Introduction to High Performance Computing: Open OnDemand

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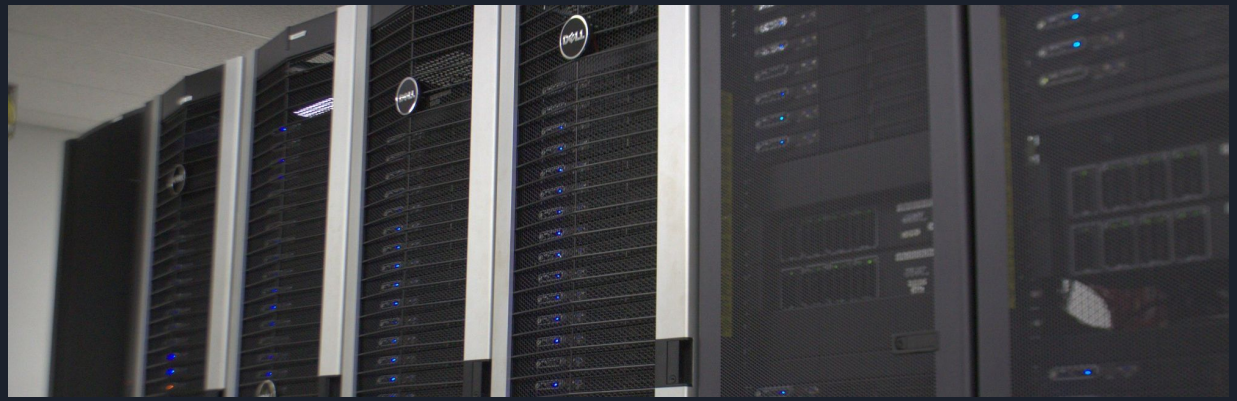
Research Computing Center
March 3 2026

Agenda

- What is the Research Computing Center
- What is High Performance Computing (HPC)
  - HPC Definitions
- Accessing the HPC: Open OnDemand
- Support from RCC Team

What is the FSU Research Computing Center (RCC)

- A unit of the FSU Information Technology Services department
- The team that hosts and administers the main supercomputing resource at FSU: the High Performance Computing system (HPC)



Benefits of High Performance Computing

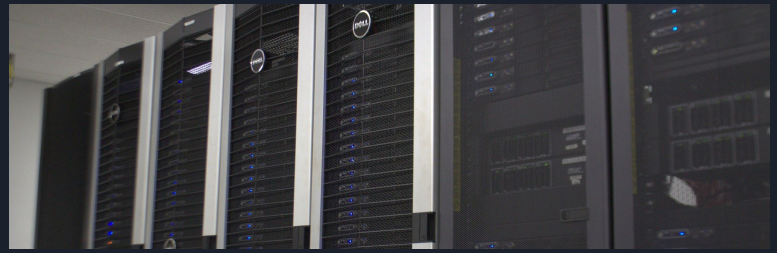
Specialized Hardware

- Contains more processors than the average home computer
- Has several generations of both AMD and Intel Processors
- Can house custom machines (via a research grant) with specialized hardware like special CPUs, DSPs, SSDs, GPUs and otherwise.

Offload Your Work

- Takes pressure off your regularly used desktop, laptop or other devices
- Scales computational processes not possible on home machines
  - parallel processes
- Runs tasks that need to be repeated many times over a long period of time

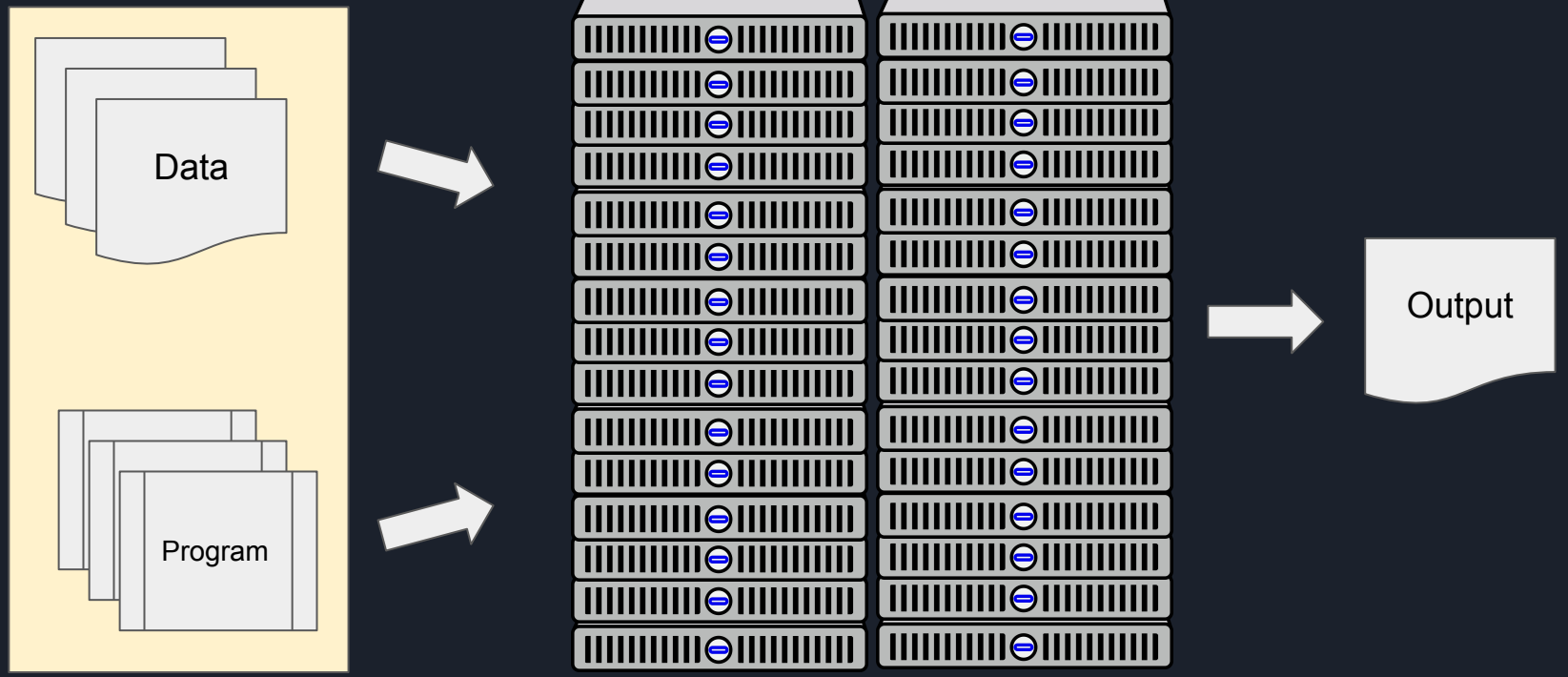
HPC Metrics



~650 Nodes	70+ GPUs	~20,500 Processors	500+ TeraFLOPS	~29,000,000 jobs
Beowulf Cluster AlmaLinux 8.6	NVIDIA: - GTX 1080 Ti - A4000 - A4500	AMD, Intel	(Not Including GPUs)	Since 2008

HPC Definitions

HPC Job



How HPC Works

FSU's HPC is a shared resource for all FSU researchers

Job Scheduler: SLURM

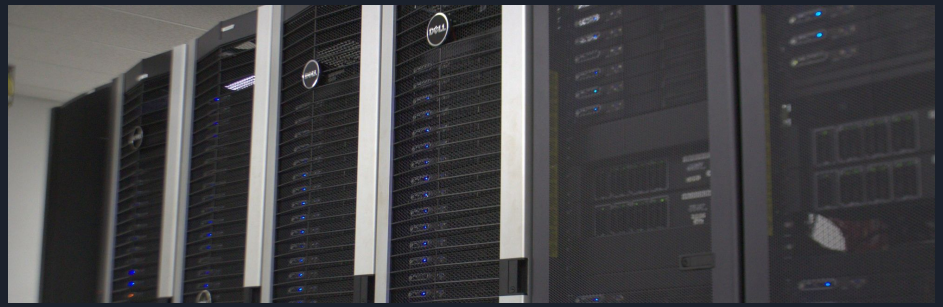
- Directs jobs so they can be processed quickly and effectively
- Allocates resources to jobs so the HPC does not freeze up

User Accounts

- Logins and Home Directories

Slurm Accounts

- Queues / Partitions



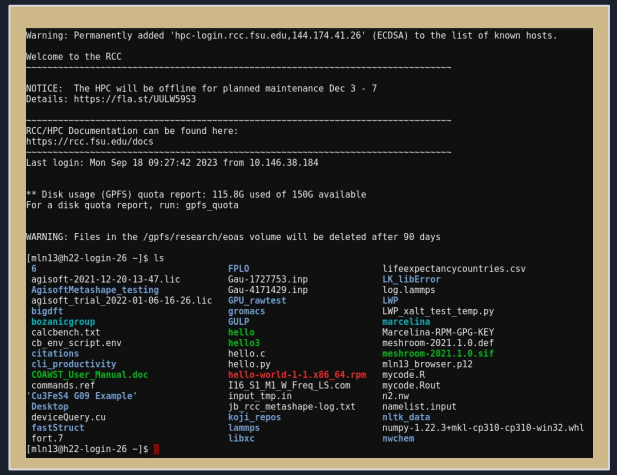
Job Scheduler: SLURM

How to Access the HPC?

