WIKI for Hyak users

- 1 News
  - 1.1 Mailing List
  - 1.2 Announcements
- 2 System Status
  - 2.1 Current Status
  - 2.2 Monthly Scheduled Maintenance
  - 2.3 Cluster Node Status
- 3 Hyak Overview
  - 3.1 ikt
  - 3.2 mox
- 4 Purchasing Hyak Capacity
- 5 Getting Started
- 6 Using Hyak
  - 6.1 First Steps
    - 6.1.1 Knowledge Pre-requisites:
    - 6.1.2 Code Pre-requisites:
- 7 Software and Development Tools
- 8 Filesystems and Data Transfer
- 9 Submitting and Running Jobs
  - 9.1 Hyak Tutorials
  - 9.2 Hyak How-tos
  - 9.3 Hyak wiki pages Index
  - 9.4 Other Tutorials
  - 9.5 Troubleshooting
- 10 Feature Requests
- 11 Citing Hyak in Publications and Proposals
- 12 Help for Hyak Node Sponsors

News

Mailing List

Sign up for the Hyak-users mailing list to stay up to date with the latest news: https://mailman1.u.washington.edu/mailman/listinfo/hyak-users

This list is used for ALL announcements to Hyak users, so please sign up. Important Hyak announcements are ONLY sent to this list, not to the individual Hyak accounts.

Announcements

You can get to this top level page using the address: http://wiki.hyak.uw.edu

System Status

Hyak consists of two independent clusters: ikt.hyak (hyak classic) and mox.hyak (hyak next-gen).

Current Status

July 11, 2017 6:06p

ikt.Hyak is operating normally.

mox.Hyak is operating normally.

Monthly Scheduled Maintenance

Hyak will be offline from 9:00 am - 5:00 pm for scheduled maintenance the second Tuesday of every month. Every third month (Feb, May, Aug, Nov), the maintenance window will last from 9:00 am to 9:00 the following morning. More on the Maintenance schedule.
Other maintenance performed on Hyak is relatively rare, short (30 - 60 minutes), and does not impact running jobs. This type of maintenance is announced to the hyak-users list.

**Cluster Node Status**

We run the Ganglia cluster status tool on ikt.hyak. Here you can find out the details about the CPU, memory, and network usage of the nodes in your allocation. (Ganglia does not run on mox.hyak.)

http://status.hyak.uw.edu/

**Hyak Overview**

Hyak is a service of UW-IT. You can read more about it in the [Service Catalog](#).

Most of the nodes are devoted for computing but the cluster also includes a few "login-nodes", dedicated to logins, file transfers, and similar communication tasks. There are also nodes that belong to the sponsoring institutions, and nodes for compiling and testing the programs.

Any UW student can get access to hyak by joining the HPC club: [http://students.washington.edu/hpcc/getting-started-on-hyak/](http://students.washington.edu/hpcc/getting-started-on-hyak/)

Hyak consists of two independent clusters: ikt.hyak (hyak classic) and mox.hyak (hyak next-gen). All new nodes are added to mox.hyak.

**ikt**

Contains two partitions, “p1” and “p2”. Both partitions contain hundreds of nodes, each comparable to a high-end server. A typical node on ikt.hyak has 16 processor cores and 128GB of memory. All the ikt.hyak nodes run CentOS 6 Linux, and they are tied together by the Moab cluster software. The user tasks are submitted through TORQUE scheduler. ikt.Hyak is made of several generations of hardware with different levels of performance, see [Hyak Node Hardware](#) for more details.

**mox**

Contains undreds of nodes, each comparable to a high-end server. A typical node on mox.hyak has 28 processor cores and 128GB of memory. All the mox.hyak nodes run CentOS 7 Linux, and they are tied together by the Slurm cluster software. The user tasks are submitted through Slurm scheduler.

For an overview of mox please see [Hyak mox Overview](#).

**Purchasing Hyak Capacity**

CPU and storage options are available for purchase to Hyak users associated with sponsored campus units. New nodes will be part of mox.hyak.

This information is provided for preliminary planing purposes only. Please contact help@uw.edu for assistance in preparing actual Hyak hardware configurations.

[https://itconnect.uw.edu/service/shared-scalable-compute-cluster-for-research-hyak/](https://itconnect.uw.edu/service/shared-scalable-compute-cluster-for-research-hyak/)

**Getting Started**

Please review everything in this section before contacting Hyak support for help with new accounts. This section also contains useful information on life with two-factor authentication, including setting up SSH tunnels to reduce hassles.

