

# **DU's Research Data Analysis Cluster (RDAC)**

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MAC lab meeting

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# Goals

## 1. Terminal

- Navigating the file system
- Basic commands

## 2. Research Data Analysis Cluster (RDAC)

- What is it?
- Logging in
- Modules (programs, tools, apps, etc)
- Job submission script (SLURM)

# Terminal

Command line or console that allows us to do things on the computer without a graphical user interface (GUI)

Terminal (Mac OS X) or Command prompt? (Windows)

Lets us connect to other systems

# Navigating the file system

`pwd` → print working/current directory (where are you now?)

`ls` → list files in current directory

`cd` → change directory

`cd /` change to root directory (highest directory)

`cd` or `cd ~` change to home directory

`cd ../` move one directory up

`cd ../../` move two directories up

# Create, move, rename, delete

`mkdir` → make a new directory  
`rmdir` → remove empty directory  
`rm` → remove file  
`cp` → copy  
    `cp -r` copy directory  
`mv` → move or rename file  
`cat` → create or view file

For command options → `man <command>`  
e.g. `man rm`

# Let's try it

1. Open terminal, see where you are ('pwd')
2. Navigate to desktop (e.g. 'cd ~/Desktop')
3. Create a directory ('mkdir <directory name>')
4. Navigate to that directory ('cd <directory name>')
5. Create a text file ('cat > filename.txt')
6. Delete text file ('rm filename.txt')
7. Move up one directory (cd ../)
8. See if our new (now empty) directory is there ('ls')
9. Delete directory ('rmdir <directory name>')

# Research data analysis cluster (RDAC)

High performance computing resource

“...practice of combining computers in a way that delivers much higher performance than one could get out of a single desktop computer or workstation in order to solve large problems.”

(<https://www.du.edu/it/services/research-services/research-computing>)

# Research data analysis cluster (RDAC)

Focusing on Mac but similar idea with Windows

<https://www.du.edu/it/services/research-services/research-computing>

Requires

- 1) Xquarts (Xming on Windows)
- 2) Connected to VPN (Citrix SSO)



# RDAC – signing on

VPN (Citrix SSO)

In terminal (or Xquarts):

```
ssh -Y <username>@rdac.du.edu
```

# RDAC – modules

List what's available → module avail

Load the module → module load apps/<module name>

Open the module → <module name>

# RDAC - SLURM job submission

1. Allocates exclusive and/or non-exclusive access to resources (compute nodes) to users for some duration of time so they can perform work.
2. Provides a framework for starting, executing, and monitoring work on the set of allocated nodes.
3. Arbitrates contention for resources by managing a queue of pending work.

[https://univofdenver.service-now.com/sp?id=kb\\_article&sys\\_id=15b7421a1b1dd890a5900d01cd4bcbf5](https://univofdenver.service-now.com/sp?id=kb_article&sys_id=15b7421a1b1dd890a5900d01cd4bcbf5)

