



RAC 2023 Q&A Session

October 4, 2022



Digital Research
Alliance of Canada

Alliance de recherche
numérique du Canada






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Before we start

- We are recording!
 - Please mute yourself if you are not speaking to avoid background noises.
 - The slides and recording will be shared with all participants and made available in the [RAC page](#) on the Alliance website.
 - We will take questions at the end of each section of the presentation. To ask a question, you can:
 - type it in the chat box
 - unmute yourself & ask at the end of each section
 - send an email to allocations@tech.alliancecan.ca if you think of a question after the presentation is over
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Useful links

- [Resource Allocation Competition](#)
 - [RAC 2023 Application Guide](#)
 - [Fast Track 2023 application guide](#)
 - [Available resources](#)
 - [Frequently Asked Questions](#)
 - [Canadian Common CV submission guide](#)
 - [RAC Glossary](#)
 - [Compute allocations and resource scheduling](#)
 - [Storage and file management](#)
 - [RAC 2022 competition results](#)
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Accessing ARC Resources



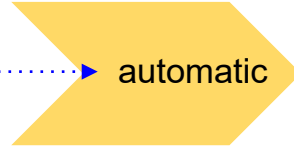
Accessing Resources

Create an Alliance account



Non competitive

Default

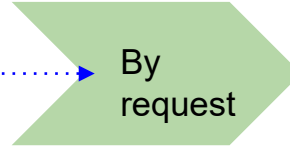


1 TB of project storage on Cedar, Graham, Béluga and Narval

CPU/GPU: opportunistic (lowest priority)

No Cloud resources available by default

RAS



Additional storage and Cloud resources available without a RAC

No additional CPU/GPU resources available

Competitive

RAC (RPP & RRG)



Allocations for:

- Compute
- Storage
- Cloud

Minimum amount required for RAC applications

HPC	Cloud
<ul style="list-style-type: none">● CPU > 50* Core years, OR● GPUs > 10 GPU years, OR● Project storage > 10 TBs, OR● Nearline storage > 10 TBs	<ul style="list-style-type: none">● Compute Cloud > 80 VCPUs, or 1 VGPU, OR● Persistent Cloud > 25 VCPUs, OR● Volume and Snapshots Storage > 10000 GB**, OR● Shared Filesystem Storage > 10 TBs, OR● Object Storage > 10 TBs

*If a group requires =<50 core years but high memory per core, use the following formula to calculate the Core Year Equivalent.

Core Equivalent = MAX(cores, mem requested / 4GB)

Mem requested = CY * mem per core requested

**Note that the unit used in the online form for Volume and Snapshots Storage is GB.

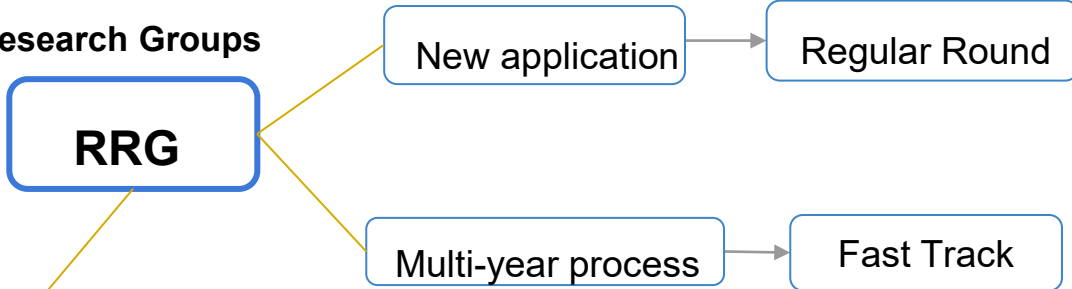
Key Competition Dates

Event	Date
Resources for Research Groups (RRG) submissions RRG Fast Track Submissions	September 22 to November 2, 2022
Research Platforms and Portals (RPP) submissions	
Annual RPP Progress Report submissions	November 7 to December 7, 2022
Announcement of results	Late March 2023
Implementation of allocations	Early April 2023



