



## NATIONAL ADVANCED RESEARCH COMPUTING SITE SELECTION RESULTS

### *Questions and Answers*

#### **Process & Decision:**

#### **What was the process for determining which institutions would host one of the new advanced research computing systems?**

Institutions were invited to submit hosting proposals on October 20, 2014 with a request for proposal document that can be found [here](#). Proponents had to meet a set of mandatory requirements that were evaluated by Compute Canada staff on a “pass/fail” basis. The International Expert Review Panel evaluated the proposals using the following criteria and weightings:

Category	WEIGHT
Data Centre Suitability	30%
Matching and Operational Support Commitments	30%
Local Staff / Expertise	20%
Facilities Management Structure	20%

The Expert Review Panel conducted an initial evaluation of the nine proposals as well as the proponents’ *Matching and Operational Support Commitments* (their financial proposals). It recommended that Compute Canada conduct a more rigorous analysis since the Panel was not familiar with the specifics of Canadian research infrastructure funding. Financial data was gathered and analyzed by Compute Canada, and then brought to the national and regional leadership for final evaluation. The Expert Review Panel was consulted to ensure consistency between their evaluation and the financial outcomes.



### **Why is Compute Canada selecting only four sites for new system investments?**

Compute Canada is attempting to optimize the use of the \$37.5M allocated by the Canada Foundation for Innovation's (CFI) Challenge 2 Stage 1 Cyberinfrastructure funding. Compute Canada's analysis of its pressing and urgent needs from the research community concluded that the optimal configuration is four separate systems. Compute Canada's Site Selection process targeted the identification of the best hosting sites for these systems. See the [high-level summary of our short-term infrastructure plan](#) for technical details of this configuration and the four systems being considered for purchase.

Buying smaller systems would limit Compute Canada's ability to meet the needs of the researchers it serves. For example, a research team may not be able to run as large a simulation or analysis as required for their work, or would have to move data from system to system in order to complete a multi-step workflow that requires different kinds of compute hardware.

### **Why are the four selected sites just in British Columbia and Ontario? Why do we not have a new system hosted by each of the four Compute Canada region organizations (ACENET, Calcul Québec, Compute Ontario, WestGrid)?**

This reflects the strength of the hosting proposals submitted by institutions in those provinces, rather than any preference by Compute Canada for one location or another. Compute Canada is committed to using these new systems, wherever they may be located, to serve the needs of researchers all across Canada. The quality of Compute Canada's services is not determined by the physical location of its computer hardware. Compute Canada selected sites on technical and financial criteria.

### **How were the three GP systems matched to their sites?**

The GP and LP systems provided in the CC call for proposals were illustrative examples. The final systems will be designed and purchased through a competitive RFP process involving experts from the local host institutions, regional organizations and CC as a whole. The precise difference between GP1, GP2 and GP3 will only be known once the best vendor is chosen for each system. As such, all combinations of GP sites and hosts were considered.



**If demand for ARC resources is growing rapidly, why is Compute Canada defunding some advanced research computing systems across Canada?**

The useful lifetime of ARC systems is usually five years. Most of Compute Canada's ARC infrastructure is at or past its useful life. Twenty-five of Compute Canada's shareable ARC systems were installed in 2010 or earlier, representing more than half of Compute Canada's compute capacity. Some systems were installed as long ago as 2004. Compute Canada performed a cost-benefit analysis on its entire portfolio of systems, and these 25 systems were identified as the systems with the highest cost per unit of computational capacity. Compute Canada has already extended the life of these systems as long as is economically feasible. Given their age, their reliability can no longer be assured, even with increased spending on repairs, maintenance and warranties.

The \$37.5M budget possible with the CFI's Challenge 2 Stage 1 Cyberinfrastructure funding will allow Compute Canada to replace these older systems with comparable capacity of greater reliability, eliminating the need for maintenance spending and reducing our costs for electrical power.

Unfortunately this project budget will not allow Compute Canada to increase the overall computational capacity of its portfolio of systems; however this should be possible with the CFI's Challenge 2 Stage 2 Cyberinfrastructure funding that will be decided in 2016.

