

O2 Portal – Simplifying the Interaction and Experience of Using an HPC Environment



Contact information

 **Email:** rchelp@hms.harvard.edu

 **Website:** <https://it.hms.harvard.edu/rc>

 **Phone:** 617-432-2000 (HMS IT Service Desk, 8:00 am - 5:00 pm)

 **Twitter:** http://twitter.com/hms_rc

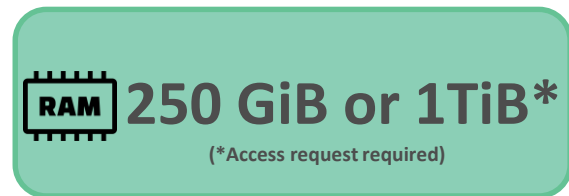
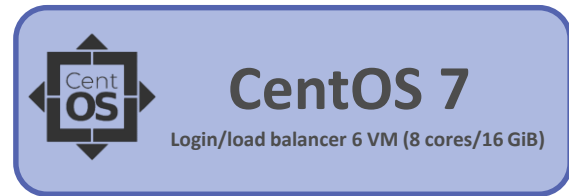
 **Location:** 1635 Tremont Street

 **Office hours:** Wednesdays 1:00-3:00 pm (Currently via Zoom - <https://rc.hms.harvard.edu/office-hours>)



What is O2?

- HMS Research Computing's newest High-Performance Compute cluster
- SLURM scheduler



How to get an O2 account?

- Available to both, on-quad and off-quad researchers
 - off-quad - researchers from labs whose PIs **do not** have a primary or secondary faculty appointment in an [HMS Blavatnik Institute Basic or Social Science Department](#)
 - off-quad researchers are charged for O2 jobs and storage
- More information at [How to request or retain an O2 account](#)











Important Note about O2 Storage

- O2 can only be used to store data of [Harvard Security Level 3](#) and below.
- None of the standard filesystems are automatically encrypted, and **cannot** be used for HIPAA-protected or other secure data (Harvard's data security above level 3) unless those data have been de-identified.



HMS Storage Offerings

- Options - <https://it.hms.harvard.edu/our-services/research-computing/services/storage>
- O2 Primary Storage
 - /home 100GiB
 - /n/data1, /n/data2, /n/groups
 - backups
- O2 Scratch
 - /n/scratch3
 - 10TiB; 30 day retention, no backups

	Active			Standby
	Scratch	Compute	Collaborations	Standard
Purpose/Used For	<ul style="list-style-type: none">Transient files used during a single job on the HMS High-Performance Compute (HPC) Cluster.Temporary (days to weeks) high performance storage for data that can be easily regenerated.	<ul style="list-style-type: none">Active research data that is frequently accessed, modified, or computed against.Run many analyses simultaneously on a High-Performance Compute (HPC) Cluster.	<ul style="list-style-type: none">Active research data that is frequently accessed, modified, or computed against.Share documents and files with colleagues, both within and outside of your department.	<ul style="list-style-type: none">Infrequently accessed data, directly available for reference, retrieval, or analysis.Can operate as an intermediary location, to organize and prepare research data for long-term retention, as required.
Filesystem Path(s)	n/scratch3	n/data1 n/data2 n/groups	\research.files	\standby.files n/standby
Write Speed	 High	 High	 Medium	 Medium
Read Speed	 High	 High	 Medium	 Medium



O2 Cluster Status

- <https://harvardmed.atlassian.net/l/cp/zLMdWTYs>

O2 Cluster Status

Created by Bergman, Andrew L., last modified about an hour ago

This page shows all service outages for the O2 cluster, including planned maintenance and unplanned events.

We also post updates on the [HMS RC Twitter page](#).

ONLINE

July 8: notes after the July OS/Slurm update

- Jupyter Notebooks users should start a new environment and remove any old runtime directories.
- "sbatch" no longer uses the "--x11" option in the new version of Slurm. Just remove it from your script and X forwarding should work by default.
 - "srun" commands still require "--x11" to enable X forwarding, though.
- If you have any custom built software, you may need to recompile or relink it on O2.