Ways to Use HPC

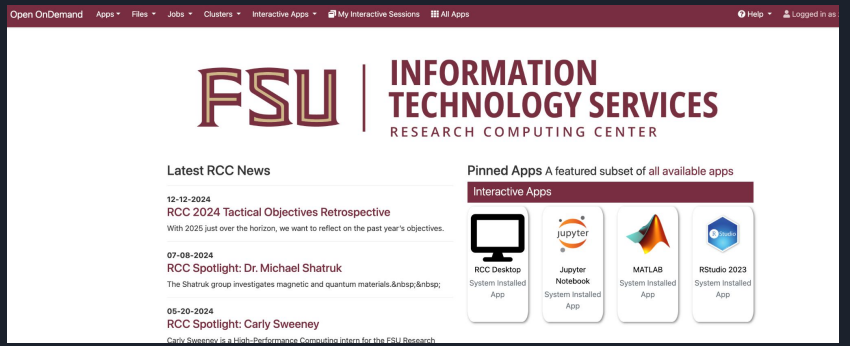
Command-Line Interface

- Any SSH-Supporting CLI Terminal



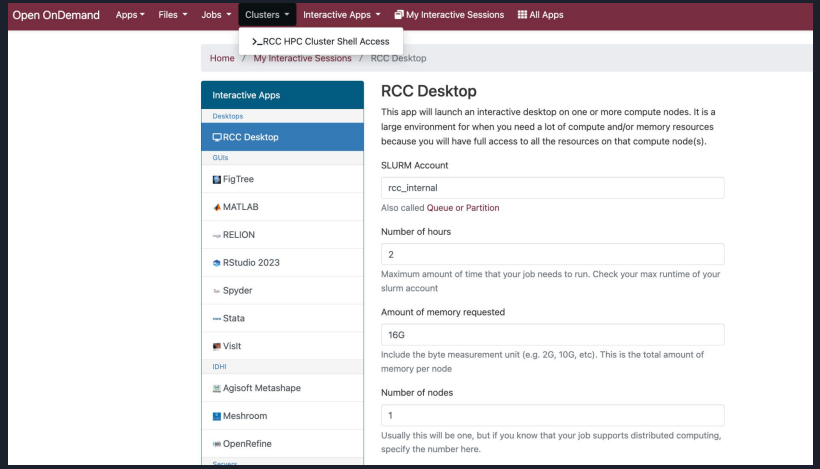
Graphical Interface

- Open OnDemand



Graphical Interface: Open Ondemand

- **GUI Applications**
  - RCC Desktop
  - MATLAB
  - STATA
  - VisIt
- **Servers**
  - Jupyter Notebooks
  - RStudio Server
- **Visualizations**
  - PyMOL
  - VMD
  - …

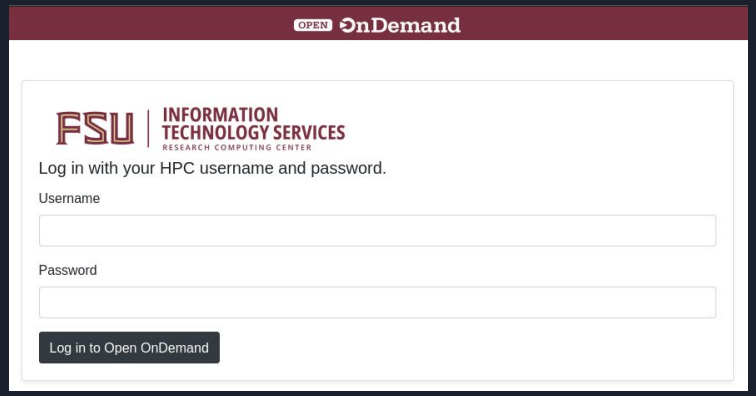


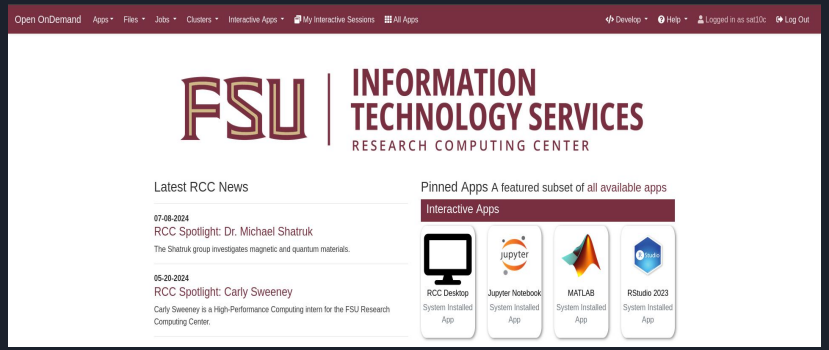
ood.rcc.fsu.edu

https://rcc.fsu.edu/docs/ood

Submitting Jobs to the HPC System

Open OnDemand Interactive Jobs





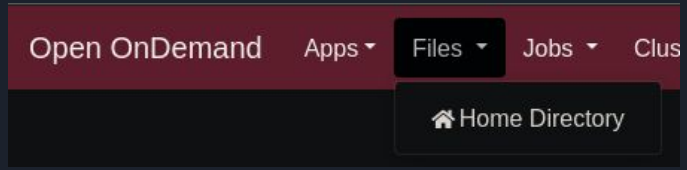
Login Page

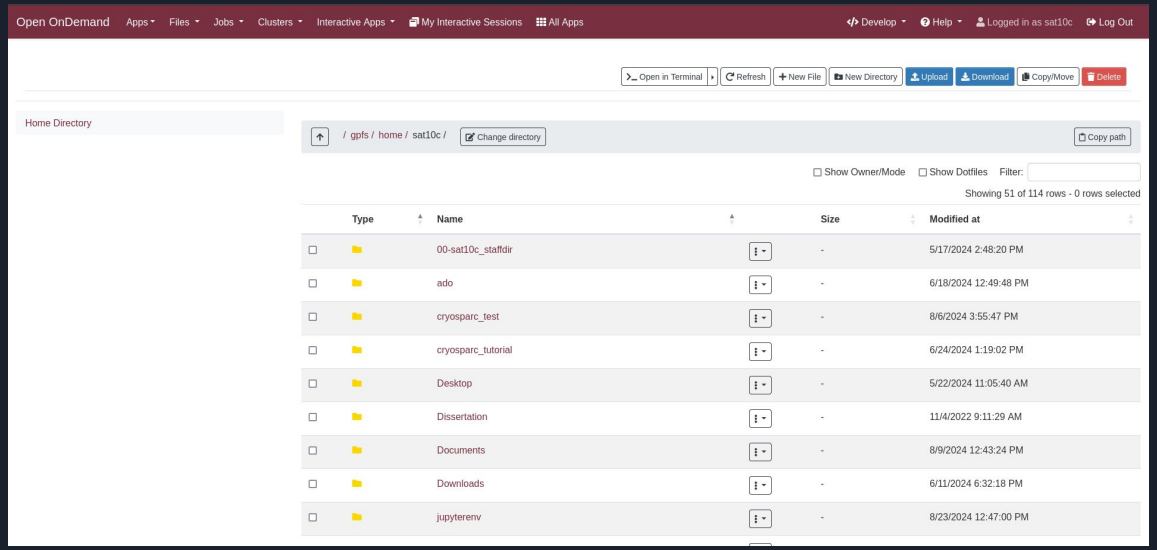
- Click the Link: ood.rcc.fsu.edu
- Login Credentials: Your RCC Account details

