

# Introduction to Compute Canada

(a faculty edition)

# Preliminaries

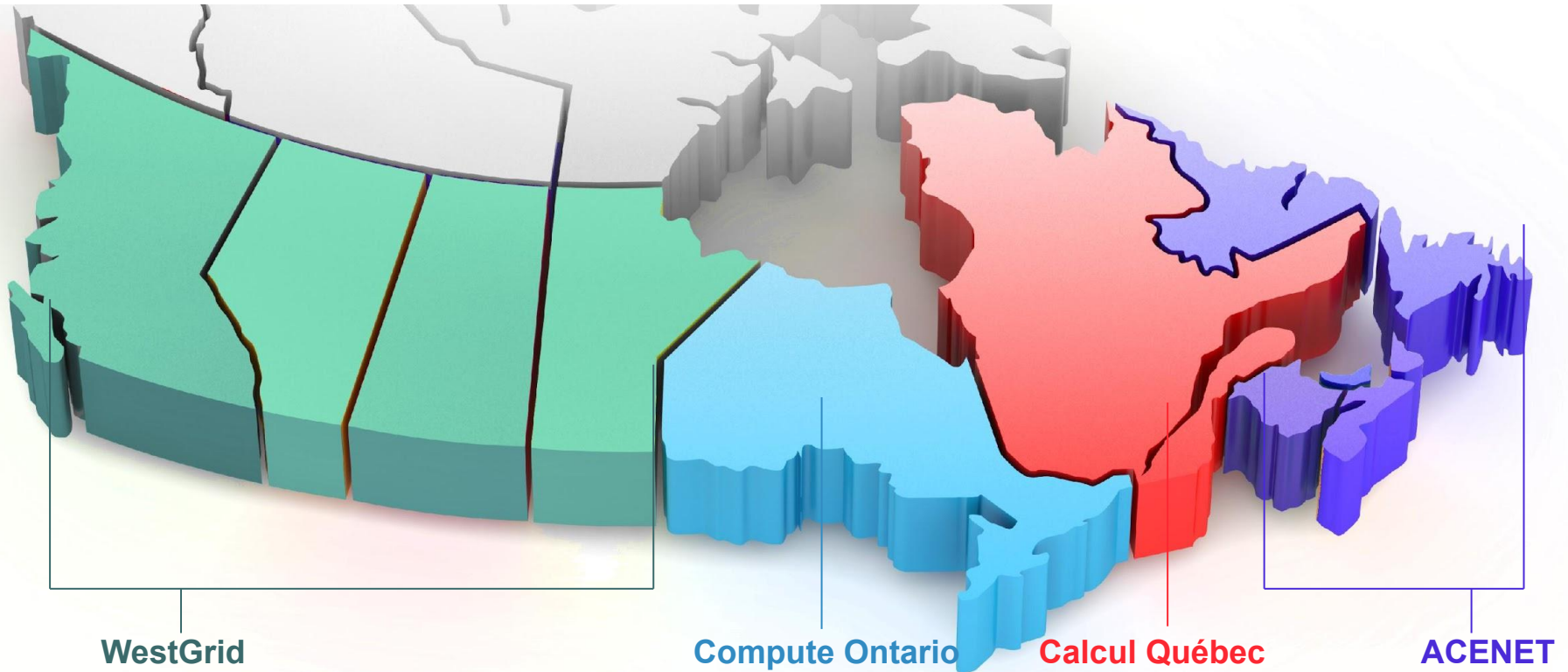
- We strongly recommend to attend our regular weekly New User webinar (every Tuesday at 2pm Eastern time) before watching this presentation.
  - Register here: <https://www.sharcnet.ca/my/news/calendar>
- You can also watch a recorded version of it on <http://youtube.sharcnet.ca>

# Outline

- What is Compute Canada
- What Compute Canada can do for you
- Getting help
- Computing resources
  - Clusters / clouds
  - Storage
  - Software
- Administering your research group
  - Adding / removing students and postdocs
  - File ownership
  - Resource Allocation Competitions
- Q and A's