Data Management

- 1. Planning: Plan ahead**
- 2. Active Research: Document**
- 3. Dissemination: Share confidently**

Note: be sure to ask your PI and your department about standard practices in your field!



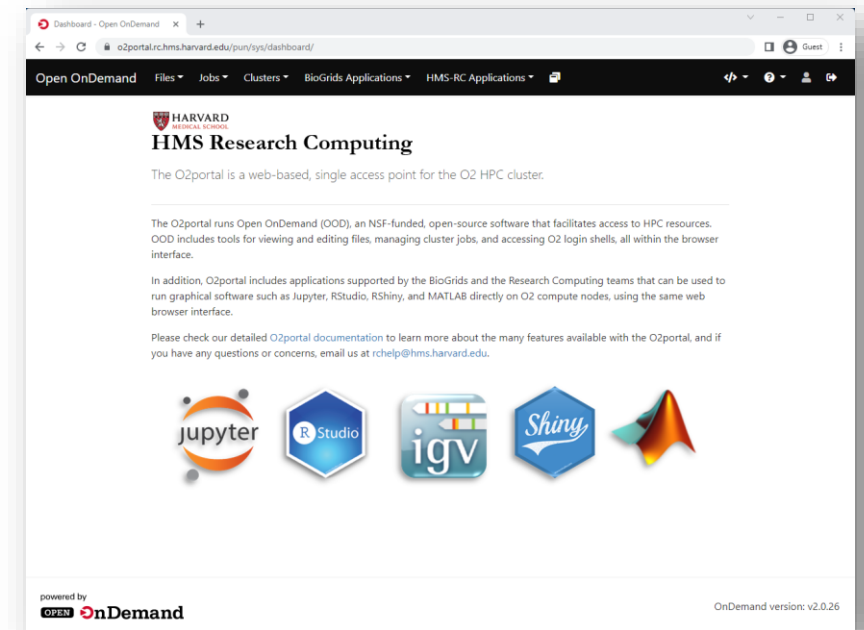
Harvard Biomedical Data Management Website: <https://datamanagement.hms.harvard.edu>

Resources: <https://datamanagement.hms.harvard.edu/about/what-research-data-management/rdm-resources>



