

# Scalable Protected Infrastructure (SPI)

2023 OLCF User Meeting

October 17, 2023

Chris Fuson

Group Lead – HPC User Assistance

Oak Ridge Leadership Computing Facility

ORNL is managed by UT-Battelle LLC for the US Department of Energy

# OLCF Security Enclaves

## Open

- Allows password authentication
- No export control restrictions
- UCAMS / XCAMS
- Separate filesystems, compute resource, DTNs
- Ascent, training resource
- Themis, longer term storage

## Moderate

- Requires 2-factor authentication
- Frontier, Summit, Andes
- Multiple levels based on Export Control review
- Category 1
  - No export control restrictions
  - Access to HPSS
  - Allowed to share with other projects on the system
- Category 2
  - Limited export control restrictions
  - No HPSS
  - Not allowed to share with other projects on the system

## Enhanced

- 2-factor authentication, from allowed IPs only
- HIPAA or ITAR regulations
- Separate filesystems
- Separate login nodes
- Separate DTNs
- No long-term storage
- Access OLCF compute resources through the SPI Citadel framework

# Scalable Protected Infrastructure (SPI)

Provides resources and protocols that enable researchers to process protected data at scale.

*Or in other words...*

The SPI is a computing environment that is designed to grow or expand easily and accommodate new services or users all while maintaining a high-level of security and protection.



# What is Citadel?

- Part of the SPI, CITADEL is a framework of security protocols that enable researchers to use our HPC resources to compute data containing:
  - Protected health information (PHI)
  - Personally identifiable information (PII)
  - Data protected under International Traffic in Arms Regulations (ITAR)
  - And other types of data that require privacy
- Enforces extra protections for managing PHI and PII
- Ensures data can not be accessed by other researchers or other projects



