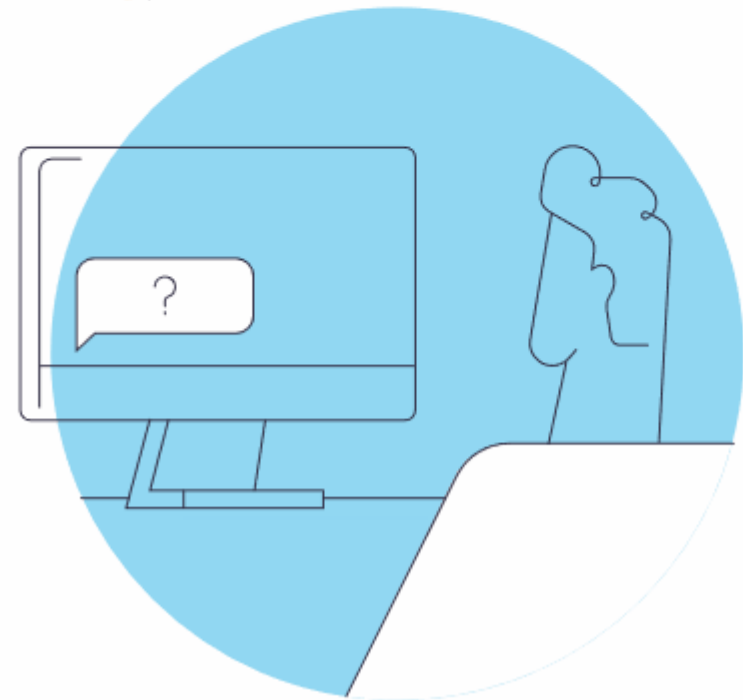


User Group Meeting ISC24 BoF

Brian Guilfoos
Emily Moffat Sadeghi
Chase Eyster



openondemand.org/isc24



This work is supported by the National Science Foundation of the United States under the awards 1534949, 1835725, 2138286, and 2303692

User Group Meeting Agenda

About Open OnDemand

Version 3.1

Key Items of Note

Engaging with the Project

Open Floor Discussion



Quick Survey

Go to

www.menti.com

Enter the code

3524 2932



Or use QR code

Run Open OnDemand

Access your organization's supercomputers through the web to compute from anywhere, on any device.



Zero installation

Run Open OnDemand entirely in your browser. No client software installation required.

Easy to use

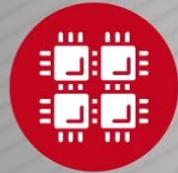
Start computing immediately. A simple interface makes Open OnDemand easy to learn and use.

Compatible with any device

Launch on any device with a browser—even a mobile phone or tablet.

openondemand.org/run

Any Device, Anywhere

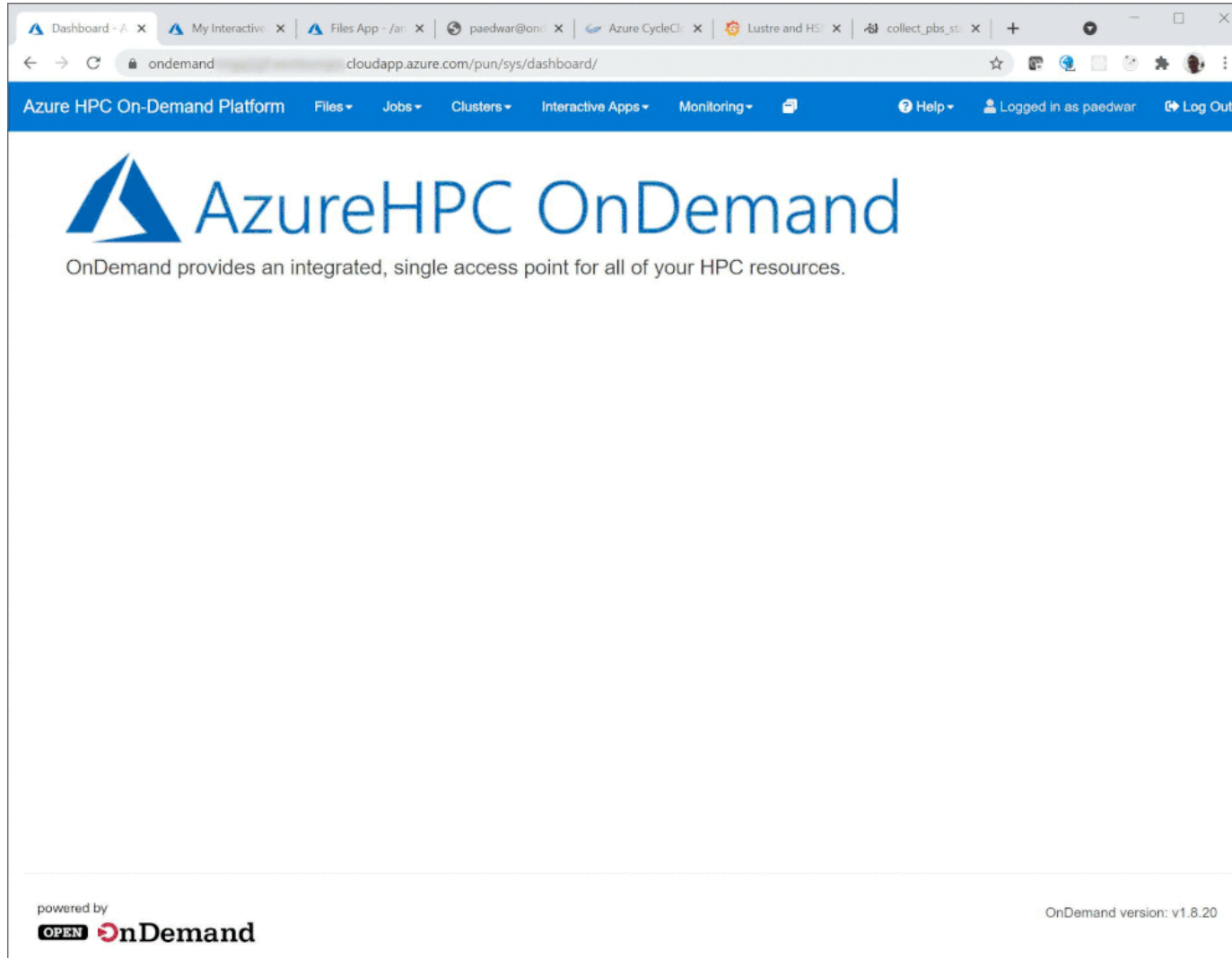


Ohio Supercomputer Center

An **OH·TECH** Consortium Member

openondemand.org/anydevice

Commercial Cloud



openondemand.org/aws



openondemand.org/azure



openondemand.org/gcp

Install Open OnDemand

Administer remote web access to your supercomputers to transform the way users work and learn.



Low barrier to entry

Empower users of all skill levels by offering an alternative to command-line interface.

Free and open source

Install Open OnDemand for free, and gather knowledge from our large open-source community.