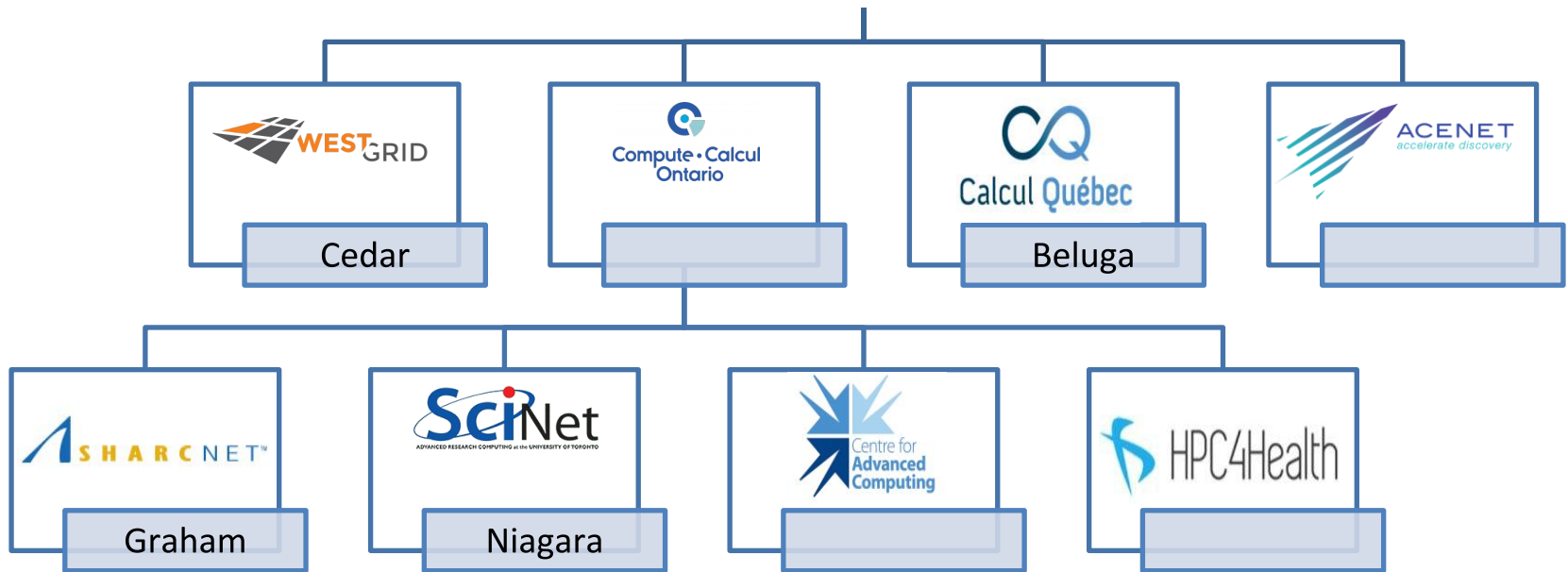
*Single account...*

**compute**canada



*One can access all national supercomputers across the country funded by the federal and provincial governments, for free.*

# Where are the resources



# What Compute Canada can do for you

- With a Compute Canada account, you can
  - access all Compute Canada national supercomputer systems and cloud resources - **for free**.
  - access computing resources (CPUs, GPUs, RAM, storage) beyond those locally available (your desktop, your lab etc).
  - get expert support from Compute Canada staff (ticketing system, emails, documentation, training events).
- As a faculty in a Canadian academic institution, you can also
  - manage your group (add/remove students, postdocs; etc.).
  - apply for dedicated resource allocations (RAC) for your group.
  - apply for dedicated programming support\*.

# PI (faculty) needs to have an account first

Having an account is **FREE** for all faculty, students and researchers from Canadian academic institutions. Steps to apply for an account:

- Go to CCDB at Compute Canada <https://ccdb.compute canada.ca/>.
- Fill out the online application form and submit.
- Your account application will be processed within about 2 working days.

# How my students and postdocs can get an account

They need to apply for an account themselves. Steps to get an account:

## What you should do

- Get your **Compute Canada Role ID (CCRI)** by logging to the Compute Canada portal <https://ccdb.computecanada.ca/>; it looks like **abc-123-13**. Give it to the person applying for an account.

## What they should do

- Go to <https://ccdb.computecanada.ca/>.
- Fill out the online application form, identifying him/herself as a **sponsored** user, type in your CCRI, and submit.

