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Memorandum of Understanding
Investment-Based Participation in Advanced Research Computing for Computing Use

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This Memorandum of Understanding (MOU) contains provisions that guide the working relationship between the Virginia Tech researcher, referred to here as *The Faculty Partner*, and *Advanced Research Computing (ARC)* for use of the High-Performance Computing (HPC) filesystems through the Investment Computing Program over the five-year term of this MOU.

Term

This MOU is effective for a term of five years from the date of participation specified at the end of this MOU.

Definitions

- The Faculty Partner – Virginia Tech faculty member identified in this MOU
- Storage Service Unit (SSU) – One SSU provides 1 terabyte of available storage on the group filesystem for the duration of this MOU
- Compute Service Unit (CSU) — One CSU provides access to one processor core for one hour

Service Overview

The Faculty Partner in investing in priority access to compute nodes and storage in ARC's HPC clusters. Investment-based participation provides the Faculty Partner with a specified number of Compute Service Units, with varying consumption rates as determined by the Exchange Rate. At the time of signing of this MOU, the Faculty Partner agrees to provide an estimate of expected usage for resource planning by ARC.

The total investment by the Faculty Partner and the associated number of CSUs and SSUs and the associated exchange rates are specified at the end of this MOU. Priority access will be granted to the participating Faculty Partner and their research team, which includes any students, post-doctoral researchers and collaborating faculty specified by the Faculty Partner. Within the five-year duration of this MOU, priority CSUs and SSUs may be transferred to future systems managed by ARC with the conversion rate determined based on the associated hardware costs.

Priority access will be granted to the participating Faculty Partner and their research team, which includes any students, post-doctoral researchers and collaborating faculty specified by the Faculty Partner.

Advanced Research Computing Responsibilities

- Use the Faculty Partner's investment to increase the capacity of associated computational infrastructure
- Provide cluster infrastructure, including data center space, racks, power cooling, and networking
- Establish and maintain user accounts and job submission queues
- Maintain cluster system hardware, networking, storage, and software
- Provide system administration services and technical support
- Provide the Faculty Partner with mechanisms determine the amount of SSUs and CSUs that have been consumed by the Faculty Partner in association with this MOU
- Provide information regarding system maintenance outages and system status via email to all users including the Faculty Partner

Faculty Partner Responsibilities

- Provide funding for priority access to computational resources as described in this MOU
- Ensure that data that must be protected by federal security or privacy laws (e.g. HIPAA, ITAR, classified information, etc.) is not stored on ARC systems unless an exception has been negotiated explicitly
- Accept responsibility for any data curation and retention costs associated with data stored on the HPC filesystems that must be supported beyond the five-year duration of this MOU
- Obtain an allocation on the cluster and provide information on publications and funding that results from the use of computational resources
- Request user accounts online using ARC's account request form

Service Availability

Advanced Research Computing maintains clusters as a highly available 24/7 resource. Exceptions to these terms of service are as follows:

- 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 use of the system in a timely manner, and
- Routine software and hardware maintenance of the system.

Planned maintenance windows will be announced at least one week in advance.

Acceptable Use Policies

The system is not intended for data protected by federal privacy and security laws and regulations (e.g. HIPAA, ITAR, classified, etc.) without special arrangement. It is the responsibility of the Faculty Partner, his/her research team, and IT staff to comply with all Virginia Tech and Commonwealth of Virginia policies and standards specified at: http://www.it.vt.edu/administration/policies.

Questions about information security can be directed to ARC by submitting a consultation request.

Facilities
The HPC filesystems are housed at Steger Hall, 1015 Life Science Cir, Blacksburg, VA.

Support Process

All incident reporting should be submitted through the ticketing system supported through VT4Help, which is also accessible from the ARC website. Advanced Research Computing will provide a response within one business day. Critical issues that disrupt large portions of the cluster or infrastructure will be addressed as quickly as possible.

Job Scheduling

Advanced Research Computing provides and operates batch job scheduling and resource management software for the cluster, which together control how much of the cluster can be used by a given user and for how long, and gives priorities to new jobs that determine when they start. This software is configured to provide privileged access to the Faculty Partner's research group, as described below.

Priority Queue

The Faculty Partner's research group will be given access to a priority job queue. The priority job queue is configured to ensure that the Faculty Partner's queued jobs are scheduled ahead of queued jobs submitted by non-investing users until the annual limit of priority CSUs purchased in this agreement is reached. The Faculty Partner may continue to use this priority queue once the annual limit of priority CSUs has been exceeded, although these jobs will no longer jump in front of jobs submitted to the normal queue. Specific details for the service provided by the queue will be negotiated with the Faculty Partner based on their job profiles and workflow and enumerated in an addendum to this MOU.

Normal Queue

The ability to share hardware is a considerable advantage to centralized computing. The normal queue can be accessed by general users according to the policies specified in ARC documentation.

Storage

Multiple types of storage are available. Support for protected data must be negotiated explicitly between the Faculty Partner and ARC.

Group Storage

Group storage is provided to each research group and is subject to a quota. The Faculty Partner may purchase additional high-performance storage for the life of the MOU, with the cost determined by the cost of storage to ARC.

Home Directories

Home directories are provided for each user of the cluster and are subject to a quota.

Scratch Storage

Scratch storage space is provided on a parallel file system. Files in the scratch file system are subject to automatic purging.

Archival Storage

Long-term storage is available via the archival storage system which includes off-site backup.

Termination

Either party may terminate this MOU 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 ARC. The Faculty Partner may sell or transfer the remainder of his/her access to another Virginia Tech researcher. ARC will facilitate the transfer to the new partner.

Initial Date of Participation: MONTH DAY, YEAR

Amount Invested: $XX,XXX

Resources Provided:

- Compute time: XXXXX CSUs / year each year for a five-year period

_____ Date: _____   _____Date: _____

Alberto Cano   NAME
Associate Vice President for   Faculty Partner
Advanced Research Computing   Professor
                                                                       DEPARTMENT

_____ Date: _____   _____Date: _____

Sharon Pitt   NAME
Vice President for IT and CIO   Department Head
                                                                       DEPARTMENT