RAC Application Processes

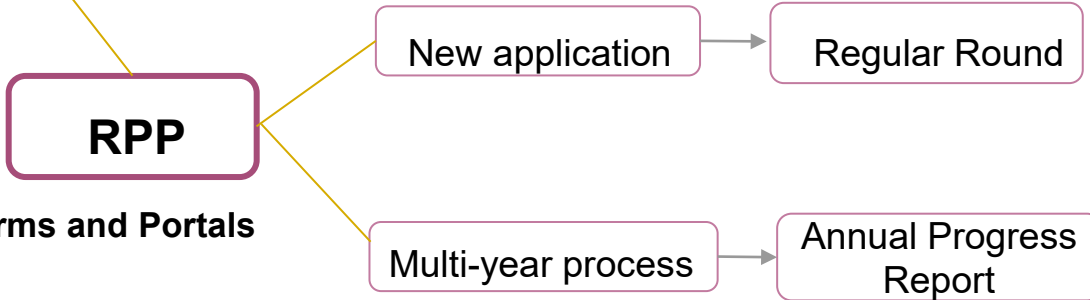
Resources for Research Groups



- Full application
- Up to 1-year request
- Requires CCV
- Scientific & Tech review
- Can be delegated

- Previous score ≥ 3.0
- Lightweight report
- No CCV required
- Tech review only
- Score reused
- Can be delegated

Research Platforms and Portals




- Full application
- Up to 3-year request
- Requires CCV
- Scientific & tech review
- Can be delegated

- All awarded RPPs
- Lightweight report
- No CCV required
- Tech review only
- Score reused
- Can be delegated

There is no out-of-round application process.

RRG vs RPP

Resources for Research Groups	Research Platforms and Portals
<p>The RRG is a peer-reviewed application process for projects whose primary purpose is to <i>conduct research</i> requiring compute, storage and cloud resources to meet their goals.</p> <ul style="list-style-type: none">• However, projects <i>primarily</i> needing persistent instances in the cloud to provide a service through a platform or a portal should apply through the RPP application process instead.	<p>The RPP is a peer-reviewed application process for projects whose primary purpose is to <i>provide a service through scientific gateways</i> that improve access to shared datasets, enhance existing online research tools and facilities, or advance national or international research collaborations.</p> <ul style="list-style-type: none">• However, projects <i>primarily</i> needing compute resources in a cluster to conduct research should apply through the RRG process instead.



Note: "Departmental" applications —that is, applications submitted on behalf of a group of PIs that may be from the same department but are not collaborating in a common research project with clear goals and outcome— will not be accepted.

Research Platforms and Portals

RPP projects often involve cloud resources, usually through the development of a front-end gateway on persistent virtual machines, with possible backend compute either through cloud compute nodes or job-based submission to the national clusters. Many platforms and portals also include large databases.

RPP projects must:

1. provide a service to a larger research community via a set of cloud-based tools, applications and/or data, thus enabling them to access national computational resources via a common interface;
2. be able to develop, operate and manage the proposed portal or platform with minimal support from the Federation.
 - If backend compute is needed, it should be requested in the application.

Fast Track application process

See eligibility details in the [Fast Track application guide](#).

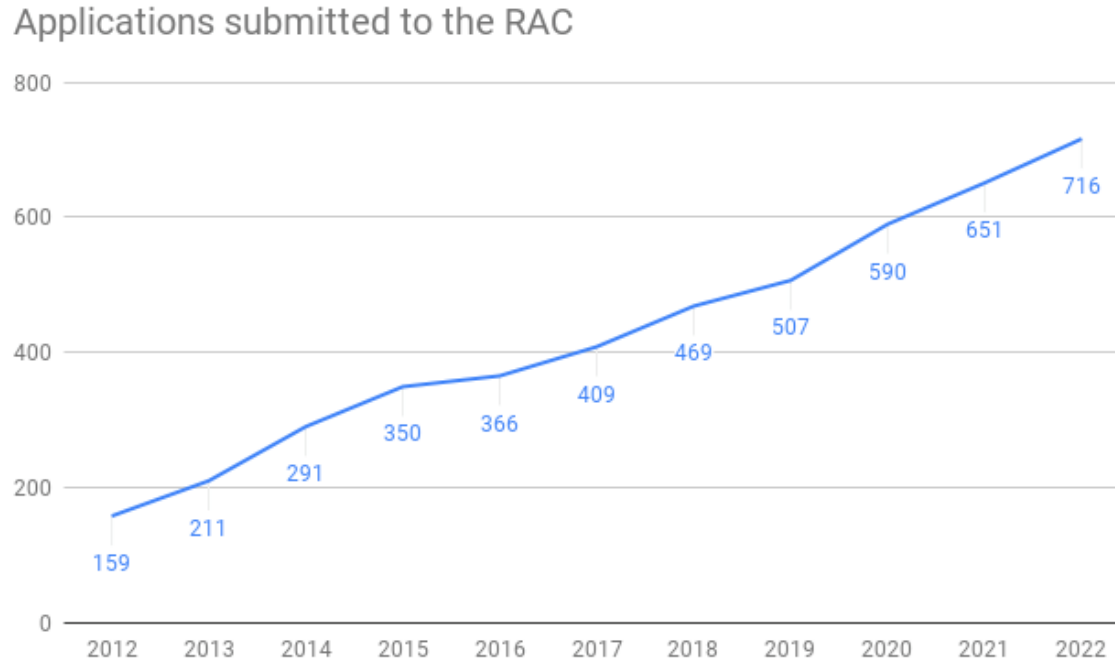
- **The score of the previous RRG application is reused to decide the allocation: if the score is close to 3.0 (cutoff), the PI may be better off submitting a new application if additional resources are needed.**