- Requesting an Account
- Logging In

**Using Hyak**

**First Steps**

**Knowledge Pre-requisites:**
You should be familiar with the Linux command line. Hyak's default shell is bash which is also the default shell on a Mac computer. Here is a link to Software Carpentry's lessons on the bash shell, Python, git etc. (Scroll down for videos of their courses.)

http://software-carpentry.org/lessons/

Software Carpentry also conducts workshops at UW. See below link for the next workshop at UW:

http://software-carpentry.org/workshops/

You should be familiar with Hyak basics:

Hyak_101

**Code Pre-requisites:**

Before you start running your code to hyak, ensure it works on your own computer, or even better, in your lab network. Be sure you know how to keep all the cores busy. For example, using GNU Parallel for weak-scaling, or MPI for strong-scaling.

A user connects to hyak by using ssh. Mac and Linux machines have ssh. Windows users will have to install appropriate ssh software.

**Software and Development Tools**

Hyak provides software development tools and libraries for HPC and data intensive computing.

- Hyak Software
- Hyak Scientific Software

**Filesystems and Data Transfer**

Hyak offers a variety of filesystems, each best suited for a different set of circumstances. Along with selecting the best filesystem for the job, this section includes instructions for moving your data to and from Hyak.

- Managing your Files

**Submitting and Running Jobs**

All Hyak use is mediated by the system scheduler. This section provides details on using the scheduler to run interactive, batch, and parallel jobs. It also includes instructions for using the scheduler to monitor your jobs and the cluster status.

ikt.Hyak uses TORQUE scheduler. It is controlled through several commands like `qsub` for starting a job or `qdel` for canceling a job. Jobs must be submitted via login nodes.

- Using the Scheduler

mox.hyak uses the slurm scheduler. Jobs must be submitted via the login nodes.

Mox scheduler

**Getting Help**

If you use the STF (Student Technology Fee) allocation, please join the mailing list for the HPC club (http://students.washington.edu/hpcc/) and direct all questions there. Do not contact UW-IT for support.

The principle means of support we provide is this Wiki - a comprehensive set of documentation covering all basic Hyak functions. If you encounter problems with one of Hyak's basic functions send an e-mail to help@u.washington.edu with 'hyak' as the first word in the subject and a brief description of your issue. If you do not use your UW provided e-mail account, please include your UW NetID in your e-mail. If you're reporting a problem with a job or the job scheduler, please include at least one affected jobid as well as paths to the job script and job stdout (<jobname>-o<jobid>).

We operate Hyak as a campus resource for research computing at scale. It provides a capable, stable platform upon which users can build complex, domain specific software environments and workflows. Our end-user support resources are limited, covering the system hardware, operating system, filesystems, networks, job scheduler, and a defined set of development tools and applications. Users are responsible for building, installing, maintaining and running any other applications.

To have a good experience using Hyak, or any other HPC/supercomputer system, we offer these general recommendations:

WIKI for Hyak users Guidelines
For users building complex codes from sources, please read this.

**Hyak Tutorials**

Here are a few tutorials written for different tasks. While not directly applicable to all users' work, they're worth taking a look at to get an idea about how some common tasks are accomplished using Hyak.

- Compiling HDF: compiling a non-parallel application with the Intel compilers
- Compiling an MPI application: compiling a test program with the Intel compilers and Intel MPI and then submitting a job to the scheduler

**Hyak How-tos**

- Hyak HOWTO is a list of articles for different tasks, including how to use R, Python and Matlab on hyak.
- Hyak_mox_HOWTO is a list of articles specifically for mox (hyak nextgen).

**Hyak wiki pages Index**

- Hyak_wiki_Index

Below is a list of Hyak wiki pages which do not start with the word Hyak.

- Managing your Files
- Logging In
- preemption
- WIKI for Hyak users Guidelines

**Other Tutorials**

Please review this online course if you are not already familiar with *nix systems:

- UNIX Book
- UNIX Presentation

The Teragrid offers an excellent online tutorial series on more advanced HPC topics. You must create an account before accessing content. Just follow the instructions on the main page.


**Troubleshooting**

- Common problems and errors

**Feature Requests**

- Wish List - requests for software features

**Citing Hyak in Publications and Proposals**

Please remember to acknowledge Hyak in any publications or posters with results Hyak contributed to generating. When citing Hyak please use the following language:

- This work was facilitated though the use of advanced computational, storage, and networking infrastructure provided by the Hyak supercomputer system at the University of Washington

When you cite Hyak, please let us know! Send mail to help@uw.edu with Hyak as the first word in the subject along with a citation we can use in the body of the message. Likewise please let know of successful funding proposals and research collaborations which relied, at least in part, on Hyak for their success.
Here's a current list of publications citing Hyak.

**Help for Hyak Node Sponsors**

- **Hyak Account Creation** - Information for Node Sponsors about how to create Hyak accounts
- **Hyak UNIX Groups** - Information for node sponsors about how to create additional filesystem permission groups.
- **Hyak Quotas** - Information for Node Sponsors about how to manage user, group, and fileset quotas.