ARC/HPC @ OntarioTech Fall Update

New Resources, Support and Training Courses

October 20, 2026, 1:00-2:00 pm

Armin Sobhani

SHARCNET | The Alliance

HPC Technical Consultant

asobhani@sharcnet.ca

armin.sobhani@ontariotechu.ca

https://staff.sharcnet.ca/asobhani



OntarioTech UNIVERSITY

SHARCNET™

Digital Research Alliance of Canada

Your Local HPC Technical Consultant

Local Staff @ OntarioTech



Armin Sobhani

HPC Technical Consultant
Faculty of Science, UA 3020
905-721-8668 x3607
asobhani@sharcnet.ca
armin.sobhani@ontariotechu.ca
https://staff.sharcnet.ca/asobhani

Arrange an Office Visit for:

- 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
- …

In Today's Update…



Where to Find Updates

Slides and Recordings

Supercomputing @ OntarioTech



Academic / Research Computing @ OntarioTech

Campus IT Groups

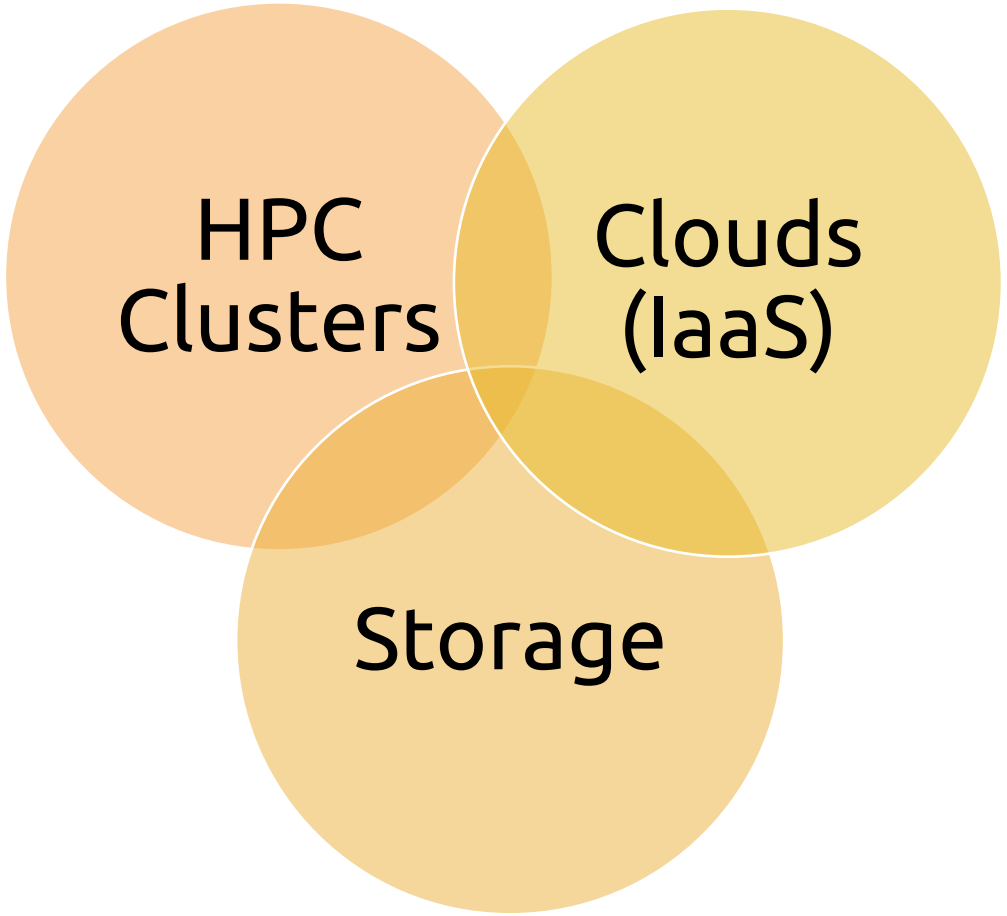
- Academic Computing
- https://itsc.ontariotechu.ca/
- OntarioTechU.Net

SHARCNET – HPC

- Advanced Research Computing (ARC)
- Research data management (RDM, e.g. for librarians)
- Training on ARC, data science, machine learning
- More: https://www.sharcnet.ca/

Supercomputing – Resources

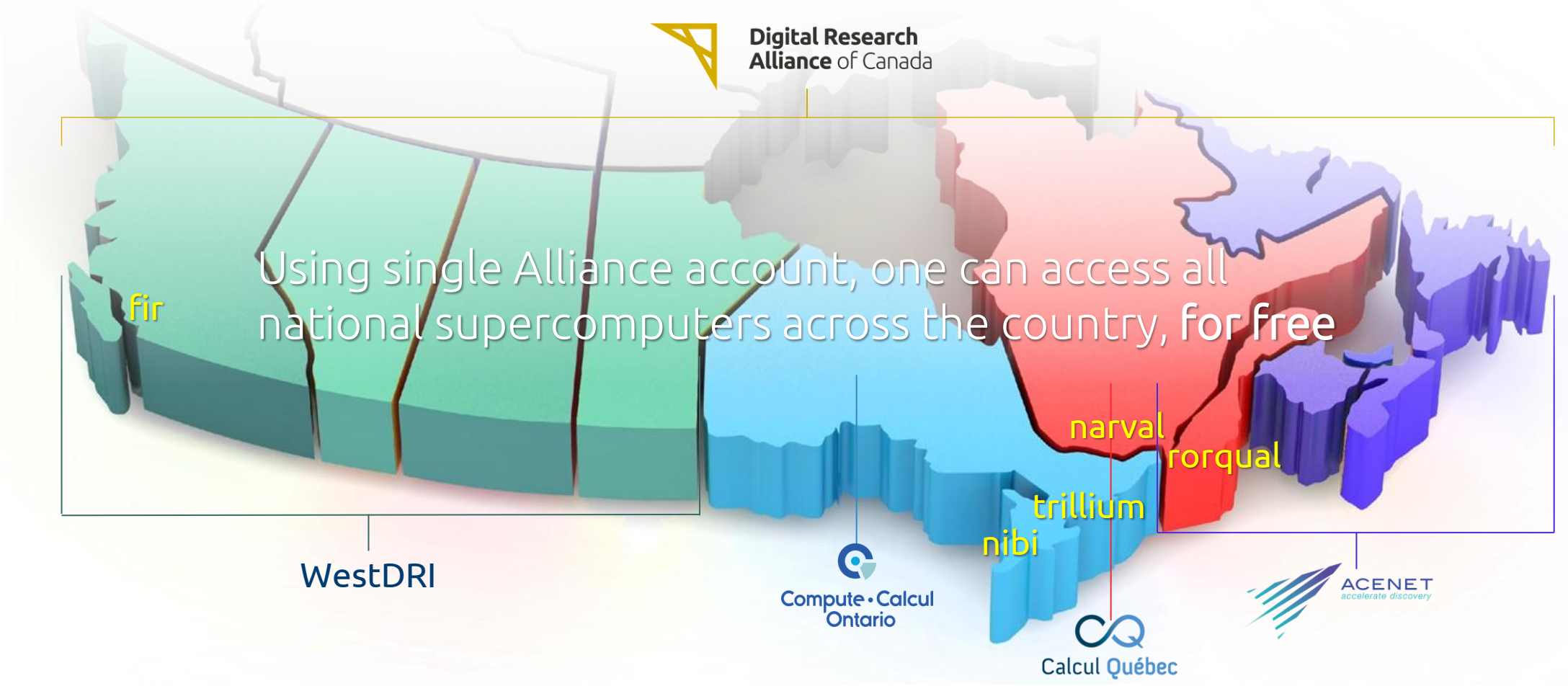
To run large and exascale simulations that need dedicated access to hundreds of thousands CPU and GPU cores and low latency, fast interconnect fabric; or to run hundreds of thousands of simulations simultaneously