Allowed modifications:

- A 10% increase of PROJECT, NEARLINE and/or dCache storage resources, up to a maximum of 50 TB of additional storage based on the eligible amount communicated in the invitation email.
- Change of resource location (i.e., request to migrate current allocation from one system to another).

Important: Increase of CPU or GPU requests is not allowed. If more compute resources are needed, a new application must be submitted.

RAC Stats



RAC 2023 projection: **756 applications**

For more stats visit the [RAC 2022 competition results](#)



Eligibility



PI and Co-PI Eligibility

To be eligible to submit a RAC application, Principal Investigators (PI) and co-PIs must have an active Alliance account with an **Academic Principal Investigator** role (Faculty, Adjunct Faculty or Librarian).

- Co-PI: Canadian faculty (must have a CCV) *directly* involved in the project.
- Collaborator: typically a non-Canadian researcher associated with the project.



Applying with the right faculty role

By default, RRG and RPP applications will be created with the applicant's primary role. Therefore,

1. PIs with more than one faculty role must make sure that the role they want the resulting allocation to be associated with is set as *primary* **before they create the application on CCDB.**
2. If a PI recently moved to a different institution and has not yet applied for a new faculty role on the CCDB, they must do so and set this new role as primary before *creating* an application on CCDB.

Applying with the wrong role will create problems if the application is successful because the allocated RAP could be linked to a role that was active at the time of submitting the application but expired by the time the allocation starts.



Pre-submission Consultations



Pre-submission consultations

Applicants are encouraged to consult with a Federation staff prior to **October 31, 2022**.

The goal of this consultation is to

- determine whether the computational resources needed for a project justifies submitting a RAC application;
- guide the research group on the most appropriate application process (RPP vs RRG) based on the nature of the project;
- provide technical assistance with the calculation of the resources needed.



How to contact us

To schedule a pre-submission consultation or for general questions, please contact allocations@tech.alliancecan.ca. You can also contact your regional support team directly:

Regional partner	Email
ACENET	support@ace-net.ca
Calcul Québec	support@calculquebec.ca
Compute Ontario - CAC	cac.help@queensu.ca
Compute Ontario - SciNet	support@scinet.utoronto.ca
Compute Ontario - SHARCNET	help@sharcnet.ca
Prairies and BC DRI Groups	rac@westdri.ca



Scientific Review



Confirmed Scientific Review Committee Chairs

RRG and RPP applications are evaluated in the following committees:

Committee	Chair	Institution
Astronomy, Astrophysics and Cosmology	Jonathan Sievers	McGill University
Bioinformatics	Robert Beiko	Dalhousie University
Chemistry, Biochemistry and Biophysics	Stacey Wetmore	University of Lethbridge
Computer Sciences and Mathematics	Katarina Grolinger	Western University
Engineering	Jean-Pierre Hickey	University of Waterloo
Environmental and Earth Sciences	Laxmi Sushama	McGill University
Humanities and Social Sciences	Raymond Siemens	University of Victoria
Nano, Materials and Condensed Matter	Tom Woo	University of Ottawa
Neurosciences, Medical Imaging and Medical Physics	Xiaoqian Chai	McGill University
Subatomic and Space Physics	Isabel Trigger	TRIUMF

Scientific review

All applications submitted to the RAC are peer-reviewed and scored. The final RAC score is based on the following:

- the scientific excellence of the specific research project for which computational resources are being requested; *and*
- the scientific and technical feasibility of the proposed research project; *and*
- the appropriateness of the resources requested to achieve the project's objectives; *and*
- the likelihood that the resources requested will be efficiently used.