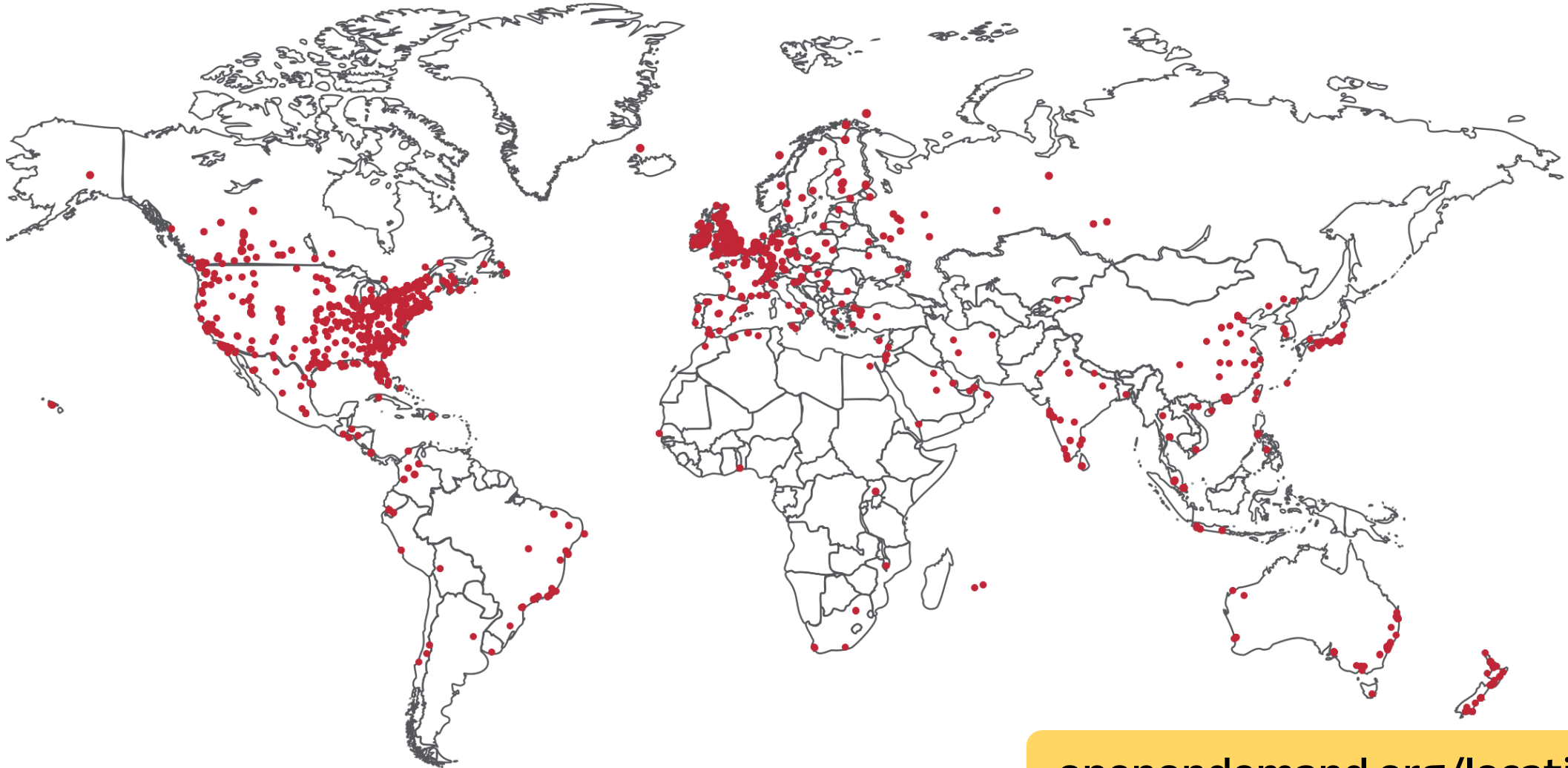
Configurable and flexible

Create and deploy your own applications to meet your users' unique needs.

openondemand.org/install

Deployed Worldwide

95 Countries | 1,646 Organizations



openondemand.org/locations

Example Deployments


Agency for
Science,
Technology and
Research

A*STAR Website >


Alto
Neurosciences

Alto Neurosciences
Website >


Amazon Web
Services

AWS Website >


Argonne
National
Laboratory

Argonne National
Laboratory Website >


Aristotle
University of
Thessaloniki

Aristotle University
Website >


Arizona State
University

ASU Website >


Australian
Academic and
Research
Network

aarnet Website >


Boise State
University

Boise State University
Website >


Boston
University

Boston University
Website >

Don't see your organization?

The more the merrier!
Let us know if you
belong on the list

California
USC Website >

OPEN  On Demand

University of Wisconsin
Eau Claire
University of
Wisconsin-Eau
Claire

UWEC Website >


Vanderbilt
University

Vanderbilt University
Website >


Virginia Tech

Virginia Tech Website >


Wageningen
University &
Research

Wageningen
University Website >


Wayne State
University

WSU Website >


West Virginia
State University

WVU Website >


Wright State
University

Wright State
University Website >


XSEDE

XSEDE Website >


Yale
University

Yale University
Website >

openondemand.org/orgs

Enabled Utilities & Apps

Abaqus

ANSYS

COMSOL

Coot

CSD

Galaxy

Grace

Grafana

Grid Engine

IDL

Jupyter

Kubernetes

LSF

Lumerical

Mathematica

MATLAB

Meshroom

NAGIOS

Octave

Open XDMoD

Ovito

Paraview

PBS Professional

QGIS

RELION

RStudio

SAS

Shiny

Slurm

Spark

STATA

Tensorboard

Torque

VISIT

Visual Studio Code

VMD

Support



Discuss on Discourse

The Get Help category features user and admin questions and answers.

openondemand.org/discourse



Slack Workspace

Communicate and collaborate with the project team and community members.

openondemand.org/slack



Github Documentation

Outlines installation steps, app guidelines, release notes, and more.

openondemand.org/docs



Constant Contact Newsletter

Subscribe to get notices about upcoming events, new releases and user stories.

openondemand.org/newsletter

openondemand.org/support

Videos & Publications

<p>11.13.23 SC23 Exhibiter</p> <p>Conference site ></p>	<p>10.30.23 Gateways23 Exhibiter</p> <p>Conference site ></p>	<p>Publication 07.24.23 PEARC23 Preso: HPC toolset</p> <p>Download ></p>	<p>07.24.23 PEARC23 Exhibiter</p> <p>Conference site ></p>	<p>Publication 05.02.23 Project Paper: Sector examples</p> <p>Download ></p>	<p>Video 04.06.23 Tips Webinar: Version 3.0</p> <p>Watch ></p>	<p>Video 03.02.23 Tips Webinar: Amazon Web Services</p> <p>Watch ></p>	<p>Video 02.02.23 Tips Webinar: Dynamic forms</p> <p>Watch ></p>
<p>Video 06.01.23 Tips Webinar: Customizations</p> <p>Watch ></p>	<p>Publication 05.24.23 ISC23 Preso: User group meeting</p> <p>Download ></p>	<p>05.21.23 ISC23 Exhibiter</p> <p>Conference site ></p>	<p>Publication 05.21.23 ISC23 Preso: HPC toolset</p> <p>Download ></p>	<p>Publication 01.26.23 NVIDIA SAE Preso: Overview</p> <p>Download ></p>	<p>Publication 01.15.23 Project Paper: Production deployments</p> <p>Download ></p>	<p>Video 12.01.22 Tips Webinar: SC22 recap</p> <p>Watch ></p>	<p>Publication 11.15.22 SC22 Preso: User group meeting</p> <p>Download ></p>
<p>Publication 05.16.23 RMACC HPC 23 Preso: Walkthrough</p> <p>Download ></p>	<p>Publication 05.11.23 I2 CommEX 23 Preso: CloudCluster</p> <p>Download ></p>	<p>Publication 05.04.23 Project Paper: General brochure</p> <p>Download ></p>	<p>Video 05.04.23 Tips Webinar: MATLAB</p> <p>Watch ></p>	<p>Publication 11.15.22 SC22 Paper: ERN cryo-EM</p> <p>Download ></p>	<p>01.15.22 SC22 Exhibitor</p> <p>Conference site ></p>	<p>Video 11.03.22 Tips Webinar: Quantifying impact</p> <p>Watch ></p>	<p>10.18.22 Gateways22 Exhibitor</p> <p>Conference site ></p>

Community Events



Tips and tricks calls

Hosted by the larger Open OnDemand community, tips and tricks webinars share best practices for setting up and using Open OnDemand. They take place on the first Thursday of every month at 1 p.m. ET.



Open office hours

Hosted by our development team, Zoom open office hours are the perfect opportunity to ask questions or make a suggestion. They are held on the second Tuesday of every month from 11:15 a.m. to 12:45 p.m. ET.

openondemand.org/events

User Group Meeting Agenda

~~About Open OnDemand~~

Version 3.1

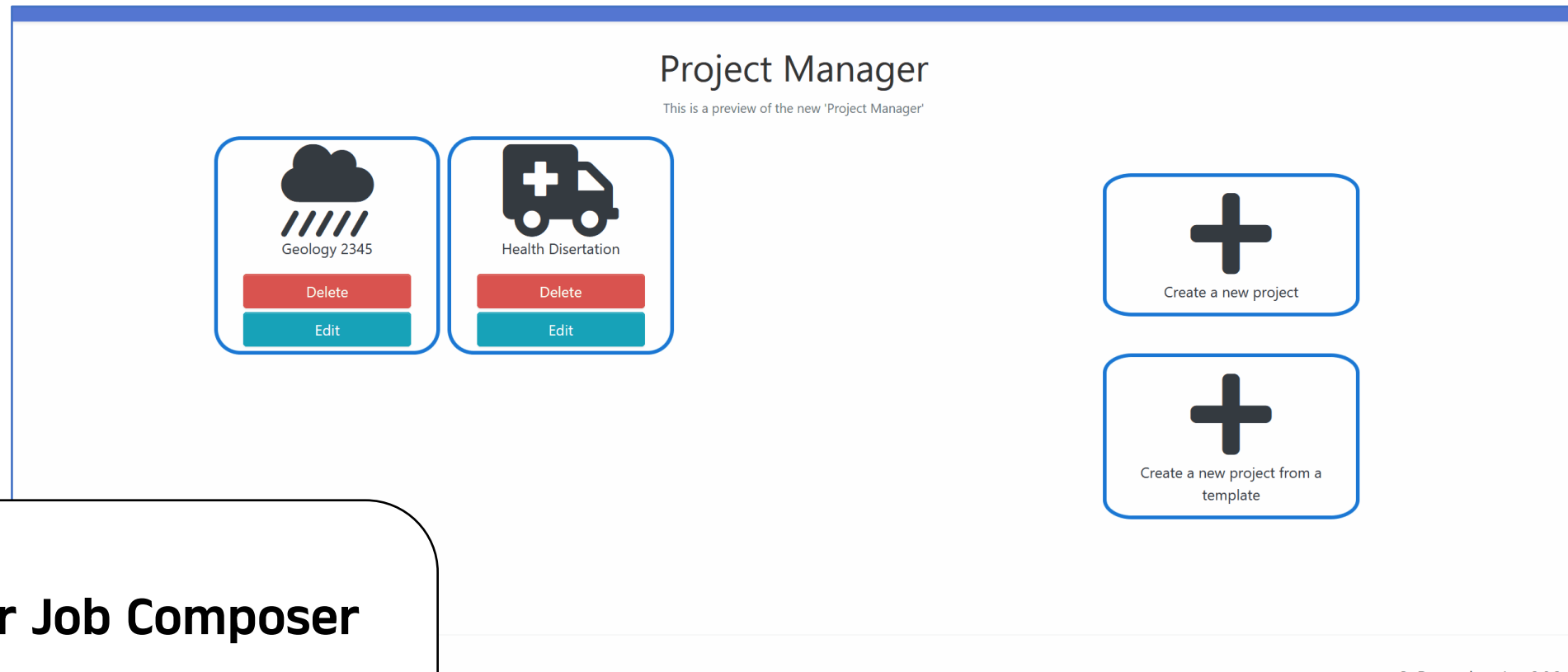
Key Items of Note

Engaging with the Project

Open Floor Discussion



“Project Manager”

