SHARCNET Research Support Programmes: Small Dedicated Resources

Application Guidelines

February 2012

SHARCNET Research Support Programmes
Small Dedicated Resources

1. Objective

To enable and facilitate large computational projects of exceptional merit that will achieve discoveries of international significance through the optimal exploitation of SHARCNET's computing infrastructure.

2. Programme Overview

The programme allocates:
- *CPU time:* An allocation of time that is beyond the level normally available through the general-access batch queues; that ia required urgently; and that can be demonstrated to be unsuitable for the Compute Canada Resource Allocation process. Allocations are available for most major systems.
- *Storage:* To provide large amounts of data storage for periods not suitable for allocation through the Compute Canada Resource Allocation process.

Note: All resource allocations are for specific projects, not to provide resource "envelopes" for multiple projects. Large requests and "envelope" allocations are to be handled through the Compute Canada Resource Allocation process.

Table 1: Resource thresholds and timelines for the Dedicated Resources Programme

Resource	Threshold
Dedicated CPU time[1]	1% – 5% of target system
Dedicated storage	More than 10TB for up to 9 months
Frequency of Applications	At most 1 allocation / year
Allocation window	3 months
Project attributes	Urgent, high-priority

[1] Thresholds are the fraction of the cpu hours available on any system in a three month period. Thus 1% of a 1000 core system would be $0.01 \times 1000 \times 24 \times 90 \approx 20{,}000$ cpu-hours.

Eligibility

The programme is open to any faculty (PI) applicant whose SHARCNET account is in good standing. *This good standing includes up-to-date reporting of outcomes of any previous SHARCNET award (Fellowship, Dedicated Resources etc.). Previous reports will form part of the adjudication process.*

Call for Applications and Announcement of Results

Applications may be made at any time and will be evaluated once complete. Results will be announced within 2 weeks of the application and technical review being submitted.
Questions regarding the programme, application process or online form may be directed to the SHARCNET office at (519) 661-4000 or via e-mail to research-support@sharcnet.ca.

3. How to Apply

Applications must be made online following consultation with SHARCNET HPTC staff. All application materials will be treated confidentially. You will be able to print a formatted hardcopy of your application from your web browser.

Note the word restrictions on the application form; excess material will be rejected.

You should request the resources necessary to complete your project. If you require more than is permitted, you should apply through the Compute Canada Resource Allocation process, which is run each Fall (www.computecanada.org). The level of resources awarded may be different than the amount requested if the adjudicating committee feels such variation is justified.

Staff Technical Review

All applicants must consult with one of the SHARCNET HPC Consultants to: a) determine the appropriate resource/system and amount of that resource to be requested; and b) to work with the staff member to demonstrate that the resources will, if awarded, be used efficiently. The intent of this consultation is for you to leverage the staff member's expertise to improve your application and to ensure that the use of our shared – and scarce – resources is optimized. This consultation must be used to iron out any technical issues concerning the applications including: which system will be most effective; whether or not the code is efficient and scales well on that system; how many iterations should be stored and computed; etc., etc. By the time the application is submitted the project should be ready to run with no further technical issues to be resolved. Applications for which such uncertainties remain will be at a serious disadvantage.

The staff member will forward separately to the adjudication committee a report on the suitability of the application for the resource requested and include a technical assessment of the feasibility of the project. **Applications are not considered complete, and will not be considered, until this report has been submitted.**

The Project Description and the Research Methodology & Technical Justification (including the Staff Technical Review) components of the application will receive equal weighting by the adjudication committee.

Project Description

Describe the research project. The overarching criterion for consideration of applications is their potential to generate high-impact research results that will advance SHARCNET's stature as a world-class centre for high-performance computing. Consider the following when making your application:
- Projects with the potential to produce significant scientific results through the use of novel or world-leading computational methods are especially valuable.
- Specify the anticipated outcomes in concrete terms. For example, give the names of journals in which you anticipate publishing results and quantify the degree to which the proposed work is world-class.
- You must make a convincing case for the urgency of the request: why is the time needed now and cannot be requested as part of the standard Compute Canada Resource Allocation process?

- If appropriate, describe the potential for development of intellectual property, or new relationships with private sector firms.

Research Methodology & Technical Justification

Provide a clear technical plan and justify the feasibility and appropriateness of the plan. The computational resources awarded under this programme are valuable: SHARCNET will not award time without a careful demonstration that the most effective numerical approach will be used. The following points need to be explicitly addressed. These same points will be addressed in the staff technical review.

- Need for the resources requested. Estimate and justify your requirements carefully so that the project can be completed but also so that the level of resources requested is reasonable.
- Your experience with large-scale HPC and your ability to carry out the project and to use the resources effectively.
- Appropriateness of the proposed method(s) or algorithm(s): is it internationally competitive; does it use resources efficiently and, for parallel code, does it scale efficiently to the number of cores/processors requested; justify the amount of storage requested: will the data be managed effectively in terms of number of outputs stored, compression of data etc.?
- Can any program output be analyzed effectively and how will this be done?

Key papers

Applicants should list up to three key papers that demonstrate their research impacts in the field of the application (or in a closely related field). Complete bibliographic details should be provided.

Additional Requirements:

- Applicants must ensure that a CV, no more than one year old, has been uploaded to their Compute Canada online portal profile.
- The PI's account must be in good standing with Compute Canada.

Multiple Applications

PIs may submit at most one application in any 12 month period.

Duration of Award

Awards for CPU time will normally be valid for 3 months. Allocations may be reduced in the 3rd month if available resources become limited.

Any part of an allocation that is unused within the 3-month allocation window is forfeit. Failure to complete an allocation as a result of congestion at the end of the allocation window will not be grounds for extending an award. Be ready to start and use your allocation early!

Storage can be used for longer than the cpu allocation window up to a maximum of approximately 9 months. Applicants need to clearly state and justify their storage requirements, including the length of time for which the storage is required. If longer term storage is required a request to Compute Canada should be considered.

4. After Awards Are Announced

Applicants will be informed of the competition results. Successful applicants will be instructed on how to access their allocation.

Feedback on applications

Upon request, applicants will receive brief comments on their application that will summarize the reasons for the committee's recommendation.

Reporting

All awardees are required to submit a one-page report describing the research accomplished. This report is due within 4 months of the end of the allocation window and is to be completed online in the reporting section of the applicant's area of the web portal by following the appropriate link under "My Account > Reporting > Outcomes".

Awardees are expected to acknowledge **SHARC**NET's and Compute/Calcul Canada's support in journal publications or presentations describing their research. Suggested wording for this acknowledgement may be found at www.sharcnet.ca/my/profile/publications/.

5. How Decisions Are Made

Applications are assessed and ranked by a committee consisting of 1 senior **SHARC**NET PI, 2 technical staff and the **SHARC**NET Scientific Director who chairs the committee. The need for quick turnaround precludes external review.

Since the committee needs to be small in order to judge applications on a short timescale, ***applicants must be acutely aware that they are writing for scientifically literate non-specialists***. The committee will judge applications on the basis of compelling science, necessity and urgency for time, "reasonableness" of the proposed methodology and on technical feasibility. Applicants should ensure that these requirements come through clearly in the small amount of written material that is permitted.

Evaluation criteria:

The following set of overarching evaluation criteria apply (in order of importance):

1. Research excellence.
2. Urgency of request.
3. Appropriateness of and need for allocation request including technical justification.
4. Potential to apply expertise, methodologies and/or applications in high-performance computing that are new to the **SHARC**NET community or environment.
5. Degree to which previous **SHARC**NET awards were used effectively and reported on.