Every year a cutoff score is determined, below which no allocation is granted.

**For RAC 2023, the minimum overall score
required to receive an allocation is 3.0.**

Scoring matrix

RAC applications are scored based on a 5-point scale as shown in the table below. ***Applications with a score below 3.0 are considered unsuccessful and will not be awarded.***

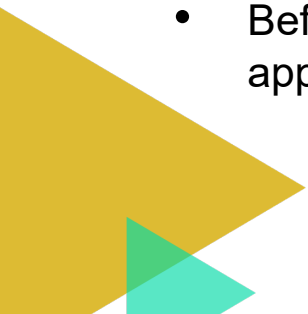
Descriptor	Range	Definitions
<i>Excellent</i>	4.0 - 5.0	The application excels in all relevant aspects of the review criteria. Any shortcomings are minimal.
<i>Good</i>	3.0 - 3.9	The application excels in most relevant aspects of the review criteria and reasonably addresses all others. Certain improvements are possible.
<i>Fair</i>	2.0 - 2.9	The application excels in some relevant aspects of the review criteria. Relevant aspects could be better addressed and/or need to be revised or improved.
<i>Poor</i>	1.0 - 1.9	The application broadly addresses relevant aspects of the review criteria. Relevant aspects of the review criteria are unclear, are missing or require major revisions or improvements .
<i>Insufficient</i>	0 - 0.9	The application fails to provide convincing information, has serious inherent flaws or gaps and/or relevant aspects of the review criteria are missing. Extensive revisions will be required.

Page limits

Keep in mind the following:

- Applicants **must** use the application template provided (for RRG and RPP) in the [RAC application guide](#).
- The proposal should not exceed 8 pages (before References). Page limits will be enforced and any information after page 8 (before References) will not be considered.
- You do not have to use the maximum page limits: use only what you need.
- If the page limit for the Resource Management section is not enough, you can use 1 more page as long as the total number of pages (before References) does not exceed 8 pages.

General recommendations when writing a proposal (I)

- You can delegate your RAC application to **one** user with any active Alliance role, by providing their CCRI.
 - Submit an up-to-date CCV. Information about PIs and co-PIs that are not in the CCV will not be considered.
 - Do not use valuable space to include information about your awards that can be found in the CCV.
 - Co-PIs do not have access to the PI's application form. Co-PIs will see an *Update CCV* button in their Resource Applications page, or they can go to <https://ccdb.computecanada.ca/reporting> to update their CCV.
 - Before submitting, make sure that an expert from your research group reviews the application to make the entire document cohesive.
- 

General recommendations when writing a proposal (II)

- Read *carefully* the instructions provided in the application template *and* in the online form. **And then follow the instructions!**
- Avoid writing an extremely technical proposal as the RAC scientific review committees are interdisciplinary.
- If you consult with a Federation technical staff, mention it in your application (including the name of the staff that provided the support).
- **IMPORTANT:** If you received a CPU and/or GPU allocation in the 2022 competition but chose not to use it (instead you decided to exclusively compute using your Default project), your submitted 2023 RAC application will be disqualified and **not** awarded as this proves that you do not need an allocation.
 - **If the projected usage of a current allocation is below 50%, you must provide justification in the *online form* (more details to come). *Failing to do so will negatively impact your application.***



Writing a RRG application



RRG Evaluation Criteria

All the sections below are required for any RRG application. However, the level of detail will vary depending on the specific needs of each project.