You will receive an email notification re the account application, asking you to approve the application (**make sure to also check your SPAM box**). Once you approve the application, the student's account becomes active.



# Where to look for information and get help

## Online documentation



The screenshot shows the Compute Canada Documentation website. The header includes the Compute Canada logo and navigation links like 'Main page', 'Discussion', 'Read', 'View source', and 'View history'. A search bar is present. The main content area is titled 'Compute Canada Documentation' and includes a welcome message and a list of 'Systems and services' and 'How-to guides'. The left sidebar contains a 'Wiki Main Page' and various links for support, resources, and tools.

Compute Canada Documentation

Other languages: English • français

Welcome to the Compute Canada technical documentation wiki. This is the primary source for users with questions on Compute Canada equipment and services.

The focus here is on national services and systems. For documentation on services and systems managed by our regional partners, please use the links provided below.

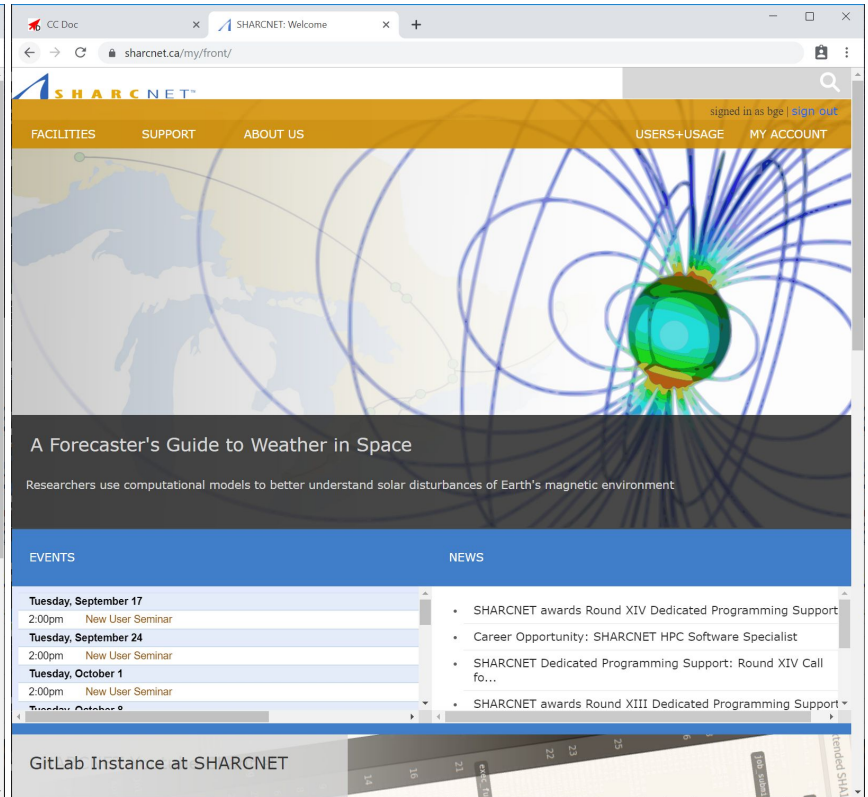
This wiki is a constant work-in-progress and some links might take you to pages which do not yet have content; such pages display **like this**. Our staff works constantly to improve and expand the available documentation; note however that any Compute Canada user is free to add new material and edit existing content.

**Systems and services** [edit]

- List of current Compute Canada systems
- Cedar, Graham and Béluga, general-purpose clusters
  - System status and upcoming outages
  - Known issues
- Niagara, a cluster designed for large parallel jobs
- Available software
- National Data Cyberinfrastructure, long-term and tape storage services (limited availability)
- Cloud computing service
- Globus file transfer service
- Policy table of contents
- FAQ, Frequently Asked Questions
- Using a resource allocation, a guide for Principal Investigators
  - RAC 2019 transition FAQ, notes on the implementation of 2019 RAC awards

**How-to guides** [edit]

- Getting started
  - Getting started with the new national systems (mini-webinar series)
  - Niagara Quick Start Guide
  - SSH - How to connect to our servers
  - Linux introduction
- Storage and file management
  - Transferring data
  - Scratch purging policy
- Best practices for data migration
- Using modules to access software
- Running jobs
- Installing software yourself
- Programming guide
- Visualization
- How to get technical support



The screenshot shows the SHARCNET website. The header includes the SHARCNET logo and navigation links like 'FACILITIES', 'SUPPORT', 'ABOUT US', 'USERS+USAGE', and 'MY ACCOUNT'. A search bar is present. The main content area features a large image of a globe with magnetic field lines and the title 'A Forecaster's Guide to Weather in Space'. Below this, there are sections for 'EVENTS' and 'NEWS'.