Landing Page

- Apps
- Files
- Jobs
- Clusters
- Interactive Apps
- My Interactive Sessions

Open OnDemand File Manager

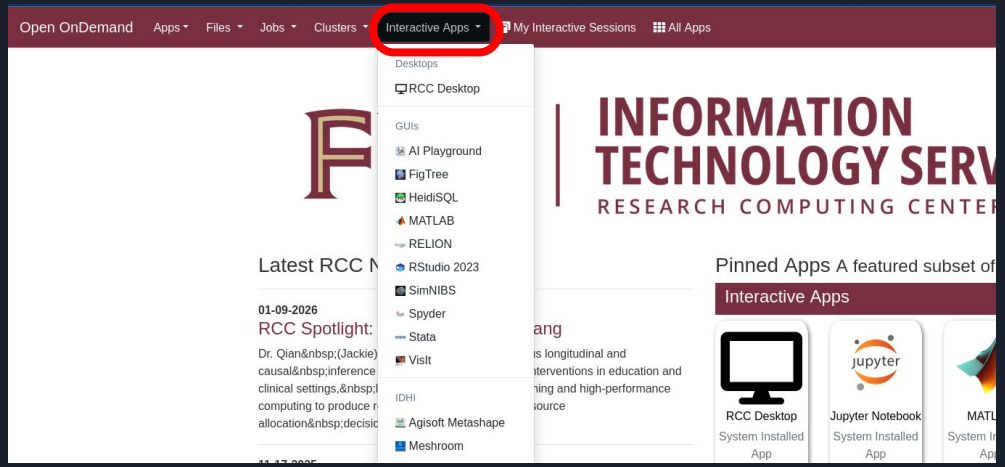


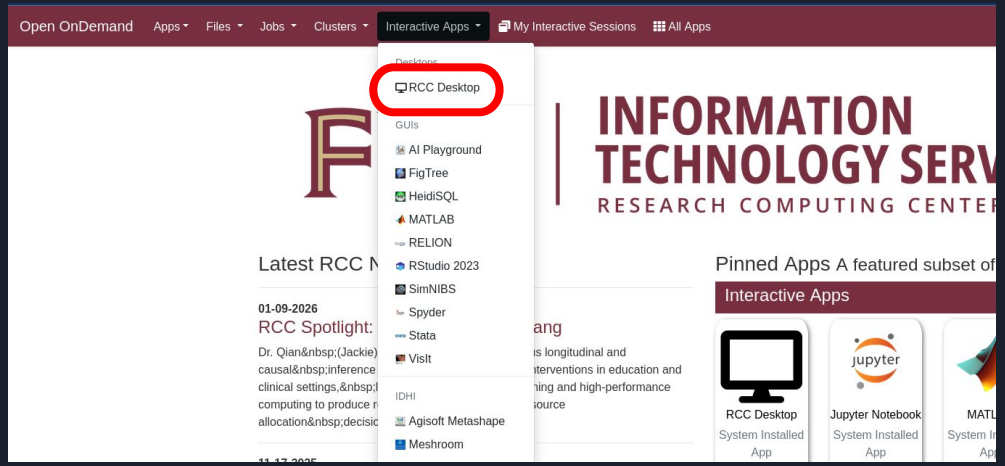


- Browse files on the HPC
- View files
- Edit files
- Delete and move files
- Upload small files (code or small datasets < 10 GB)
- Download small files (code or small datasets < 10 GB)
- Data Transfer Docs

Open OnDemand Resource Allocation

Resource Allocation





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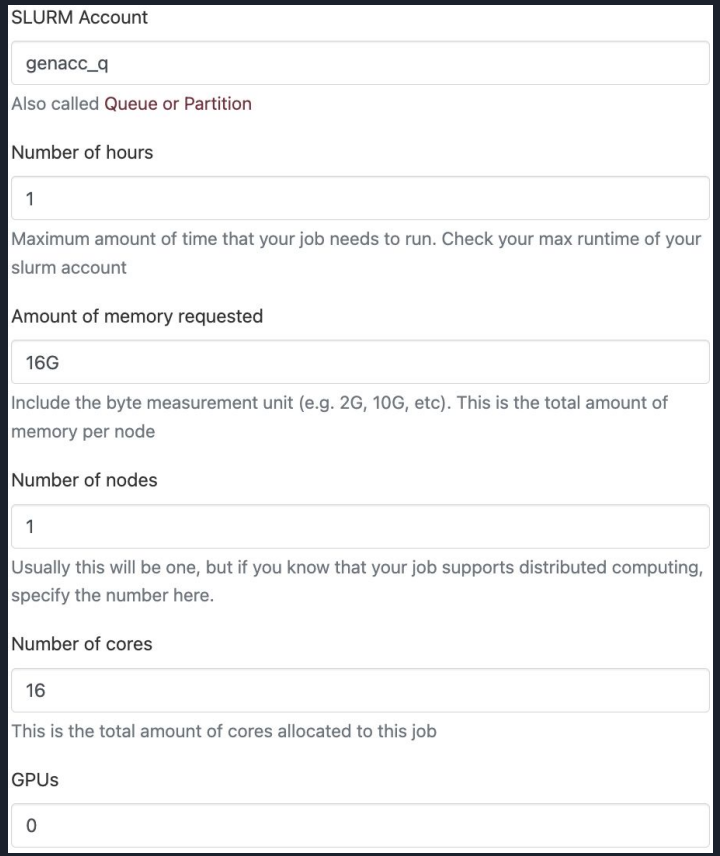
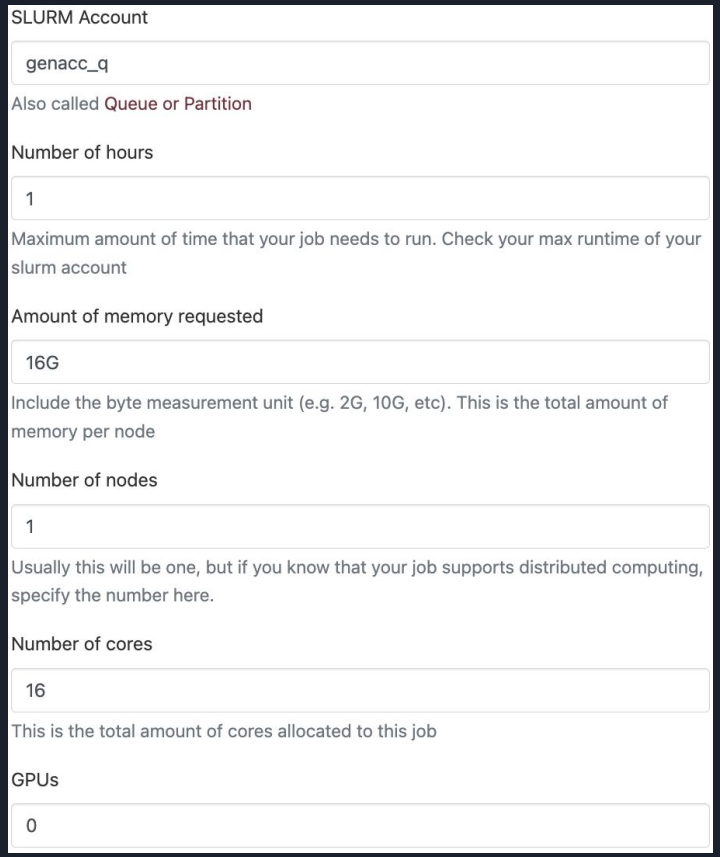


SLURM Account

- *The set of computers you want to pull resources from*
- *If you leave this blank, it will default to the **genacc_q** SLURM Account.*