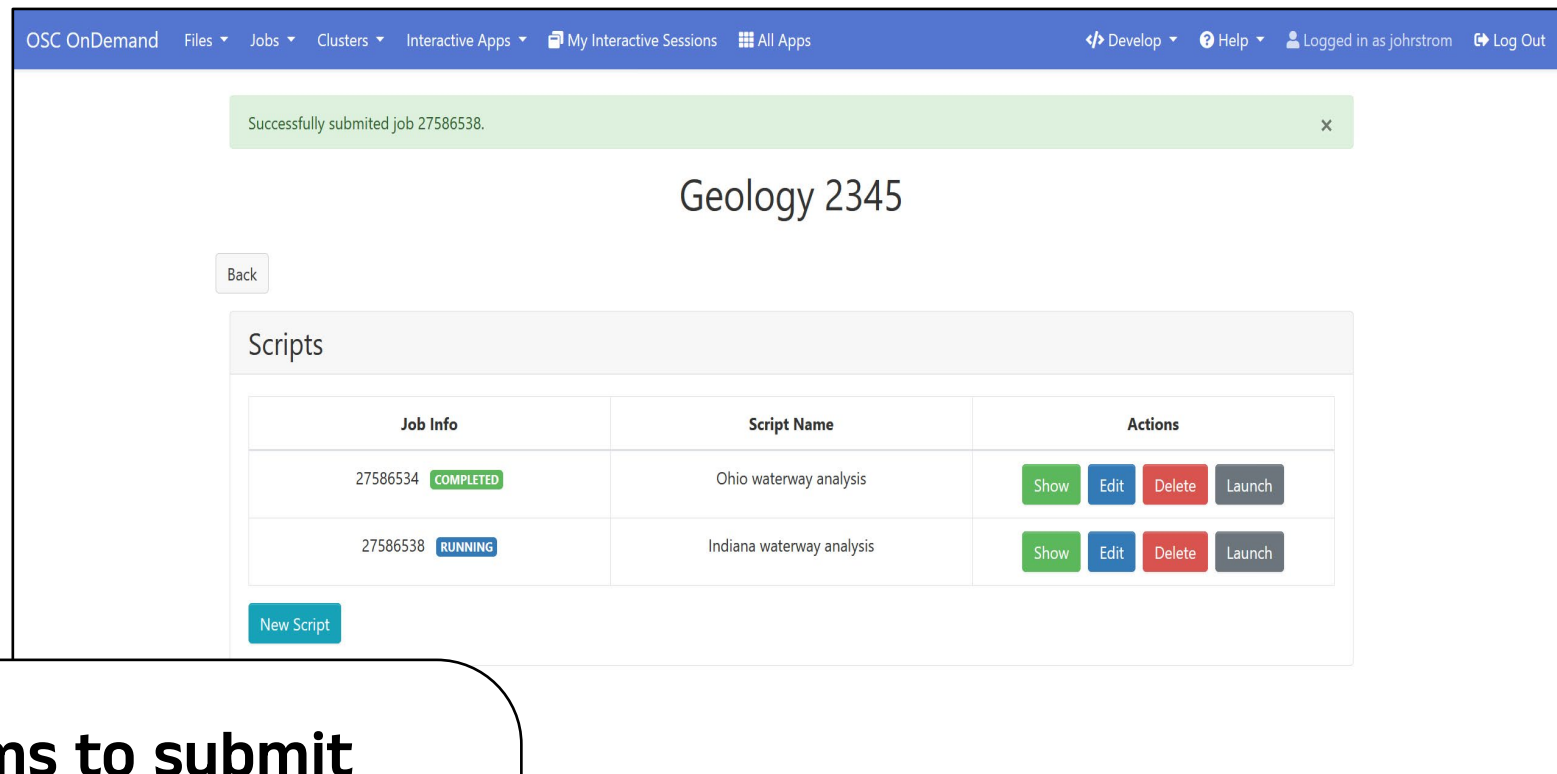


Replacement for Job Composer

3.1 has a 'preview' that can be enabled

Thanks to Harvard for helping with this

“PM” - Project View



Each project has script forms to submit jobs

'Launch' launches the job directly with default values

This UI is subject to change

openondemand.org/releasesnotes

“PM” - Job Forms

Indiana waterway analysis

Account

Script

Cluster

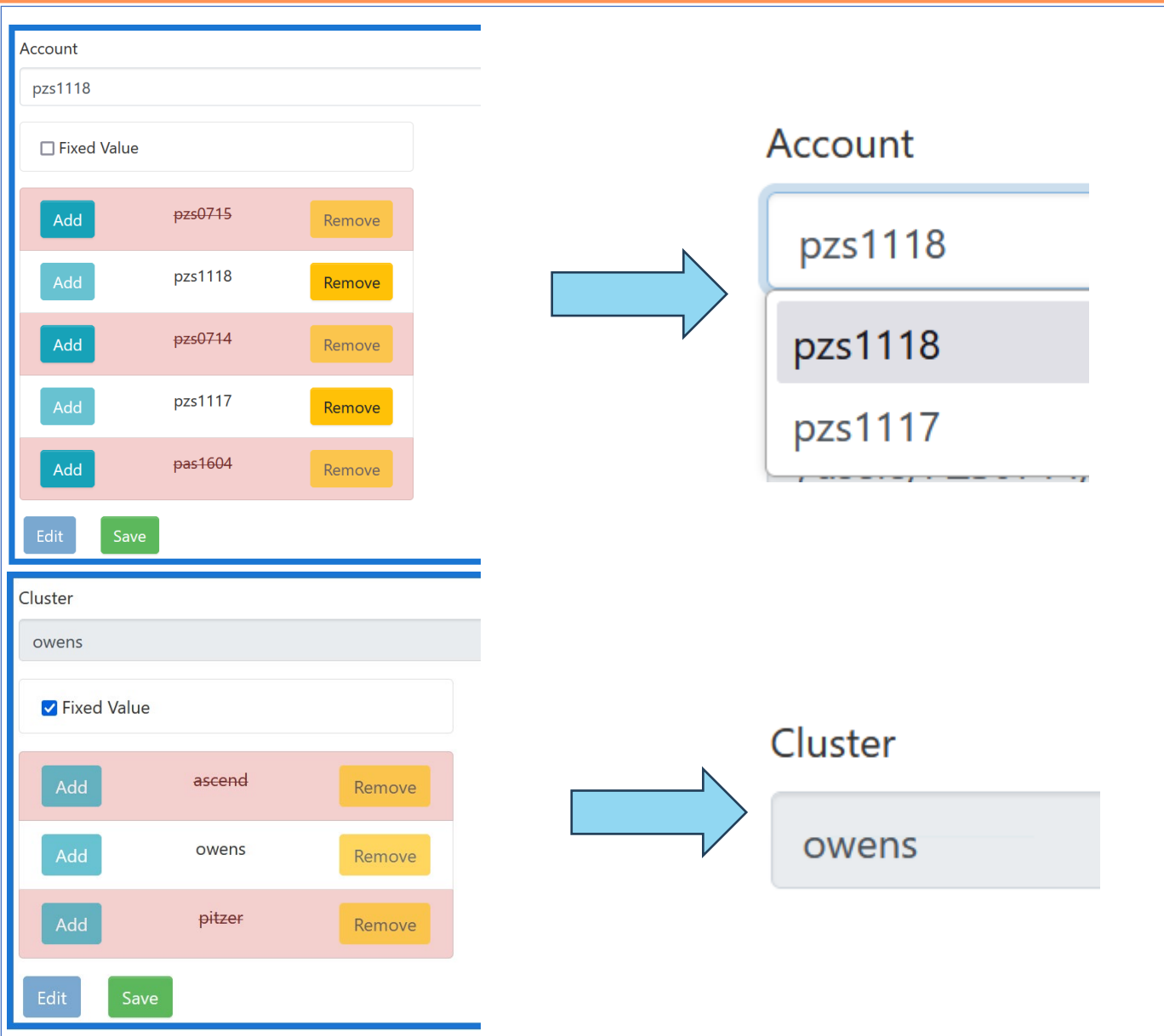
Script forms look like Interactive App forms

This is the 'Show' script page

This UI is subject to change

openondemand.org/releasesnotes

“PM” - Form Building UI



The diagram illustrates the process of building a form. On the left, the 'Account' section shows a list of items with 'Add' and 'Remove' buttons. The 'Cluster' section also shows a list of items with 'Add' and 'Remove' buttons. On the right, the resulting form is shown with the selected values: 'pzs1118' for the Account field and 'owens' for the Cluster field.

