Participation by Columbia Researchers in Shared Central High Performance Computing (HPC) Resources

Shared Research Computing Policy Advisory Committee (SRCPAC)
Chair, Professor David Madigan (Chair, Department of Statistics)

Contact
For questions contact Research Computing Services (RCS) at rcs@columbia.edu
This document and “Intent to Participate” forms are available at:
http://researchinitiatives.columbia.edu/shared-research-computing

Purpose
Following the recommendation of the Shared Research Computing Policy Advisory Committee (SRCPAC) to create a shared central high performance computing (HPC) cluster, Columbia University plans to establish an HPC cluster with a minimum of 48 nodes (servers).

Three ways to participate in this shared resource will be offered, based on the experience of the current Hotfoot HPC cluster, and reflecting the desires expressed in a survey of potential users for both an option to purchase equipment and an option to rent, as well as a desire to provide a resource for entry-level researchers.

The deadline for receipt of “Intent to Participate” forms for this first opportunity to participate is Monday, April 15, 2013.

The system launch is targeted for Fall 2013. A second opportunity to participate will likely occur at that time for resources to be available in Spring/Summer 2014.

Support for this HPC Service includes funding from the Core Research Computing Facility project supported by NIH Research Facility Improvement Grant 1G20RR030893-01, and the NYS Empire State Development, Division of Science, Technology and Innovation (NYSTAR), Innovation Economy Matching Grant Program, Contract No. C090171. Contributions are also provided by A&S, SEAS and CUIT.

Options for Participation in HPC Service

Purchase
A research group may purchase one or more compute servers and some amount of storage, all with a four-year lifetime. A research group consists of one or more users. The total number of users on the system may be capped to ensure timely user support with limited support staff.

Purchases are made through CUIT. The Office of the Controller indicates that any purchase of servers and storage for the shared HPC resource is considered “major equipment” and is not subject to indirect cost recovery (ICR) charges. The HPC resource is housed in the Core Research Computing Facility, a portion of Columbia’s Morningside campus data center, and managed by CUIT.

There will be a support fee of $250 per purchased server per year for the four-year lifetime. This support fee is not considered major equipment, and is subject to indirect cost recovery (ICR) charges.

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As a one-time offer to pioneer purchasers, SRCPAC will increase each purchased share by 20%. Purchase of these additional servers will be funded through a New York State matching grant. The menu of available server types is below.

The number of servers purchased by a research group defines a share of the total system (expressed as a percentage) that will affect how computing jobs submitted by users in that group are processed by the system (job priority). Each group has access to system resources that are not being used by the other groups. System policies that determine job priority are approved by a faculty operations committee consisting of representatives of participating research groups, and are implemented by CUIT staff.

Rent
An individual researcher may pay $1000 to rent a share of the system (equal to 1/16th of a server) for one year as a single user only, with the ability to use more based on system policies.

Free
Researchers – particularly graduate students, post-docs, and sponsored undergraduates – may use the system on a low-priority, as-available basis. User support for this option will be limited to online documentation.

Menu for Purchasers
Prices below include $1000 to cover the $250 per year support fee, charged each year of the four-year equipment lifetime. (This support fee is not considered major equipment, and is subject to indirect cost recovery (ICR) charges.)
Each purchase must include some amount of scratch (temporary, not backed up) storage. Prices and server hardware are based on latest vendor quotes, which may change after the competitive vendor bidding procedure which will follow the collection of all “Intent to Participate” forms from research groups by April 15, 2013.

1. Standard Server: $4890
HP SL230 with dual E5-2650L processors (total of 16 cores) and 64 GB memory.

2. Infiniband Server: $6183
Same as standard server with additional Infiniband interface.

3. High Memory Server: $7130
HP SL230 with dual E5-2650L processors (total of 16 cores) and 256 GB memory.

4. GPU Server: $10,941
HP SL250 with dual E5-2650 processors (total of 16 cores), 64 GB memory, and 2 NVidia K20 GPU modules (total of 4492 CUDA cores).

Mandatory Scratch Storage: $1819 per TB
With the purchase of one or more of the above servers, some amount of scratch (temporary, not backed up) storage must be purchased. The RCS general recommendation is to purchase 1TB of scratch storage per server, although actual requirements will vary.

Purchase Process and Timeline
1. Purchasers and renters must fill out the appropriate “Intent to Participate” form and email it to RCS at rcs@columbia.edu by 5:00 pm on Monday, April 15, 2013.
2. The equipment in the forms will be combined, and an order will be created for a competitive bid for three vendors. The target date for vendor selection is Friday May 3, 2013.

3. After a vendor is selected from the competitive bid, RCS will confirm with each purchaser the hardware and exact purchase amount that will be charged to the provided account number. Once this is done, the order will be placed with the selected vendor.

4. The system launch is targeted for Fall 2013.

5. A second opportunity to participate as a purchaser will likely occur in Fall 2013.

FAQs
Several researchers have asked questions about participation in shared central HPC which we share below:

Q1: Is the purchase of a server considered “major equipment”?

A1: The Office of the Controller indicates that any purchase of servers and storage for the shared HPC resource is considered “major equipment”. Although some purchasers may need to rebudget current proposals, it also means that the purchase is not subject to indirect cost recovery (ICR) charges. The annual support fee for purchasers of $250 per year per server is not considered major equipment, and is subject to ICR.

Q2: I am participating in the NSF Major Research Instrumentation (MRI) competition for a shared HPC system submitted in February 2013 by PI Professor Kathryn Johnston. What happens if we receive the MRI award? What happens if we do not receive the MRI award?

A2: The terms of the matching New York State grant that is supporting the purchase of this HPC cluster require that we place an order before we know the outcome of the NSF MRI proposal. We expect to know the outcome of the award by Fall 2013. If Columbia is awarded the MRI grant, we anticipate that the servers purchased through the MRI would be combined with the cluster now being ordered. If Columbia is not awarded the MRI grant, it is expected that SRCPAC will consider allowing NSF MRI participants to purchase additional servers and storage to augment the cluster.