SHARCNET

FACILITIES SUPPORT ABOUT US USERS+USAGE MY ACCOUNT

A Forecaster's Guide to Weather in Space

Researchers use computational models to better understand solar disturbances of Earth's magnetic environment

**EVENTS**

**NEWS**

Tuesday, September 17  
2:00pm New User Seminar

Tuesday, September 24  
2:00pm New User Seminar

Tuesday, October 1  
2:00pm New User Seminar

Tuesday, October 2

- SHARCNET awards Round XIV Dedicated Programming Support
- Career Opportunity: SHARCNET HPC Software Specialist
- SHARCNET Dedicated Programming Support: Round XIV Call fo...
- SHARCNET awards Round XIII Dedicated Programming Support

GitLab Instance at SHARCNET

<https://docs.computeCanada.ca/>

<https://www.sharcnet.ca/>

# Where to look for information and get help

## Online events

- New User webinar every Tuesday at 2pm.
- Bi-weekly General Interest webinars at noon on Wednesday.
- Prior webinars recordings can be found on [youtube.sharcnet.ca](https://youtube.sharcnet.ca).

The screenshot shows the SHARCNET website's Events Calendar for October 2019. The calendar is a grid view with days of the week as columns and dates as rows. Events are listed in the cells for specific dates. The events include '2pm New User Semi' on Tuesdays (Oct 1, 8, 15, 22, 29) and '12pm Webinar "Intro"' on Wednesdays (Oct 9, 23). The date October 16 is highlighted in yellow. Navigation links for 'FACILITIES', 'SUPPORT', and 'ABOUT US' are at the top. At the bottom, it says 'Events shown in time zone: Eastern Time - Toronto' and includes a Google Calendar integration link.

Sun	Mon	Tue	Wed	Thu	Fri	Sat
29	30	Oct 1 2pm New User Semi	2	3	4	5
6	7	8 2pm New User Semi	9 12pm Webinar "Intro"	10	11	12
13	14	15 2pm New User Semi	16	17	18	19
20	21	22 2pm New User Semi	23 12pm Webinar "Leve"	24	25	26
27	28	29 2pm New User Semi	30	31	Nov 1	2

# Where to look for information and get help

## Interactive help

- **Ticketing system:** send an email to [support@computeCanada.ca](mailto:support@computeCanada.ca)
- Direct email to staff - check staff contact info on <https://www.sharcnet.ca/>
- Call us\*
- Office visit\*

*Use of systems*

*Installation of software*

*Access to commercial software and site licence*

*Debugging and optimizing code*

*Programming*

*Consultation on various research problems*

*Grant application for compute hardware*

...

# The computing resources

## Clusters across the country

- [cedar.computeCanada.ca](http://cedar.computeCanada.ca)
- [graham.computeCanada.ca](http://graham.computeCanada.ca)
- [niagara.computeCanada.ca](http://niagara.computeCanada.ca)
- [beluga.computeCanada.ca](http://beluga.computeCanada.ca)

