UBC Advanced Research Computing

UBC Advanced Research Computing (ARC)

We support:

- Research across all disciplines
- Computationally-intensive research

- Data-intensive research
- All levels of experience

We are here to assist UBC researchers with high-performance computing and data management. Our experienced, dedicated team provides consultation, expertise, and access to digital platforms and infrastructure.

Distinguishing UBC ARC's Services

- Research too big or complex for a standard computer
- Specific needs not typically supported by IT
- Experience and familiarity in academic research

What UBC ARC Does

- Sockeye HPC system
- Chinook object storage
- Support access to national resources
- Security threat assessments
- Cloud computing
- REDCap
- Training and education
- Consultation
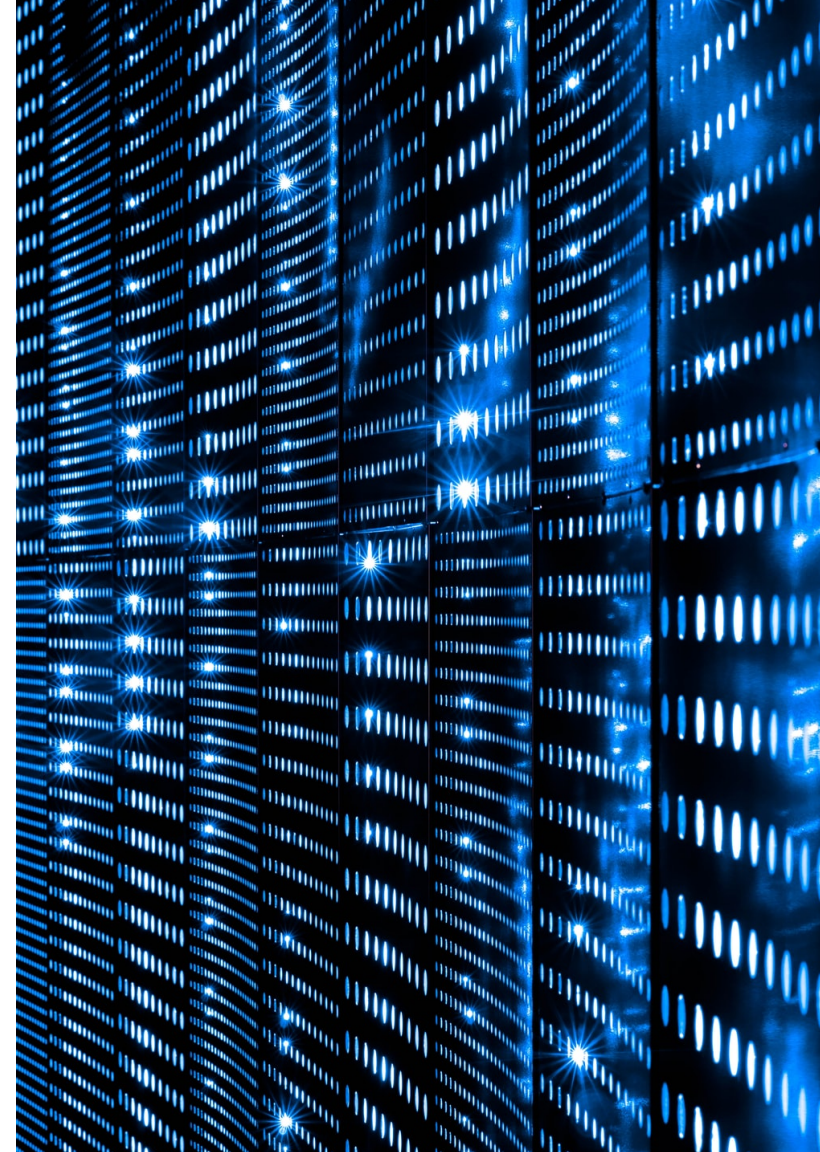
Sockeye High-Performance Computing System

Large-scale Analytics

Computing power for large data workloads, Sockeye is a 15,872 CPU core, 200 GPU, HPC cluster with 101 TB system memory, EDR (100 Gdps) InfiniBand, and 1.3 PB Dell Isilon storage with 192 TB all-flash burst buffer.

