



SHARCNET Research Support Programmes: Dedicated Resources

Application Guidelines

January 2010

Note that the Dedicated Resources programme was revised Fall 2009, and now encompasses two streams with different deadlines and resource thresholds. The “Small DR” stream is new and will be run as a pilot to assess its utility. The previous Dedicated Resources programme becomes “Large DR”.

Checklist

At least **two weeks** prior to the deadline:

Contact a SHARCNET Staff Member to initiate the technical review.	
Ensure that your online profile and your reporting on previous awards are up to date.	
An up-to-date CV is required. This should be in your online SHARCNET profile or can be uploaded via the application form.	
Check www.sharcnet.ca/Documents/SN_SP_DR.pdf for the up-to-date guidelines and the online FAQ for answers to common questions	
Receive updates by registering an intent to apply for an award at www.sharcnet.ca/my/profile/intent/DR	

SHARCNET Research Support Programmes

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:** Large allocations of time that are beyond the level normally available through the general-access batch queues. Allocations are available for most major systems.
- **Storage:** To provide large amounts of data storage and/or data storage for extended periods.

Note: All resource allocations are for specific projects, not to provide resource “envelopes” for multiple projects.

The programme has two streams: **Small Dedicated Resources (Small DR)** and **Large Dedicated Resources (Large DR)**. These differ in the level of resources available, the frequency of open competitions, the period within which resources must be used and the attributes of the project as shown in Table 1. The application process is essentially the same for each.

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

Resource	Resource Threshold	
	Small DR	Large DR
Dedicated CPU time ¹	1% – 5% of system	> 5% of system
Dedicated storage	More than 15TB for more than 6 months	
Deadlines ²	15 th Feb, Apr, Jun, Aug, Oct, Dec	September, March
Allocation window	3 months	6 months
Project attributes	Urgent, high-priority	Substantial, Grand-Challenge

¹ Thresholds are the fraction of the cpu hours available on any system in a six month period. Thus 1% of a 1000 core system would be $0.01 \times 1000 \times 24 \times 183 \approx 40,000$ cpu-hours.

² Deadlines for Large DR will be announced in the calls for applications. The precise dates may vary from those shown.

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

Large DR

A call for applications will be made, usually twice per year. (Check www.sharcnet.ca for current open competitions.) Normally, six weeks elapses from call to submission deadline. Announcements are made within approximately 8-10 weeks

Small DR

Applications may be made at any time but applications will be accumulated and evaluated at the next mid-even-month deadline as shown in Table 1. Results will be announced within 2 weeks.

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. A FAQ is available with the online form.

3. How to Apply

Applications must be made online at www.sharcnet.ca/my/resource_applications. Additional materials, such as CVs, must also be submitted electronically as directed in the online form. 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 under Small DR (see Table 1), you should apply for Large DR; the online form will permit requests only within the limits specified. 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, at **least two weeks prior to submission**, 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, particularly for Small DR.

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. Since this process is time consuming and the staff member will have to deal with several applications before the submission deadline, applicants must begin the process early.

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. Applications for which the staff technical review is missing or incomplete because an applicant did not contact a staff member (early enough or at all) will not be considered.

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.
- For Small DR you must make a convincing case for the urgency of the request: why is the time needed now?
- 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 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 analysed effectively and how will this be done?

Curriculum vitae

No specific format is required for your submitted CV but an NSERC Form 100, Parts I and II or any reasonably analogous document with equivalent information is acceptable. The CV may be uploaded to your online profile either via the DR application form or via the web portal at "My Account > Settings >Details".

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.

Suggested reviewers (*Large DR only*)

Large DR applications will be sent out for peer review to up to three reviewers. Applicants should list on the form three suggested reviewers who can give an informed opinion of the proposal. The suggested reviewers should be “arms-length” in that the reviewer should not:

- be from the same university (or associated institution) as the applicant
- have a personal relationship with the applicant (close friend, relative)
- have been a research supervisor or graduate student of the applicant within the last 6 years
- have been the applicant’s Ph.D. (or equivalent) supervisor
- have collaborated with the applicant in the last six years or have plans to collaborate in the near future
- be in a position to gain financially from the application

The selection committee will endeavour to use at least one of the suggested reviewers, but may select additional or alternate reviewers as it feels appropriate.

Multiple Applications

Faculty may submit multiple applications in a single Round. For Dedicated Resources it is anticipated that the individual projects would be unrelated: thus multiple applications to a single competition should not be used to make several Small DR requests instead of a single Large DR request.

Each application must be made on a separate form and must be self contained.

Duration of Award

Large DR
Awards for CPU time will normally be valid for 6 months.

Small DR
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 by the (6- or 3-month) deadline 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 (this may be a particular issue for slow usage of Small DR allocations). Use your allocation early!

Storage can be used for longer than the cpu allocation window. Applicants need to clearly state and justify their storage requirements, including the length of time for which the storage is required.

4. After Awards Are Announced

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

Feedback on applications

Upon request, applicants will receive brief comments on their application that will summarise the reasons for the committee’s recommendation. These comments may include specific comments from the report of the SHARCNET HPC consultant and, for Large DR, comments from the external reviewers.

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 SHARCNET’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

Large DR

Recommendations for allocations are made by the Resource Allocation Committee (RAC). Applications will also be sent out for peer review. The Adjudication of applications follows exactly the procedure used for the SHARCNET Fellowships as described in the guidelines for that programme (see www.sharcnet.ca/). Current membership of the RAC is listed at www.sharcnet.ca/About/committees.php.