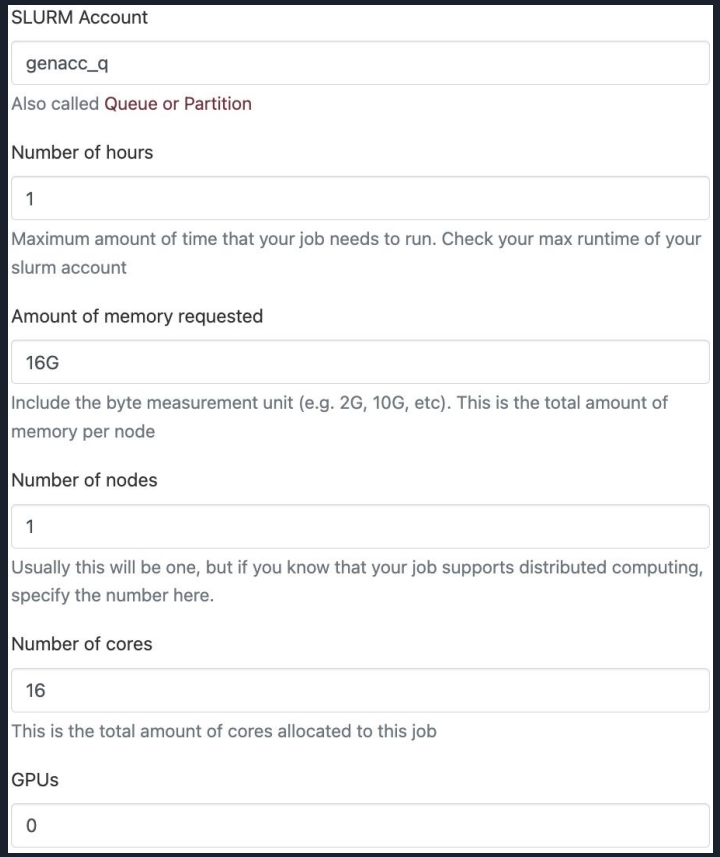
Resource Allocation



Number of Hours

- *Maximum amount of time you expect to need for your work*
- *Maximum runtime for each SLURM account*

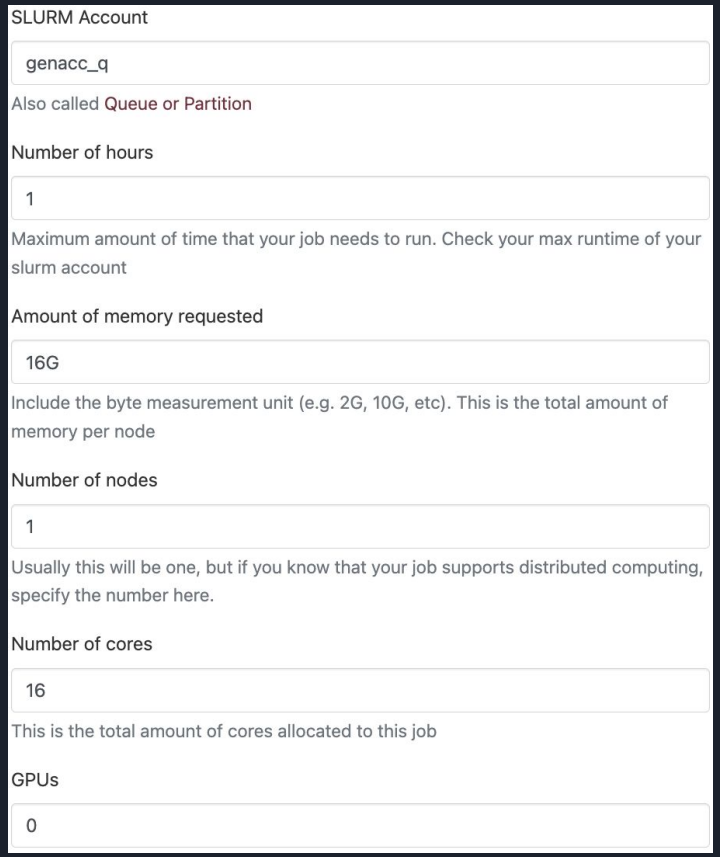
Resource Allocation



Amount of Memory Requested

- *The **total amount of memory** you expect to need per node for your job*

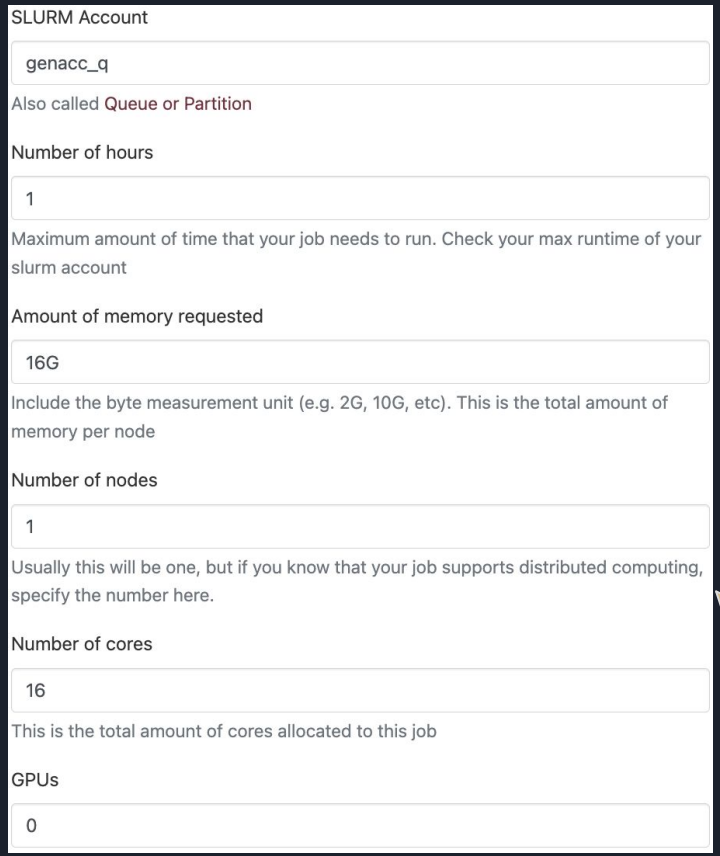
Resource Allocation



Number of Nodes

- *The number of individual computer machines you want to use. (Not all OOD apps will have this option available!)*

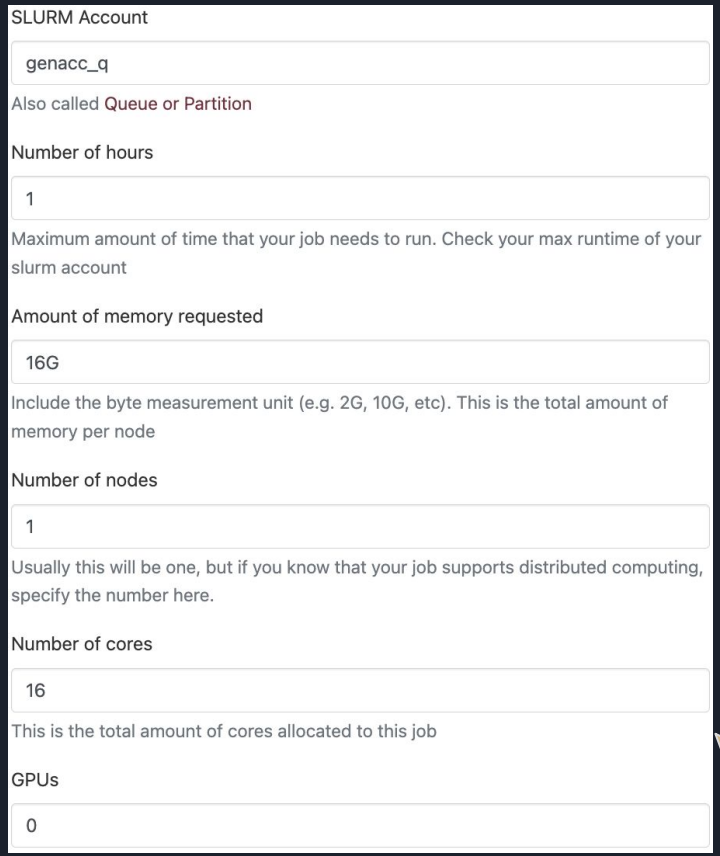
Resource Allocation



Number of Cores

- *The total number of cores you want to use for your job*
- *Maximum cores for each SLURM account*

Resource Allocation



GPUs

- *The number of GPU cards you want to use for your job (can leave at 0 if none needed).*

Exercise 1:

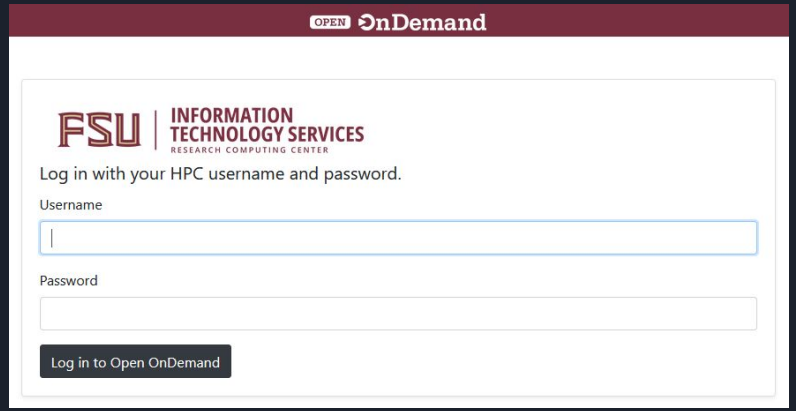
1. Navigate to https://ondemand.rcc.fsu.edu
2. Log in with your RCC workshop Credentials
3. Navigate to the RCC Desktop Interactive App
4. Set up RCC Desktop with the following resources:

Slurm Account	workshop
Hours	1
Memory	16G
Cores	4
GPUs	0
Internet Access Proxy	Checked

5. Launch the job
6. Open the RCC Desktop and look around a bit!

Solution

1. Open OOD in a Browser
   https://ood.rcc.fsu.edu



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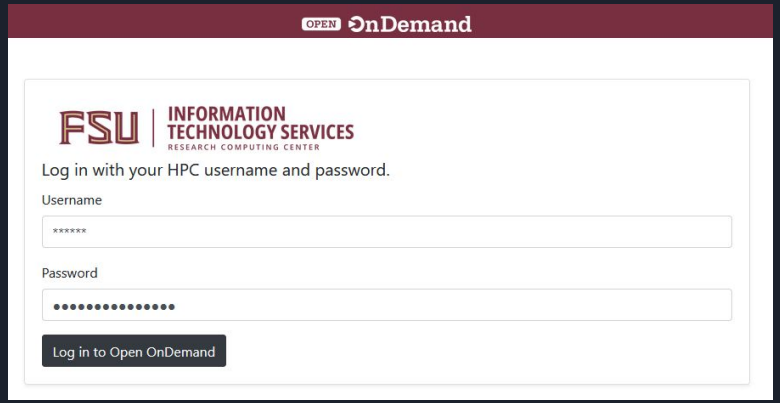
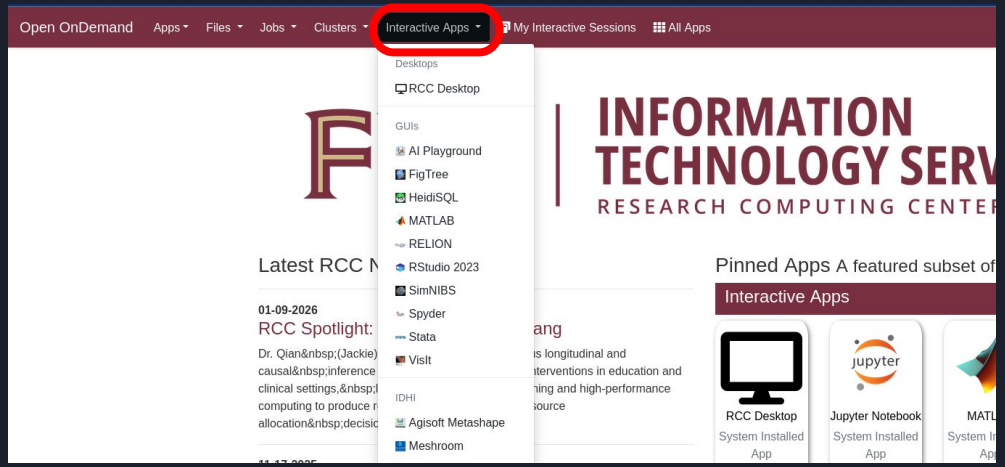
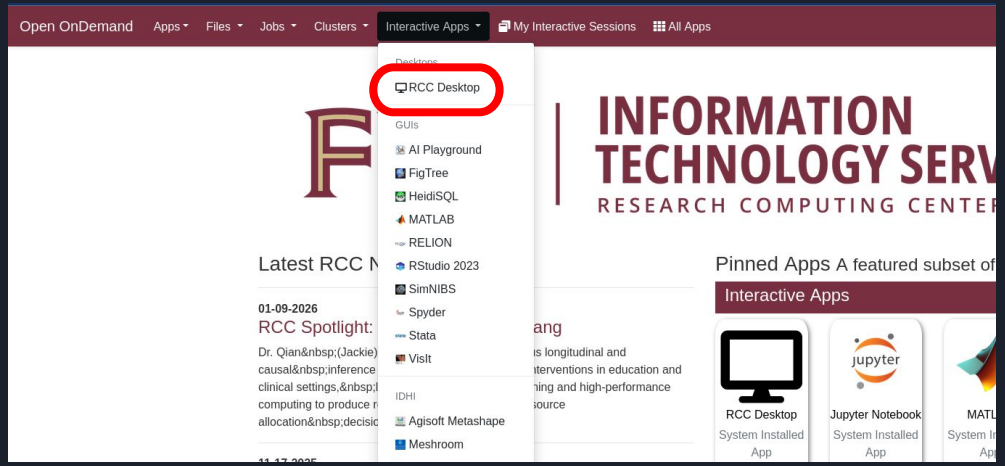


Solution

3. Navigate to the RCC Desktop app

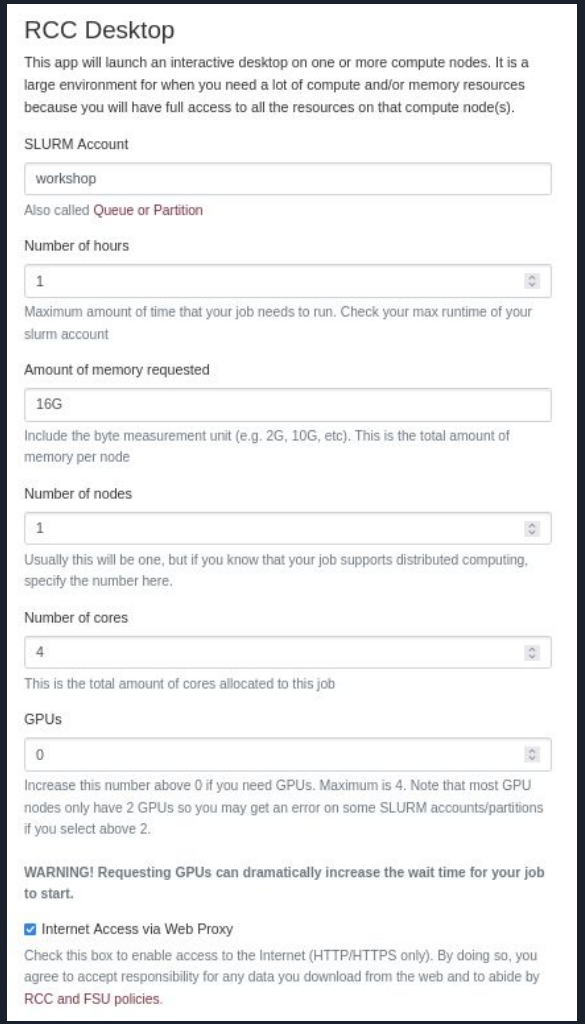




Solution

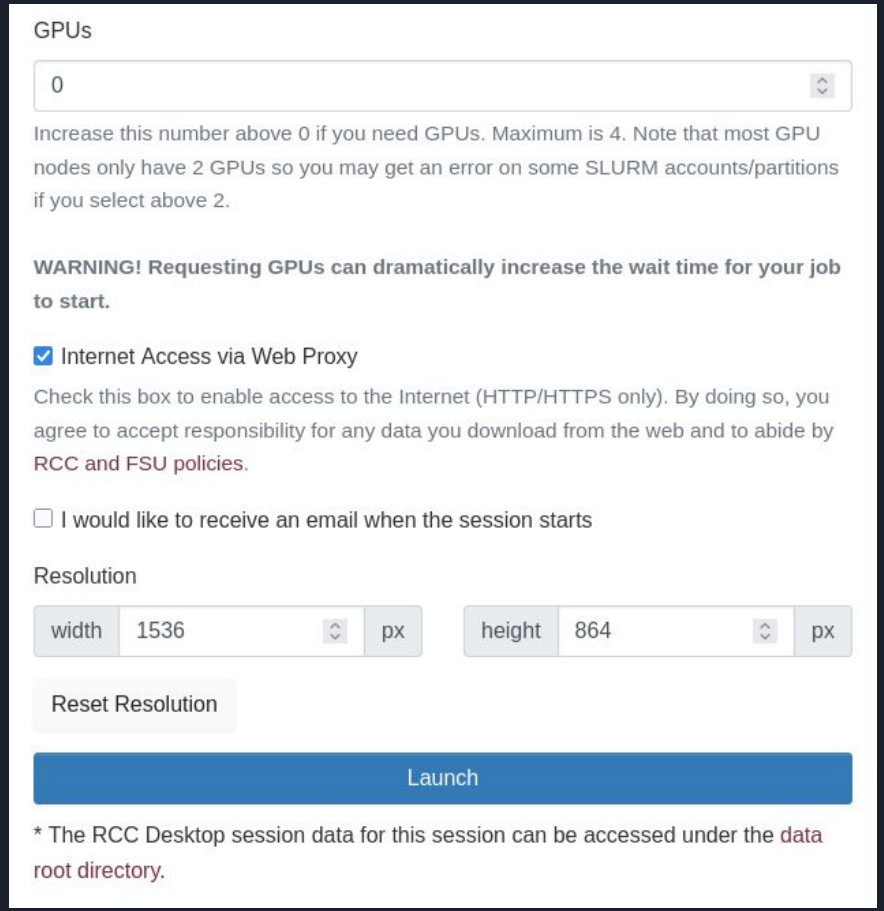
4. Set up RCC Desktop with the following resources:

- **workshop** SLURM Account
- 1 Hours
- 16 GB of Memory
- 1 Node
- 4 Cores
- No GPUs
- Internet Access via webproxy



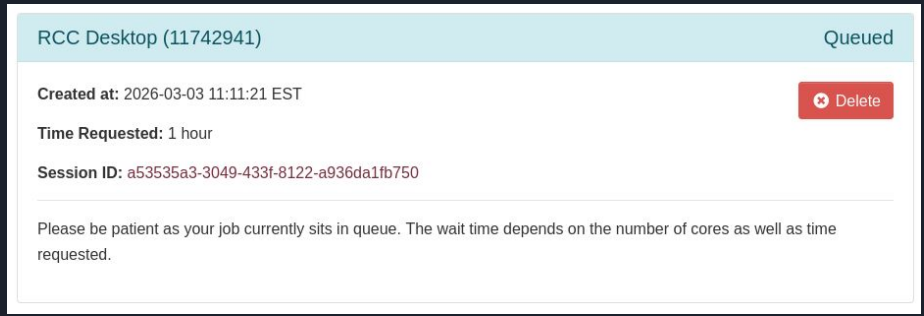
Solution

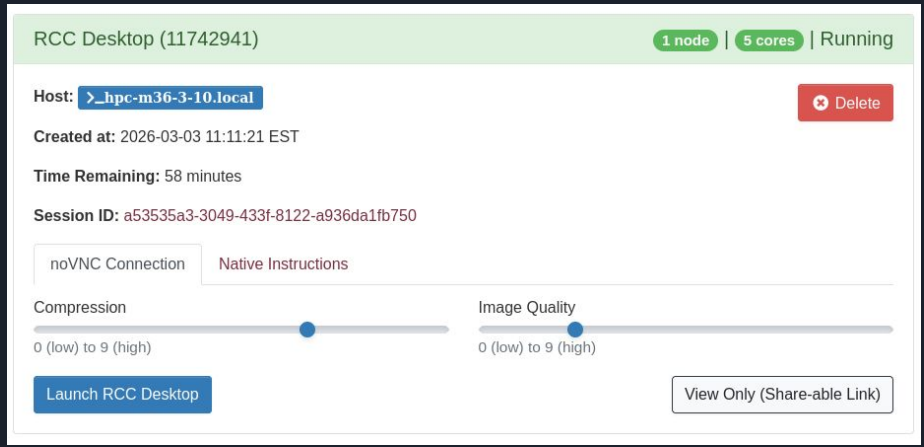
5. Launch the job
   - *Click the blue Launch button at the bottom of the Open OnDemand job setup screen.*



Solution

6. Open the RCC Desktop window
   - *A Queuing Screen*
   - *The job will appear in BLUE while it waits for resources*
   - *When the job is ready, the box will turn green*
   - *Click the blue “Launch RCC Desktop” button*



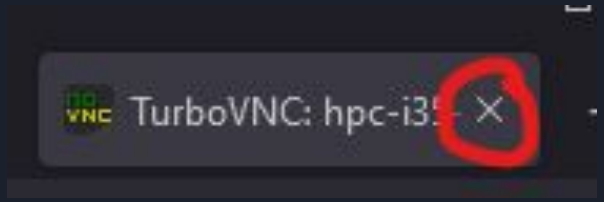


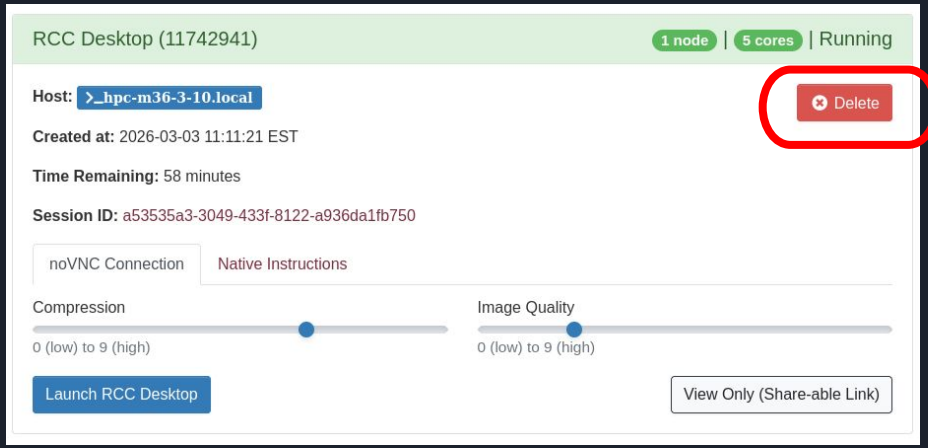
Solution

7. Click the “Launch RCC Desktop” button

Solution

8. Close the session:
   - Close the tab your Open OnDemand session
   - You will be back to the “My Interactive Sessions” tab
   - Click the “Delete” button to end the job





Support from RCC Team

Register For an Account

Faculty Requirements

- FSU ID and password

Student Requirements

- FSU ID and password
- Faculty Sponsor

Guest (non-FSU)

- Guest FSU ID
- Faculty Sponsor

www.rcc.fsu.edu/manage

Infrastructure

FSU | INFORMATION TECHNOLOGY SERVICES
RESEARCH COMPUTING CENTER

Physical Location

- Cluster held in the Sliger Data Center in Innovation Park. Tours available!

Standard HPC accounts

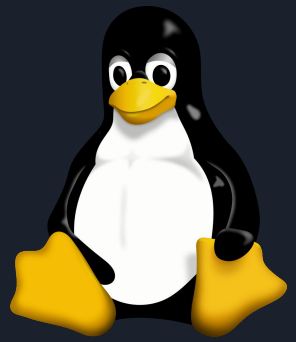
- 1 Home directory per user
- 150GB of Parallel Storage
- Temporary Scratch Space (Space Limit is variable)
- Access to the General Access Queues
- Accessible via Open On Demand and CLI

Infrastructure

Additional Paid Features for RCC Accounts

- Access to highly scalable Parallel and Archival storage systems
- Priority access to dedicated computing resources in your own queue
- Custom and specialized hardware and infrastructure (as available)

OPEN OnDemand



General Access Slurm Accounts

https://acct.rcc.fsu.edu/manage/hpc_partitions

Slurm Account	Default Runtime	Max Runtime	Max CPU Cores/Job	Max Jobs/User	Max Running Jobs/User
`genacc_q`	14 days	14 days	400	100	100
`backfill`	4 hours	4 hours	512	100	100
`backfill2`	4 hours	4 hours	512	100	100
`condor`	14 days	90 days	8	100	100
`quicktest`	10 minutes	10 minutes	8	2	1

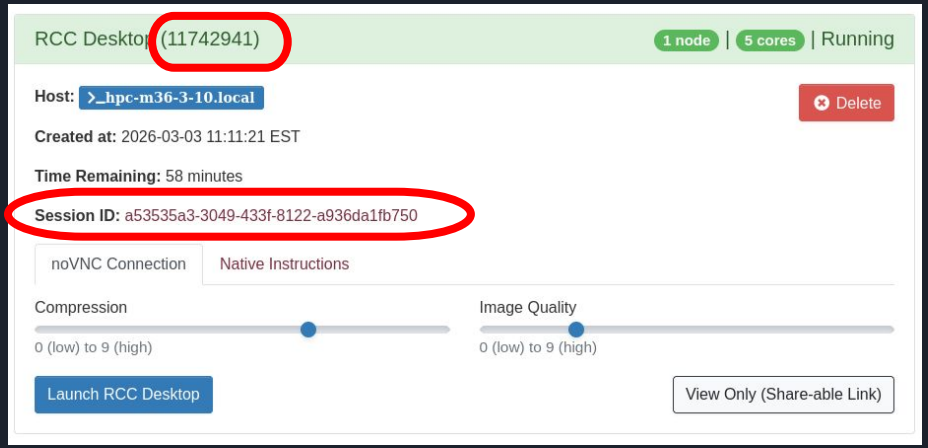
Support Services

Basic Software Support

- Basic Software installation, configuration, and maintenance
- Technical support for installed applications and software
  - Provide your Session ID and or Job ID
- Workflow process support and improvement assistance
- Assistance with HPC commands and utilities

