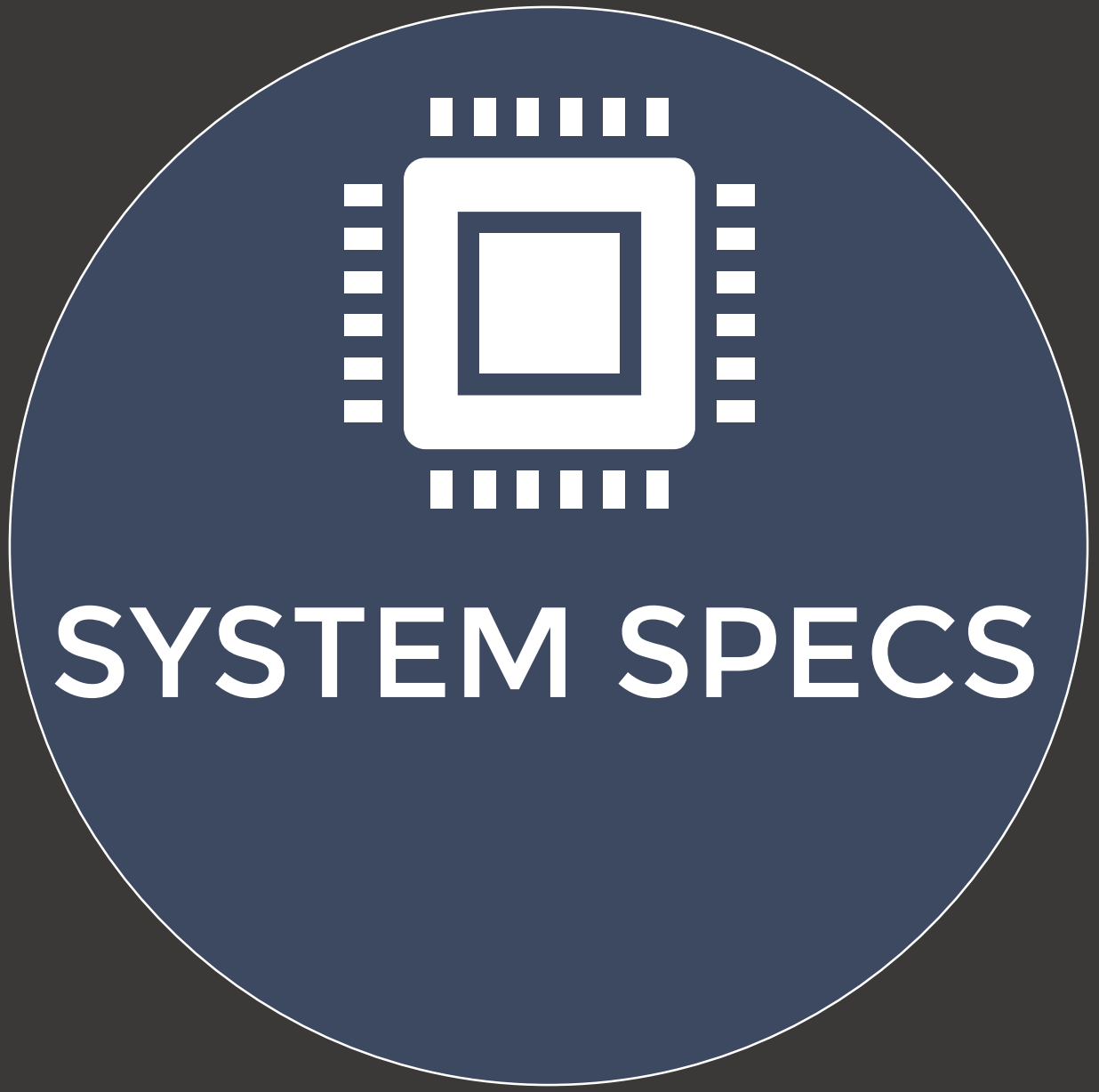

SYSTEM SPECS

SYSTEM SPECS

Head Node

- **Server**: PowerEdge R740XD
- **CPU**: Dual Intel Xeon Gold 6126 2.6G, 12C/24T, 10.4GT/s , 19.25M Cache, Turbo, HT (125W) DDR4-2666
- **Memory**: 96GB DDR4 2666MHz DRAM
- **Hardrdrives**:
  - **OS**: 2 x 240GB SSD SATA 6Gbps 512e 2.5in Flex Bay Drives in Raid 1 (mirrored) for a total of 240GB of storage
  - **Storage**: 12 x 4TB 7.2K RPM NLSAS 12Gpbs 512n 3.5in Hot-plug Hard Drives in RAID 6 (double parity) for a total of 40TB of storage. This RAID configuration gives 10x read speed, but no write speed gain.

SYSTEM SPECS

Compute Node

- **Server**: PowerEdge R440