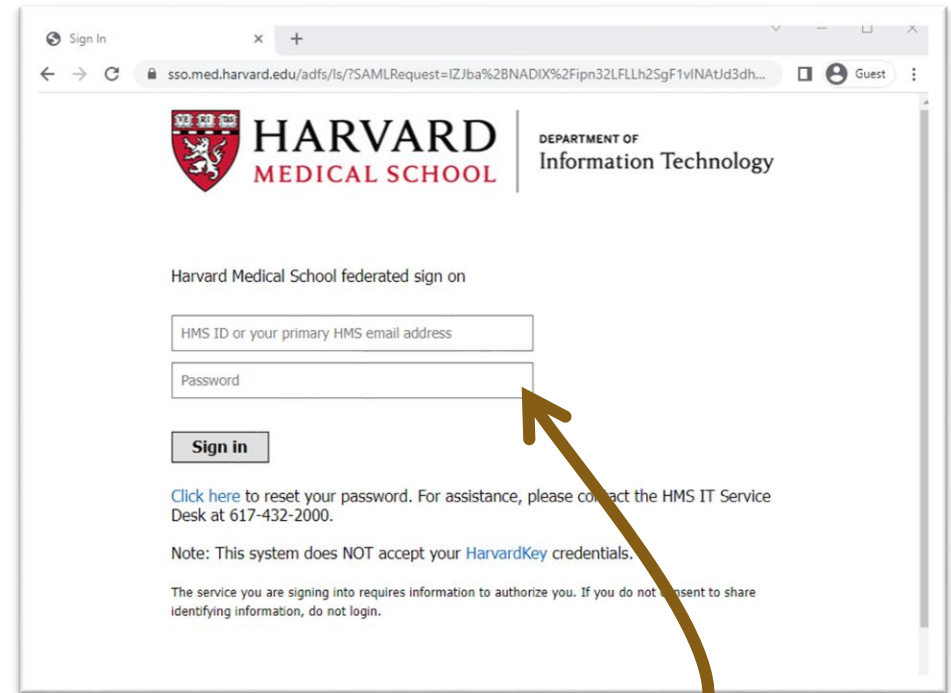
O2 portal – O2 web-based access point

- Powered by Open OnDemand
- Developed by Ohio Supercomputer Center (OSC)
- NSF Funded




Requirements to Access the O2 Portal

- O2 account
- Setup 2FA authentication



Sign In

sso.med.harvard.edu/adfs/ls/?SAMLRequest=IZJba%2BNADIX%2Fipn32LFLh2SgF1vINATd3dh...

 **HARVARD**
MEDICAL SCHOOL

DEPARTMENT OF
Information Technology

Harvard Medical School federated sign on

HMS ID or your primary HMS email address

Password

Sign in

[Click here](#) to reset your password. For assistance, please contact the HMS IT Service Desk at 617-432-2000.

Note: This system does NOT accept your [HarvardKey](#) credentials.

The service you are signing into requires information to authorize you. If you do not consent to share identifying information, do not login.

Authenticate with HMS ID





Transfer Files



Submit Jobs



Monitor Jobs

Terminal



View/Edit Files



Applications



2Portal



HARVARD
MEDICAL SCHOOL

Research Computing



Transfer Files



Submit Jobs



Monitor Jobs

Terminal



View/Edit Files



Applications

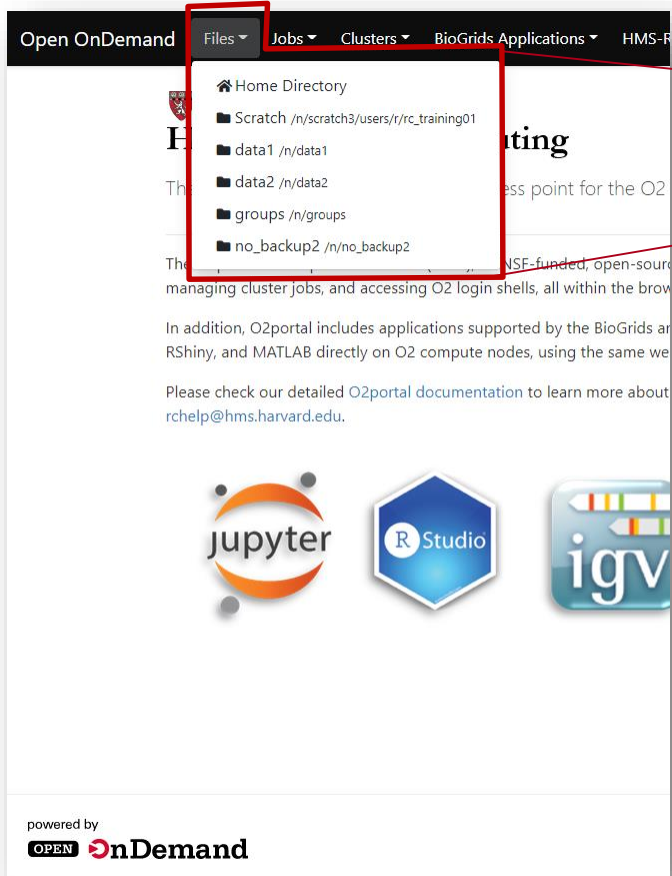


Portal





Transfer Files



Select a filesystem





Transfer Files

Upload

>_ Open in Terminal + New File New Directory Upload Download Copy/Move Delete

Home Directory

Scratch

data1


data2

groups

no_backup2

Drop files here, [browse files](#) or
[browse folders](#)

Empty directories will be included in the upload only when a directory upload is initiated via drag and drop. This is because the File and Directory Entries API is available only on a drop event, not during an input change event.