Basic Hardware Support

- Data Center Colocation



Support Services

Additional Paid Support (more Information)

- Software Development Consulting
- Complex or Highly Customized Software Installations
- In-depth HPC and software focused consulting for research projects

RCC Service Metrics

2 Million

Average Jobs per Year

2,200+

Support Cases Serviced since 2022

Software Team Services

- Regular Office Hours 9AM - 5PM Monday through Friday
  - We work a hybrid schedule and are available by Zoom or email
  - Dirac Science Library 151

Email us at support@rcc.fsu.edu
for any questions or concerns

Software Team Services

- HPC Drivers Ed - Introductory HPC materials
  - Videos and links for ssh, Open OnDemand, Matlab, Python, and R Studio
  - Available as a Canvas course
- docs.rcc.fsu.edu - RCC Official Documentation

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RCC Upcoming Events

Spring 2026

- Python Bootcamp - March 31, 2026 9-4pm [Hybrid]
- REDCap Lunch Learn and Collaborate 12:30 - 1:30 [Virtual]
  - March 25 - Users Roles and DAGs
  - April 29 - Logic and Syntax

Survey

Questions?

Exercise

Exercise A:

1. Navigate to https://ondemand.rcc.fsu.edu
2. Log in with your RCC Credentials
3. Navigate to the MATLAB Interactive App
4. Set up a MATLAB Job with the following resources:
    a. *4 Hours*
    b. *Using the **workshop** SLURM Account*
    c. *4 Cores*
    d. *16 GB of Memory*
    e. *No GPUs*
    f. *MATLAB 2022b Version*
    g. *Leave everything else default*
5. Launch the job
6. Open the MATLAB window in OOD and look around a bit!

Solution

1. Open OOD in a Browser
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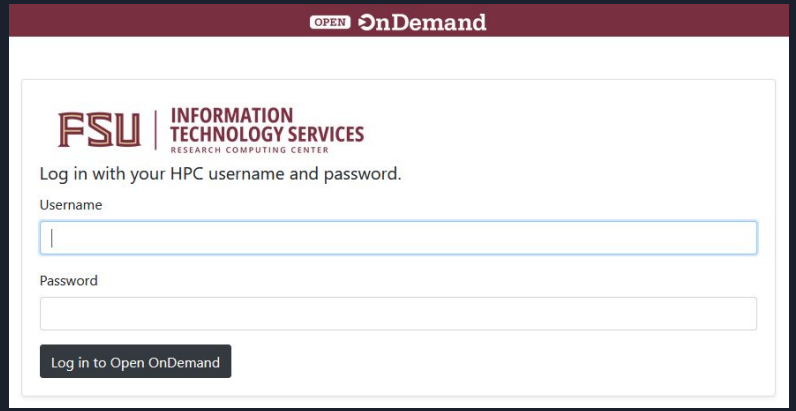

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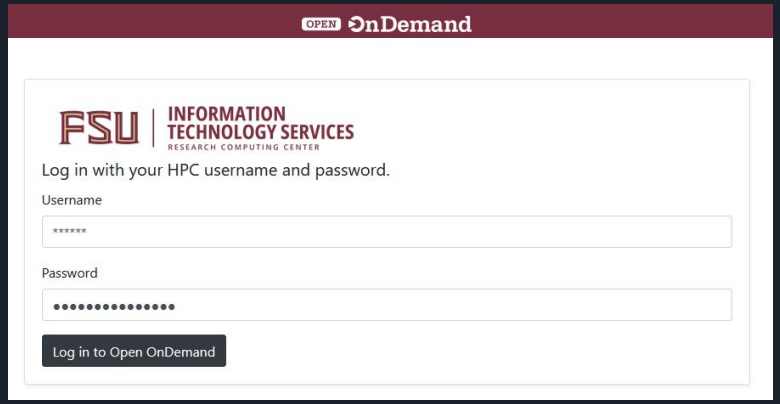

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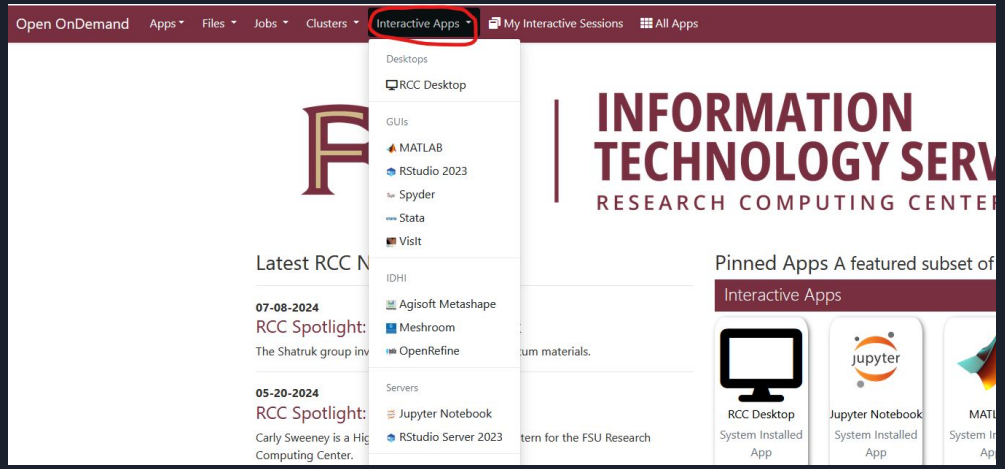
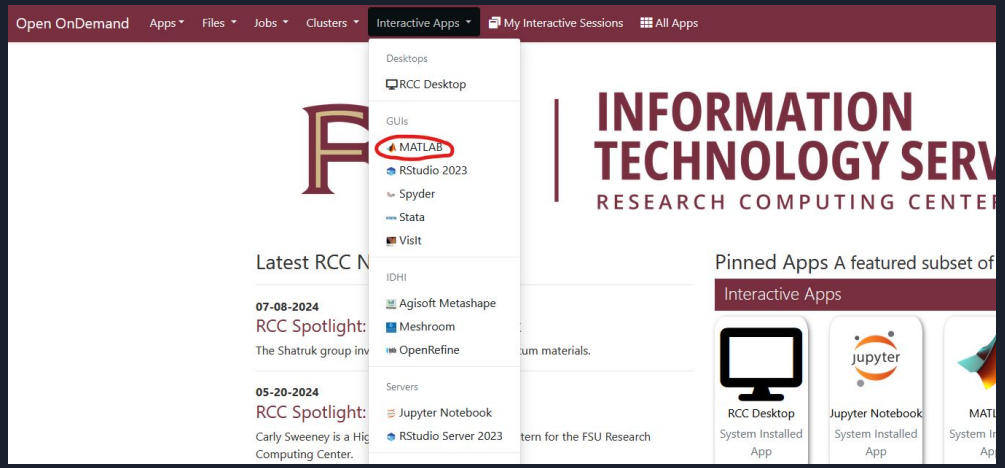
3. Navigate to the MATLAB Interactive App