To run web services, databases or use virtual machines (VMs) with full control. The CPU and GPU resources are typically over committed, that is, a CPU core or GPU device might be shared by the running VMs

To store hundreds of thousands TB of research data

Resources – What and Where They Are…



Supercomputing – Getting an Account

Sign up for an account (FREE)

step-by-step

http://ccdb.alliancecan.ca

Your supervisor should have an account

Students, postdoc, visiting scholars and other research staff can sign up for an account with supervisor's role ID (CCRI)

This account allows you to access all the supercomputers and clouds across the country



Multi-Factor Authentication (MFA) is now required

Supercomputing – Resources

Clusters across the Country

- fir.alliancecan.ca
- narval.alliancecan.ca
- nibi.alliancecan.ca
- rorqual.alliancecan.ca
- trillium.alliancecan.ca

Cloud Services (IaaS)

- arbutus.cloud.alliancecan.ca
- beluga.cloud.alliancecan.ca
- cedar.cloud.alliancecan.ca
- nibi.cloud.alliancecan.ca

Storage Space

- **home**
  50G, backed up
- **project**
  1T per group, backed up
- **scratch**
  20T per user, purged 60 days
- **nearline**
  (tapes) - archive

Supercomputing – Resources

Clusters across the Country

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- nibi.alliancecan.ca
- rorqual.alliancecan.ca
- trillium.alliancecan.ca

Cloud Services (IaaS)

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- cedar.cloud.alliancecan.ca
- nibi.cloud.alliancecan.ca

Latest Status

https://status.alliancecan.ca/

Resources – HPC Clusters and Storage

National systems at a glance

Resource	Fir	Narval	Nibi	Rorqual	Trillium	Total
CPU cores	166,656	49,664	136,320	131,712	235,008	**719,360**
GPU cores	7,680 H100s	5,068 H100s	6,912 H100s AMD MI300A	5,184 H100s	5,760 H100s B200s	**30,604**
Storage[1]	49PB	19PB	25PB	68PB	29PB	-

Source: https://docs.alliancecan.ca/wiki/National_systems

1. These numbers represent the major storage.

Resources – AI Specific Systems NEW

Pan-Canadian AI Compute Environment (PAICE)

TamIA

Québec Artificial Intelligence Institute (Mila)

Killarney

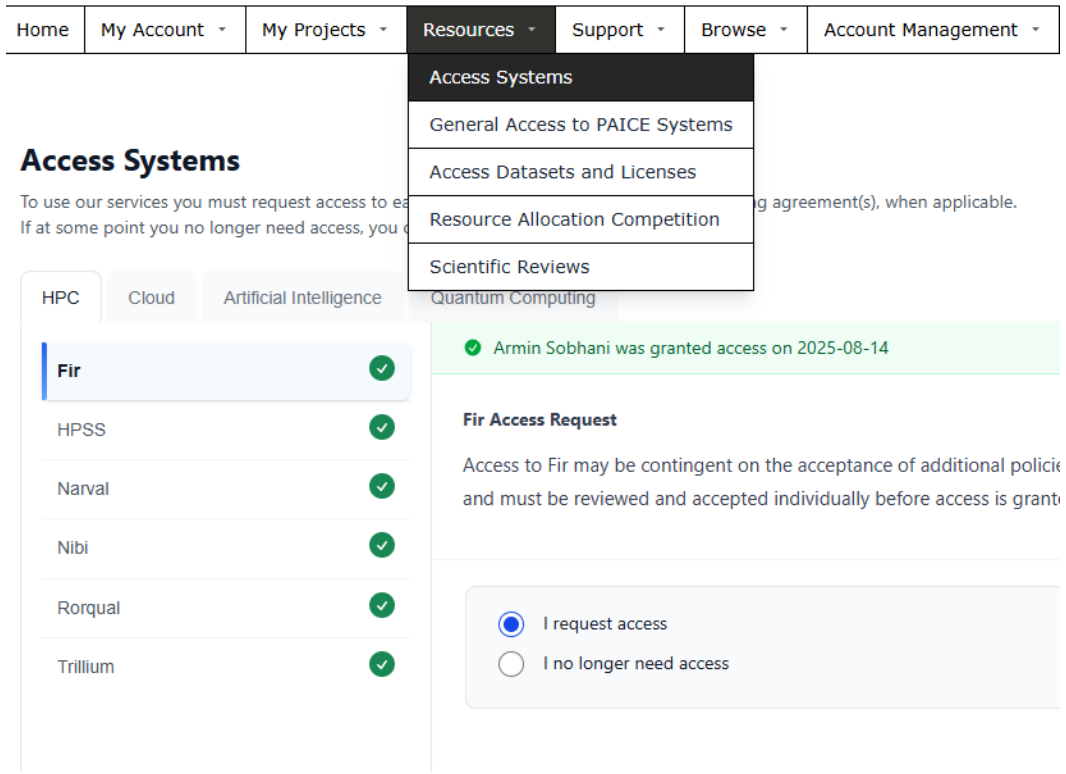
Vector Institute

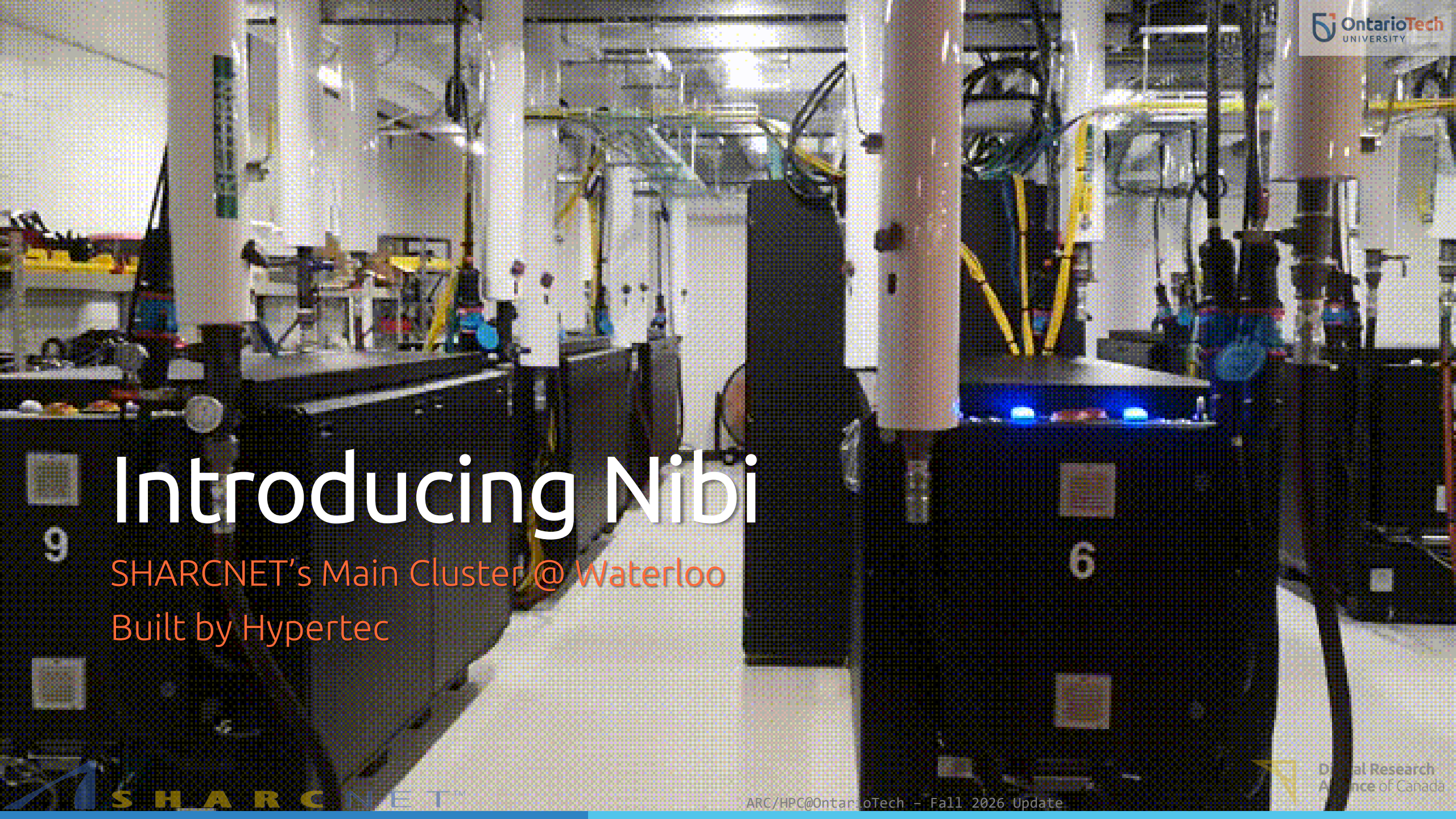
Vulcan

Alberta Machine Intelligence Institute (Amii)