Powered by  Uppy

Copy path

Mode ☐ Show Dotfiles Filter:

Showing 5 of 16 rows - 0 rows selected

	Modified at
	8/8/2022 5:01:26 PM
	8/8/2022 4:00:36 PM
	8/8/2022 5:09:16 PM
	8/8/2022 3:59:27 PM
ytes	8/8/2022 4:01:16 PM

OnDemand version: v2.0.26





Transfer Files

Download

[Open OnDemand](#)[Files](#)[Jobs](#)[Clusters](#)[BioGrids Applications](#)[HMS-RC Applications](#)[My Interactive Sessions](#)[Help](#)[Logged in as rc_training01](#)[Log Out](#)[Open in Terminal](#)[New File](#)[New Directory](#)[Upload](#)[Download](#)[Copy/Move](#)[Delete](#)[Home Directory](#)[Scratch](#)[data1](#)[data2](#)[groups](#)[no_backup2](#)[/ home / rc_training01 /](#)[Change directory](#)[Copy path](#)☐ Show Owner/Mode☐ Show DotfilesFilter:

Showing 5 of 16 rows - 1 rows selected

	Type	Name	Size	Modified at
<input type="checkbox"/>	Folder	ondemand		8/8/2022 5:01:26 PM
<input type="checkbox"/>	Folder	programs		8/8/2022 4:00:36 PM
<input type="checkbox"/>	Folder	R		8/8/2022 5:09:16 PM
<input type="checkbox"/>	Folder	tissue_project		8/8/2022 3:59:27 PM
<input checked="" type="checkbox"/>	File	rstudio_launcher.sh	0 Bytes	8/8/2022 4:01:16 PM

- View
- Edit
- Rename
- Download

[Delete](#)

powered by

[OPEN OnDemand](#)

OnDemand version: v2.0.26



HARVARD
MEDICAL SCHOOL

Research Computing



Transfer Files

Within O2

Open OnDemand Files Jobs Clusters BioGrids Applications HMS-RC Applications My Interactive Sessions ? Help Logged in as rc_training01 Log Out

Open in Terminal New File New Directory Upload Download Copy/Move Delete

Copy or move the files below from /home/rc_training01 to the current directory:

rstudio_launcher.sh

Copy Move

Home Directory
Scratch
data1
data2
groups
no_backup2

/ home / rc_training01 / Change directory Copy path

☐ Show Owner/Mode ☐ Show Dotfiles Filter:

Showing 3 of 9 rows - 1 rows selected

Type	Name	Size	Modified at
<input type="checkbox"/>	programs	-	8/8/2022 4:00:36 PM
<input type="checkbox"/>	tissue_project	-	8/8/2022 3:59:27 PM
<input checked="" type="checkbox"/>	rstudio_launcher.sh	0 Bytes	8/8/2022 4:01:16 PM

powered by OPEN OnDemand OnDemand version: v2.0.26

- 1 Select file or directory
- 2 Click on "Copy/Move"
- 3 Move to target location
- 4 Click on Copy or Move





Transfer Files

Within O2

Open OnDemand Files Jobs Clusters BioGrids Applications HMS-RC Applications My Interactive Sessions Help Logged in as rc_training01 Log Out

Open in Terminal New File New Directory Upload Download Copy/Move Delete

Copy or move the files below from /home/rc_training01 to the current directory:

rstudio_launcher.sh

Copy Move

Home Directory Scratch data1 data2 groups no_backup2

/ home / rc_training01 / Change directory Copy path

Show Owner/Mode Show Dotfiles Filter: Showing 3 of 9 rows - 1 rows selected

Type	Name	Size	Modified at
<input type="checkbox"/>	programs	-	8/8/2022 4:00:36 PM
<input type="checkbox"/>	tissue_project	-	8/8/2022 3:59:27 PM
<input checked="" type="checkbox"/>	rstudio_launcher.sh	0 Bytes	8/8/2022 4:01:16 PM

powered by OPEN OnDemand OnDemand version: v2.0.26

- 1 Select file or directory
- 2 Click on "Copy/Move"
- 3 Move to target location
- 4 Click on Copy or Move