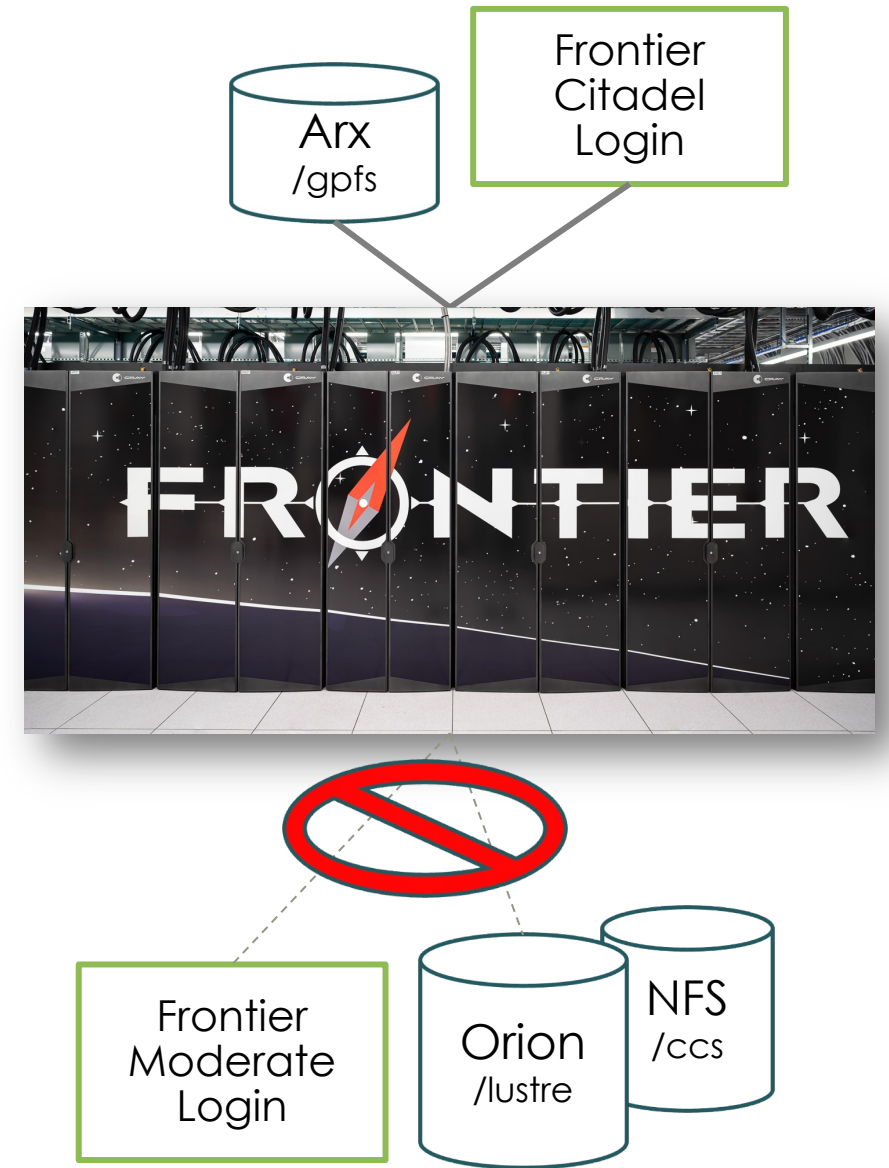
# Available OLCF Resources



<b>Compute</b>	Summit and Frontier
	All compute nodes available
	Compute nodes reconfigured prior to access
	Separate login nodes
<b>File Systems</b>	GPFS resource named Arx (3PB)
	Provides both home and scratch
	Only assessable within Citadel framework
<b>Data Transfer</b>	Separate Data Transfer Nodes

# Citadel framework

- Connection
  - ssh allowed from approved IPs only
- Login Nodes
  - Frontier Citadel login nodes separate from Moderate login nodes, but hardware and PrgEnv same
  - Arx is the only filesystem mounted in the Citadel framework. It provides home, scratch, and project areas.
  - Cannot see outside world
- Batch Submission
  - Moderate filesystems unmounted before Citadel job start
  - Separate queue
- Compute Resources
  - Same hardware and PrgEnv as seen from Moderate
  - Only mounts Arx



# Notable Differences between SPI and Moderate

- UserIDs are unique to each SPI project
  - <userID>\_<projID>\_mde
- Direct access requires whitelisted IP
  - PI approval
- SPI resources mount only SPI filesystems
  - home, scratch, project shared
- SPI compute resources can not access external resources
  - Build workflow impacts
- Must use the system's Citadel resource login and submit batch jobs

# Notable Similarities between SPI and Moderate

- Compute hardware is the same
- Login node hardware is the same
- Programming environment is the same
- Module system is the same
- Batch system is the same



# Requesting Access to SPI Resources

- [my.OLCF.ornl.gov](https://my.OLCF.ornl.gov)
- Appy for a new project
- Tell us about your work
- Your answers will trigger the SPI project process
- Process may take longer due to the nature of the data
- If you don't know, reach out to [help@olcf.ornl.gov](mailto:help@olcf.ornl.gov)

A screenshot of the myOLCF self-service portal. The header includes the Oak Ridge National Laboratory logo, the text 'LEADERSHIP COMPUTING FACILITY', and the 'myOLCF' logo. On the right, there is a 'NEW ACCOUNTS' dropdown menu with options: 'PROJECT APPLICATION', 'ACCOUNT APPLICATION', 'CHECK APPLICATION STATUS', and 'SCHEDULE A VIDEO CONFERENCE'. The main content area has a dark green background with the text 'Your Self-Service Portal At The Oak Ridge Leadership Computing Facility'. Overlaid on this is a white login form titled 'RSA SecurID® (Moderate) Log In' with fields for 'OLCF Username', 'Passcode', and a 'Log In' button.