- **CPU**: Dual Intel Xeon Gold 6126 2.6G, 12C/24T, 10.4GT/s , 19.25M Cache, Turbo, HT (125W) DDR4-2666
- **Memory**: 96GB DDR4 2666MHz DRAM
- **Had drives**:
  - **OS:** 1 x 200GB SSD SATA Boot 6Gbps 512n 2.5in Hot-plug Drive, 1 DWPD, 219 TBW
  - **Storage:** None

SYSTEM SPECS

Spec Summary

- **Servers**: 8 nodes
  - 1 Head node
  - 7 Computer nodes
- **CPU**: 16
  - 2 CPU per node
- Cores: 192
  - 12 cores per CPU
- **Memory**: 768GB DDR4 2666MHz DRAM
  - 96GB per node
- **Storage**: 40TB
  - Only on Head node

Accessing Bruce

Who?

How?

Who Can Access Bruce?

All UCA:

Faculty

Staff

Students

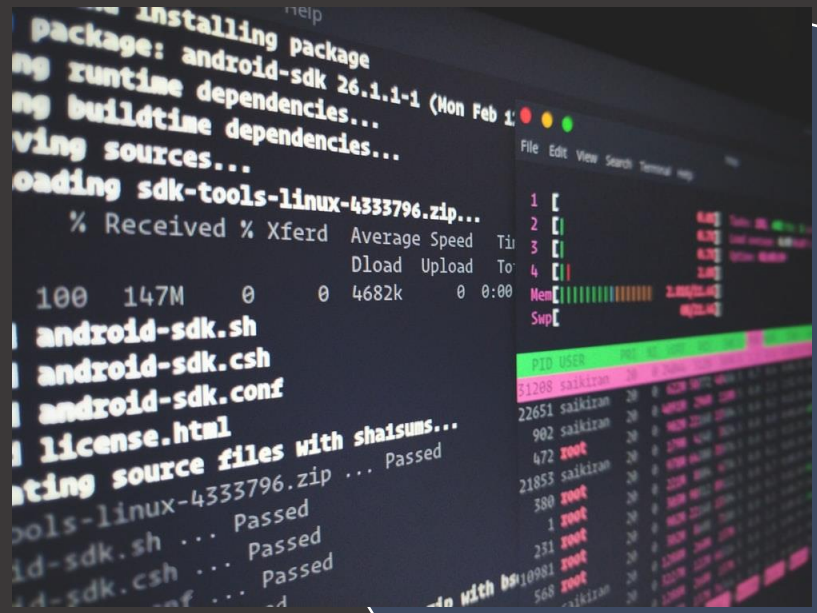
How to access Bruce?