Resources – Requesting Access NEW

Digital Research Alliance of Canada | Alliance de recherche numérique du Canada





Introducing Nibi

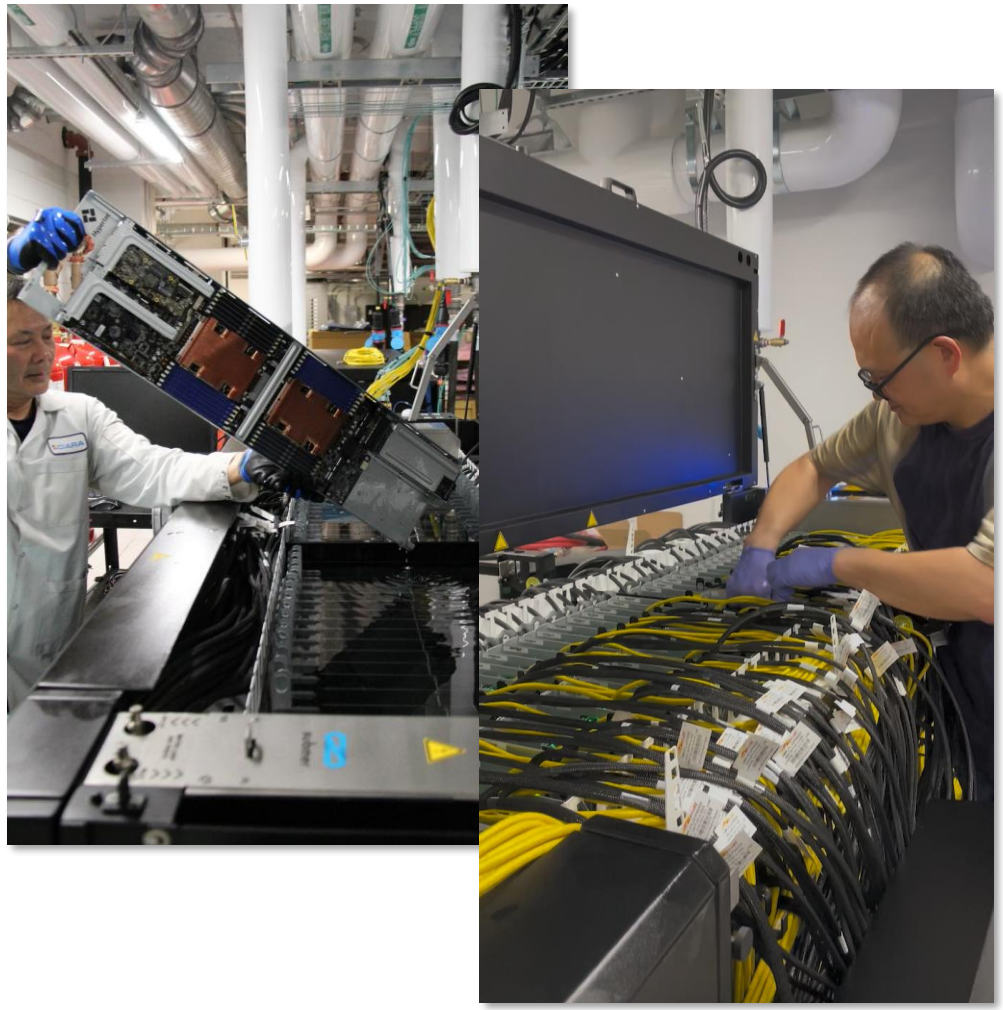
SHARCNET's Main Cluster @ Waterloo

Built by Hypertec

Nibi Specs – CPU Nodes

Nodes	Cores	Memory	Storage	CPU
700	192	748 GB	3 TB	2 x Intel 6972P @ 2.4 GHz
10	192	6 TB	3 TB	2 x Intel 6972P @ 2.4 GHz

- 136,320 CPU cores
- 200 Gbit/s network bandwidth for CPU nodes
- All have Internet access
- Liquid immersion cooling



Nibi Specs – GPU Nodes

Nodes	Cores	Memory	Storage	GPU
36	112	2 TB	11 TB	8 x Nvidia H100 SXM (80 GB)
6	96	495 GB	3 TB	4 x AMD MI300A

- 312 GPUs
- 200 Gbit/s network bandwidth for GPU nodes
- All have Internet access
- Direct-to-chip liquid cooling