Transfer Files

Within O2

Open OnDemand Files Jobs Clusters BioGrids Applications HMS-RC Applications My Interactive Sessions Help Logged in as rc_training01 Log Out

Open in Terminal New File New Directory Upload Download **Copy/Move** Delete

Copy or move the files below from /home/rc_training01 to the current directory:

rstudio_launcher.sh

Copy Move

Home Directory
Scratch
data1
data2
groups
no_backup2

/ home / rc_training01 / Change directory Copy path

Show Owner/Mode Show Dotfiles Filter: Showing 3 of 9 rows - 1 rows selected

	Type	Name	Size	Modified at
<input type="checkbox"/>	Folder	programs	-	8/8/2022 4:00:36 PM
<input type="checkbox"/>	Folder	tissue_project	-	8/8/2022 3:59:27 PM
<input checked="" type="checkbox"/>	File	rstudio_launcher.sh	0 Bytes	8/8/2022 4:01:16 PM

powered by OPEN OnDemand OnDemand version: v2.0.26

- 1 Select file or directory
- 2 Click on "Copy/Move"
- 3 Move to target location
- 4 Click on Copy or Move





Transfer Files

Within O2

Open OnDemand Files Jobs Clusters BioGrids Applications HMS-RC Applications My Interactive Sessions Help Logged in as rc_training01 Log Out

Open in Terminal New File New Directory Upload Download Copy/Move Delete

Copy or move the files below from /home/rc_training01 to the current directory:

rstudio_launcher.sh

Copy Move

Home Directory
Scratch
data1
data2
groups
no_backup2

/ home / rc_training01 / Change directory Copy path

Show Owner/Mode Show Dotfiles Filter: Showing 3 of 9 rows - 1 rows selected

Type	Name	Size	Modified at
Folder	programs	-	8/8/2022 4:00:36 PM
Folder	tissue_project	-	8/8/2022 3:59:27 PM
File	rstudio_launcher.sh	0 Bytes	8/8/2022 4:01:16 PM

powered by OPEN OnDemand OnDemand version: v2.0.26

- 1 Select file or directory
- 2 Click on "Copy/Move"
- 3 Move to target location
- 4 Click on Copy or Move





Transfer Files

Within O2

Open OnDemand Files Jobs Clusters BioGrids Applications HMS-RC Applications My Interactive Sessions Help Logged in as rc_training01 Log Out

Open in Terminal New File New Directory Upload Download Copy/Move Delete

Copy or move the files below from /home/rc_training01 to the current directory:

rstudio_launcher.sh

Copy Move

Home Directory Scratch data1 data2 groups no_backup2

/ home / rc_training01 / Change directory Copy path

Show Owner/Mode Show Dotfiles Filter: Showing 3 of 9 rows - 1 rows selected

Type	Name	Size	Modified at
Folder	programs	-	8/8/2022 4:00:36 PM
Folder	tissue_project	-	8/8/2022 3:59:27 PM
File	rstudio_launcher.sh	0 Bytes	8/8/2022 4:01:16 PM


powered by OPEN OnDemand OnDemand version: v2.0.26

- 1 Select file or directory
- 2 Click on "Copy/Move"
- 3 Move to target location
- 4 Click on Copy or Move





Transfer Files




Submit Jobs




Monitor Jobs

Terminal



View/Edit Files



Applications



Portal





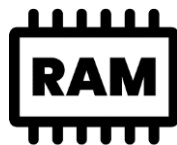
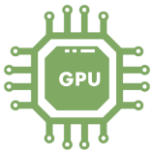
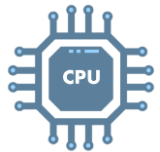
*A job is a **resource** request sent to O2 via the O2 Portal containing one or more **tasks**.*