Proposals are ranked by the RAC. These rankings are submitted to the Scientific Director who, in consultation with the RAC Chair, and taking account of resource availability, makes a recommendation to the SHARCNET Board for approval.

When preparing project descriptions, applicants should bear in mind that their principal audience is the RAC: a group of scientists knowledgeable in the uses of high-performance computing, but not necessarily expert in the research area of the applicant. ***Therefore, project descriptions should not use highly specialized language, and should clearly state the motivation, methods, and expected outcomes of the research.***

Small DR

Applications are assessed and ranked by a committee consisting of 3 senior SHARCNET PIs, 3 technical staff and chaired by the Scientific Director. The need for quick turnaround precludes external review.

The committee ranking will be used by the Scientific Director together with knowledge of current resource allocations and system availability to determine which applications can be awarded. It should be emphasized that a large number of allocations made in the Large DR competition will leave relatively less time available to be allocated through Small DR: Large DR will have precedence.

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 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.

Ranking Criteria:

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

1. Research excellence.
2. Appropriateness of and need for allocation request including technical justification.
3. Potential to apply expertise, methodologies and/or applications in high-performance computing that are new to the **SHARCNET** community or environment.
4. Degree to which previous **SHARCNET** awards were used effectively and reported on.
5. Distribution of previously awarded Research Support across subject areas.
6. Distribution of previously awarded Research Support across the partner institutions.

6. Notes

- The programme is subject to modification in future rounds as a result of the needs of the community and of our ability to manage systems effectively, and may change in response to the national resource allocation process of Compute/Calcul Canada.
- All **SHARCNET** resource allocations remain free of charge at present and any award of dedicated resources does not affect the priority of other jobs submitted to the general access queues by a successful applicant.
- In some circumstances related applications may be made for both fellowship support and dedicated resources. These must be made as separate applications, but the relationship should be noted. Bear in mind, however, that coupling such applications may be unrealistic since the timescale for hiring personnel may be more than six months, whereas the time for using dedicated resources will be at most six months from the time of the award.



SAMPLE Dedicated Resources Application Form (Large DR)

(the actual application must be made online and may differ slightly from the format below)

1. Applicant Information (the online form will automatically fill in this part)	
Last Name:	First Name:
Institution:	Department:
Telephone:	FAX:
E-mail Address:	

2. SHARCNET Staff Reviewer:

3. Allocation	
Max number of concurrent processors/cores:	Max number of concurrent jobs:
Max number of processors/cores per job:	
System on which allocation is requested:	
CPU time requested:	
Storage required:	Length of time storage is required:

4. Title of Research Project

5. Description of Research Project: Describe the research project, justifying its significance and potential impact.
The online form will permit a maximum of 500 words.

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6. Research Methodology & Technical Feasibility: Describe the computational techniques and methodology to be exploited to do the research. Estimate the total computational requirements (cpu hours & storage), justifying what is needed and how long storage is required. Indicate if the computational needs are for serial or parallel computation and justify the numbers given in section 3. If parallel code is to be used, the applicant must demonstrate efficiency and scaling to the number of processors requested. This section carries equal weight to §5 and must be undertaken in consultation with the technical staff member. *The online form will permit a maximum of 500 words.*

7. Key papers: Applicants may list up to 3 key papers that demonstrate his/her impact in the field of the application or in a closely related field.

8. Suggested reviewers: Please list the names, email addresses and telephone numbers of 3 arms-length reviewers who can assess your application. *The definition of arms-length is given in the guidelines.*

	Name	Email	Telephone
1			
2			
3			

9. Additional Information:

- CV of applicant (e.g. NSERC Form 100, Parts I and II; CFI CV; or equivalent)

Submit To:

Applications should be submitted electronically via the web form available at www.sharcnet.ca/my/resource_applications. If you have any questions regarding the process, please contact the SHARCNET office at (519) 661-4000 or email research-support@sharcnet.ca.

SAMPLE Dedicated Resources Application Form (Small DR)

(the actual application must be made online and may differ slightly from the format below)

1. Applicant Information (the online form will automatically fill in this part)	
Last Name:	First Name:
Institution:	Department:
Telephone:	FAX:
E-mail Address:	

2. SHARCNET Staff Reviewer:

3. Allocation	
Max number of concurrent processors/cores:	Max number of concurrent jobs:
Max number of processors/cores per job:	
System on which allocation is requested:	
CPU time requested:	
Storage required:	Length of time storage is required:

4. Title of Research Project

5. Description of Research Project, Research Methodology and Technical Feasibility:

Describe the research project, including its significance and potential impact. Justify the urgent need for resources (a key purpose of Small DR). Describe the computational techniques and methodology to be exploited to do the research. Justify the computational requirements (cpu hours, number of processors & concurrent jobs, and storage) and the technical feasibility and appropriateness of the computational methods to be used. You must clearly demonstrate need and that your code will use the resources effectively. Staff consultation is required in order to complete this section. *The online form will permit a maximum of 500 words.*

6. Key papers: Applicants may list up to 3 key papers that demonstrate his/her impact and computational expertise in the field of the application or in a closely related field.

7. Additional Form Information:

- Applicants must ensure that a CV no more than one year old is present in their online portal profile.

Submit To:

Applications should be submitted electronically via the web form available at www.sharcnet.ca/my/resource_applications/. If you have any questions regarding the process, please contact the SHARCNET office at (519) 661-4000 or email research-support@sharcnet.ca.

SAMPLE ONLY