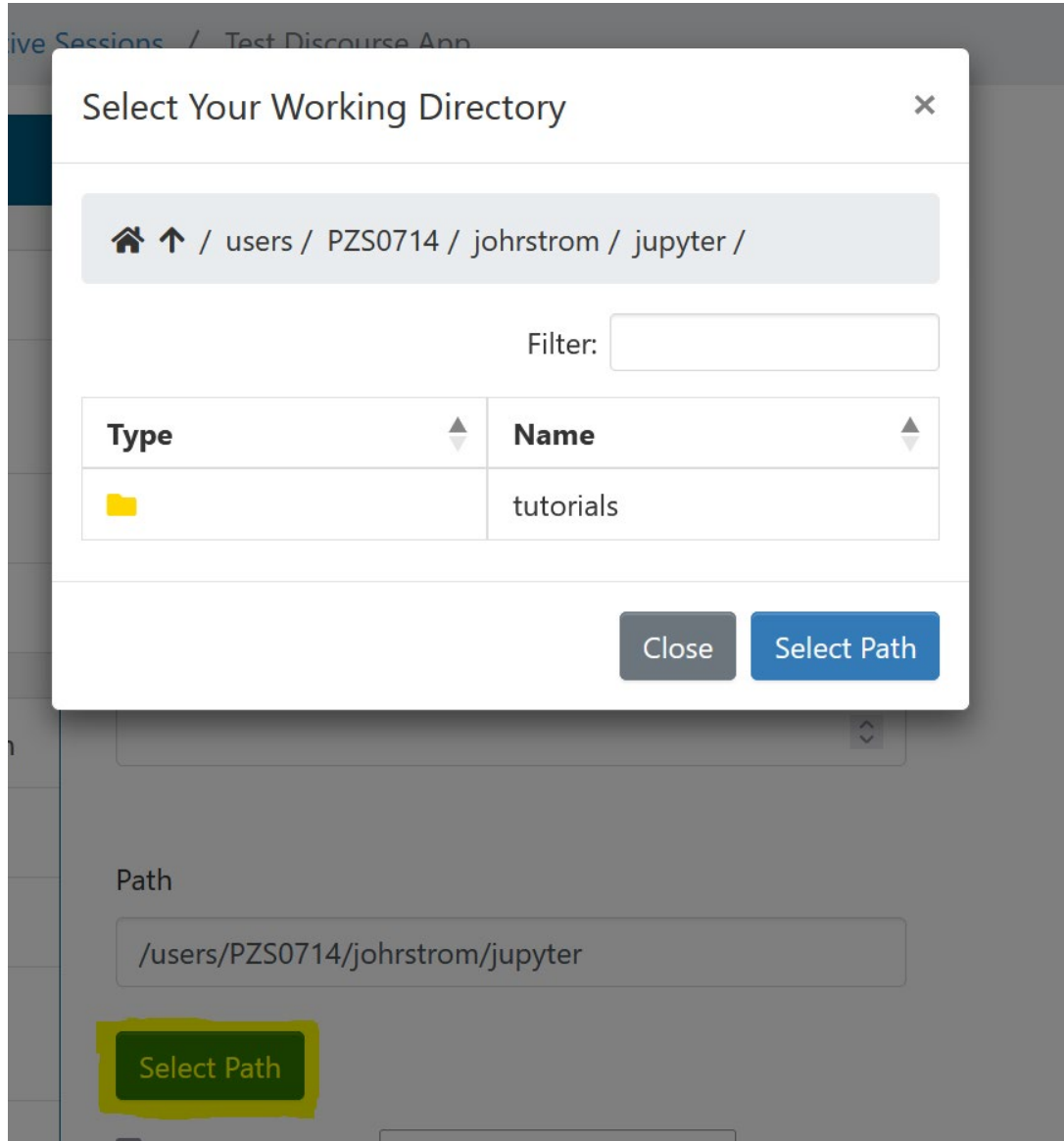
Clients use to build/edit form to submit jobs

Can add/remove form options (queue, nodes, etc)

Limit or fix options in select menus

Set min, max or fix number options

Built-in Path Selector



App form 'path_selector'

Is a built-in widget

Clients can select a path used in forms

Replaces pulling 'form.js' from another project

Interactive App Templates

Interactive Apps

Desktops

- Ascend Desktop
- Lightweight Desktop
- Owens Desktop
- Pitzer Desktop

GUIs

- ANSYS Workbench
- Abaqus/CAE
- Blender
- COMSOL Multiphysics
- IQmol
- MATLAB
- ParaView
- PyMOL
- QGIS

Jupyter version: v0.25.1

This app will launch a [Jupyter](#) server using [Python](#) on the [Ascend](#), [Owens](#) or [Pitzer](#) clusters.

Prefill with template

-- select a template --

Cluster

owens

Project

PZS1118

Mode

Jupyter Lab

Jupyter Notebook

Number of hours

4

Node type

any

- Standard Compute**
These are standard HPC machines. Owens has 648 of these nodes with 40 cores and 128 GB of memory. Pitzer has 224 of these nodes with 40 cores and 340 of

Interactive app form templates

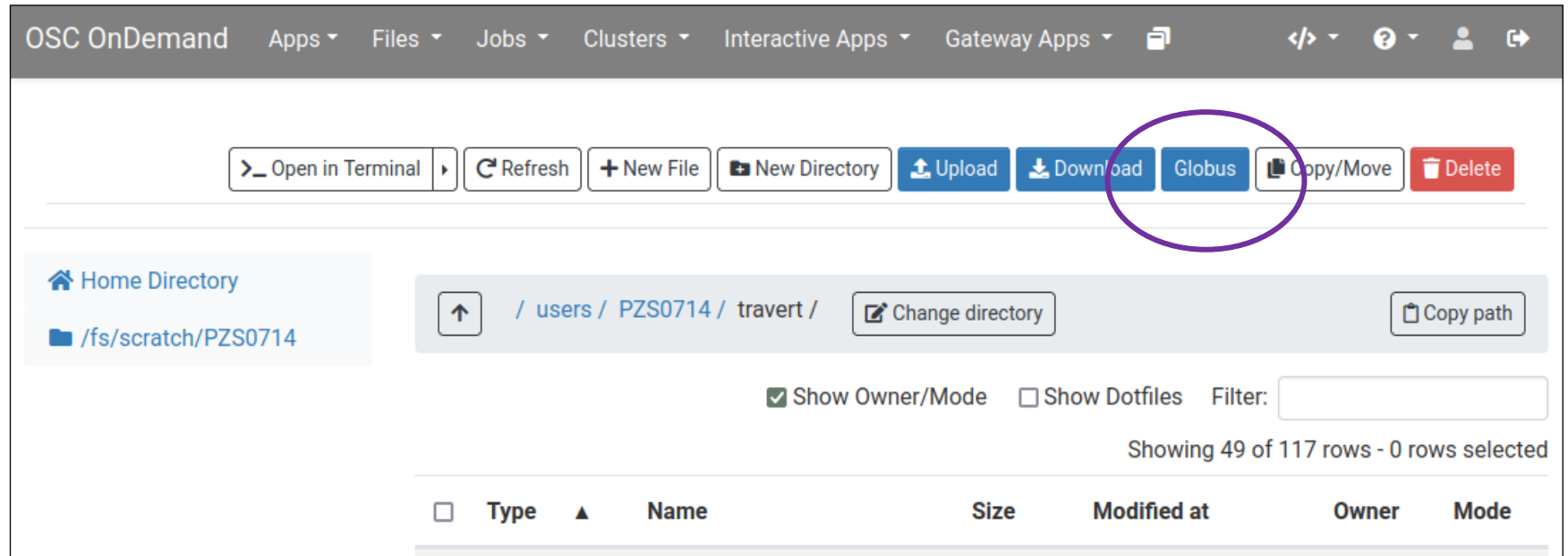
Completely client defined

Local to that client

Can be saved

Thanks to CSC-FI for helping with this

Globus Integration



Globus integration

The files app now has a button to the Globus endpoint associated with that directory

Additional Items of Note

Arch64 & ppc64le support.