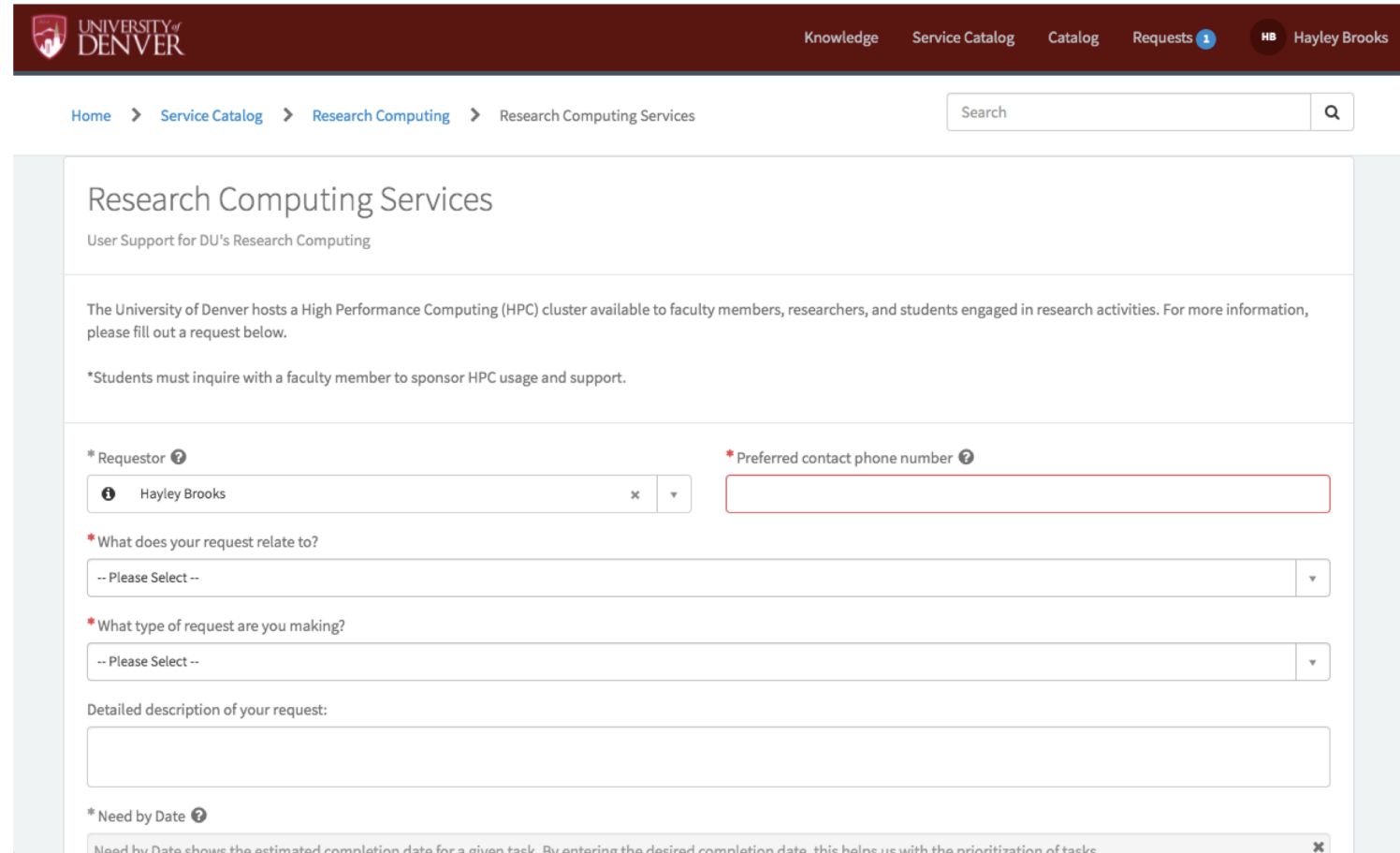
# SLURM job submission script

Can run a single job

Or multiple jobs (job array)

# Suggestions

- Start simple
- Google everything
- Have a low bar for submitting a request (Ivan Kovanda)



The screenshot shows the University of Denver Research Computing Services website. The header includes the university logo and navigation links: Knowledge, Service Catalog, Catalog, Requests (with a notification icon), and a user profile for Hayley Brooks. The breadcrumb trail indicates the path: Home > Service Catalog > Research Computing > Research Computing Services. A search bar is located in the top right. The main content area is titled "Research Computing Services" with the subtitle "User Support for DU's Research Computing". A paragraph explains that the university hosts a High Performance Computing (HPC) cluster for faculty, researchers, and students, and asks them to fill out a request. A note states that students must inquire with a faculty member to sponsor HPC usage. The form contains several fields: a required "Requestor" field with a dropdown menu showing "Hayley Brooks"; a required "Preferred contact phone number" field; a required "What does your request relate to?" dropdown menu with "-- Please Select --"; a required "What type of request are you making?" dropdown menu with "-- Please Select --"; a "Detailed description of your request:" text area; and a required "Need by Date" field with a tooltip explaining that it shows the estimated completion date for a given task. The form is designed to be simple and accessible.

UNIVERSITY of DENVER

Knowledge Service Catalog Catalog Requests 1 HB Hayley Brooks

Home > Service Catalog > Research Computing > Research Computing Services

Search

## Research Computing Services

User Support for DU's Research Computing

The University of Denver hosts a High Performance Computing (HPC) cluster available to faculty members, researchers, and students engaged in research activities. For more information, please fill out a request below.

\*Students must inquire with a faculty member to sponsor HPC usage and support.

\* Requestor ⓘ

Hayley Brooks x v

\* Preferred contact phone number ⓘ

\* What does your request relate to?

-- Please Select -- v

\* What type of request are you making?

-- Please Select -- v

Detailed description of your request:

\* Need by Date ⓘ

Need by Date shows the estimated completion date for a given task. By entering the desired completion date, this helps us with the prioritization of tasks. x