Criteria	Weight	Considerations	Page limits
Research Methods	(70%)	<ul style="list-style-type: none">● <i>Research Outline</i>● <i>Expected Outcomes</i>● <i>Progress Over the Past Year</i>● <i>Computational Methods</i>● <i>Resource Request Justification</i>	6 pages
Resource Management and Expertise of the Team	(30%)	<ul style="list-style-type: none">● <i>Funding</i>● <i>Computational Expertise of the Team</i>● <i>Management Strategy</i>	2 pages

Research Methods (I)

Research Outline

- If your research program has already been evaluated and funded by a Tri-council agency, you do not have to justify the science again: focus on **what** research will be done and not on *why* it is important.
- If the computational project for which you are requesting resources is not funded and the science has not been evaluated by a Tri-council agency, you should spend some space justifying the science *in addition to* explaining **what** research will be conducted, always respecting the page limits.

Expected Outcomes

- What are the expected results of the project linked to the use of the computational resources requested, indicating how they will be measured and how these will lead to advances in the research area.

Research Methods (II)

Progress Over the Past Year

- Highlight any research performed with the use of computational resources provided by the Federation, whether via the RAC or the Rapid Access Service.

Computational Methods

- Be specific. Provide details about, *and justification for*, the tools, methods, models and approaches that will be followed to address the research objectives.
 - These methodologies may be community codes or models, data analysis methods, or algorithmic formulations expressed in user-developed scripts or tools.
 - When applicable, provide justification for the number of samples proposed in the computational project(s). If trials or test implementations will be carried out, please provide details here.
 - Critical details that define the quality of the data should be included.

Research Methods (III)

Resource Request Justification

- Do not inflate your request to compensate for scaling. The request should fit with both the calculations to be done and the size of the research group.
- You may include more than one subproject in your RAC application. Particularly for large requests, it is useful to know what is the priority of the multiple subprojects presented.
 - **Any request mentioned in the attached pdf MUST match what is requested in the online form. *In case of discrepancies, what is requested in the online form will prevail.***
- You must justify any projected usage that is below 50% of your allocation. In the **Resource Utilization** section of the *online form*, justify what was done in the past with Federation resources and explain how the group plans to change/ramp up.
 - If you have only used resources opportunistically or via RAS, mention it. If you have access to other computational resources in Canada or abroad, please also mention it as well.


Research Methods (IV)

Resource Request Justification

- It is useful to provide some context about how the resources requested in the application connect with resources used in the past.
- Complete the Compute, Storage and/or Cloud sections based on the resources that you need. For instance, if you only request storage, you do not need to complete the compute and cloud sections.
- Use the [Compute Calculator spreadsheet](#) (included in the application templates) to estimate CPU and GPU needs.
 - Estimate your memory requirements as accurately as possible. If you need help with this, please contact allocations@tech.alliancecan.ca.
- Explain what part of the requests is critical for running the experiments vs what part is needed to get results faster or better.

Research Methods (V)

Resource Request Justification

- Consider including tables or graphs showing scaling or testing for various CPU/GPU combinations, or examples of the resources typically used to run similar calculations. This helps reviewers understand the request and shows that the group has a solid understanding of how to use the resources.
 - If you request VGPUs with your cloud request, you **must** justify why you cannot use GPUs in a national cluster.
 - IP addresses are a scarce resource: you are free to ask for what you need but we may have to cut.
- 

Resource Management and Computational Expertise

- Evaluation of the capacity of team as a whole and the feasibility of the project: The proposed research must be achievable by the listed team members, **particularly if it is only one PI and/or if there is no funding available.**
- Includes the PI, any co-PIs and, if applicable, other collaborators.
- The level of detail needed in this section depends on the size of the team and the amount of computational resources requested.
- **Important: If you (the PI) are participating as a co-PI in one or more RAC 2023 applications, you must mention the full name of the PI(s) and the project title(s) of each RAC application in which you are listed as a co-PI.**



Resource Management and Computational Expertise

Funding Available to Use Advanced Research Computing Resources

- Provide details of any funding available to directly support the project(s)
- Applications asking for large amounts of resources should have funding
- If no funding is available, explain how the project will be resourced and the computational resources requested will be used.