3.1 has packages for arch64 and ppc64le architectures

Dropping support for EL7

EL 7 is EOL June 2024 and we will no longer be able to use CentOS to build & test

Debian 12 support

OOD version 3.1 has packages available for Debian 12 'Bookworm'

User Group Meeting Agenda

~~About Open OnDemand~~

~~Version 3.1~~

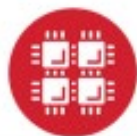
Key Items of Note

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Open Floor Discussion



OnDemand for a Decade



Ohio Supercomputer Center
An OH·TECH Consortium Member

OSC OnDemand: A Web Platform Integrating Access to HPC Systems, Web and VNC Applications

Dave Hudak, Thomas Bitterman, Patricia Carey, Douglas Johnson,
Eric Franz, Shaun Brady, Piyush Diwan

www.osc.edu

OH·TECH | Ohio Technology Consortium
A Division of the Ohio Board of Regents

OSC OnDemand: A Web Platform Integrating Access to HPC Systems, Web and VNC Applications

David E. Hudak, Thomas Bitterman, Patricia Carey, Douglas Johnson,
Eric Franz, Shaun Brady, Piyush Diwan
The Ohio Supercomputer Center, 1224 Kinnear Road, Columbus, OH 43201 USA
011-1-614-292-9248
{dhudak, tbitter, pcarey, djohnson, efranz, sbrady, pdiwan}@osc.edu

ABSTRACT

In this paper, we describe the OnDemand web platform for providing OSC users integrated access to HPC systems, web applications and VNC services. We present the user experience and implementation of OnDemand and compare it with existing science gateway approaches.

Categories and Subject Descriptors

I.6.7 [Simulation and Modeling]: Simulation Support Systems - environments

General Terms

Design, Reliability, Security, Human Factors.

Keywords

Web platform, OpenID, REST, High Performance Computing, Virtual Organizations, Cyberinfrastructure.

1. INTRODUCTION

The web has become the dominant access mechanism for remote compute services in every computing area except HPC. In HPC, web applications primarily exist in the form of science gateways. However, the majority of work is performed via HPC system access provided through SSH for text-based access and (occasionally) VNC for visualization access. This separation between web and system functionality inhibits the impact of HPC. Web applications (gateways) have not truly proliferated in HPC due to the development and administrative overheads required for each individual gateway. Meanwhile, traditional SSH interfaces represent a barrier to entry for new users who must locate acceptable client software and learn command-line interfaces for file editing and job control.

We created OSC OnDemand to be a unified web platform where users could access science gateway-style web applications, VNC applications, HPC center filesystems and login node terminals. The user has to know only three things: the URL (ondemand.osc.edu), their username and their password. Once logged into OnDemand, the user is presented with a dashboard showing a set of applications for filesystem access, job

construction and monitoring, login node terminal access, visualization node access via VNC and science gateways.

2. RELATED WORK

There has been a large and impressive body of work completed to support grid services and science gateways. The Globus Toolkit [5], [6] provides fundamental technologies for identification, authentication, authorization and service discovery. For example, the Computational Chemistry Grid project created and maintains the GridChem science gateway, [4] using Globus technologies. GridChem users from multiple institutions can securely access services from multiple resource providers. GridChem is also illustrative of the use of science gateways to form *virtual organizations*, where participants from multiple physical institutions can perform calculations and share data via a common web platform, thus forming a single virtual organization. This model has proven popular. Presently, XSEDE supports twenty-nine individual science gateways, many of them supporting discipline-specific virtual organizations [15]. The XSEDE User Portal (XUP), (portal.xsede.org) provides integrated GSI-SSH, job status, machine status and account management. OnDemand includes similar functions but adds file browsing and editing, job control (job submission and deletion) and VNC application access. In addition, the nanoHUB project [9] has released the HUBzero [10] software distribution for the creation of virtual organizations at the institutional (or even the laboratory) level. The Open Science Grid also supports non-browser applications for submitting HPC jobs from desktops, like BoSCO [16]. UNICORE [17] supports web portals through its Portal Task Force [18]. Current efforts address basic services, security, and workflow management.

Our team began designing web applications in 2008, including examples in remote instrumentation [2] and data-intensive biomedical science [7]. These applications, like many XSEDE science gateways, are built as standalone web applications that provide user separation at the application level and are deployed in community accounts, i.e., a single HPC account holding all gateway users' data. We encountered two major problems with scaling this approach: first, the increasing overhead of managing gateway deployments and accounts on a per-gateway basis and second, an inability to effectively support use cases in which a user required both gateway functionality as well as system-level access to their data (e.g., access at the command line). In order to solve the overhead problem, we experimented successfully with multiple services reachable from a single entry point that relied on common authentication [8]. In order to solve the second problem, we invented a new mechanism for web server deployment that is used in OnDemand (see section 4).

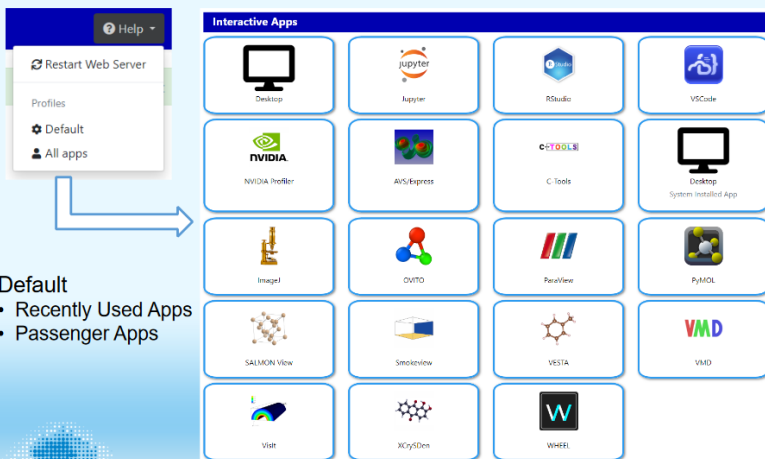
Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyright for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, or to republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from Permissions@acm.org.
XSEDE '13, July 22 - 25 2013, San Diego, CA, USA
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openondemand.org/xsede13

Riken Workshop

Some Visualization Applications (OnDemand)

Select "All apps" if "Batch Jobs" and "Interactive Apps" do not appear.



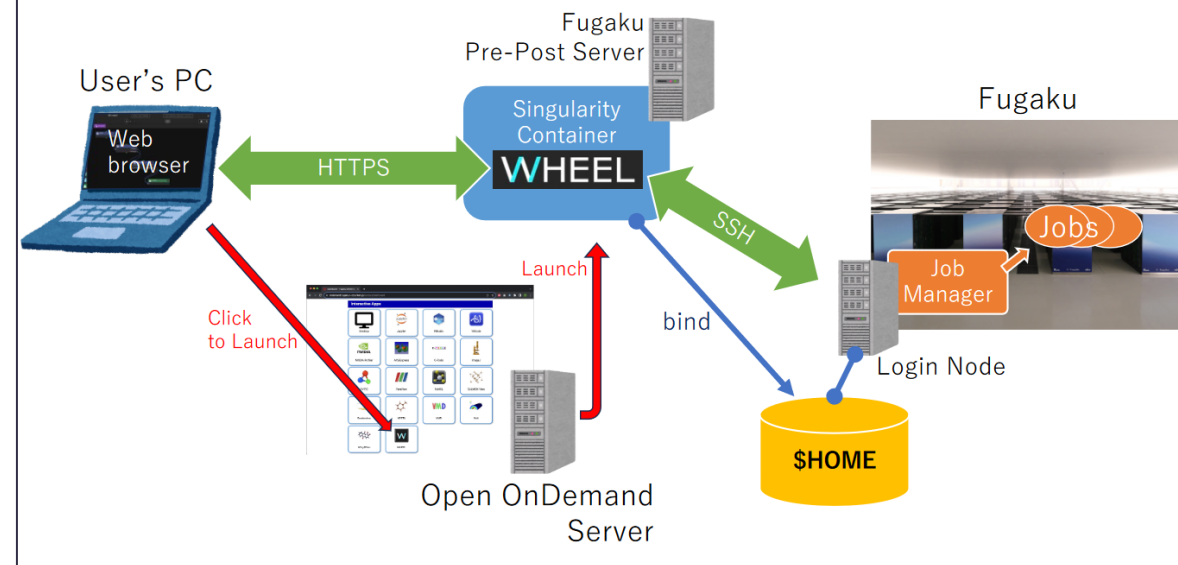
The screenshot shows the OnDemand application interface. On the left, there is a sidebar with a "Help" menu and a "Profiles" dropdown menu containing "Restart Web Server", "Default", and "All apps". The main area is titled "Interactive Apps" and displays a grid of application icons. The icons include Desktop, Jupyter, RStudio, VSCode, NVIDIA (NVIDIA Inference), AVS/Express, C-Tools, Desktop System installed App, ImageJ, OVITO, ParaView, PyMOL, SALMON View, Smokeview, VESTA, VMD, VisIt, XCrystal, and WHEEL. Below the grid, there is a "Default" section with the following items:

- Recently Used Apps
- Passenger Apps

- **General-Purpose**
 - AVS/Express (Non-OSS)
 - ParaView
 - VisIt
- **Domain Specific**
 - VMD
 - OVITO
 - PyMol
 - ...