Machine-learning

With 1.5 PB DDN Lustre and 11.4 TB Local NVMe SSD available, research models that use machine learning algorithms to forecast and predict are able to use Sockeye's speed for quick results.
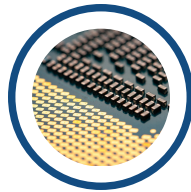
Batch-processing

Sockeye supports jobs which benefit from parallelization and large jobs that can be run in multiple segments.

House high-risk data

Researchers are able to process sensitive or confidential data in an on-premise UBC environment, with Sockeye located at the UBC Data Centre and accessed by UBC myVPN, enforced MFA, and secure shell (SSH) client.

Sockeye Allocations

Standard Allocation

- Shared access to CPUs and GPUs
- 5 TB project storage
- 5 TB scratch space
- Reviewed by ARC staff
- Allocations expire June 30 each year - renewal through new application
- Apply anytime year round

Priority Allocation

- Priority access to CPU and GPU resources
- Up to 50 TB project storage
- Up to 50 TB scratch space
- Recommended to have existing Standard Allocation and demonstrate need for more compute
- Reviewed by DRAC Faculty Committee
- Two calls per year
- Apply by May 7, 2021

Reservation Allocation

- Reserved for existing Standard or Priority Allocation
- Ad-hoc requests for short-term boosts in compute resources
- Apply anytime year round - consultation required to apply

Chinook Object Storage

 Large data-sets

With 5 PB after geo-replication available for researchers for multi-year allocations, Chinook stores data as an object (using metadata) permitting large amount of unstructured data to be stored safely.

 Back-up

Chinook offers UBC researchers a location to backup research data in one location for access by multiple collaborators; preferable to multiple hard drives of local servers.

 Short- and medium-term storage

For data that is not needed on a daily basis, Chinook offers geo-replication, 48 nodes across two physical sites, and 25/100 Gbps networking.

 House high-risk data

Researchers are able to store sensitive or confidential data in a UBC environment using their UBC Enhanced CWL account and restricted access Globus accounts.

Chinook Allocations

Research

- Images and video files
- Back-up and log files
- Data generated from scientific instruments (e.g. microscopes, spectrometers, etc.)

Allocations

- Applications should explain clearly the purpose of the allocation and the estimated TB needed
- Annual progress reports to solicit feedback and engage with Allocation Owners
- Applications reviewed by ARC for technical feasibility review by Faculty Review committee for larger storage requests

Eligibility

Sockeye and Chinook were funded to support:

- Early-career researchers and new recruits who require "bridge" access to resources to establish their research at UBC.
- Critical research areas such as machine learning, real-time image processing and interactive processing.
- Research using sensitive or confidential data.

Priority applications are reviewed by the Faculty review committee, DRI Resource Allocation Committee (DRAC). Early careers researchers and those new to UBC (each within their first five years) will receive stronger consideration for additional computational resources

Eligibility

Eligibility In an effort to be in alignment with other VPRI services, we define Eligible UBC Researchers as UBC Persons eligible for research spending responsibility (as defined in UBC Research Policy LR2:

- Professor
- Associate Professor
- Assistant Professor
- Professor of Teaching
- Senior Instructor
- Instructor
- Clinical Faculty
- Research Associate
- Post-Doctoral Fellow
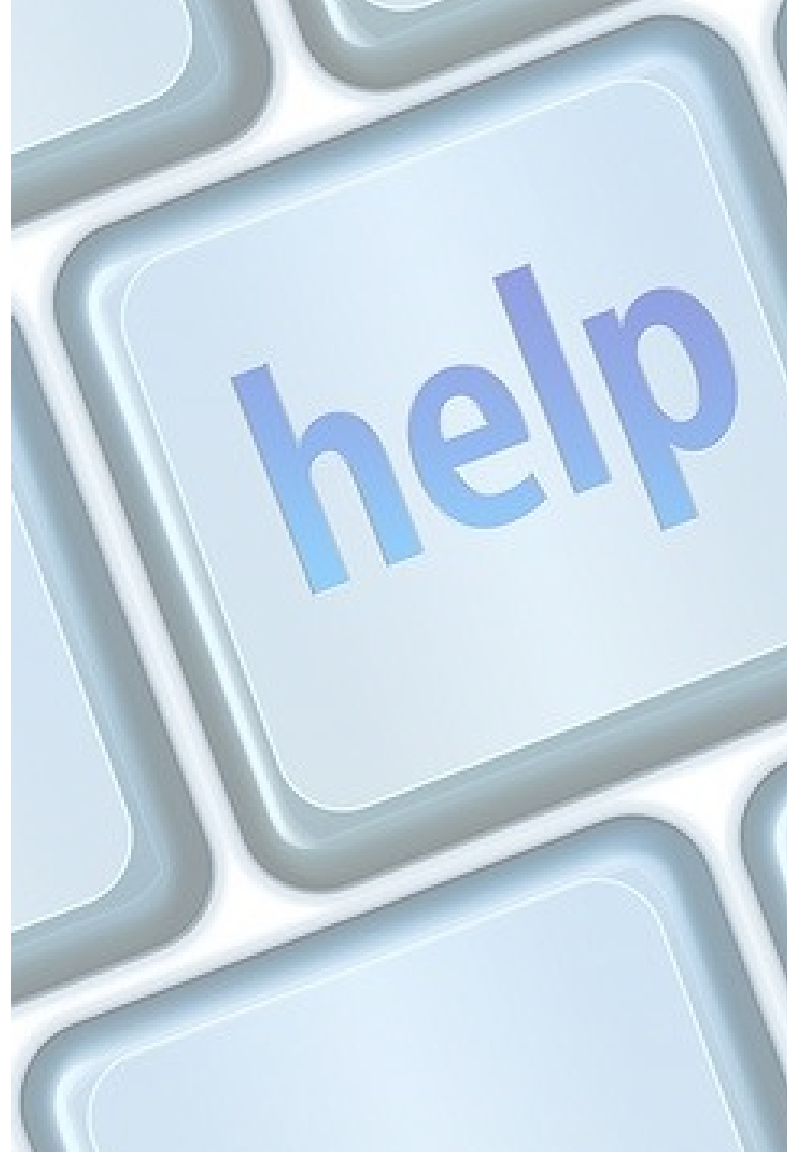
Compute Canada & WestGrid

National HPC & cloud systems:
- Quick access to default allocations
- Research Allocation Competitions (RAC) for larger needs

Collaboration and sharing tools.

REDCap

- Easily build and manage data collection instruments
- Supports surveys and longitudinal studies
- Online and offline data capture
- Highly secure

RONIN and AWS Proof of Concept

RONIN is an incredibly simplistic web application that allows researchers to launch complex compute leveraging AWS cloud infrastructure. ARC has worked directly with RONIN to configure this platform to the needs of the UBC research community.

Mircosoft and VPRI

VPRI Open Science partnership has been established to work cooperatively to design and pilot solutions, determine how to address barriers, particularly those unique to the Canadian context, and enable leading researchers to accelerate time to discovery and innovation.

Cloud Computing

Cloud computing may be a good fit for your research if it requires:

- Virtual machines
- Windows applications
- Web services
- Very large jobs that require resources simultaneously
- Interactive computing and visualization
- Desktop environment (GUI)

We are here to help determine the best infrastructure for your research data and team.

Training and Education

2020 Summer School

Over 600 registrants

Python, HPC, Running GPUs on Sockeye, Linux & Bash

2020 Research Data Management

Collaboration with UBC Library

Best Practices, Resources, & Tips

Lectures, Talks, & Workshops

Disciplinary Experts

ARC Services, Digital Research, RDM,& Cloud

Consultation

ARC staff are always happy to meet and discuss your research, from pre-proposal to project close-out and publication, we are here to support you with:

- Grant applications
- Research data management
- Data privacy and security

- Cloud
- Meta-data
- Data capture

Reach out any time!

Accessing Services

Sockeye: https://arc.ubc.ca/ubc-arc-sockeye

Chinook: https://arc.ubc.ca/chinook

Commercial Cloud: arc.support@ubc.ca

ARC Technical User Documentation:
https://arc.ubc.ca/docs

Contact us: arc.support@ubc.ca