



Alpine in your Browser with Open OnDemand

Alpine in your Browser with Open OnDemand

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- Website: www.rc.colorado.edu
- Documentation: <https://curc.readthedocs.io>
- Helpdesk: rc-help@colorado.edu
- Slides:
https://github.com/ResearchComputing/alpine_in_your_browser_with_ood_primer
- Survey: <http://tinyurl.com/curc-survey18>

Agenda

- About Open OnDemand
 - What is ACCESS-CI?
- How to log in to Open OnDemand
- Features of Open OnDemand
 - Using the Shell
 - File Transfer
- Interactive Applications
 - Demos!

Open OnDemand



- Open OnDemand is an NSF-funded open-source HPC portal based on the Ohio Supercomputing Center's original OnDemand portal
- Enables web access to HPC resources, including:
 - Easy file management
 - Command-line shell access
 - Job management and monitoring across different batch servers and resource managers
 - Graphical desktop environments and desktop applications (Jupyter notebooks, MATLAB, RStudio)

Open OnDemand (at CURC)



- Open OnDemand provides a browser-based interface to interact with Alpine and Blanca!
- All CURC users can access Open OnDemand
 - CU Users: <https://ondemand.rc.colorado.edu/>
 - CSU, AMC, RMACC users: <https://ondemand-rmacc.rc.colorado.edu>

ACCESS-CI (AMC and RMACC Users Only)

- ACCESS-CI provides:
 - Allocations
 - Support
 - Operations
 - Metrics
- Supports CURC by managing RMACC users
- Get an ACCESS-CI Account:
<https://identity.access-ci.org/new-user.html>



Advanced Cyberinfrastructure Coordination Ecosystem:
Services & Support

ACCESS-CI (RMACC Users Only)

- Once you have an ACCESS-CI Account, reach out to us with the following information:
 - Your ACCESS-CI username
 - Your institutional affiliation
 - Your role
 - Your department
 - Your first and last name
 - Your preferred email address
- We will provision you an account!