On Fugaku Open OnDemand



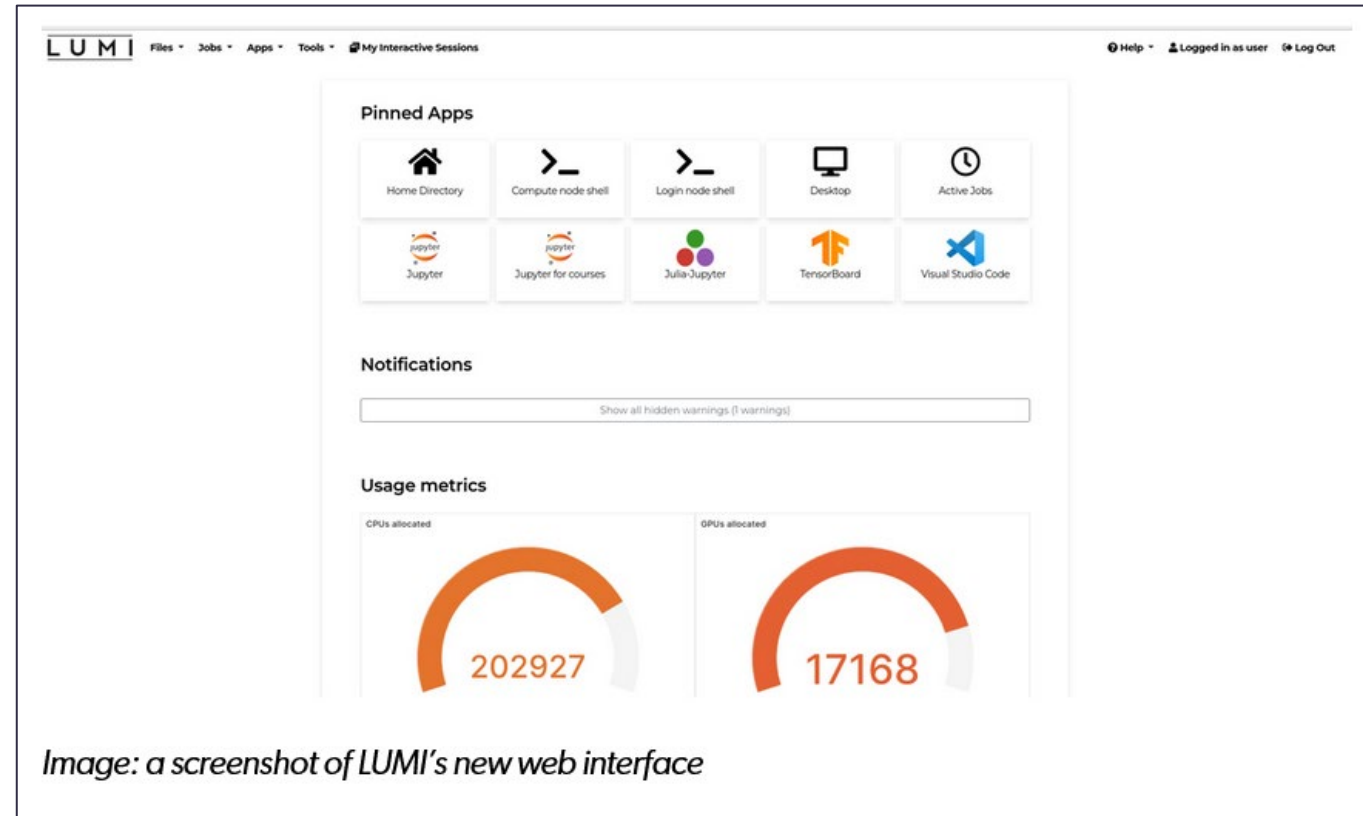
LUMI OnDemand

Introducing a new web interface for LUMI

9.11.2023

A new, easy-to-use web interface for LUMI has been launched at <https://www.lumi.csc.fi>, providing all the resources and power of the LUMI supercomputer with an easy-access web interface.

This new user interface offers something both for less experienced users as well as seasoned power users. The main features are its ability for users to easily launch interactive applications and connect to them seamlessly from the browser. Key highlights include a comprehensive Linux Desktop that offers a rich graphical environment for data visualization and analysis as well as Jupyter environments for Python and Julia. Additionally, users can launch custom containerized environments for, e.g., courses. It also includes VSCode for code development as well as Tensorboard for AI.



Classroom Computing

Classroom Computing

Challenge

A professor at The Ohio State University wanted to help more scientists access high performance computing (HPC) resources.

Approach

The scientist developed a course, “Computational Chemistry,” to teach graduate-level students how to use HPC in their research.

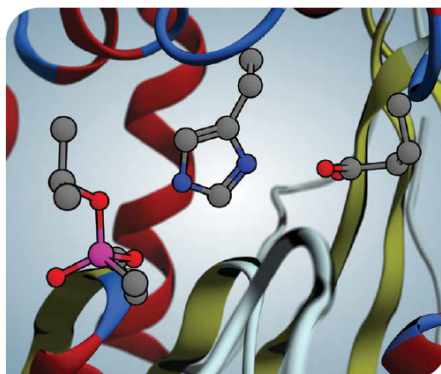
Solution

Over 40 student HPC research projects have been published in different academic journals, including top chemistry journals.

Any Device, Anywhere

“The idea I’ve always had was essentially to help develop expertise in different research groups on how they can use computational methods as a benefit to their experimental studies.”

— Chris Hadad, Ohio State professor



Ohio State course helps students use HPC in chemistry research

Chris Hadad has been a client of the Ohio Supercomputer Center (OSC) for over two decades and leads one of the most active accounts.

A professor of organic chemistry at The Ohio State University, Hadad is currently developing medical countermeasures against organophosphorus chemical nerve agents used in chemical warfare and as pesticides in agriculture.

More than 20 years ago, Hadad was inspired by the impact of OSC on his research to help others in the scientific community learn about and access high performance computing (HPC) resources.

“The idea I’ve always had was essentially to help develop expertise in different research groups on

“The idea I’ve always had was essentially to help develop expertise in different research groups on how they can use computational methods as a benefit to their experimental studies.”

— Chris Hadad, Ohio State professor

openondemand.org/hadad

Remote Science

Remote Science

Challenge

Researchers seek to build an online portal that allows remote use of scientific instruments across the nation.

Approach

With its widespread usage, security measures and adaptability, Open OnDemand serves as a foundation for the project.

Solution

The team is collaborating with institutions to expand functionality and begin implementation of the portal within the research community.

Any Device, Anywhere

“Open OnDemand is an interface that a lot of researchers are familiar with, which made it an obvious choice for our interface.”

— J. Barr von Oehsen, Rutgers University



Ecosystem for Research Networking develops portal for remote instruments

The Ecosystem for Research Networking (ERN), a team consisting of members from Rutgers University, MGHPC, Omnibond, Virginia Tech, UMass Amherst, Penn State University and Pegasus, is developing a way to use scientific instruments remotely online. The project seeks to improve access to high-cost, specialized equipment to advance national research initiatives.

The ERN Cryo-EM Federated Instrument Pilot Project, in partnership with Rutgers University, is creating a portal, built upon Open OnDemand, that enables the remote control of cryo-electron microscopes and analysis of electron microscopy data.

Cryo-electron microscopy (Cryo-EM) is quickly gaining popularity within the biochemistry

“Open OnDemand is an interface that a lot of researchers are familiar with, which made it an obvious choice for our interface.”

— J. Barr von Oehsen,
Rutgers University

openondemand.org/ern

ALL GOOD Overview

Title: Advocate Led Long-term Gameplan for Open OnDemand (ALL GOOD)

PI: Alan Chalker, OSC

Co-PI: Julie Ma, MGHPCC

Period of Performance: Sept 2023 – August 2025

Broader Impacts:

- Increased adoption of computing resources across domains and communities
- Improved collaboration between the public and private computing sectors
- Early engagement of students who will be future research computing clients

ALL GOOD Elements

- **Developer Relations (Dev Rel) Program manager:** establishing the ecosystem and securing partnerships and sponsorships
- **Security / QA technical expert:** implement process and infrastructure recommendations from Trusted CI
- **Community engagement manager:** conduct market discovery research and produce collateral
- **Open-source governance consultant:** from NumFOCUS, an org that supports nearly 100 open-source projects
- **Graduate research associate:** mentor computer science undergrad capstone experiences