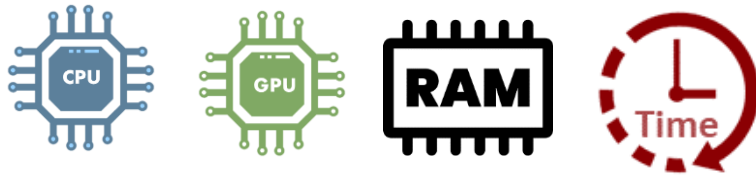
A job is a **resource** request sent to O2 via the O2 Portal containing one or more **tasks**.

Resources



A job is a **resource** request sent to O2 via the O2 Portal containing one or more **tasks**.

Resources



Launch Application



Data Analysis





Transfer Files



Submit Jobs



Monitor Jobs

Portal

Terminal



View/Edit Files



Applications





Monitor Jobs

Open OnDemand

Files ▾

Jobs ▾

Clusters ▾

BioGrids Applications ▾

HMS-RC Applications ▾

My Interactive Sessions

Help ▾

Logged in as rc_training01

Log Out

RStudio Environment (59163745)

Queued

Created at: 2022-08-08 17:03:32 EDT

Time Requested: 1 hour

Se

Pl

rec

RStudio Environment (59163745)

1 node

1 core

Running

Host: compute-a-16-160.o2.rc.hms.harvard.edu

Created at: 2022-08-08 17:03:32 EDT

Time Remaining: 56 minutes

Session ID: 9ce067da-658d-42e0-bad0-6879fbb5d766

Connect to RStudio Server

Job Status



HARVARD
MEDICAL SCHOOL

Research Computing



Monitor Jobs

Open OnDemand


Files ▾

Jobs ▾

Clusters ▾

BioGrids Applications ▾

HMS-RC Applications ▾

 My Interactive Sessions

Help ▾

Logged in as rc_training01

Log Out

RStudio Environment (59163745)

1 node

1 core

Running


Host: compute-a-16-160.o2.rc.hms.harvard.edu

Created at: 2022-08-08 17:03:32 EDT

Time Remaining: 56 minutes

Session ID: 9ce067da-658d-42e0-bad0-6879fbb5d766

 Delete

 Connect to RStudio Server

Important!
(Stop the job)



HARVARD
MEDICAL SCHOOL

Research Computing



Monitor Jobs

Open OnDemand


Files ▾

Jobs ▾

Clusters ▾

BioGrids Applications ▾

HMS-RC Applications ▾

 My Interactive Sessions

Help ▾

Logged in as rc_training01

Log Out

RStudio Environment (59163745)

1 node

1 core

Running

Host: compute-a-16-160.o2.rc.hms.harvard.edu


 Delete

Created at: 2022-08-08 17:03:32 EDT

Time Remaining: 56 minutes

Session ID: [9ce067da-658d-42e0-bad0-6879fbb5d766](#)

Hyperlink to logs

 Connect to RStudio Server



HARVARD
MEDICAL SCHOOL

Research Computing



Monitor Jobs

Open OnDemand

Files ▾

Jobs ▾

Clusters ▾

BioGrids Applications ▾

HMS-RC Applications ▾

My Interactive Sessions

Help ▾

Logged in as rc_training01

Log Out

RStudio Environment (59163745)

1 node

1 core

Running

Host: compute-a-16-160.o2.rc.hms.harvard.edu

Delete

Created at: 2022-08-08 17:03:32 EDT

Time Remaining: 56 minutes

Session ID: 9ce067da-658d-42e0-bad0-6879fbb5d766

Connect to RStudio Server

Open Application



HARVARD
MEDICAL SCHOOL

Research Computing



Monitor Jobs

[Open OnDemand](#)[Files](#)[Jobs](#)[Clusters](#)[BioGrids Applications](#)[HMS-RC Applications](#)[My Interactive Sessions](#)[Help](#)[Logged in as rc_training01](#)[Log Out](#)