**How did Compute Canada decide what kinds of systems need to be installed in the future?**

Current needs and trends were analyzed through the Compute Canada allocations process whereby researchers apply for services annually. Other requests for Compute Canada resources, including support for visualization, programming, cloud hosting, and advanced support, were also considered. Compute Canada's Sustainable Planning for Advanced Research Computing (SPARC) initiative is a formal consultation process that, in 2014, solicited statements of current and future needs from across Canada. Whitepapers submitted to SPARC helped to guide the technology mix of the new systems.



Compute Canada also maintains two groups that advise the Compute Canada Board, the Advisory Council on Research (ACOR), a group of notable Canadian researchers, as well as the International Advisory Council (IAC), a smaller group of international researchers. Compute Canada has involved both of these groups in the development of our technical plan, and we have incorporated much valuable feedback from them.

For more information on our Sustainable Planning for Advanced Research Computing (SPARC) and other initiatives visit [www.computecanada.ca](http://www.computecanada.ca).

### **If Compute Canada personnel were involved in the process, how was conflict of interest prevented?**

All individuals involved in the process, including Compute Canada staff and members of the Expert Review Panel, signed a Non-Disclosure and Conflict of Interest Agreement that required conflicts to be disclosed and established a procedure for handling such conflicts when they were disclosed.

The Expert Review Panel's deliberations were at arm's length from Compute Canada, with the exception of Compute Canada's Chief Technology Officer, Dr. Newby who joined Compute Canada in January 2015.

### **Who were the members of the expert panel review?**

- Rod Wark, Secretary to the Expert Panel, President, VMG Strategic Consulting
- Lindsay Botten, Director, National Computational Infrastructure, Australian National University
- Earl J. Dodd, Chief Strategy Officer, Ideas And Machines, Inc.
- AJ Byers, President, JEDTech Group Inc.
- Greg Newby, Chief Technology Officer, Compute Canada

### **How was the process developed?**

Compute Canada and its regional partners consulted with their member institutions to develop a site selection process that was seen as fair and transparent by the research community. This process was reviewed and approved by the Compute Canada Board of Directors on October 9, 2014. On February 26, 2015, the Board was presented with



status and outcomes of the analysis, and approved negotiation and finalization by the CEO.

### **What happens next?**

Compute Canada will work with the nominated sites' teams to assist in the development of Compute Canada's Challenge 2 Stage 1 capital proposal for the Cyberinfrastructure Initiative, which must be submitted April 17, 2015. Subject to CFI's award to Compute Canada, Compute Canada will work with those institutions to establish service agreements and ensure access for all researchers regardless of location or discipline. A coordinated national procurement process will be developed with the participation of hosting site and institutional personnel, as well as the four hosting institutions that will actually purchase and own the systems to be installed. Formal vendor RFPs will be developed in late summer 2015, contemplating the delivery of new systems by late 2016 and availability for use shortly thereafter.

### **Will any new systems be installed after Stage 1?**

The CFI's Cyberinfrastructure Initiative has established a "Challenge 2 Stage 2" round of funding for Compute Canada with a proposal due in April 2016 and a decision by CFI in June 2016. This round will fund a project budget of at least \$37.5M to procure new ARC systems. As in Stage 1, the Stage 2 installations will be optimized to meet the growing needs of Canada's research community, and there will be a planning process, including community consultation, to make sure Compute Canada satisfies research needs as well as possible. It is likely that Stage 2 will again involve just a small number of new systems. The location of those Stage 2 systems will be determined using a Site Selection Process similar to the one used for Stage 1. Stage 2 systems may be configured as expansions of Stage 1 systems, or as new installations in locations other than the four sites being announced today.

### **Why did the provinces with the cheapest power not get a system?**

Of the proposals received, the lowest power costs were quoted by proponents in British Columbia and Quebec. The selection process considered the cost of operating the whole system as well as the technical quality of the host site and the capabilities of the local support team. Many factors were weighed including cost of personnel, power, institutional and provincial support. The criteria were established to ensure the best choice for Canadian researchers.



### **Is there an appeal process?**

There is no appeal process. Unsuccessful proponents can respond to future requests for hosting proposals from Compute Canada for the hosting of Stage 2 and subsequent systems. All proponents in Stage 1 will receive feedback on their proposals from the Expert Review Panel, which may aid in developing a more successful future proposal.

### **Who funds advanced research computing in Canada?**

The Canada Foundation for Innovation, in partnership with provincial funding bodies, academic and research institutions, fund the activities of Compute Canada and its regional partners.