## Cloud services

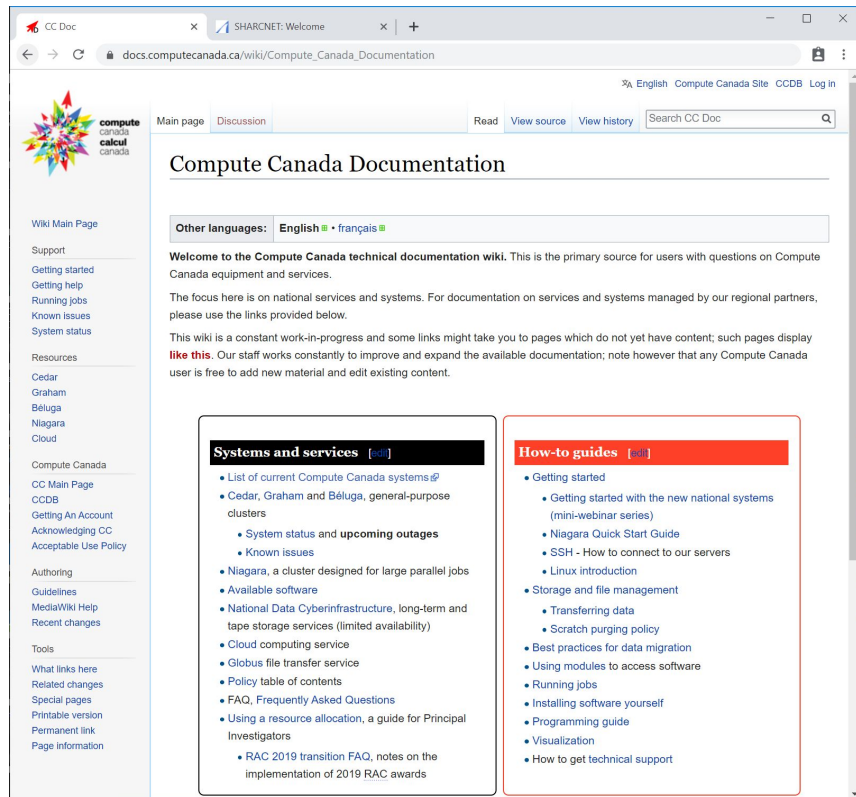
- [arbutus.cloud.computeCanada.ca](http://arbutus.cloud.computeCanada.ca)
- [cedar.cloud.computeCanada.ca](http://cedar.cloud.computeCanada.ca)
- [graham.cloud.computeCanada.ca](http://graham.cloud.computeCanada.ca)
- [east.cloud.computeCanada.ca](http://east.cloud.computeCanada.ca)

## *Highlight of the computing power*

- Total number of CPU cores: ~270,000.
- Total number of research-grade GPUs: ~2600.
- Total RAM: ~1.2 PB.
- Total storage: ~70 PB.

# What software packages are available?

Check for software on the web site



Check for software while on a cluster

\$ module avail

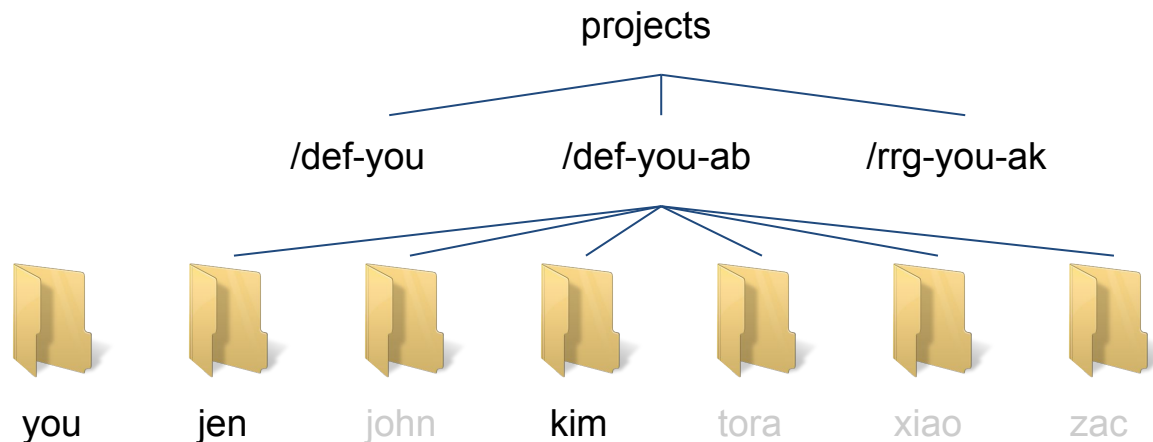
\$ module spider *keyword*

# The storage you have

home: 50GB



project: 1T, up to 10TB per group; >10TB needs RAC



*The project space is meant to be shared among group members. However, the ownership can be set by individuals. Accessing files owned by others requires a consent of the **owner**.*

scratch: 20TB per user, 60 days

nearline (tapes): 2T per group\*

# Who owns files

- In legal terms
  - In principle, individuals own the files they created, accessing files owned by someone needs a consent.
  - Check your home institution policies regarding the ownership of research data (files etc).
- In Operational System terms
  - For all newly created files, by default only the owner has the write permissions (PI and the group have the read permissions).
  - The default behaviour can be changed (using umask command).
  - The permissions of any file (old or newly created) can be modified (made more or less permissive), using Linux commands (chmod and setfacl).