- Requires an account
- Remote Access only
- Accessed through the secure protocol SSH
- Provides a text-based interface
- All commands typed locally and executed on the remote server
- **NOTE: Campus Access ONLY!**

Examples:

ssh [username]@161.31.5.50

Bruce Basics

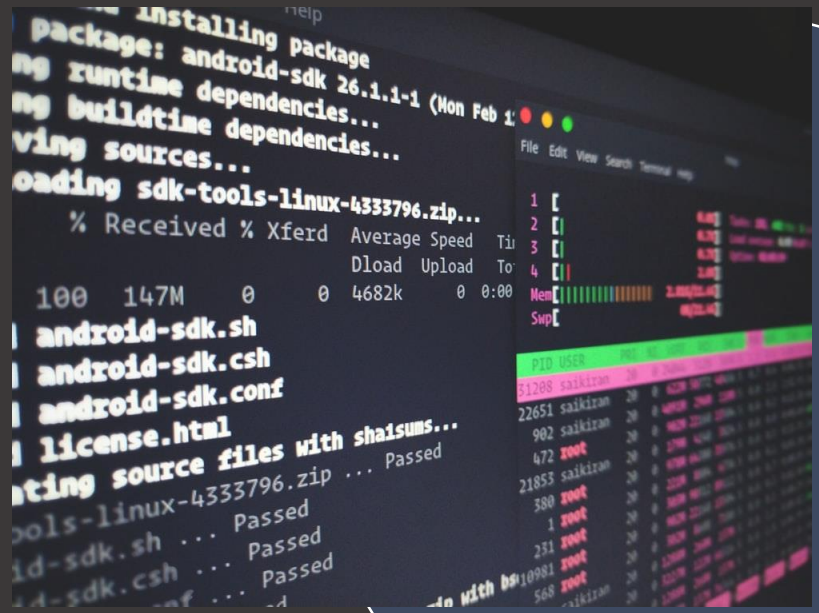


Bruce Basics

Working on Bruce

- ssh[username]@161.31.5.50
- By default, you will be taken to your home directory
- A comprehensive list, including examples https://dev.to/awwsmm/101-bash-commands-and-tips-for-beginners-to-experts-30je#pwd-ls-cd

Transferring Files



Bruce Basics

FTP Clients

- Filezilla
  - Download: https://filezilla-project.org/
- WinSCP
  - Download: https://winscp.net/eng/index.php

SCP

- scp [local_file] [username@]server_IP:[remote_file] [destination]

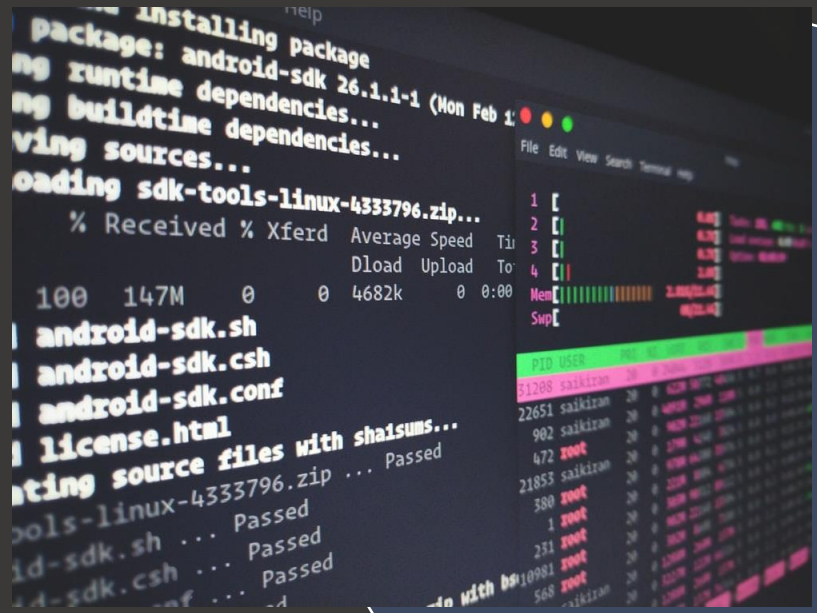
Examples

- Copying local to remote.
  - $ scp myfile.txt jcorkran@161.31.5.50: ~
- Copying remote to local.
  - $ scp jcorkran@161.31.5.50:~/documents/myfile.txt .

