

Introduction to Midway2

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BFI

References:

- <https://rcc.uchicago.edu/docs/>
- Clindaniel MACS-30123

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What is and why Midway2?

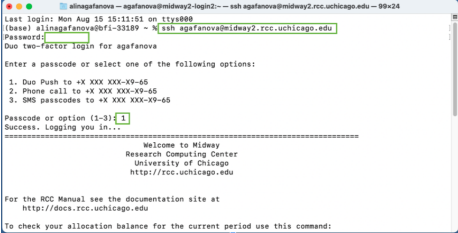
- High-performance computing platform at the UChicago's Research Computing. Other computing resources such as **Acropolis Cluster**.
- Necessary and important when running out of computing powers on your local machine
 - Storing and working with heavy data files
 - Parallel computing of computationally expensive tasks

Requesting an account

- RPs request a General User Account associated with their PIs account via <https://rcc.uchicago.edu/accounts-allocations/general-user-account-request>.
- Your PI might or might not have resources allocated to their account. Allocation request can be submitted through <https://rcc.uchicago.edu/accounts-allocations/research-i-allocation-request>.

Connecting to Midway2: terminal

- Same credential as CNetID login and passwords
- Open terminal and enter
`ssh <CNetID@midway2.rcc.uchicago.edu>`
- It will prompt you to enter password and proceed with the regular two-factor authentication (2FA).



```
alinagafanova — agafanova@midway2-login2:~ — ssh agafanova@midway2.rcc.uchicago.edu — 99x24
Last login: Mon Aug 15 15:11:51 on ttys000
(base) alinagafanova@bf1-33189 ~ % ssh agafanova@midway2.rcc.uchicago.edu
Password:
Duo two-factor login for agafanova

Enter a passcode or select one of the following options:

1. Duo Push to +X XXX XXX-X9-65
2. Phone call to +X XXX XXX-X9-65
3. SMS passcodes to +X XXX XXX-X9-65

Passcode or option (1-3): 1
Success. Logging you in...

=====
                        Welcome to Midway
                        Research Computing Center
                        University of Chicago
                        http://rcc.uchicago.edu

For the RCC Manual see the documentation site at
http://docs.rcc.uchicago.edu

To check your allocation balance for the current period use this command:
```

Connecting to Midway2: graphical interface

- You can also connect and use Midway2 without terminal (though less efficient).



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Username:

Password:

Version 4.12.1 (build 6733) on midway2.rcc.uchicago.edu.
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Duo two-factor login for agafanova

Enter a passcode or select one of the following options:

1. Duo Push to +X XXX XXXX-X9-65
2. Phone call to +X XXX XXXX-X9-65
3. SMS passcodes to +X XXX XXXX-X9-65

Passcode or option (1-3):

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Checking resources

Once logged in, you can check your allocation, storage and etc.
Enter `rcchelp` in terminal and you will see a list of commands.

- `rcchelp balance`: remaining and total allocation
- `rcchelp quota`: remaining and total space of data storage
- When working with large data, check on your storage from time to time.

Data storage on Midway has a hard and a soft limit.

Once you go over a soft limit, you can still store new data but only during a grace period.
After a grace period, you won't be able to store new data on server anymore.

Navigating Midway2 folders

- Two main commands
 - `cd` for changing directory
 - `ls` for listing files
- For work, we would use PI's directory since it is a shared folder and generally has more space.
 - `cd /project2/<PI CNetID>`
 - `cd /project/<PI CNetID>`
- Enter `cd ~` to get back to your home directory `/home/<CNetID>`.

Transferring files

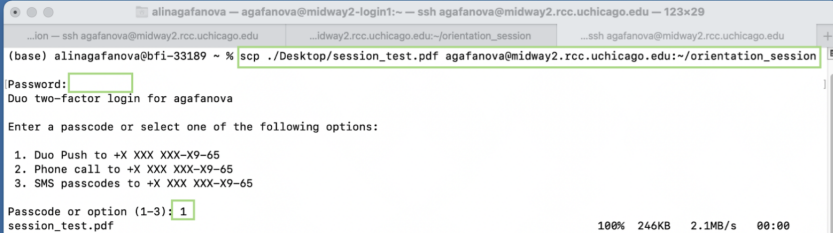
- Transfer a file from local machine to your home directory

```
$ scp <some file> <CNetID>@midway2.rcc.uchicago.edu:<path>
```

- Transfer a directory to your home directory on Midway2

```
$ scp -r <some dir> <CNetID>@midway2.rcc.uchicago.edu:<path>
```

- You will be prompted to enter your password and 2FA



```
alinagafanova — agafanova@midway2-login1:~ — ssh agafanova@midway2.rcc.uchicago.edu — 123x29
...lon — ssh agafanova@midway2.rcc.uchicago.edu  ...idway2.rcc.uchicago.edu:~/orientation_session  ...ssh agafanova@midway2.rcc.uchicago.edu
(base) alinagafanova@bfi-33189 ~ % scp ./Desktop/session_test.pdf agafanova@midway2.rcc.uchicago.edu:~/orientation_session
Password: 
Duo two-factor login for agafanova

Enter a passcode or select one of the following options:

1. Duo Push to +X XXX XXX-X9-65
2. Phone call to +X XXX XXX-X9-65
3. SMS passcodes to +X XXX XXX-X9-65

Passcode or option (1-3): 1
session_test.pdf
```

100% 246KB 2.1MB/s 00:00

Cloning git repository

- You may need to clone git repository to a specific directory on Midway2 to access files and code, pull updates and push changes.

```
$ git clone https://github.com/linghui-wu/RP-orientation-2022.git
```

- If any adjustments to file before/after running the jobs on Midway is needed, you can do so with command text editors such as nano, vim, and etc.

```
$ nano <file_name>
```

```
$ vim <file_name>
```

Loading modules

- Before running jobs, you need to make sure appropriate software modules have been loaded

```
$ module avail <module_name>
```

```
$ module load <module_name>
```

```
$ module list
```

Run interactive jobs

- Intensive computational tasks are not recommended on the login nodes.
- You can specify memory allocation, running time, partition and etc by passing arguments.

```
$ sinteractive --time=00:15:00 --ntasks=4 --partition=broadwl --nodes=2
```

Run parallel batch jobs with Slurm scripts

- Simple julia script: `hello_world.jl`
- Slurm script used for running parallel jobs: `julia.sbatch`
- To run the Julia script, simply submit the jobs to the cluster

```
$ sbatch julia.slurm
```

- After the jobs complete, you can check the results in `.out` or debug in `.err` files
- Monitoring or canceling your job status

```
$ squeue --user=$USER  
$ scancel <your_job_ID>
```