

This Memorandum of Understanding (MOU) contains basic provisions that will guide the working relationship between the Purdue researcher referred to here as *The Faculty Partner* and *Purdue IT* concerning the Hammer Community Compute Cluster.

Term

This agreement will be in effect until the decommissioning of the 2015-model nodes within the Hammer Community Cluster, which is expected to occur when the 5-year hardware warranty expires in 2020.

Service Overview

The Faculty Partner agrees to purchase access to compute nodes in the Hammer Community Cluster, which will be in production beginning Spring 2015. A batch job queue will be established for *The Faculty Partner* and his/her research team. No other users will have access to this queue unless a special short-term arrangement is made. However, *Purdue IT* may run HTCondor on all nodes in the cluster when the nodes are otherwise idle.

Purdue IT Responsibilities

- Provide cluster infrastructure, including racks, power, cooling, and networking.
- Establish and maintain user accounts and job submission queues.
- Maintain cluster system hardware and software.
- Provide system administration services and technical support.
- Provide a base suite of software including compilers, operating system software, and some applications and libraries, not to exceed limits provided in current licensing agreements with vendors.
- Install and provide best-effort support for commercial and public domain packages and libraries beyond the base software suite. Additional applications will be provided by *The Faculty Partner* and installed in accordance with licensing agreements. However, primary responsibility for support of discipline-specific application software will remain with the research team.
- Provide information regarding this system via the Research Computing website, the login Message-of-the-Day (MOTD), and email to the system stakeholders.

Faculty Partner Responsibilities

- Provide funding for access to the equipment as identified.
- Recommend queue characteristics and identify users who are allowed to access *The Faculty Partner*'s queue.
- License discipline-specific software as needed. *Purdue IT* will install and maintain the software on the Hammer cluster upon receipt of the software, licensing, and vendor contact information. When multiple software packages are requested, *The Faculty Partner*'s research team will advise *Purdue IT* staff on a priority and target installation date for each package to be installed. The research team has responsibility for support of discipline-specific application software.

- Ensure that data that must be protected by Federal security or privacy laws (e.g., HIPAA, ITAR, classified information, etc.) is not stored on this system. This system is not intended to meet the enhanced security required by those laws or regulations.
- Help establish general guidelines for the management and use of the Hammer cluster.
- Manage user accounts through the Self-Service Account Management Application.
- Provide timely reports of all problems to *Purdue IT* at rcac-help@purdue.edu.
- Routinely check the Research Computing website, the MOTD, and email from Purdue IT for information regarding this system.
- Send requests for additional information to rcac-help@purdue.edu.

Job Scheduling

Batch System

Purdue IT will provide and operate batch job scheduling and resource management software, optimized for high-throughput, serial workflows. The system's general characteristics and structure will be established based on input from *The Faculty Partner*. In addition, members of *The Faculty Partner's research group* will be given unrestricted access to a dedicated job queue. Occasionally, batch scheduling and queue management may need to be adjusted to better meet the needs of the *Hammer* partners.

Standby Queue

One of the advantages of the community cluster program is the ability to share hardware. A shared *standby* queue exists that will allow all Hammer users access to any idle node in the cluster.

Standby queue jobs have lower priority than queues associated with the faculty partners. Standby queue jobs run only when a sufficient number of idle nodes are available. Jobs submitted to partners' queues will be started immediately or as soon as any currently running standby jobs finish.

By default, the standby queue will have a time limit of 4 hours per job and a maximum of 1,000 jobs total in queue. Should the Hammer community cluster partners desire to alter these limits, *Purdue IT* can change the limits associated with the standby queue.

HTCondor

Purdue IT has the option to run HTCondor, a distributed computing system, on any idle nodes so long as HTCondor's presence does not interfere with batch jobs running in the system.

Changes

The queuing parameters can be changed upon request by *The Faculty Partner*. *Purdue IT* will act as a broker to facilitate short-term scheduling changes as needed – perhaps to help meet a research deadline.

Governance

Meetings related to management of the Hammer cluster may be scheduled as necessary. The meetings

will focus on reviewing any potential issues or avenues for improvement, highlight key successes, and discuss potential future plans.

Service Availability

Purdue IT will maintain the cluster system as a highly available, 24/7 resource. However, there are exceptions to these terms of service:

- Unplanned system outages due to issues with other aspects of the facility such as power, HVAC, network, or emergency maintenance to address computer security incidents may prevent the use of the system in a timely manner.
- Routine software and hardware maintenance of the system. Maintenance windows are typically announced at least 4 weeks in advance.

Acceptable Use Policies

The Faculty Partner, his/her research team, and *Purdue IT* staff agrees to comply with all Purdue University and Purdue IT/Research Computing policies and procedures, including the University's information technology policies located at: <http://www.purdue.edu/securePurdue>. Research Computing policies may be found at: <https://www.rcac.purdue.edu/policies/>. The system is not intended to store data protected by Federal privacy and security laws (e.g., HIPAA, ITAR, classified, etc.). It is the responsibility of the faculty partner to ensure that no protected data is stored on the system. Questions about information security may be directed to the Purdue IT Help Desk at (765) 494-4000.

Facilities

Purdue IT will house the Hammer cluster in the Math Building machine room (G109/G190) or in a suitable facility chosen by *Purdue IT*.

Support Process

All incident reporting should start with email to rcac-help@purdue.edu. *Purdue IT* will provide a response within one business day. In general, critical issues will be addressed as soon as possible. Critical issues are defined as disruptions to large portions of the cluster or infrastructure.

Termination

Either party may terminate this agreement by providing written notification to the other party thirty (30) days in advance of termination. In the event of termination, all equipment will remain the property of *Purdue IT*. *The Faculty Partner* may sell or transfer the remainder of his/her access to Hammer to another Purdue researcher. *Purdue IT* will facilitate the transfer of access to the cluster to the new partner.

Storage

Purdue IT provides access to multiple types of storage for working with the Hammer cluster. Requests for *Purdue IT* to support custom storage needs beyond these types can be discussed, and will be considered on a case-by-case basis.

Home Directories

Home directories are provided for each user of the cluster. These directories are backed up, and files can be recovered when needed.

Research Data Depot Storage

Persistent, shared group storage spaces are available to any research group using the cluster. The Research Data Depot is redundant and protected against hardware failures and accidental deletion. Information on the Research Data Depot can be found at <https://www.rcac.purdue.edu/storage/depot/>.

Scratch Storage

Hammer will use a high performance parallel Lustre scratch system that is available for each user of the cluster. Files in the scratch file system are subject to being automatically purged. Information on the purging policy can be found at <http://www.rcac.purdue.edu/policies/scratchpurge>..

The integrity of the scratch storage components will be accomplished via a redundant disk system. No backup, either via remote copy or transfer of data to other media will be performed. No disaster recovery other than the redundant disk systems will be provided.

Archival Storage

Long-term storage is also available via the Fortress archival storage system. Information on the archival storage system can be found at <https://www.rcac.purdue.edu/storage/fortress/>.