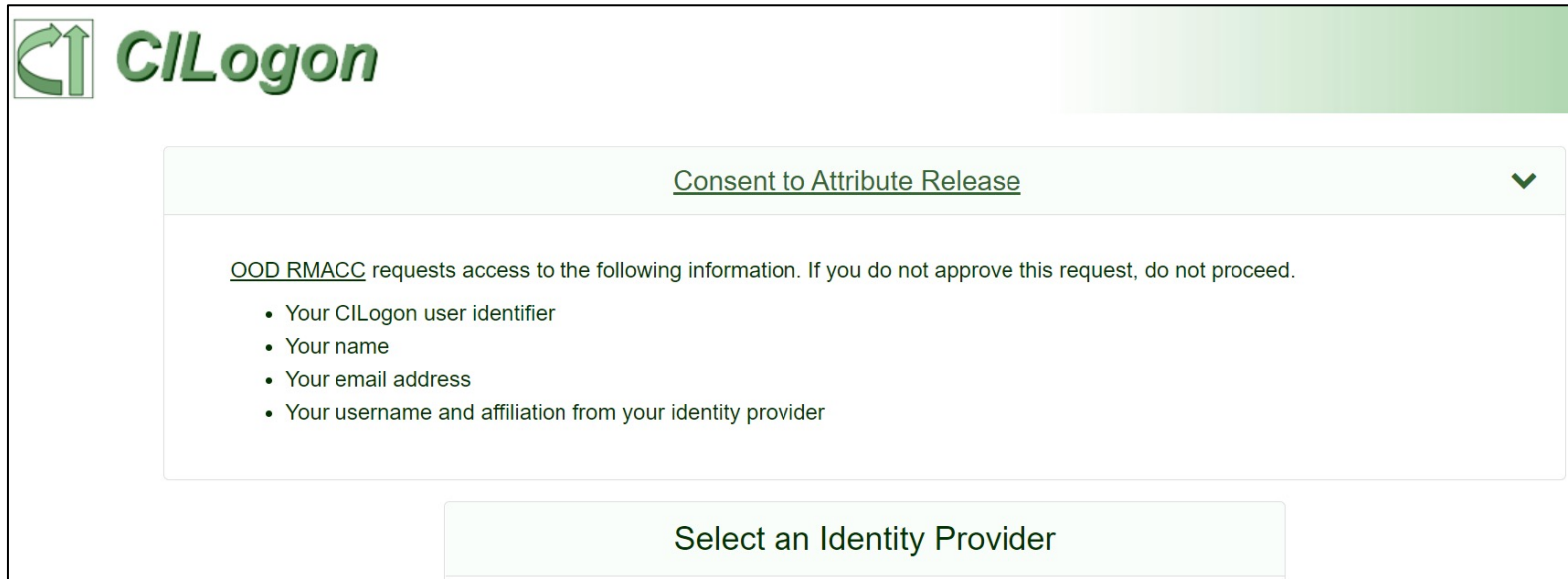


Advanced Cyberinfrastructure Coordination Ecosystem:
Services & Support

Logging in to Open OnDemand

Logging In

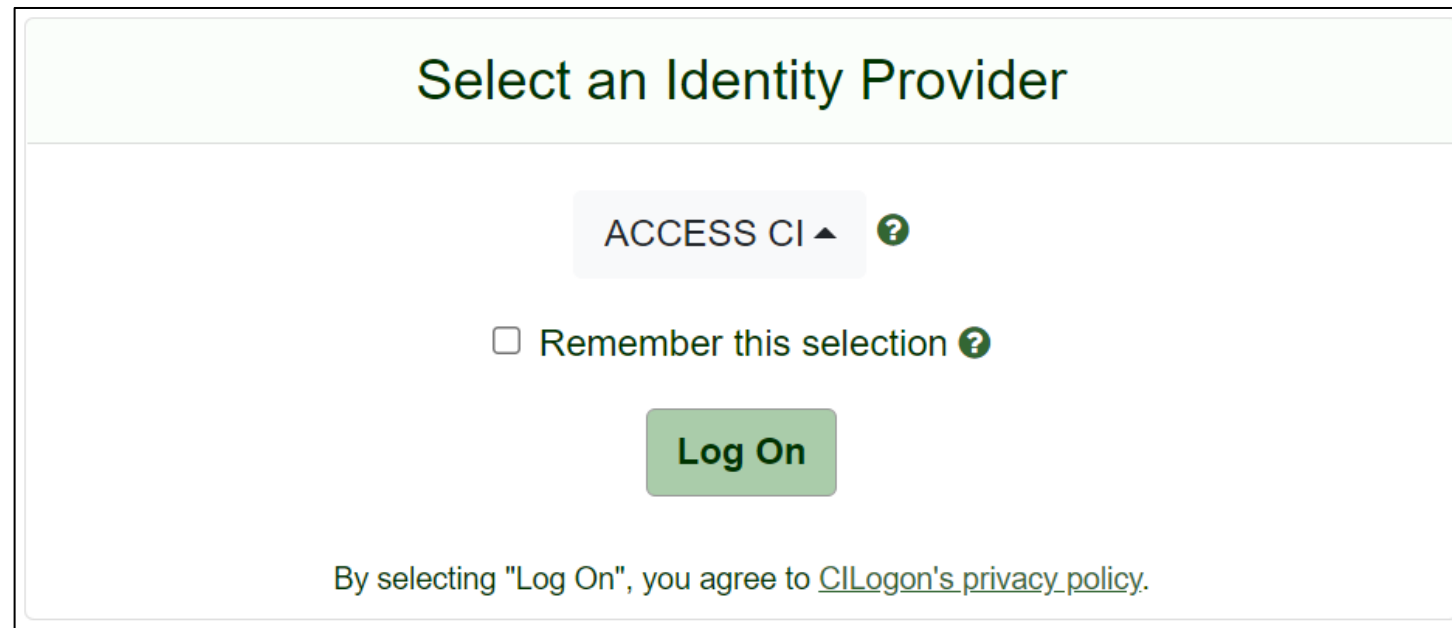
- CU Boulder: <https://ondemand.rc.colorado.edu/>
- CSU, AMC, RMACC: <https://ondemand-rmacc.rc.colorado.edu>
 - You will be re-directed to the CILogon sign-in page:



The screenshot shows the CILogon interface. At the top left is the CILogon logo, which consists of a green circular arrow icon and the text "CILogon". Below the logo is a green header bar. The main content area is white and contains a consent dialog. The dialog has a title bar that says "Consent to Attribute Release" with a green checkmark icon on the right. Below the title bar, the text reads: "OOD RMACC requests access to the following information. If you do not approve this request, do not proceed." Below this text is a bulleted list of the requested information: "Your CILogon user identifier", "Your name", "Your email address", and "Your username and affiliation from your identity provider". At the bottom of the dialog is a green button that says "Select an Identity Provider".