Submitting Jobs - Slurm

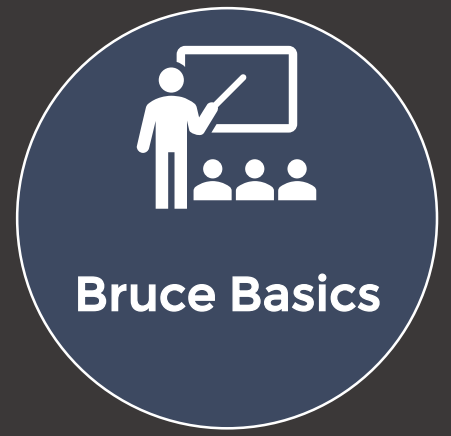
Slurm: Jobs Scheduler

- A workload management system
  - Monitors jobs
  - Modifies jobs
  - Deletes jobs
- Settings
  - Job script being processed
  - Number of processors allocated
  - Resource usage
  - Application-specific variables
  - and more...



Bruce Basics

Running Jobs - sbatch



sbatch - command

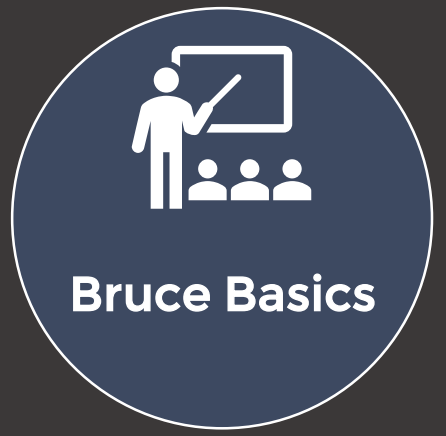
- To submit a job to slurm, we use the sbatch command

```
#!/bin/bash
#SBATCH --job-name=hello          <- The name you want the job to have
#SBATCH --output=sample-%j.out    <- The filename for the jobs output (stdout)
#SBATCH --error=sample-%j.err     <- The filename for the jobs error output (stderr)
#SBATCH --partition=defq          <- The name of the default queue is defq


srun <script_name>            # used for script submission
```

NOTE: This is by no means an exhaustive overview of the capabilities and commands available in SBATCH. This is just a very small sample of what is possible

Running Jobs - sbatch




```
[jcorkran@bruce sandbox]$ ls -l
total 16
-rwxrwxr-x 1 jcorkran jcorkran 8848 Feb 14 09:41 hello
-rwxr-xr-x 1 jcorkran jcorkran  434 Feb 14 09:41 slurm.scr
[jcorkran@bruce sandbox]$ vim slurm.scr
[jcorkran@bruce sandbox]$
```

```
#!/bin/bash
#SBATCH --job-name=hello        <- The name you want the job to have
#SBATCH --output=sample-%j.out  <- The filename for the jobs output (stdout)
#SBATCH --error=sample-%j.err   <- The filename for the jobs error output (stderr)
#SBATCH --partition=defq              <- The name of the default queue is defq
#SBATCH --nodes=6               <- These two lines specify the number of cores
#SBATCH --ntasks-per-node=16

srun hello
srun hostname
```

```
[jcorkran@bruce sandbox]$ sbatch slurm.scr
Submitted batch job 36
[jcorkran@bruce sandbox]$
```

Computer Science

The Department of Computer Science at UCA is the second largest computer science department in Arkansas. Our mission is to serve the region, state, and nation by providing high quality programs in computer science and engineering. Our department is recognized for its high standards of education, cutting-edge research, state-of-the-art facilities, award winning faculty, and dedicated staff.

The department offers programs of study leading to the Bachelor of Science in Computer Science, the Bachelor of Science in Computer Engineering, the Bachelor of Science in Cybersecurity, the Master of Science in Computer Science, a concentration in Data Science, and a minor in Computer Science.

More information about the department can be obtained by exploring this website, visiting our Facebook page, contacting the department at (501) 450-3401, or contacting the chair by email at ecelebi@uca.edu.

Bear Facts About the Department

- We have about 360 students, making us the fourth largest department in UCA and second largest Computer Science department in the state.

Documentation

Computer Science Website

https://uca.edu/computerscience/supercomputer/