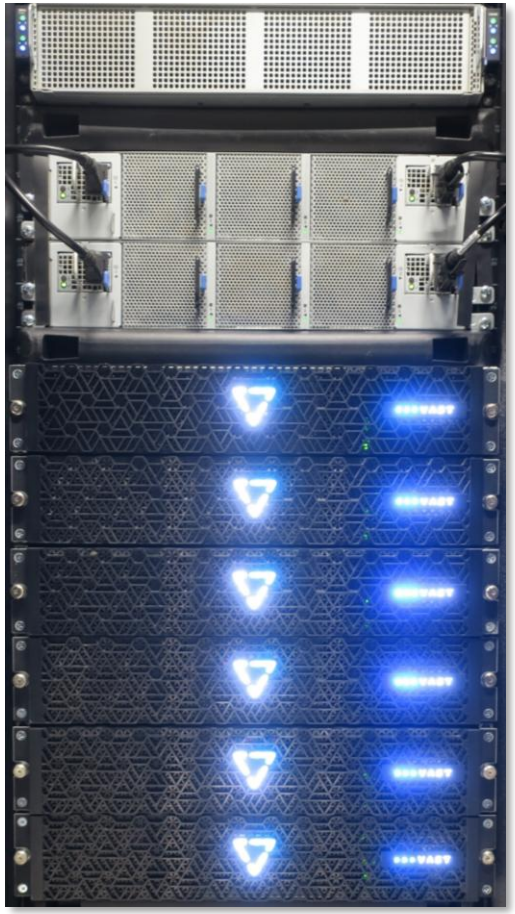


Nibi Specs – Storage

Parallel filesystem from VAST Data

25 petabytes

All SSD

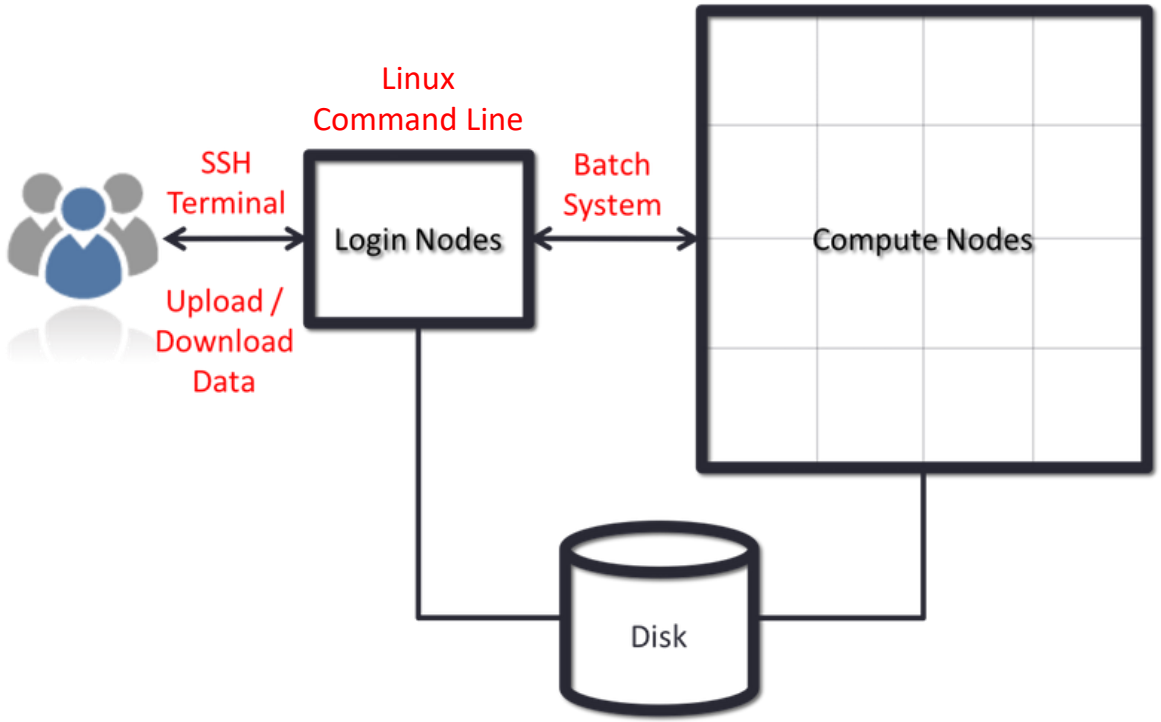


Accessing Resources

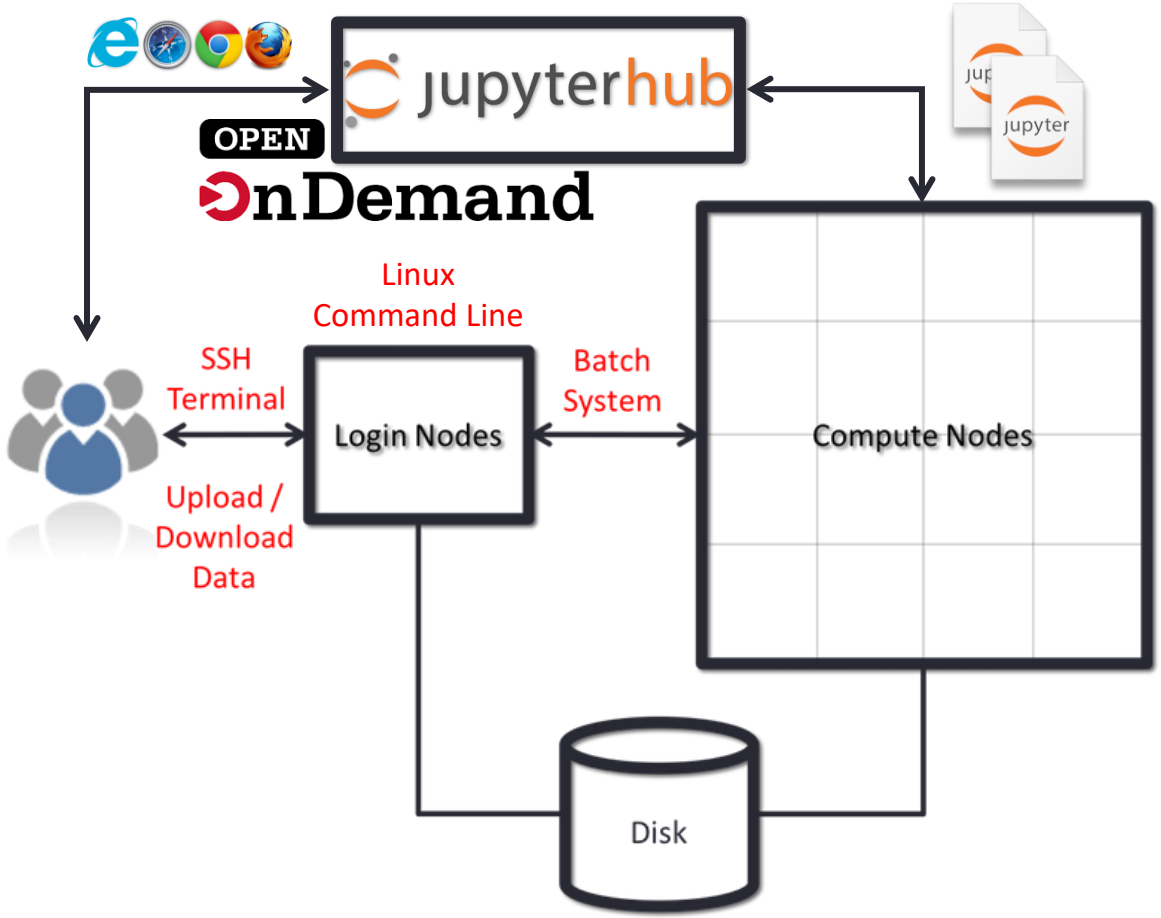
The new and existing ways



Resources – Connecting to Clusters