Logging In for CSU, AMC, RMACC


- Select your identity provider.
 - If you are a CSU user, select 'Colorado State University'
 - If you are from AMC or RMACC, select 'ACCESS CI (XSEDE)'



The screenshot shows a web form titled "Select an Identity Provider". It features a dropdown menu currently set to "ACCESS CI" with a green question mark icon to its right. Below the dropdown is a checkbox labeled "Remember this selection" followed by a green question mark icon. A green "Log On" button is positioned below the checkbox. At the bottom of the form, a line of text states: "By selecting 'Log On', you agree to [CILogon's privacy policy](#)."

Logging In (cont.)

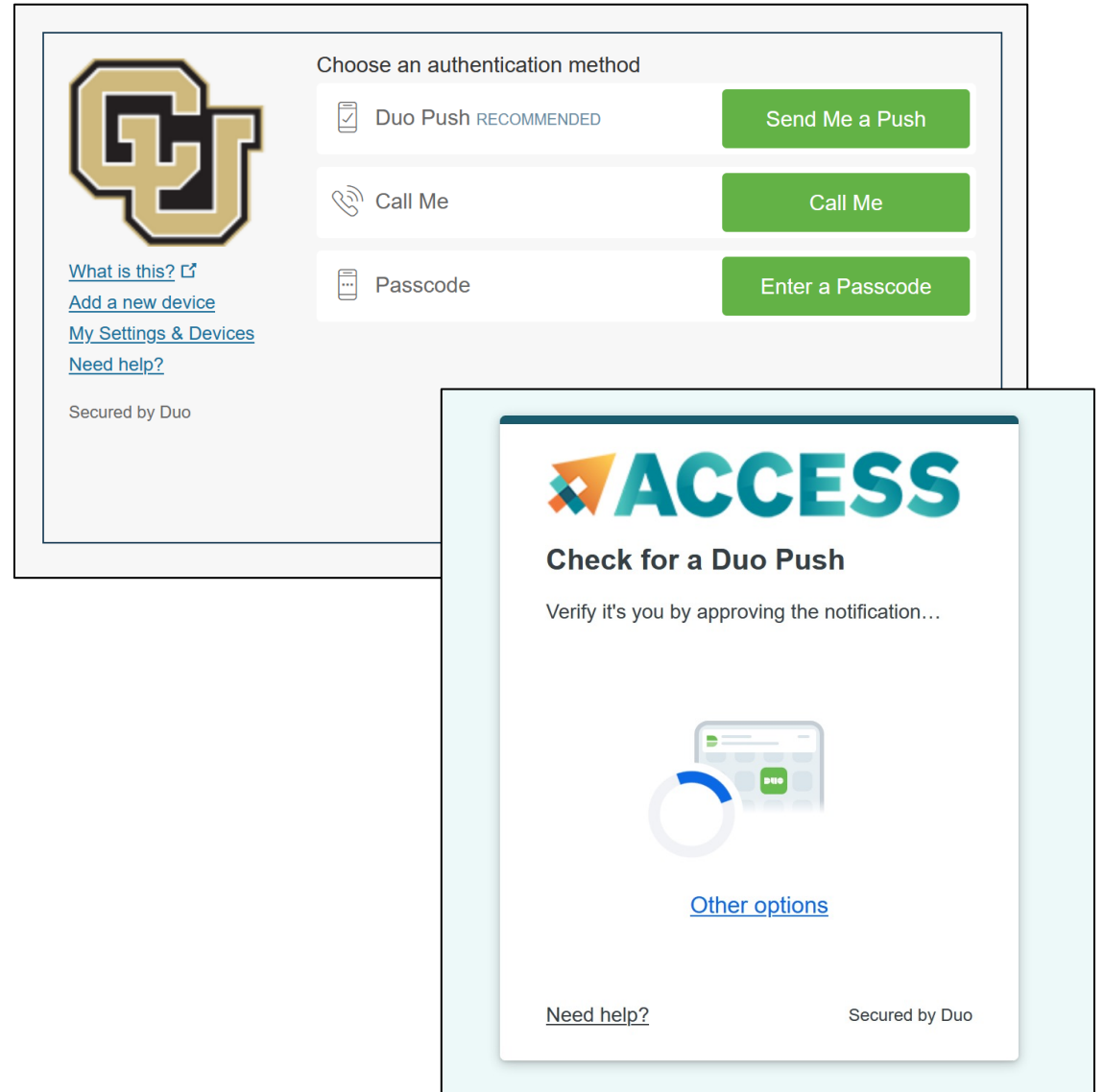
- CU Boulder: Authenticate with your Identikey and Password
- CSU: Authenticate with your EID and Password
- AMC and RMACC: You will be redirected to the ACCESS-CI login page
 - Use your ACCESS username and password