<i>Projects</i>	<i>Funding source</i>	<i>Grant</i>	<i>Grant start date</i>	<i>Grant expiry date</i>	<i>Total grant award</i>	<i>Portion allocated for computational project(s)</i>
<i>Project 1</i>	<i>NSERC</i>	<i>Discovery Grant</i>	<i>01-01-2010</i>	<i>07-01-2024</i>	<i>CAD \$250,000</i>	<i>CAD \$50,000</i>
<i>Project 2</i>	<i>Regional funder</i>	<i>Provincial Grant</i>	<i>06-15-2008</i>	<i>03-31-2023</i>	<i>CAD \$50,000</i>	<i>CAD \$20,000</i>
	<i>Total</i>	<i>2 grants</i>			<i>CAD \$300,000</i>	<i>CAD \$70,000</i>

Resource Management and Computational Expertise

Computational Expertise of the Team

- Describe the level of confidence, experience and expertise of your research team in using the computational methods proposed, as well as the different resources (e.g., CPU, GPU, storage, cloud, etc.) requested.
- *If the team does not have experience using computational resources, please provide a training plan.*

Management Strategy

- Describe how the team will be managed
 - Explain the involvement of any co-PI listed in the application.
- 



Writing a RPP application



RPP Evaluation Criteria

All the sections below are required for any RPP application. However, the level of detail will vary depending on the specific needs of each project.

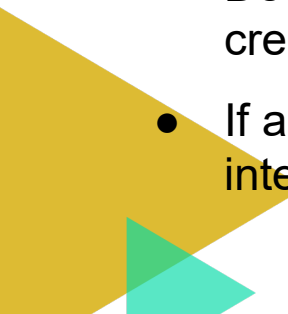
Criteria	Weight	Considerations	Page limits
Project Justification	(50%)	<ul style="list-style-type: none">● <i>Project description, objectives and goals</i>● <i>Use of the Platform/Portal</i>● <i>Expected Outcomes</i>● <i>Progress Over the Past Year</i>● <i>Resource Request Justification</i>	6 pages
Resource Management and Expertise of the Team	(50%)	<ul style="list-style-type: none">● <i>Funding</i>● <i>Computational Expertise of the Team</i>● <i>Management Strategy</i>	2 pages

Project Justification (I)

Project Description, Objectives and Goals

- Discuss the problem or need that each platform or portal listed in this proposal will address
- List the general objectives and specific goal(s) of the portal or platform.

Use of the Platform/Portal

- Describe the user community for which the platform will provide services. Include (if possible) estimates of the size and activity of the user community.
 - Describe the added value that the platform/portal will create or is currently creating for the user community.
 - If applicable, describe the level of interaction between Canadian and international research groups and platforms.
- 

Project Justification (II)

Expected Outcomes

- New platforms/portals should concentrate on the development of the platform or portal.
- Existing platforms/portals should focus on continuing operations and possible expansion of the offerings and user community.
- Present a clear timeline for the delivery of the anticipated outcomes over the entire duration of the requested allocation (1-3 years).
- Provide a detailed list of the outcomes resulting from the use of computational resources and the expected schedule for achieving these outcomes.
- Explain the means by which the expected outcomes will be measured.

Progress Over the Past Year

- Highlight any research performed with the use of computational resources provided by the Federation, whether via the RAC or the Rapid Access Service.

Project Justification (III)

Resource Request Justification

- Same requirements as RRG proposals.
- The only difference is that in section **5.1**, the Resource Request Summary must be broken down by the number of years requested.
- The amount of storage requested in your application must reflect the sum of any existing storage allocation or data that you may currently have with the Federation PLUS any new, additional storage needed to meet the goals of your project.
 - *For example, if you request an allocation for 2 years and expect that in year 1 you will need 50 TB of storage and 50 additional TB in year 2, then the request should be as follows: Year 1: 50 TB, Year 2: 100 TB (and not 50 TB for year 2)*

Resource Management and Computational Expertise

Funding Available to Use Advanced Research Computing Resources

- Same as for RRG.

Team Configuration and Expertise

- The team must prove that is able to manage, develop and operate the platform or portal with minimal support from the Federation.
- Mention any previous experience of the Team using computational resources provided by the Federation (e.g. via a RAC award, the Rapid Access Service, etc.) or using any other HPC resources in Canada or abroad.



Resource Management and Computational Expertise

Management Strategy

- Mostly the same as for an RRG application.
- **Important:** In cases of international collaboration, please describe the context of the Canadian request within the overall request:
 - Who is managing the Canadian resources - how are those people funded?
 - What does the Canadian group get out of this?
 - Is Canada's participation exceptional (leadership, fair share...)?





RAC online forms on CCDB (demo)





Questions