Resources – Connecting to Clusters



Connecting to Clusters – SSH Terminal

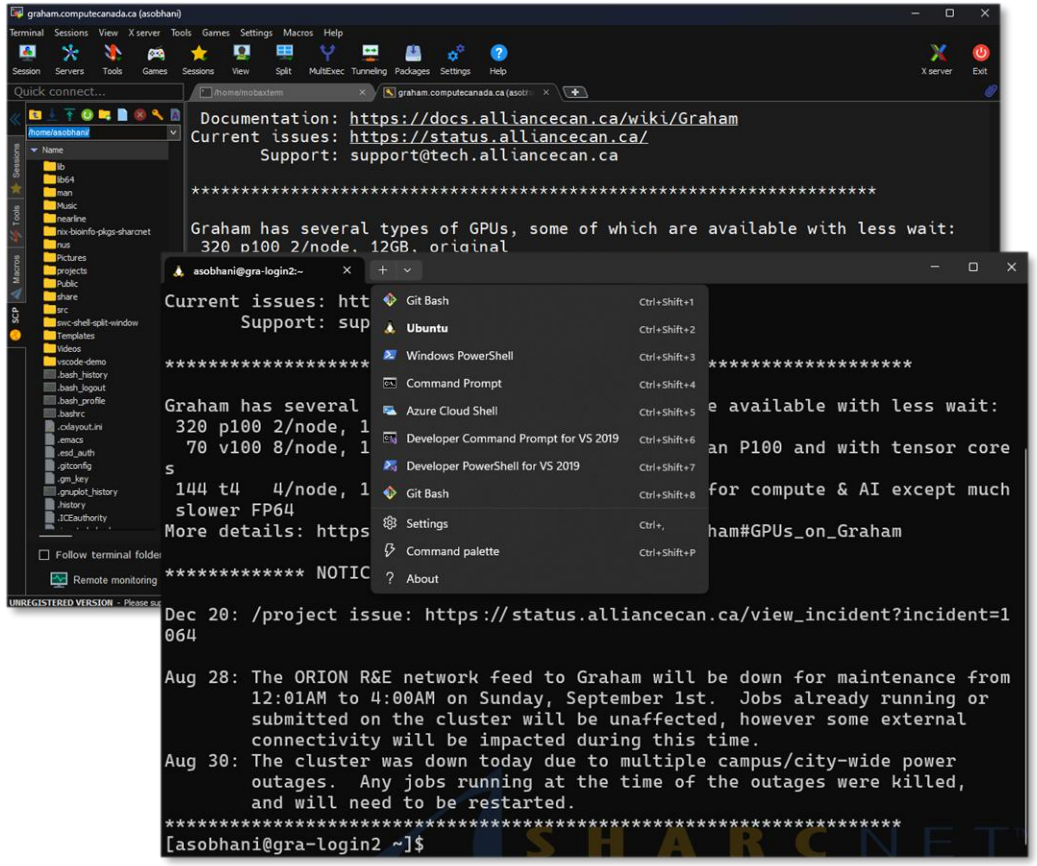
SSH Client

Windows 10 and 11

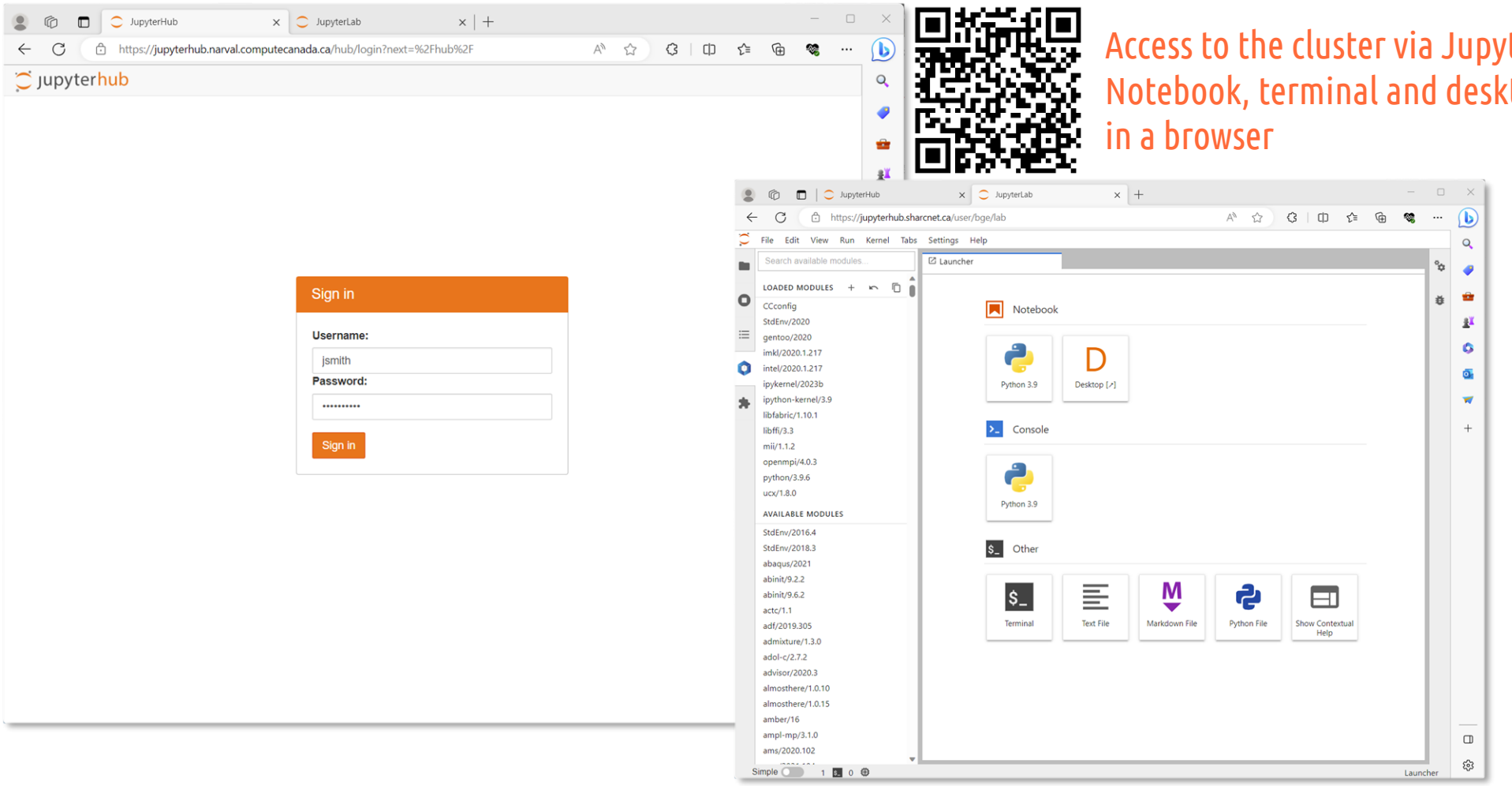
- Windows Terminal
  - OpenSSH in PowerShell or CMD
  - WSL
  - Git Bash
- MobaXterm