Session ID folder

RStudio Environment (59163745)

1 node | 1 core | Running

Host: comput

Created at: 20

Time Remain

Session ID: 9c

[Connect](#)[/ home / rc_training01 / ondemand / data / sys / dashboard / batch_connect / sys / RC_rstudio / output / 9ce067da-658d-42e0-bad0-6879fbb5d766 /](#)[Change directory](#)[Copy path](#)☐ Show Owner/Mode ☐ Show Dotfiles Filter:

Showing 13 rows - 0 rows selected

Type	Name	Size	Modified at
Folder	bin	-	8/8/2022 2:46:31 PM
Folder	etc		
Folder	logs		
File	after.sh		
File	before.sh		
File	connection.yml	133 Bytes	8/8/2022 5:04:28 PM
File	job_script_content.sh	4.31 KB	8/8/2022 5:03:32 PM
File	job_script_options.json	528 Bytes	8/8/2022 5:03:32 PM
File	output.log	10.3 KB	8/8/2022 5:04:28 PM
File	rsession.sh	549 Bytes	8/8/2022 5:04:25 PM



HARVARD
MEDICAL SCHOOL

Research Computing



Transfer Files



Submit Jobs



Monitor Jobs

Terminal



View/Edit Files



Applications



Portal





Terminal

Open OnDemand Files Jobs Clusters BioGrids Applications HMS-RC Applications

HARVARD MEDICAL SCHOOL
HMS Research Computing

The O2portal is a web-based, single access point for the O2 HPC cluster.

The O2portal runs Open OnDemand (OOD), an NSF-funded, open-source software that facilitates

rc_training01@transfer06:~
o2portal.rc.hms.harvard.edu/pun/sys/shell/ssh/transfer.rc.hms.harvard.edu Guest (3)

```
Host: transfer.rc.hms.harvard.edu
running kernel 3.10.0 born on 2020-08-11

----- O2 -----

News (Jan 3 2022)

+-----+
| ##### RC Core launched in July 2021 ##### |
| Since July 2021, researchers whose PI does not have a primary or secondary |
| faculty appointment in an HMS Basic or Social Science Department will incur |
| charges to their lab for O2 usage. Details at: it.hms.harvard.edu/rc/core |
+-----+

-----
Contact HMS Research Computing:
E-mail   rchelp@hms.harvard.edu
Web      it.hms.harvard.edu/rc
Twitter  @hms_rc

[rc_training01@transfer06 ~]$
```

rc_training01@login02:~
o2portal.rc.hms.harvard.edu/pun/sys/shell/ssh/o2.hms.harvard.edu Guest (3)

```
Host: o2.hms.harvard.edu
running kernel 3.10.0 born on 2021-09-27

----- O2 -----

News (Jan 3 2022)

+-----+
| ##### RC Core launched in July 2021 ##### |
| Since July 2021, researchers whose PI does not have a primary or secondary |
| faculty appointment in an HMS Basic or Social Science Department will incur |
| charges to their lab for O2 usage. Details at: it.hms.harvard.edu/rc/core |
+-----+

-----
Contact HMS Research Computing:
E-mail   rchelp@hms.harvard.edu
Web      it.hms.harvard.edu/rc
Twitter  @hms_rc

[rc_training01@login02 ~]$
```