The screenshot shows the ACCESS-CI login interface. At the top left is the ACCESS logo, which consists of a stylized orange and blue icon followed by the word "ACCESS" in blue. Below the logo, the text "Login to CILogon" is displayed. Underneath, there are two input fields: the first is labeled "ACCESS Username" and the second is labeled "ACCESS Password". Below these fields is a blue "Login" button. At the bottom of the page, there is a green circular arrow icon next to the text "CILogon" in a green, italicized font.

Logging In

- Duo 2-Factor Authentication is a requirement for the security of our systems.
- CU Boulder and CSU users must have this configured prior to logging in
- AMC and RMACC users will be prompted to set up Duo 2FA upon logging in for the first time



Demo: Logging in to Open OnDemand

<https://ondemand.rc.colorado.edu/>

<https://ondemand-rmacc.rc.colorado.edu>

Features of Open OnDemand

OnDemand Home Page

- From the home page, you can access the following Open OnDemand Features:
 - Files
 - Jobs
 - Clusters
 - Interactive Apps
 - My Interactive Sessions



Files ▼

Jobs ▼

Clusters ▼

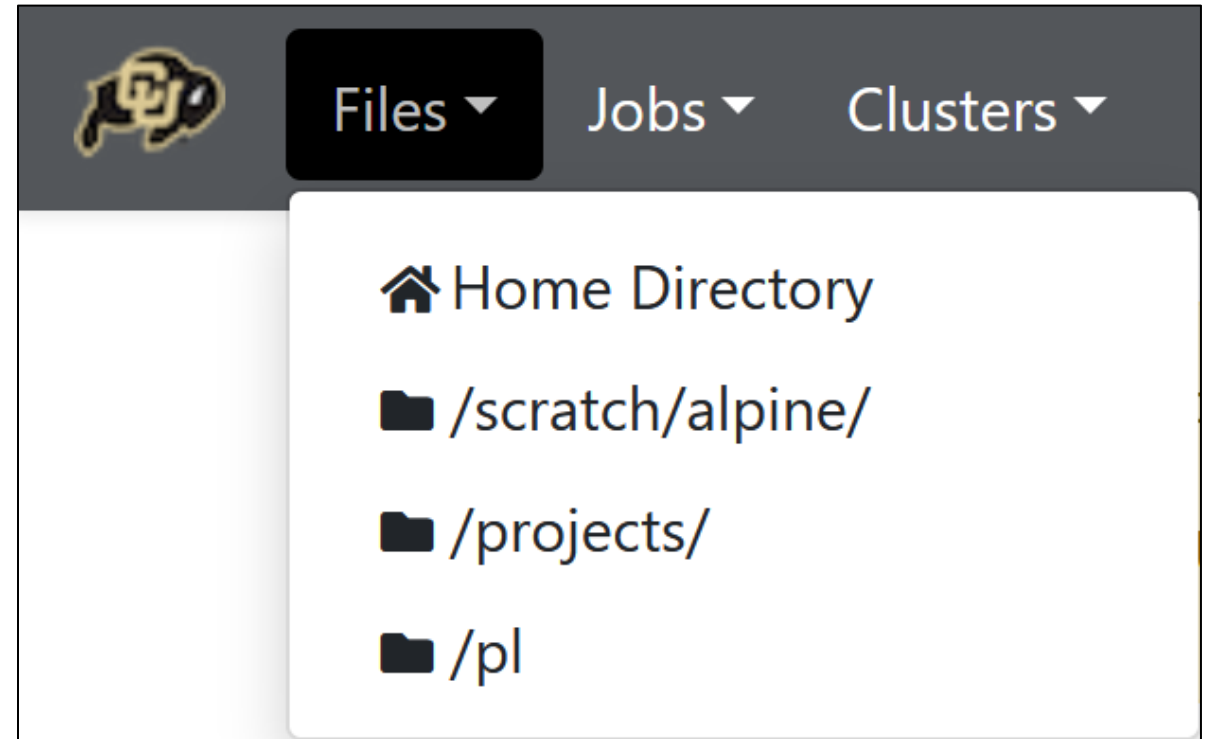
Interactive Apps ▼



My Interactive Sessions

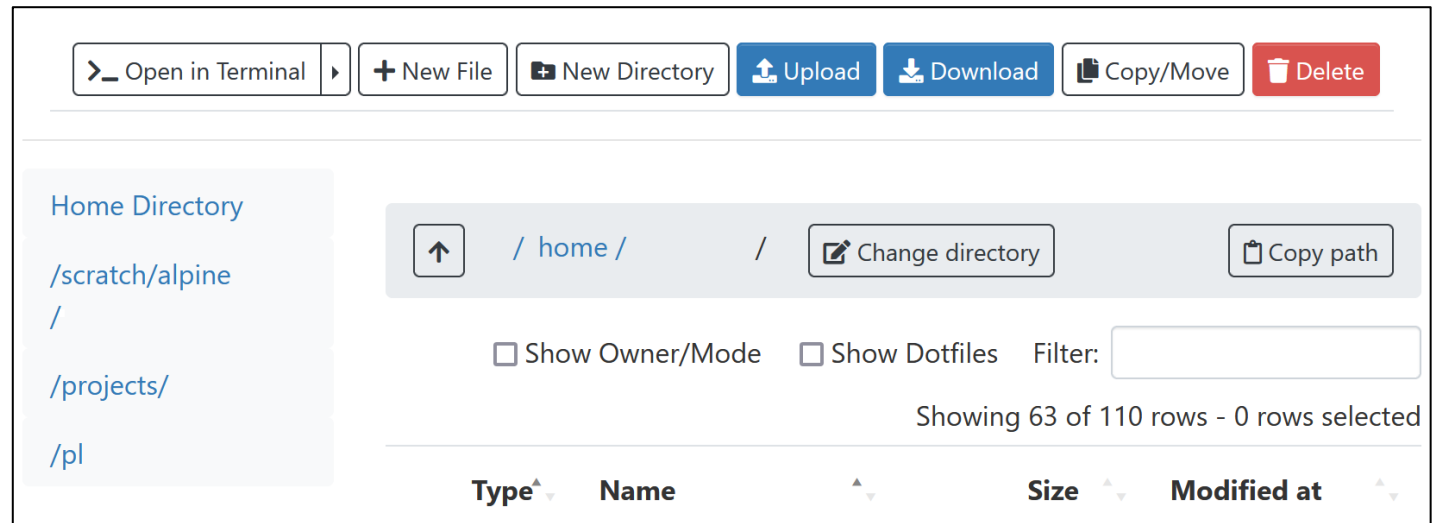
Files

- Open OnDemand allows you to navigate and manipulate your files
- You can access your entire CURC filesystem using this tool:
 - /home
 - /projects
 - /scratch/alpine
 - /pl (if applicable)