Linux and Mac

- OpenSSH
- ssh username@nibi.alliancecan.ca

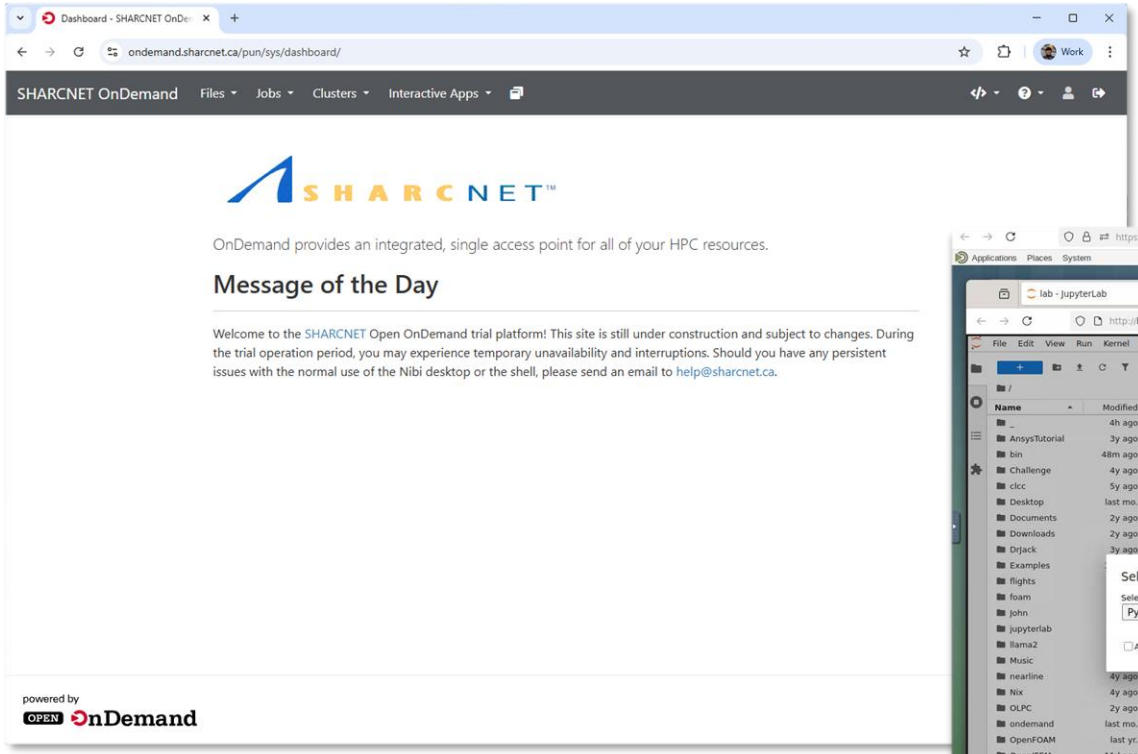


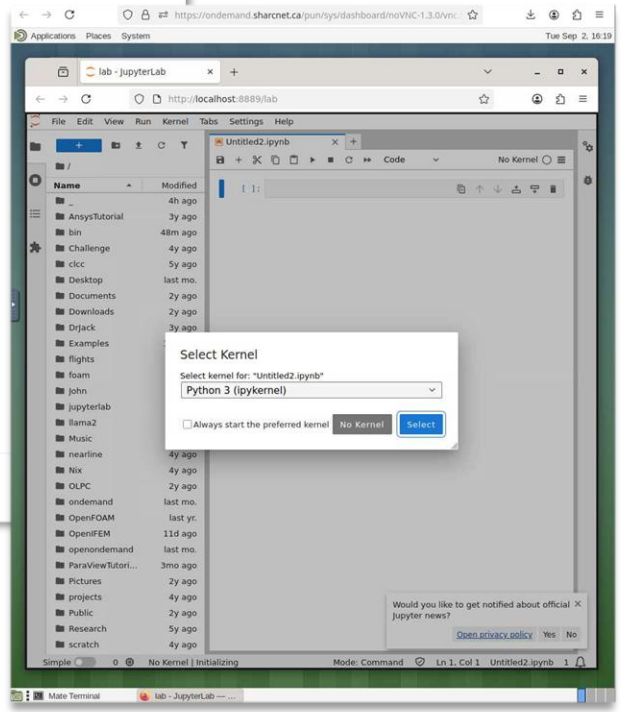
Connecting to Clusters – JupyterHub



Access to the cluster via Jupyter Notebook, terminal and desktop in a browser

Connecting to Clusters – OPEN OnDemand

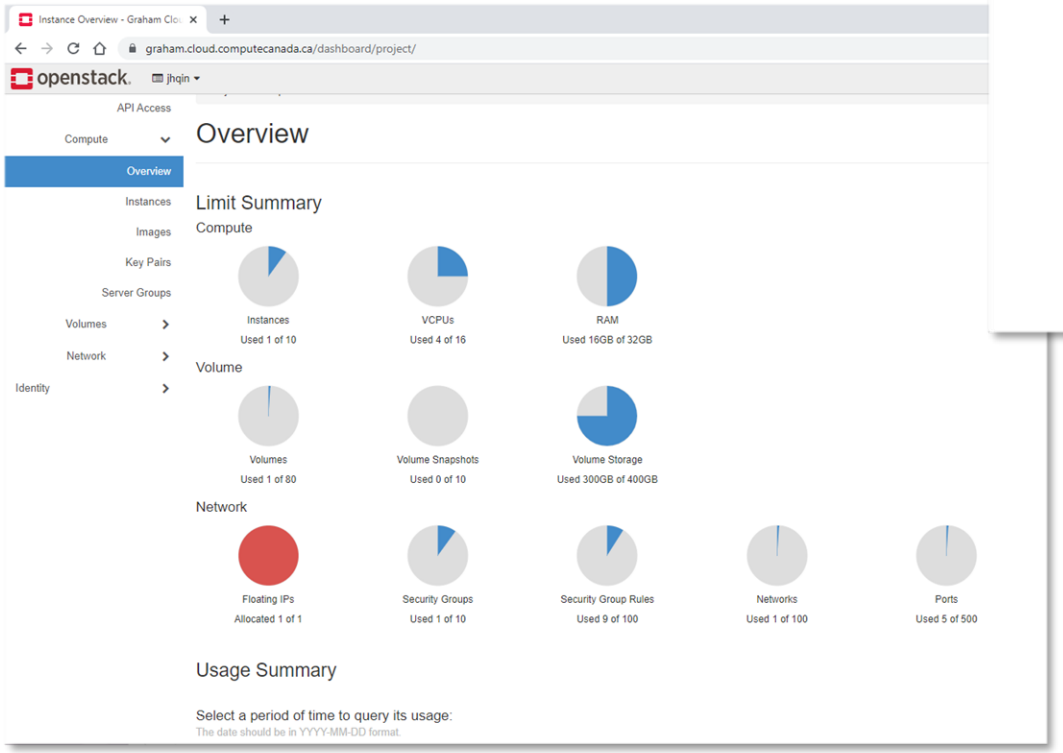


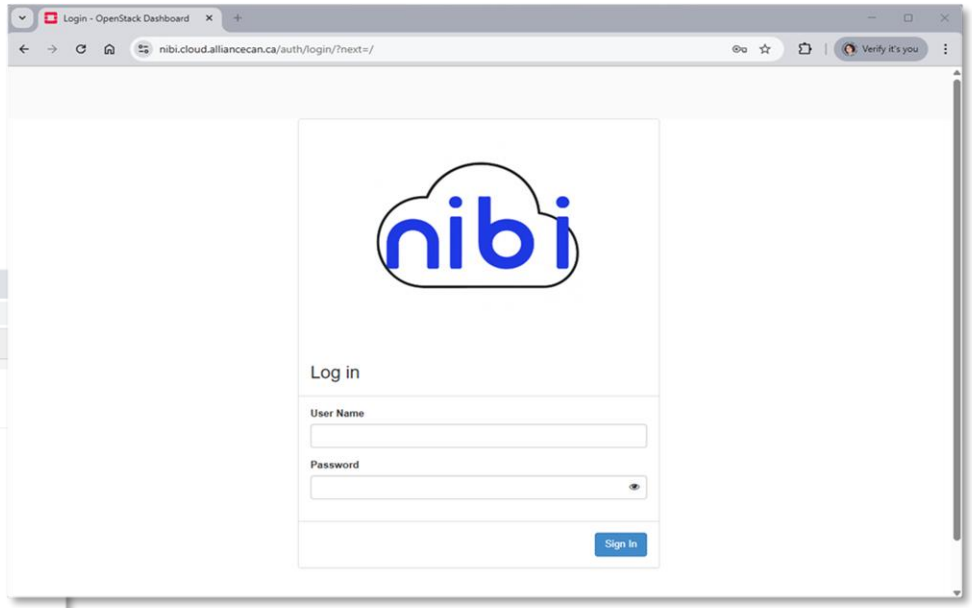


Web access to Nibi via https://ondemand.sharcnet.ca

Resources – Connecting to Cloud

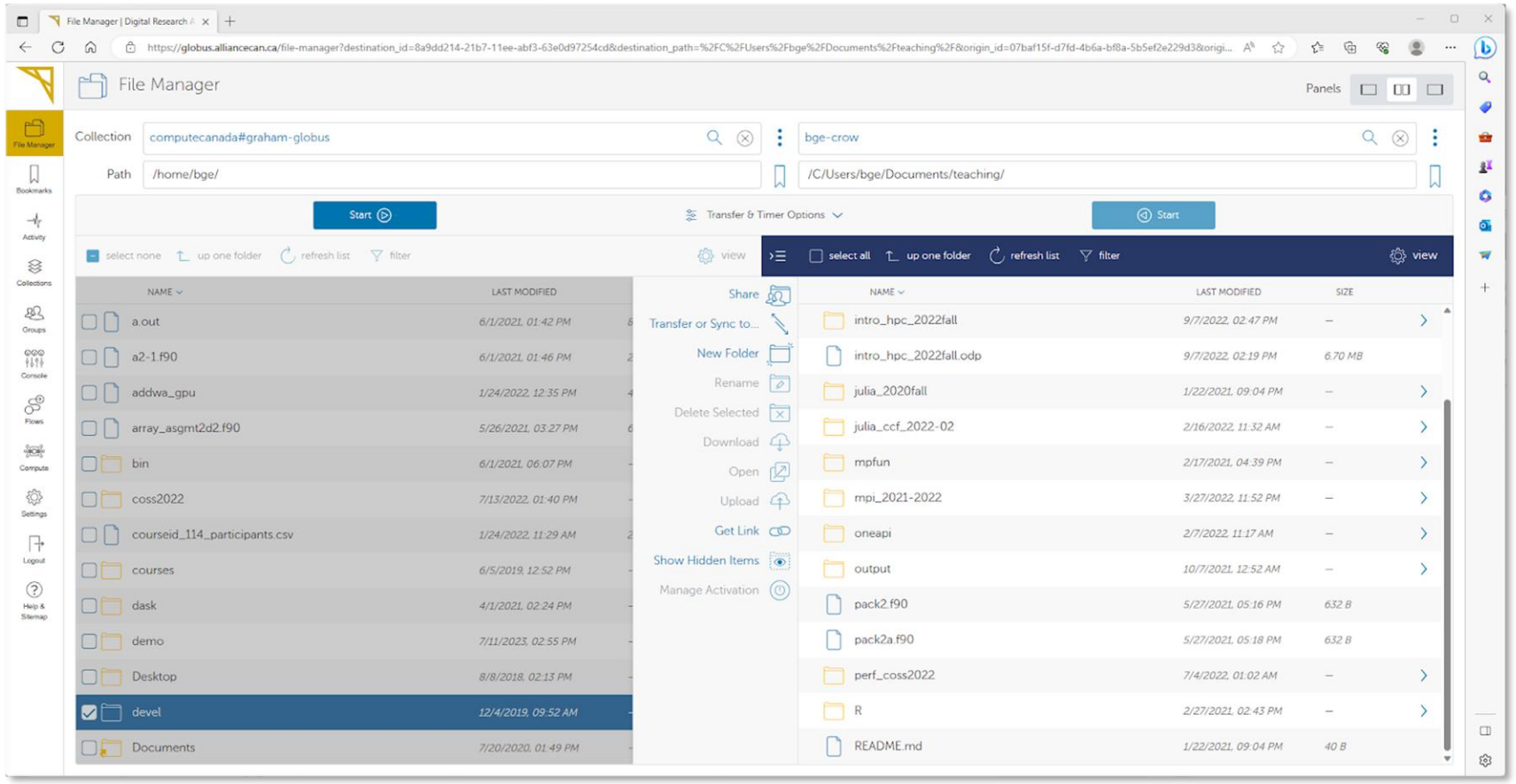
- arbutus.cloud.alliancecan.ca
- beluga.cloud.alliancecan.ca
- cedar.cloud.alliancecan.ca
- nibi.cloud.alliancecan.ca