OAK RIDGE National Laboratory LEADERSHIP COMPUTING FACILITY myOLCF

NEW ACCOUNTS ▾

- PROJECT APPLICATION
- ACCOUNT APPLICATION
- CHECK APPLICATION STATUS
- SCHEDULE A VIDEO CONFERENCE

Your Self-Service Portal  
At The Oak Ridge  
Leadership Computing Facility

RSA SecurID® (Moderate) Log In

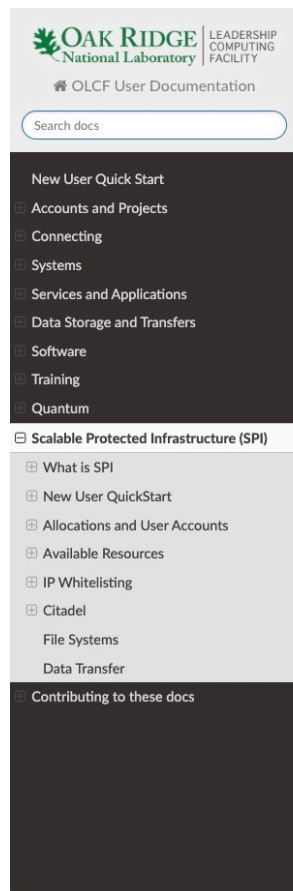
OLCF Username

Passcode

Log In

# Support

- [docs.olcf.ornl.gov](https://docs.olcf.ornl.gov)
- SPI section
  - SPI specific use
- Resource pages
  - Frontier/Summit use
- Questions:
  - [help@olcf.ornl.gov](mailto:help@olcf.ornl.gov)



department can provide a range of externally facing IP addresses that can be whitelisted.

## Citadel

The **Citadel** framework allows use of the OLCF's existing HPC resources **Summit** and **Frontier** for SPI workflows. Citadel adds measures to ensure separation of SPI and non-SPI workflows and data. This section provides differences when using OLCF resources for SPI and non-SPI workflows. Because the Citadel framework just adds another security layer to existing HPC resources, many system use methods are the same between SPI and non-SPI workflows. For example, compiling, batch scheduling, and job layout are the same between the two security enclaves. Because of this, the existing resource user guides still cover the majority of system use methods.

### Note

This section covers differences between SPI and non-SPI workflows, but the existing resource user guides cover the majority of system use methods. Please use the [Summit User Guide](#) and [Frontier User Guide](#) for resource use details.

## Login Nodes

To help separate data and processes, the Citadel framework provides separate login nodes to reach Summit and Frontier's compute resources:

Resource	Citadel Login Node Name	Example
Summit	spilogin1.ccs.ornl.gov	<code>ssh username_projID_mde@spilogin1.ccs.ornl.gov</code>
Frontier	frontierspi.olcf.ornl.gov	<code>ssh username_projID_mde@frontierspi.olcf.ornl.gov</code>

### Note

The Citadel login nodes must be used to submit SPI jobs to Summit and Frontier's compute resources and access the SPI specific filesystem.

The login nodes listed above mirrors the Summit and Frontier login nodes in hardware and software. The login node also provides access to the same compute resources as are accessible from Summit and Frontier's non-SPI workflows.

The Citadel login nodes cannot access the external network and are only accessible from whitelisted IP addresses.

## Connecting

Similar to the non-SPI resources, SPI resources require two-factor authentication. If you are new to the center, you will receive a account approval/creation process. If you are an existing user of non-SPI resources, you can use the same SecurID fob and PIN u





Questions?

Summit

Frontier

We are here



# OLCF Reminders

## Alpine Decommission in 11-weeks

- The GPFS center-wide scratch filesystem, Alpine will be decommissioned on Dec 31
- Data remaining on the system on January 01, 2024, will be **permanently and physically deleted**
- Please migrate any needed data now

## OLCF Annual Survey now open

- Annual survey is now open
- We truly value your feedback
- Only takes 10-minutes