Files Management

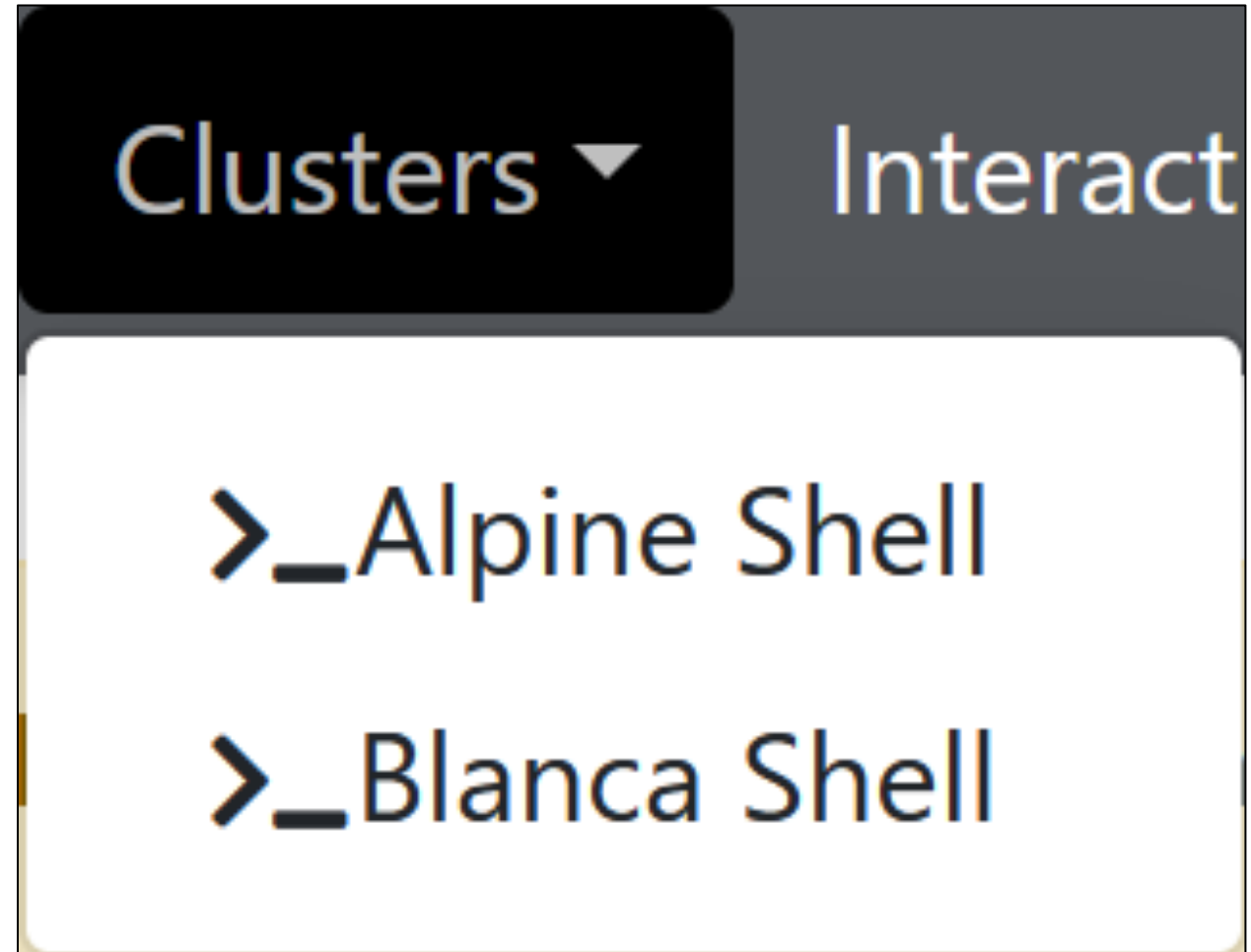
- On the files page you can:
 - Upload data
 - Download files
 - Create new files
 - Edit files
 - Copy/move data
 - Delete files
 - Create directories



Demo: File Transfer

Clusters

- Open OnDemand allows you to open a terminal in your browser, no SSH required



Terminal

```
Host: login.rc.colorado.edu
Password:
Welcome to CU-Boulder Research Computing.

* Website http://colorado.edu/rc
* Questions? rc-help@colorado.edu
* Subscribe to system announcements: https://curc.statuspage.io/
* Please type rc-help for the Acceptable Use Policy and a short help page.

You are using login node: login11









trha5176@login11:~$
```


Interactive Applications

<https://curc.readthedocs.io/en/latest/gateways/OnDemand.html>

Interactive Apps

- Interactive apps are comprised of built-in Graphical User Interfaces (GUIs) for many of the most popular research applications
- Current Offerings Include:
 - Jupyter Notebooks
 - Remote desktop (Core Desktop)
 - RStudio
 - MATLAB
 - VS Code-Server
 - ...with more coming soon!