Transfer Cluster
O2 Cluster

✓	✗	research.files
✗	✓	Computations
✓	✗	Globus
✓	✗	rclone





Transfer Files



Submit Jobs



Monitor Jobs

Portal

Terminal



View/Edit Files



Applications





powered by

OPEN  **nDemand**



Transfer Files



Submit Jobs



Monitor Jobs

Portal

Terminal



View/Edit Files



Applications





Applications

1. Select Application





Applications

1. Select Application



2. Specify Resources





Applications

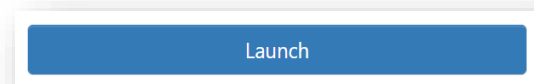
1. Select Application



2. Specify Resources






3. Launch Application











Applications

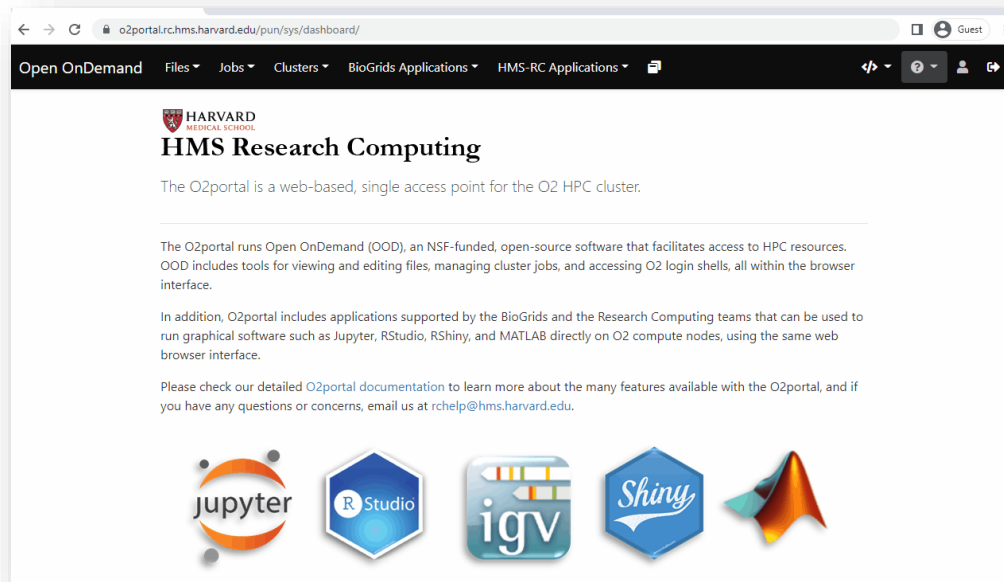
- Two sets of scientific software applications provided by BioGrids and HMS Research Computing

BioGrids Applications	
GUIs	
	IGV
IDE	
	Jupyter
	RStudio

HMS-RC Applications	
GUIs	
	Desktop Mate
	MATLAB
IDE	
	Jupyter
	MATLAB-proxy-app
	RStudio Environment
	Shiny (Internal)



Documentation



O2 Portal Documentation in Confluence

How to use HMS RC Desktop App

O2Portal - Jupyter App

HMS - RStudio on O2

O2Portal



Created by William (Gaby) Rodriguez
Last updated: Jun 09, 2022 by Amir Karger • 4 min read • 8 people viewed

- [How to login to O2Portal](#)
- [Features available in O2Portal](#)
- [Computational Applications available in O2Portal](#)
 - [HMS Research Computing Applications](#)
 - [BioGrids Applications](#)
- [F.A.Q.](#)

The O2Portal runs Open OnDemand (OOD), an NSF-funded, open-source software that facilitates access to HPC resources. Open OnDemand was created and is maintained by the Ohio Supercomputer Center.

The O2Portal provides easy access to HMS' O2 cluster and includes tools for viewing/editing files, managing cluster jobs, accessing login shells and more, entirely via the same single-sign-on web-based interface.

How to login to O2Portal

⚠ You must have an [O2 account](#) in order to use the O2Portal

<https://harvardmed.atlassian.net/l/cp/vZ58cLoQ>



HARVARD
MEDICAL SCHOOL

Research Computing

Please fill out the survey

- Accessible through the Harvard Training Portal
<https://trainingportal.harvard.edu>
- Click on “Me” ➡ “O2 Portal”
- Scroll to “Evaluations” and click on the survey



We appreciate any feedback or comments!





HARVARD
MEDICAL SCHOOL

Research Computing