User Group Meeting Agenda

About Open OnDemand

Version 3.1

Key Items of Note

Engaging with the Project

Open Floor Discussion



Engaging with the Project

Reaching Us

Staying Up to Date






Getting Involved



Reaching Us

- Discourse
 - Questions and Feedback

Latest

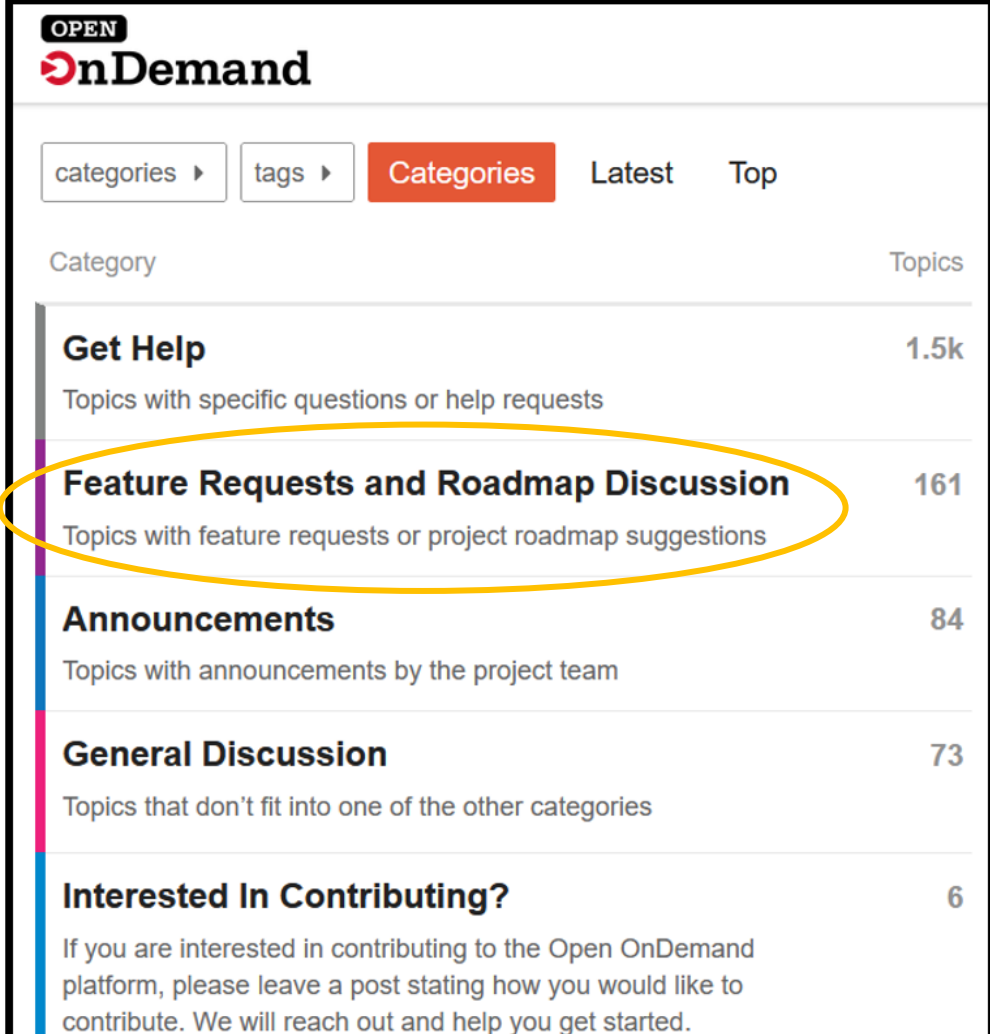
	Issues with Bundler and Passenger when Updating Open OnDemand 3.0 ■ Get Help	8 10h
	Open OnDemand tips and tricks calls ■ Announcements	105 22h
	Restrict users from accessing some apps ■ Get Help	1 1d
	Unexpected behavior when there is a single character surrounded by underscores ■ Get Help question	1 1d
	☑ JUPYTER_PATH does not add my customized directory into kernelspec ■ Get Help question	2 4d


discourse.ondemand.org

Reaching Us

- Discourse

- Features and bugs moving to GitHub
- Open an issue in our main repository



OPEN 

categories ▾ tags ▾ **Categories** Latest Top

Category	Topics
Get Help Topics with specific questions or help requests	1.5k
Feature Requests and Roadmap Discussion Topics with feature requests or project roadmap suggestions	161
Announcements Topics with announcements by the project team	84
General Discussion Topics that don't fit into one of the other categories	73
Interested In Contributing? If you are interested in contributing to the Open OnDemand platform, please leave a post stating how you would like to contribute. We will reach out and help you get started.	6



discourse.ondemand.org

Staying Up To Date


- Discourse

- Announcements

Topic

  About the Announcements category
Topics with announcements by the project team

[Open OnDemand tips and tricks calls](#)

 OnDemand 3.1 release

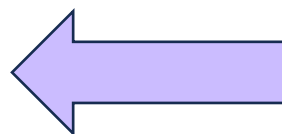
[Open OnDemand team is hiring!](#)


Open OnDemand at SC23: See you in Denver!

[3.1 will drop support for EL7](#)

[Ubuntu NodeJS apt changes happening today](#)

[Open OnDemand Workshop in Japan](#)



OPEN 

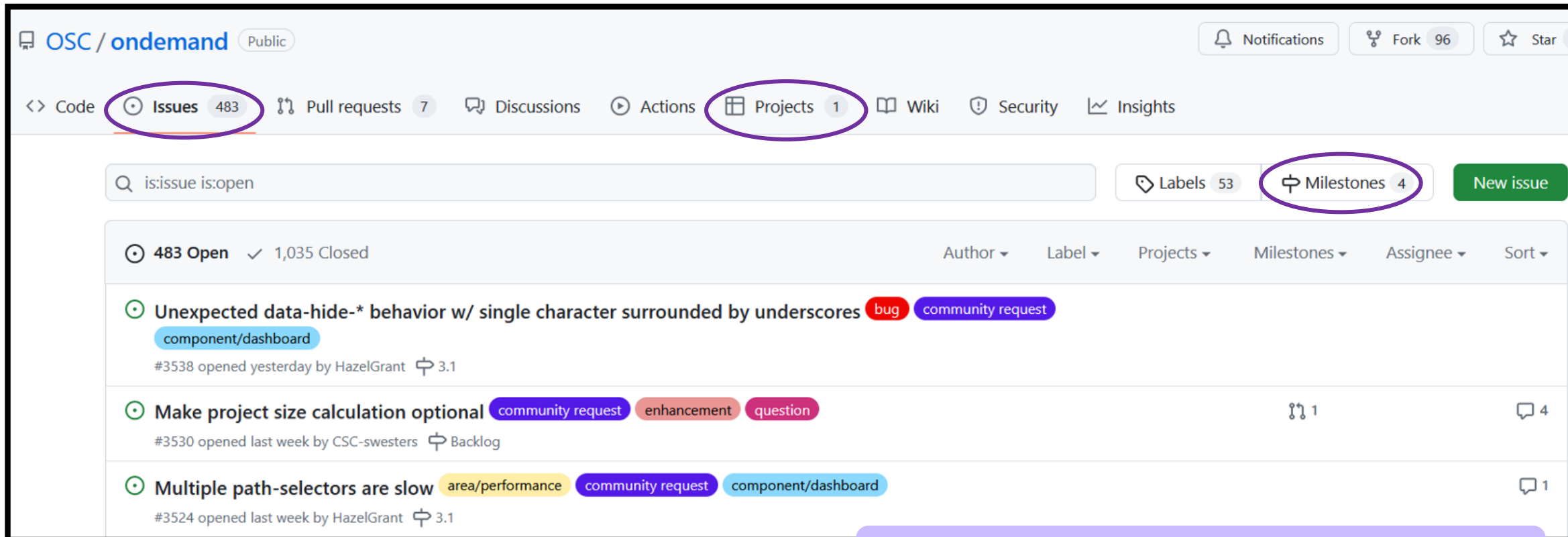
categories ▾ tags ▾ **Categories** Latest Top

Category	Topics
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discourse.ondemand.org

Staying Up To Date

- Github
 - Main repository: ondemand



OSC / ondemand Public

Notifications Fork 96 Star

<> Code **Issues 483** Pull requests 7 Discussions Actions **Projects 1** Wiki Security Insights

is:issue is:open Labels 53 **Milestones 4** New issue

483 Open ✓ 1,035 Closed Author Label Projects Milestones Assignee Sort

- Unexpected data-hide-* behavior w/ single character surrounded by underscores **bug** **community request**
component/dashboard
#3538 opened yesterday by HazelGrant 3.1
- Make project size calculation optional **community request** **enhancement** **question** 1
#3530 opened last week by CSC-swesters Backlog 4
- Multiple path-selectors are slow **area/performance** **community request** **component/dashboard** 1
#3524 opened last week by HazelGrant 3.1

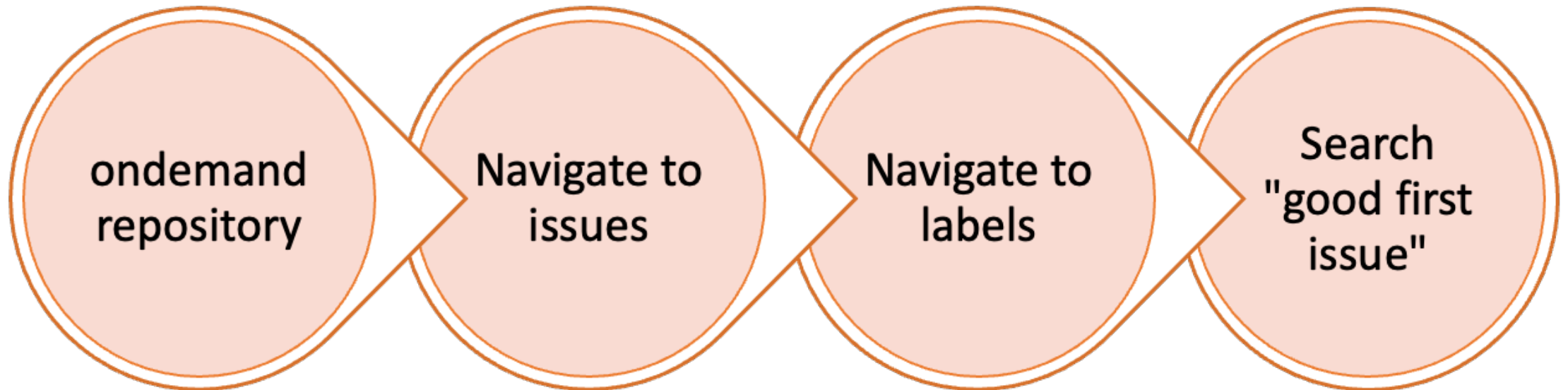
github.com/OSC/ondemand

Getting Involved

- **Contribute to Open OnDemand!**
 - We want our community to be a part of our development
 - Good First Issue

