O2

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 “O2”.

- 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.

Getting Started with O2 and Slurm
- Basic guide to O2 and the Slurm job scheduler
  New users, start here!
- Switching workflows from Orchestra to O2
  Orchestra users, start here!
- How to login to O2
- Frequently Asked Questions about O2

O2 Jobs and the Slurm scheduler
- How to choose a partition (the Slurm equivalent to job queues in LSF)
- 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
- 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

General UNIX Information
- Using X11 applications remotely
- UNIX permissions tutorial
- O2 cron service

Cluster Status
Our cluster status page has details of service outages and planned maintenance.

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

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 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!

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
- Aspera to download NCBI SRA data
- Batch small jobs together as a big job

Grants and Citation Information
- Text about Research Computing and O2 for grant applications
- Published papers that cite HMS Research Computing resources
Data Storage

- There are a number of storage options available for research data.
- Copying files to and from O2 (including downloading from websites)
- If you had an Orchestra account, you will get access to the same home directory and shared network storage from O2.