	XDMoD
8518969	JCG_chr1:45553844	jw24	big	44:09:54	general-com...	Completed	UB HPC	XDMoD
8519044	JCG_chr1:69553856	jw24	big	44:07:31	general-com...	Completed	UB HPC	XDMoD



Staying in Touch

- Visit our website
 - <http://openondemand.org>
- 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



Thank you! Any questions?



Ohio Supercomputer Center



Alan Chalker, Ph.D.

Director of Strategic Programs at OSC

Ohio Supercomputer Center

alanc@osc.edu

openondemand.org