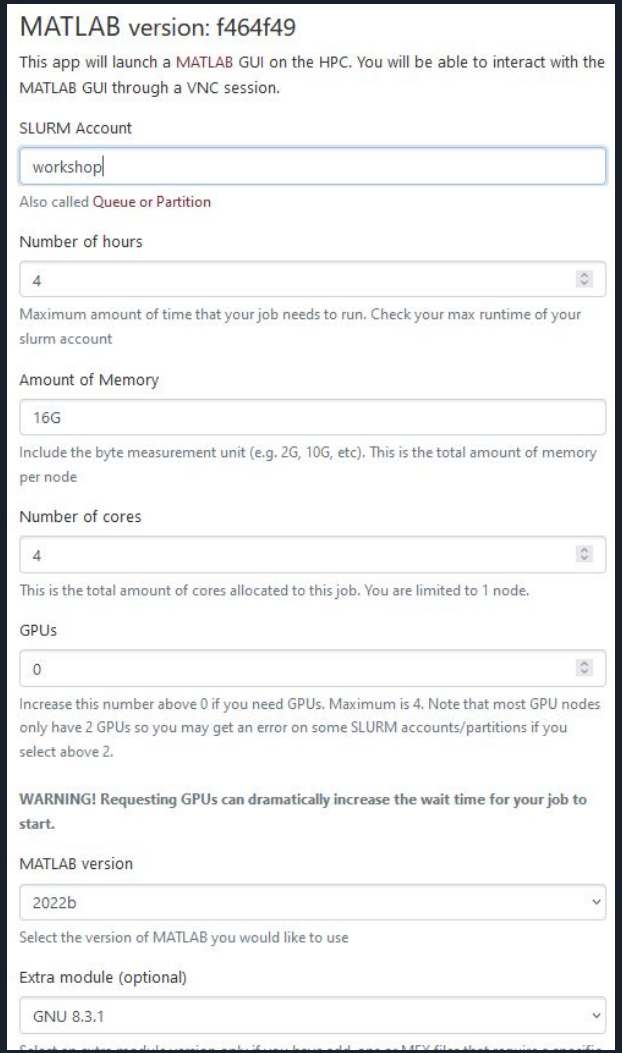




Solution

4. Set up a MATLAB Job with the following resources:

- *4 Hours*
- *Using the **workshop** SLURM Account*
- *4 Cores*
- *16 GB of Memory*
- *No GPUs*
- *MATLAB 2022b Version*
- *Leave everything else default*



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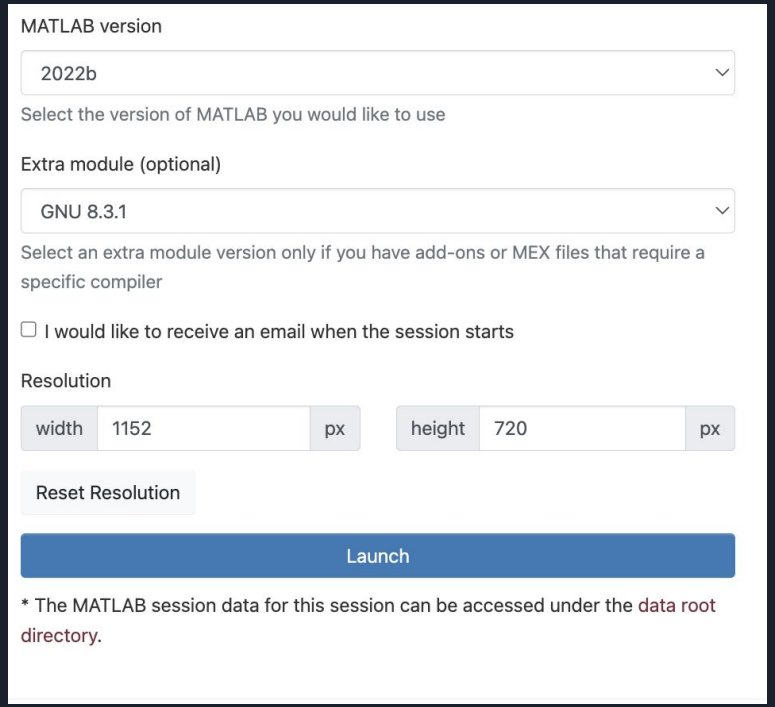

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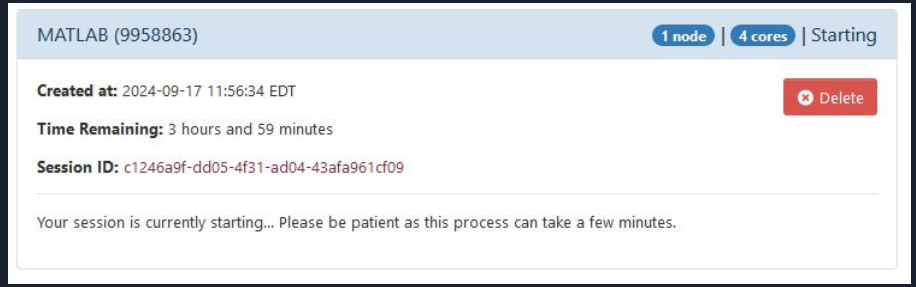
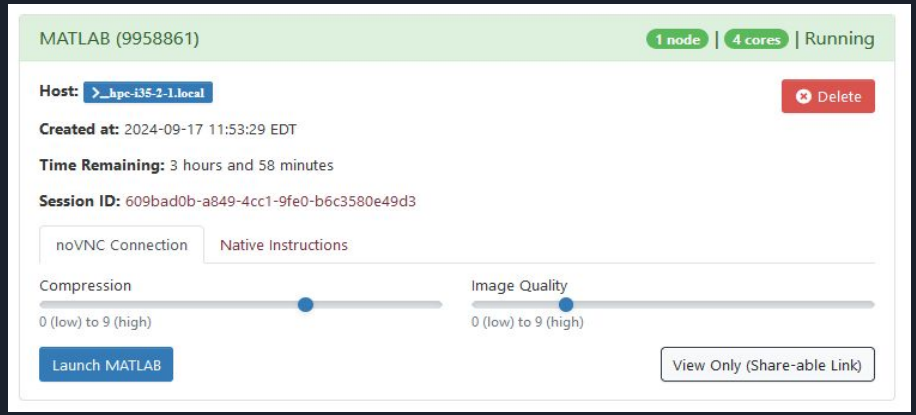
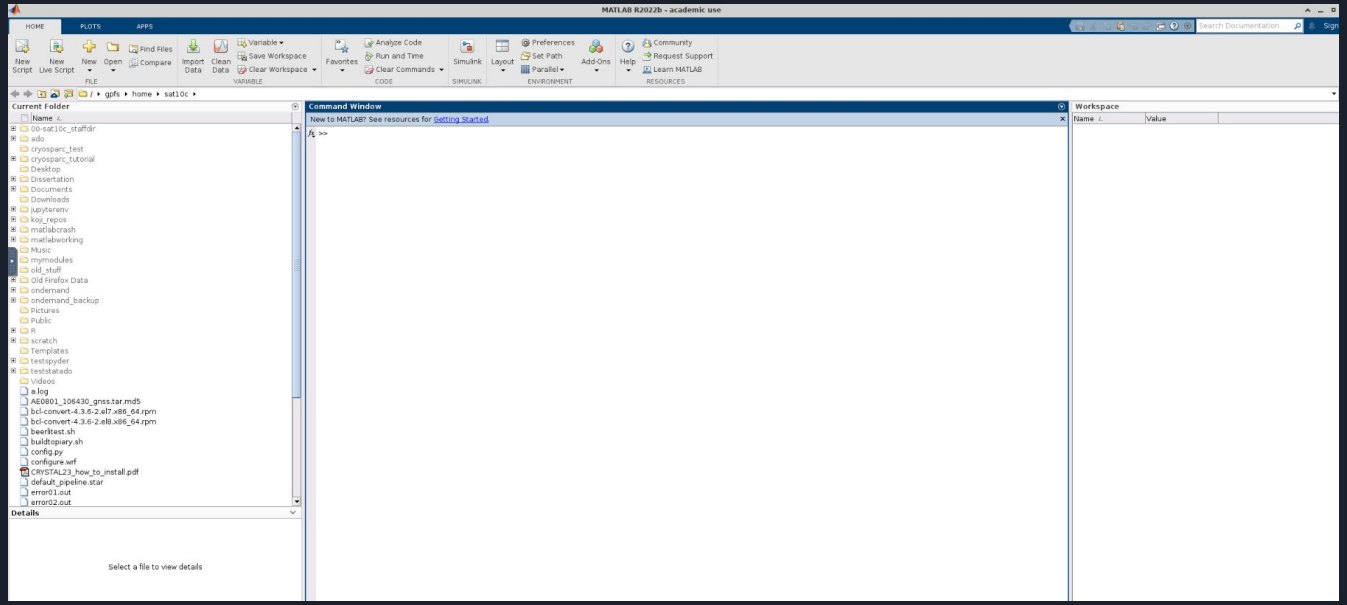
   - *Click the blue "Launch MATLAB" button*





Solution

7. Click the “Launch MATLAB” button
   - *It may take 2-3 minutes for MATLAB to fully launch*



Solution

8. Close the session:
   - Close the tab your Open OnDemand session
   - You will be back to the “My Interactive Sessions” tab
   - Click the “Delete” button to end the job