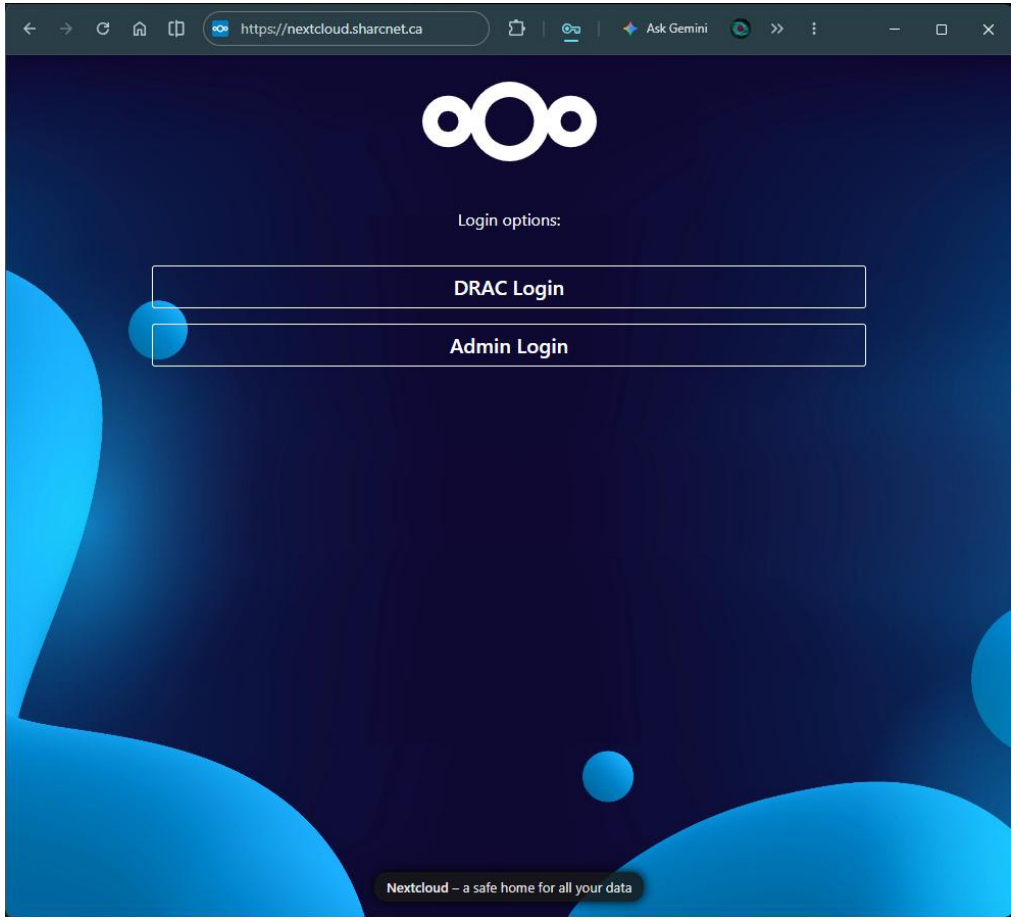
- A cloud project must be created by the PI
- No Windows images, all VMs are Linux
- Up to 80 virtual CPU cores
- May have virtual GPUs
- Up to 10 TB storage
- Up to 25 persistent CPU cores

Resources – Transferring Files via Globus



Check https://docs.alliancecan.ca/wiki/Globus. Go to https://globus.alliancecan.ca/ and follow the instructions

Resources – SHARCNET Nextcloud NEW



Resources – AI as a Service (AIaaS) NEW

Brine https://brine.sharcnet.ca

- Always-on
- OpenAI-compatible API
- Backed by NVIDIA H200s
- Your data stay in SHARCNET, Canada

For hosted models that support

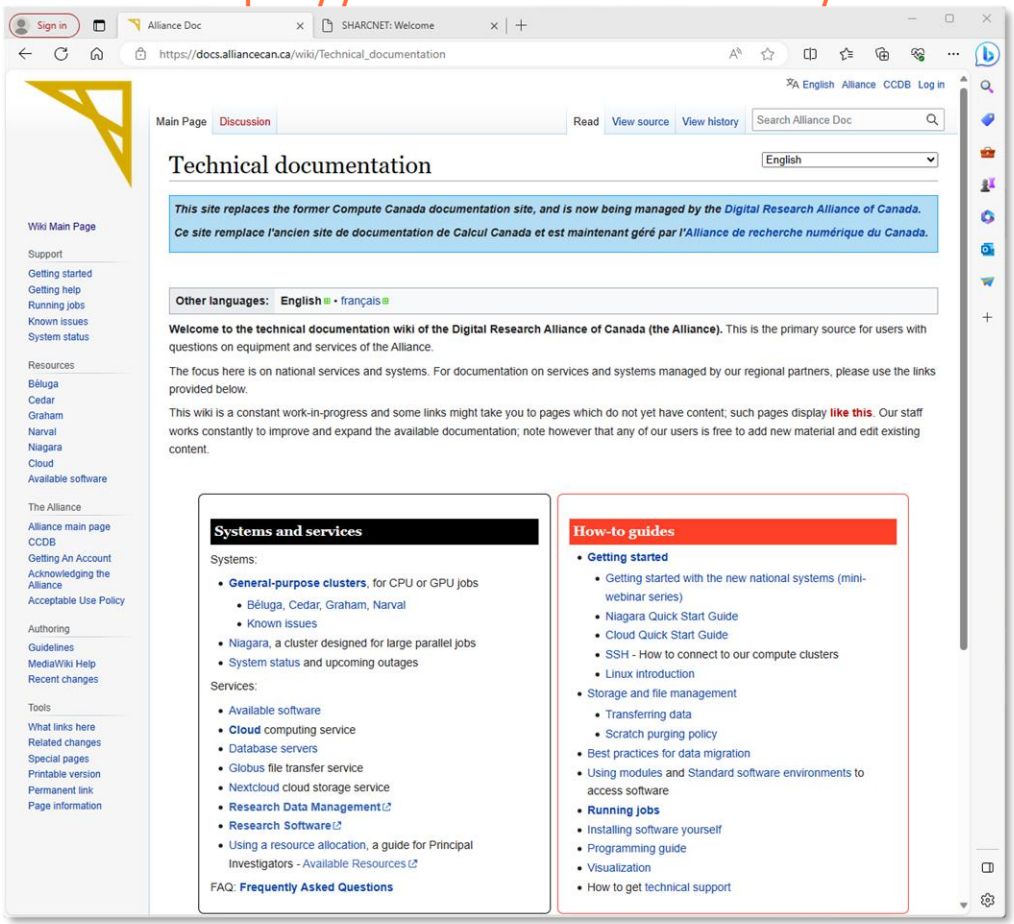
- Chat
- Tool calling
- Audio transcription
- etc.