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github.com/OSC/ondemand

User Group Meeting Agenda

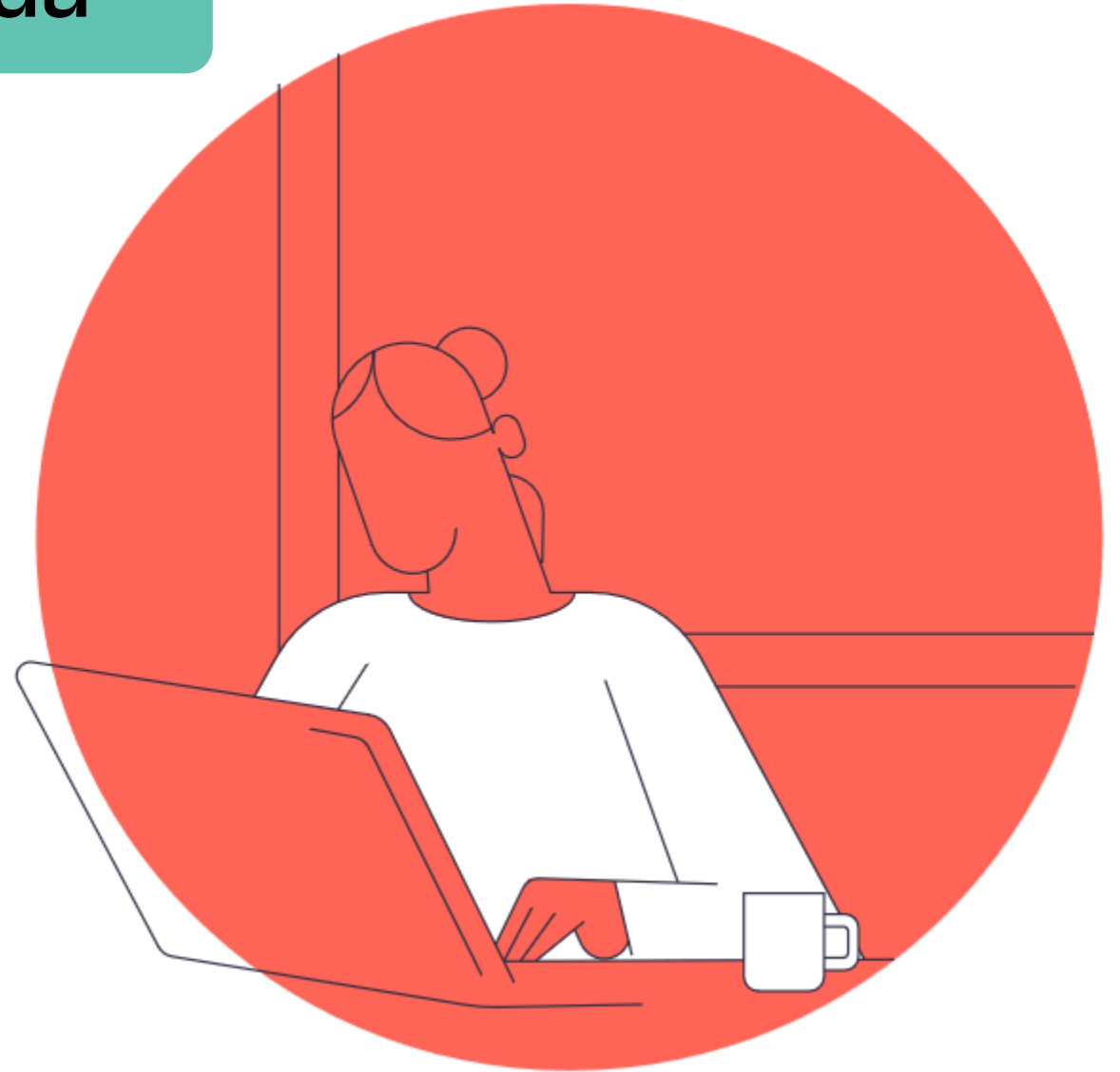
~~About Open OnDemand~~

~~Version 3.1~~

~~Key Items of Note~~

~~Engaging with the Project~~

Open Floor Discussion



openondemand.org/discuss

Questions/Comments

Ask at the microphone or post on the Menti page!

Go to

www.menti.com

Enter the code

3524 2932



Or use QR code

Thank You!

Brian Guilfoos

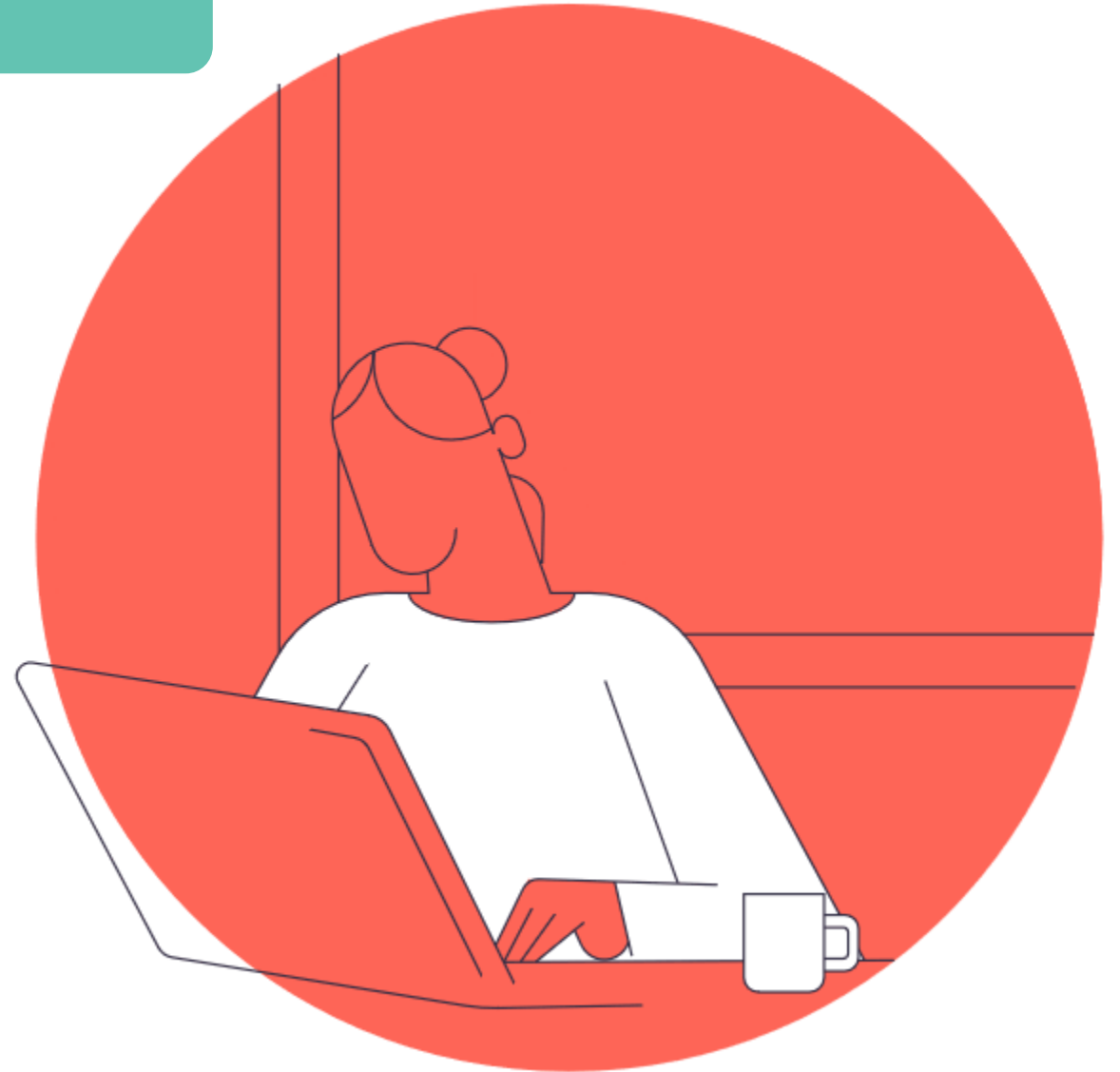
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