Overview

O2 is a platform for Linux-based high performance computing at Harvard Medical School. The name is derived from being the next generation of the HMS “Orchestra” cluster, hence “O”2.

- O2 is managed by the Research Computing Group, part of HMS IT.
- O2 is an HPC cluster built on Linux and the Slurm open source job scheduler.
- Please submit a request for O2 help or feedback.
- Follow us on Twitter for updates and alerts about service outages.

Cluster Status

**SLURM SCHEDULER: POTENTIAL SERVICE DEGRADATION**

Our [cluster status page](https://example.com/status) has details of service outages and planned maintenance.

**Nov 18 - Slurm scheduler performance issue**

Slurm job scheduler commands (e.g. sbatch, srun, squeue) on the O2 HPC cluster may potentially be unavailable at times due to an ongoing performance issue. Jobs already running should be unaffected.

**August 9 - Potential Service Degradation**

Under certain conditions, new jobs may intermittently not start on the cluster (or the sbatch command has errors) due to an issue with cluster-storage communication. After consulting with the vendor, there is a planned infrastructure fix for the issue being scheduled. We believe that currently running jobs are still executing normally, otherwise.

Two Factor Authentication:

All O2 cluster logins from outside of the HMS network require two-factor authentication. Please see:

- Two Factor Authentication on O2
- Two Factor Authentication FAQ
- [How to setup your HMS Duo profile](https://example.com/duo_setup)

Community Events

User Training

- Classes are offered each semester to the HMS community to help you ramp up your research skills!
- Please check the [User Training page](https://example.com/training) for courses, dates, and registration

Office Hours

- RC’s Office Hours are held every Wednesday, 1 - 3 PM.
  - As part of the HMS response to COVID-19, office hours are being held online, using Zoom.
  - **During these hours only**, you can join the Zoom meeting room for a consultation.
- Please contact us first with a support request before joining office hours so we can better help you!

Getting Started with O2 and Slurm

- [Basic guide to O2 and the Slurm job scheduler](https://example.com/guide): New users, start here!
- How to login to O2
- Frequently Asked Questions about O2
- Security on O2

O2 Jobs and the Slurm scheduler

- How to choose a job partition
- Troubleshooting your O2 jobs
- Parallel Jobs in O2
- Using O2 GPU resources
- O2 HPC Cluster and Computing Nodes Hardware Information
- Job Priority
- Examples of O2 commands
- Get information about current and past jobs

Software and Programming on O2

- Using research applications on O2
- Using MATLAB on O2
- Using Mathematica on O2
- Using Conda on O2
- Using Java on O2
- Using Jupyter on O2
- Using RStudio on O2
- Maintain your own library of software for different languages
  - Personal Python packages
  - Personal R packages
  - Personal Perl packages
- Installing custom software
- Using Genome Browsers (IGV, UCSC Genome Browser)
- [Available Software on O2](https://example.com/software)

General UNIX Information

Cluster Status

**SLURM SCHEDULER: POTENTIAL SERVICE DEGRADATION**

Our [cluster status page](https://example.com/status) has details of service outages and planned maintenance.

**Nov 18 - Slurm scheduler performance issue**

Slurm job scheduler commands (e.g. sbatch, srun, squeue) on the O2 HPC cluster may potentially be unavailable at times due to an ongoing performance issue. Jobs already running should be unaffected.

**August 9 - Potential Service Degradation**

Under certain conditions, new jobs may intermittently not start on the cluster (or the sbatch command has errors) due to an issue with cluster-storage communication. After consulting with the vendor, there is a planned infrastructure fix for the issue being scheduled. We believe that currently running jobs are still executing normally, otherwise.

Two Factor Authentication:

All O2 cluster logins from outside of the HMS network require two-factor authentication. Please see:

- [Two Factor Authentication on O2](https://example.com/duo)
- [Two Factor Authentication FAQ](https://example.com/duo_faq)
- [How to setup your HMS Duo profile](https://example.com/duo_setup)

Community Events

User Training

- Classes are offered each semester to the HMS community to help you ramp up your research skills!
- Please check the [User Training page](https://example.com/training) for courses, dates, and registration

Office Hours

- RC’s Office Hours are held every Wednesday, 1 - 3 PM.
  - As part of the HMS response to COVID-19, office hours are being held online, using Zoom.
  - **During these hours only**, you can join the Zoom meeting room for a consultation.
- Please contact us first with a support request before joining office hours so we can better help you!
Data Storage

- There are a number of storage options available for research data, such as Active and Standby
- Copying files to and from O2 (including downloading from websites)
- Home directory and shared network storage on O2
- Quotas on home directory and shared network storage on O2

Intermediate Slurm

- Research Computing Group custom workflows
- Get more informative slurm email notification
- Report CPU/Mem usage in slurm job standard output
- screen: go back to the same terminal window from anywhere, anytime
- tmux: go back to the same terminal window from anywhere, anytime
- Install and run HiC-Pro-2.10.0
- Install and run salmon-0.10.0 and Trinity-2.6.6
- Batch small jobs together as a big job
- Aspera
- sratoolkit/2.10.7 to download NCBI SRA data
- sratoolkit/2.10.7 to download dbGAP data

Grants and Citation Information

- Text about Research Computing and O2 for grant applications
- Published papers that cite HMS Research Computing resources