Interactive Apps
Desktops
 Core Desktop (Presets)
GUIs
 MATLAB (Presets)
Servers
 Jupyter Session (Custom)
 Jupyter Session (Presets)
 RStudio Server (Custom)
 RStudio Server (Presets)
 VS Code-Server (Custom)
 VS Code-Server (Presets)

Interactive Apps (cont.)

- Each app comes with two spawning options:
 - ‘Custom’ allows you to spawn a session with customizable configurations
 - If your configurations are incompatible, your job will not run!
 - ‘Presets’ allows you to spawn a session with common, functional configurations
 - Works ‘out of the box’

Custom Application Inputs

Input	Description
Cluster	Possible options are Alpine and Blanca
Account	The account you would like to use: <ul style="list-style-type: none">• Standard CU Boulder value → “ucb-general”• Standard CSU value → “csu-general”• Standard RMACC value → “rmacc-general”• Standard AMC value → “amc-general”• Can use project allocations e.g. “ucbXXX_asc1”
Partition	Specifies a particular node type to use e.g. “ahub”
Number of cores	The number of physical CPU cores for the job
Memory [GB]	The total amount of memory allocated for the Job
QoS Name	Quality of Service (QoS) constrains or modifies certain job characteristics
Time	The duration of the job, in hours

Jupyter Sessions

- You can spawn a Jupyter Notebook using JupyterLab or Jupyter Notebook
- If you want to use a custom environment, you must create a Jupyter Kernel
 - <https://curc.readthedocs.io/en/latest/gateways/jupyterhub.html?#creating-your-own-custom-jupyter-kernel>
 - Easiest to do with a conda environment
- One can access a single Alpine GPU via the “Custom” application

Interactive Apps

Desktops

Core Desktop (Presets)

GUIs

MATLAB (Presets)

Servers

Jupyter Session (Custom)

Jupyter Session (Presets)

RStudio Server (Custom)

RStudio Server (Presets)

VS Code-Server (Custom)

VS Code-Server (Presets)

Jupyter Session (Custom)

This app will launch a Jupyter Notebook or JupyterLab session. For more information on possible settings for this application, see [Running Custom Interactive applications](#) in our documentation.

Cluster

Alpine

Anaconda Version

2020.11

Conda environment

base

Important: Please check your spelling, if the provided environment is not found it will default to the environment "base". For more information on creating a compatible Conda environment, please see [Creating a Jupyter Session Conda Environment](#).

Account

Partition

Time

4

Number of cores

1

QoS Name

normal

☒ Use JupyterLab instead of Jupyter Notebook?

Launch

Demo: Jupyter Session

Core Desktop

- A remote desktop i.e. an interactive desktop
- Ran on their own compute nodes (not Alpine or Blanca)
- All jobs are launched on shared GPUs
 - Not meant for serious GPU workflows!
- **Very useful for running GUI based software**

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VS Code-Server (Presets)

Core Desktop (Presets)

This app will launch an interactive desktop on a compute node. GPU based options are not meant for computationally intensive workflows. Additionally, please keep in mind that these GPU based options are a shared resource amongst all users. Thus, significant computation by one user can affect other users of this service.

Configuration

2 cores, 1 hour, K80 GPU

Launch

* The Core Desktop (Presets) session data for this session can be accessed under the [data root directory](#).

Demo: Core Desktop

RStudio Server

- Allows you to use RStudio, an Integrated Development Environment (IDE) for R
- Currently in a Beta phase
- Ran inside an Apptainer container
 - Most R libraries are easily installable, but some may fail due to dependency issues.
 - Documentation for installing dependencies can be found at <https://curc.readthedocs.io/en/latest/gateways/OnDemand.html#installing-dependencies-for-rstudio-currently-available-only-on-alpine>
 - **First launch** of application can take several minutes (use 4 cores), subsequent launches will be fast!