# Our jobs waited in queue for X days, can you do something?

## What we can do

- We will look at the resources requested by the jobs.
- We may possibly find out the reasons why the jobs are waiting.
- We may help users to better reshape the jobs so they would have a better chance to start in the future.

## What we can't do

- We can't manually let your group jobs start.

## What you can do

- To educate group members to balance the workload and usage.
- To advise group members to review the information on how the fairshare/scheduler works and the best practice.



# What does RAC mean and should I apply for it?


- You need to apply for Resource Allocation Competition (RAC) if you expect your group to need more than the default amount of resources (50 core years, 10 GPU years, 10 TB storage) for the next year.
- RAC competitions are run once a year, in the fall.
- Only the PI (faculty) can apply for RAC, for the whole research group.
- What RAC is for
  - **Compute** - guaranteed priority access to CPUs and GPUs for a prescribed amount.
  - **Storage** - access to the storage exceeding the default amount (10 TB).
  - **Portal** - guaranteed access to cloud and the storage via cloud.
- What RAC is NOT for
  - to have the resources set aside for you all the time.
  - your jobs not to wait in the queue.

# How do I add/remove a member from a RAC project

PI has the ability to control whom in a group should have access to the RAC allocations. This is done in CCDB. To proceed

- Login to Compute Canada portal <https://ccdb.computecanada.ca/>, you will see a list of your roles, with the current one listed at the top.
- Click your current role to navigate to the page of RAC projects (**RAP**) listed under that role.
- Click **Manage RAP memberships**.
- By default all your group members having a CC account belong to the RAC project. They have the equal priority for running jobs. You may remove a person from the RAC project so to limit the priority access.
- You may also promote a person to be the “manager” so he/she will be delegated may control the membership as well.

# How do I add/remove a member from a RAC project



compute  
canada

calcul  
canada

My Account

Resource Applications

Resource Allocations

FAQ

Browse

Account Management

Details for RAP

Rapi	
Group Name	
Type	default
Status	Active
Gid	
Graphs	<a href="#">Usage by allocation and resource</a> <a href="#">Usage by submitter and resource</a>
Owner	
Title	Default Resource Allocation Project
Description	Default Resource Allocation Project
Primary research areas	None
Secondary research areas	
Associated resource application	-
Managers	
Members	Activated (1 role) 
Created	2010-04-21 15:46
Updated	2017-07-13 10:28
Terminated	-
Allocations	

[Edit](#)  
[Manage RAP memberships](#)

Manage Resource Allocation Project Membership

RAPI	
Group Name	
Type	RRG
Status	Inactive
Title	Analysis of a predator-prey evolving ecosystem simulation
Allocations	10 allocations, RAC 2015
Created at	2015-01-06

Resource Allocation Project (RAP)  
Choose...

Notes

- Membership of a RAC RAP can be modified at any time.
- Any user with an active Compute Canada role can be added as a member.
- For details about RAP and membership management, visit [this page](#).

Add Members

Enter the CCRI of the member you want to add  
ccri  
Add

Add roles sponsored by PIs already member of the selected RAP (you will be taken to a new page)  
Add in bulk

Enter the groupname or RAPI that you want to import the membership from (you will be taken to a new page)  
groupname  
Import

Download a CSV of the list of members of this RAP  
Download CSV

Person	CCRI	Role status	Sponsor	Position Department Institution	Type
		Activated		Faculty Computer Science Un. of Windsor	Owner
		Activated		Doctoral Student Computer Science Un. of Windsor	Member <a href="#">Promote to Manager</a> <a href="#">Remove</a>
		Activated		Doctoral Student School of Computer Science Un. of Windsor	Member <a href="#">Promote to Manager</a> <a href="#">Remove</a>

# Q&A