Models

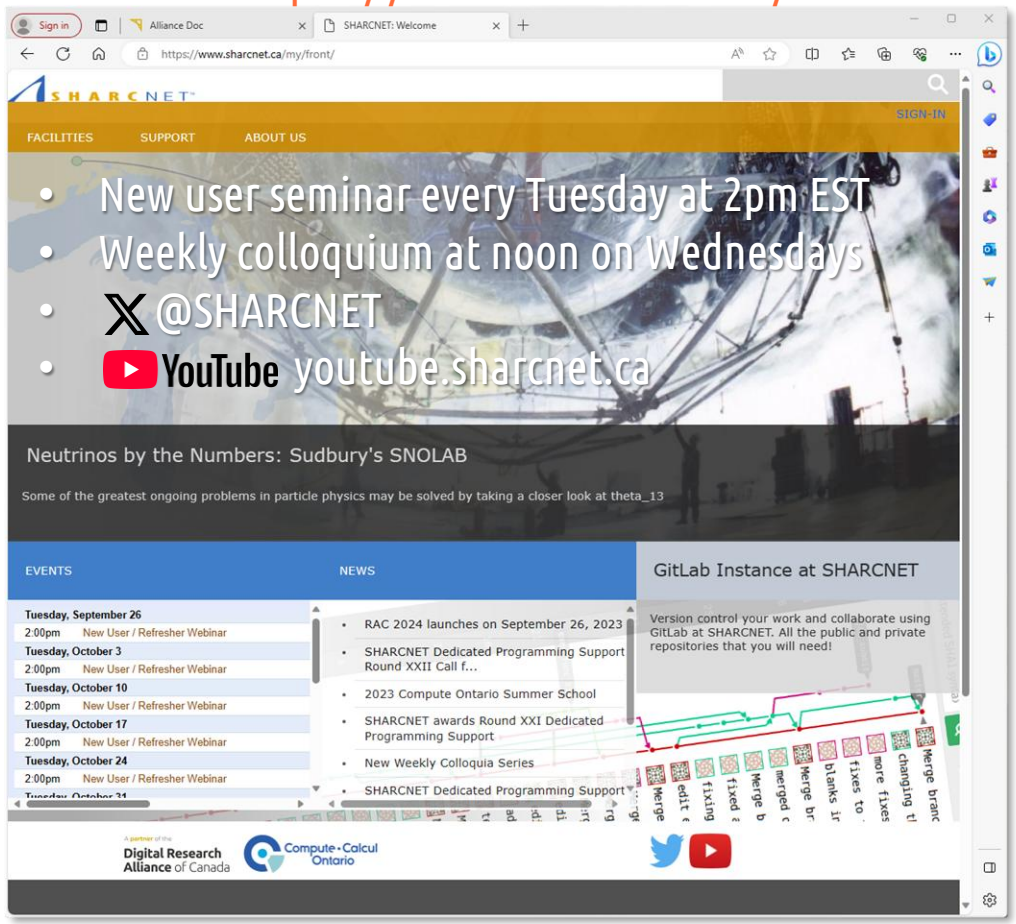
- DeepSeek-V4-Flash-0731
- Qwen3.8-27B
- gpt-oss-120b
- North-Mini-Code-1.0

Resources – Getting Help

https://docs.alliancecan.ca/



https://www.sharcnet.ca/



Resources – Getting Help

Help from beyond **OntarioTech**



Weekly Q&A session:
https://www.sharcnet.ca/my/news/calendar



Ticketing system (most recommended):
support@tech.alliancecan.ca



Staff contact info to email or phone:
https://www.sharcnet.ca/my/contact/directory

RAC 2027



Resources - Caps

Default Access	Rapid Access Service (RAS)	Resource Allocation Competition (RAC)
Compute – No limit in CPU and GPU cores, but low priority, hence longer wait time.	**Compute** – May ask for increase in priority *temporarily*, to bump up jobs with that have deadlines.	**Compute** – Best assurance of priority access to allocated number of CPU cores (200+) and GPU (25 RGUs).
Storage – Limited storage space – 50 GB home – 1 TB project - work space – 20 TB scratch – 10 TB nearline (tape)	**Storage** – `project` - up to 40 TB over all clusters – `nearline` - up to 100 TB – Not available at some sites.	**Storage** – Guaranteed access to: – `project` (40+ TB) – `nearline` (100+ TB)
Cloud – Limited cloud resources – 80 VCPU years – Persistent 25 VCPU years – 10 TB volume and snapshot storage	**Cloud** – Moderate increase.	**Cloud** – Guaranteed access to to allocated cloud resources
Request – No	**Request** – Any time	**Request** – Annual application

RAS vs. RAC

RAS

- **R**apid **A**ccess **S**ervice
- AKA Default Allocation
- CPU/GPU: Opportunistic
- Storage: 40 TB across all clusters
- Cloud compute instance: 1 month
- Cloud persistent instance: 1 year

RAC

- **R**esource **A**llocation **C**ompetition
- Annual (in fall)
- Peer-reviewed (scientific and technical)
- Roughly 80% of resources

RAC – Types

RRG

Resources for **R**esearch **G**roups

Resource: **Compute and/or Storage**

CPU ≥ 200 core-years, or

GPU ≥ 25 reference GPU units (RGU) years, or

or project storage ≥ 41 TB, or

or nearline storage ≥ 101 TB

RPP

Research **P**latforms and **P**ortals

Resource: **Cloud**

Persistent cloud storage ≥ 1 TB, or

Compute cloud ≥ 81 vCPUs, or

Persistent cloud ≥ 26 vCPUs

2027 RAC – Important Info

Important Dates

- Applications accepted: September 23 to November 3, 2026
- Announcement of Results: late March 2027
- Implementation of allocations: early April 2027

Info Sessions Recordings

- RAC Overview
- GPU Requests
- Cloud Requests

2027 RAC – Links

Guides

Application Form

SHARCNET's Online Training

https://training.sharcnet.ca/

Introduction to ARC Series

Intro to ARC

- Starts in early October
- Two 1-hour classes each week
- Include lectures and labs

Topics

- HPC Python
- Data Science with R (Tidyverse)
- C++
- PyTorch
- Jupyter
- Apptainer
- CMake
- SLURM
- Visualization

SHARCNET's Self-Paced Courses

Self-Paced Courses

Just google for SHARCNET self-paced

Online self-directed courses, with quizzes and/or home assignments

If successfully completed, the Certificate of Completion will be issued

Available Courses

- New User Course
- Introduction to GPU Programming
- Introduction to Machine Learning
- Introduction to SQL
- Introduction to the Shell
- Mastering GPU Efficiency
- Mastering the Alliance Job scheduler
- Bioinformatics

Other SHARCNET's Online Training

SHARCNET General Interest Seminars

- Every two weeks on Wednesday at 12pm-1pm, online
- Topics of general interest to our users
- No registration is required
- Alliance account is not required

Compute Ontario Summer Schools

- Every June
- Three weeks, 2 parallel streams, ~40 courses
- Alliance account is not required

SHARCNET's YouTube Channel

- http://youtube.sharcnet.ca
- Hundreds of webinar recordings and short videos

Q&A

