Connecting to R2 cluster at Boise State

1. To connect to R2 you need to be on campus network, or connected to Boise State VPN. For instructions on VPN, go to: https://www.boisestate.edu/oit-network/vpn-services/

2. You will need a terminal app. You have terminal on Linux and Mac by default. If you are on a Windows machine, download and install MobaXTerm: https://mobaxterm.mobatek.net/download.html

3. In the terminal, type: `ssh -XC <R2 username>@r2-login.boisestate.edu` where <R2 username> is your R2 username (not necessarily your Boise State username)

4. You will be prompted for a R2 password. The first time around it will be a password provided by OIT. Once you log in for the first time, change your password by typing `passwd` in the R2 terminal

Navigating R2

You use basic unix commands to navigate R2 (see unit handout in resources folder):

`ls` - list the content of current directory

`pwd` - show the path to current directory

`cd <directory_name>` - open <directory_name>

`mkdir <directory_name>` - create <directory_name>

`cp <file_to_copy> <destination>` - open <directory_name>

`emacs <file_name>` - open <file_name> in emacs (works the same for vi <file_name>)

`cat <file_name>` - show content of <file_name>

`tail -n 20 <file_name>` - show last 20 lines of <file_name>

`head -n 15 <file_name>` - show first 15 lines of <file_name>

Moving data to/from R2

This section will be updated once we get to move large files, or OIT starts to shout at us, but for now we do the following to copy a file from your computer to R2 (do this on your computer in the directory where a file you want to move is located):

```
scp <file> <R2_username>@r2-login:~/<destination_folder_on_R2>
```

When you want to move a file from R2 to your computer, do the following (from your computer, not while ssh to R2):

```
scp <R2_username>@r2-login:~/<file_on_R2> .
```

The dot at the end means you want to copy a file to your current directory. If you want another location, just type the path to it at the end (instead of the dot)

Running jobs on R2

Basic commands:

`squeue` - check the current jobs in the queue

`sbatch <script_name>` - submit job from <script_name>

`scancel <job_number>` - cancel execution of the job with <job_numer>

Your submission script could look like this:

```
#!/bin/bash
###
###
#SBATCH --time=01:00:00                 # maximum runtime for the job
#SBATCH --tasks=1                       # how many tasks (processors)
#SBATCH --partition=classroom           # which queue to use
#SBATCH --job-name=fdiff                # job name
#SBATCH --output=fdiff.o%j              # output name

module load gcc                         # load gcc compiler
module load openmpi                     # load mpi library

mpiexec -np 1 ./finite_difference 10000000       #run your code
```