## **Implications for Researchers, Institutions, and Regions**

### **What will happen at the other 23 hosting sites currently used for Compute Canada systems?**

At eleven (11) sites, Compute Canada will continue to operate one or more ARC systems. Other systems are own by specific research groups and managed by Compute Canada.

Compute Canada operates twelve (12) sites that will be removed from the Compute Canada budget and support. The individual universities will decide the future of these systems. The data centres at those sites are operated by the host institution and will continue to operate.

Personnel funded by Compute Canada at these 23 locations will continue to work with Compute Canada, providing user support to researchers on campus, acting as subject matter experts in specialized areas, or assisting in the technical administration of other systems in the Compute Canada portfolio.

### **What financial arrangements will be established with these four sites?**

Each of the nominated sites committed sufficient matching to fund the purchase and operation of the designated system for five years. Each of the nominated sites have identified provincial matching (40%) for the capital costs of the equipment to be purchased. This commitment includes five to six technical support staff, as well as the



power costs. Where multiple sites were nominated as hosts in a single province, Compute Canada confirmed the commitment of the province in question to provide enough matching commitments.

**What are the financial obligations of provinces and institutions without one of the new systems?**

Institutions/regions that have not been selected to host one of the new systems will not make contributions to the purchase and operation of those systems. Other costs include support for personnel located on campus, as well as national and regional staff and specialists who provide a range of services and expertise to researchers across Canada.

**Will other regions/institutions have to provide in-kind/matching funds for the capital purchases?**

The provincial and institutional funders in ACENET and Calcul Québec regions will not be required to provide matching funds for the capital purchases in stage-1, as no stage-1 systems will be located in those regions. They will, however, need to continue to match funding for MSI to cover regional staff, its operational costs, and costs related to legacy equipment.

**How will this benefit Canadian researchers and their industrial and international partners?**

Modern scientific research is driven by advanced research computing. Compute Canada aims to ensure Canadian researchers and their international and industrial partners have access to both the people and advanced research computing systems necessary to remain competitive. The current consolidation process replaces but does not increase capacity currently available in Canada. Further investment is required to keep pace with world-class research activities in Canada.

**Will I continue to have local support at my institution?**

Yes. Local support will remain strong. Compute Canada is committed to working with its regional partners and institutions to maintain a network of experts at campuses across Canada, whether or not those campuses host physical infrastructure.

**Will all users/regions get equal access to the systems?**



Users and regions will have access to the new infrastructure on the same basis as they do now.

**Will there be user fees?**

Compute Canada is working with the regions, funding bodies and the federal government to evolve the usage model along with the technical refresh. For the immediate future the expectation is to retain the current model.

**If I do not have a system at my institution am I still part of Compute Canada?**

Yes. Institutional membership in Compute Canada is not determined based on hosting physical computing resources. Compute Canada is committed to providing service to researchers across Canada, regardless of their institution or discipline, and regardless of whether or not that institution hosts any Compute Canada physical infrastructure. The nature of advanced research computing allows for remote access and management while maintaining local support models. Nationally, over 50% of usage is already provided outside of a researcher's institution and/or region.

**How will systems that must reside in a specific province be handled?**

Those systems will continue to be managed as they are now. Systems will reside within the specific province. Compute Canada will provide system administration and computational research support as needed.

**Will support staff continue to be available for carryover systems?**

Yes. Nothing will change in terms of support for legacy systems.

**How does this affect dedicated resource systems?**

Those systems will continue to be managed as they are now. Systems will reside within the research group. Compute Canada will provide system administration and computational research support as needed.

**What about bandwidth issues?**

We are working with CANARIE to manage these requirements.

**What happens if provinces housing the datacenters decide to no longer support them?**

There will be contracts in place with each of the provinces housing datacenters for a minimum of five years, which is the general life expectancy of computing equipment. Future rounds of infrastructure renewal will use the same or a similar process as this round, opening the possibility for housing data centers in different locations should these provinces opt not to provide capital support.



**How will you guarantee researchers in my institution/region are served in their language of choice?**

Compute Canada's site selection process established clear expectations that service delivery and procedures would conform with Compute Canada's national standards and policies, which include a commitment to serve researchers across the country using either of Canada's official languages. Access is managed through Compute Canada and the regional partners and not the host institutions. Support will be provided by the same local regional experts in the language of your choice. National services will be provided bilingually.