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VS Code-Server (Presets)

RStudio Server (Presets)

This app will launch [RStudio Server](#), an IDE for R on Alpine.

Before utilizing this application, please see the [RStudio section of the CURC documentation](#). This documentation includes important information regarding quitting an RStudio session. For more information on installing dependencies required by R packages, please see the [Installing dependencies for RStudio](#) section in our documentation.

Please note that the first time you launch RStudio it may take 15 minutes or more to create a persistent overlay, if 1 core is used. For this reason, we recommend using 4 cores or more during your first launch of an RStudio session. Subsequent sessions will not require the creation of the persistent overlay; therefore 1 core may be sufficient.

RStudio Version

Rstudio 2023.03.0, R 4.2.2

Configuration

4 cores, 4 hours, 0 GPUs (Alpine)

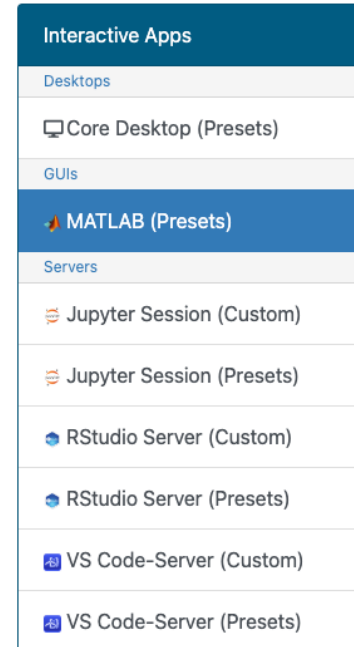
Launch

* The RStudio Server (Presets) session data for this session can be accessed under the [data root directory](#).

Demo: RStudio

MATLAB

- Launches a MATLAB GUI using Core Desktop
 - Same setup as Core Desktop
- Not meant for serious workflows!
- Has only one version of MATLAB
 - Currently this is MATLAB version R2021b
 - Other versions can be used from the Alpine command line



MATLAB (Presets)

This app will launch a MATLAB GUI on a CURC node. You will be able to interact with MATLAB through a VNC session. GPU based options are not meant for computationally intensive workflows. Additionally, please keep in mind that these GPU based options are a shared resource amongst all users. Thus, significant computation by one user can affect other users of this service.

Configuration

2 cores, 1 hour, K80 GPU

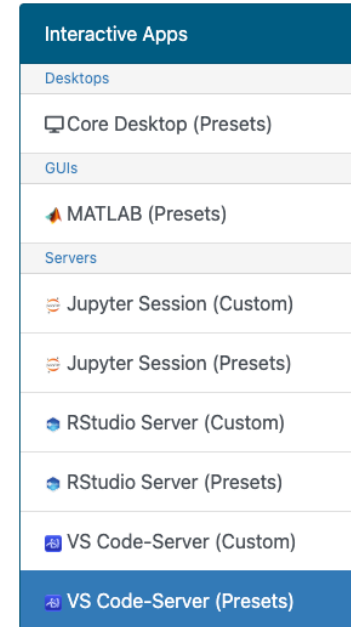
Launch

* The MATLAB (Presets) session data for this session can be accessed under the [data root directory](#).

Demo: MATLAB

VS Code-Server

- Launches Visual Studio (VS) Code in your browser
 - Uses the software Code-Server
 - Contains a majority of standard VS Code functionality
- Downloading extensions may have to be done differently
 - <https://curc.readthedocs.io/en/latest/gateways/OnDemand.html#installing-vs-code-server-extensions>



VS Code-Server (Presets)

This app will launch a VS Code server using Code-Server. For more information on installing VS Code extensions, please see our [Installing VS Code-Server Extensions](#) section of the documentation.

Configuration

1 core, 12 hours

Code-Server version

4.16.1

Launch

* The VS Code-Server (Presets) session data for this session can be accessed under the [data root directory](#).

Demo: VS Code-Server

Survey and feedback

<http://tinyurl.com/curc-survey18>

