Clusters of Computers

Outline

- Clusters
- Workload Scheduler & Resources Manager
  - Description
  - Existing and commonly used
    - PBS/TORQUE, SLURM
- Example of WLRM across universities and institutions
  - OU SLURM
  - OSU TORQUE
  - Blue Water PBS/TORQUE
- Equivalent Basic Commands across Workload schedulers
- Structure of Job Scripts
  - Resource Manager (computing nodes, Memory, software application, job size)
  - Scheduling Partition (time duration needs)
- Examples of Programs & Job scripts (hello_world_mpi, Area_curve)
- Screenshots

Workload Scheduler & Resources Manager

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Equivalence of Basic Commands

User Command	PBS/TORQUE	SLURM
Job Submission	qsub [script file]	sbatch [script file]
Job Status(by job)	qstat [job ID]	squeue [job ID]
Job Status (by User)	qstat –u [User_Name]	squeue –u [User Name]
Job Deletion	qdel [job ID]	scancel [job ID]
Job hold	qhold [Job ID]	scontrol hold [job ID]
Queue List	qstat -Q	squeue

Example of WLRM across universities and institutions

- OU : SLURM
- OSU : TORQUE
- Blue Water : PBS/TORQUE
- Lawrence National Laboratory:

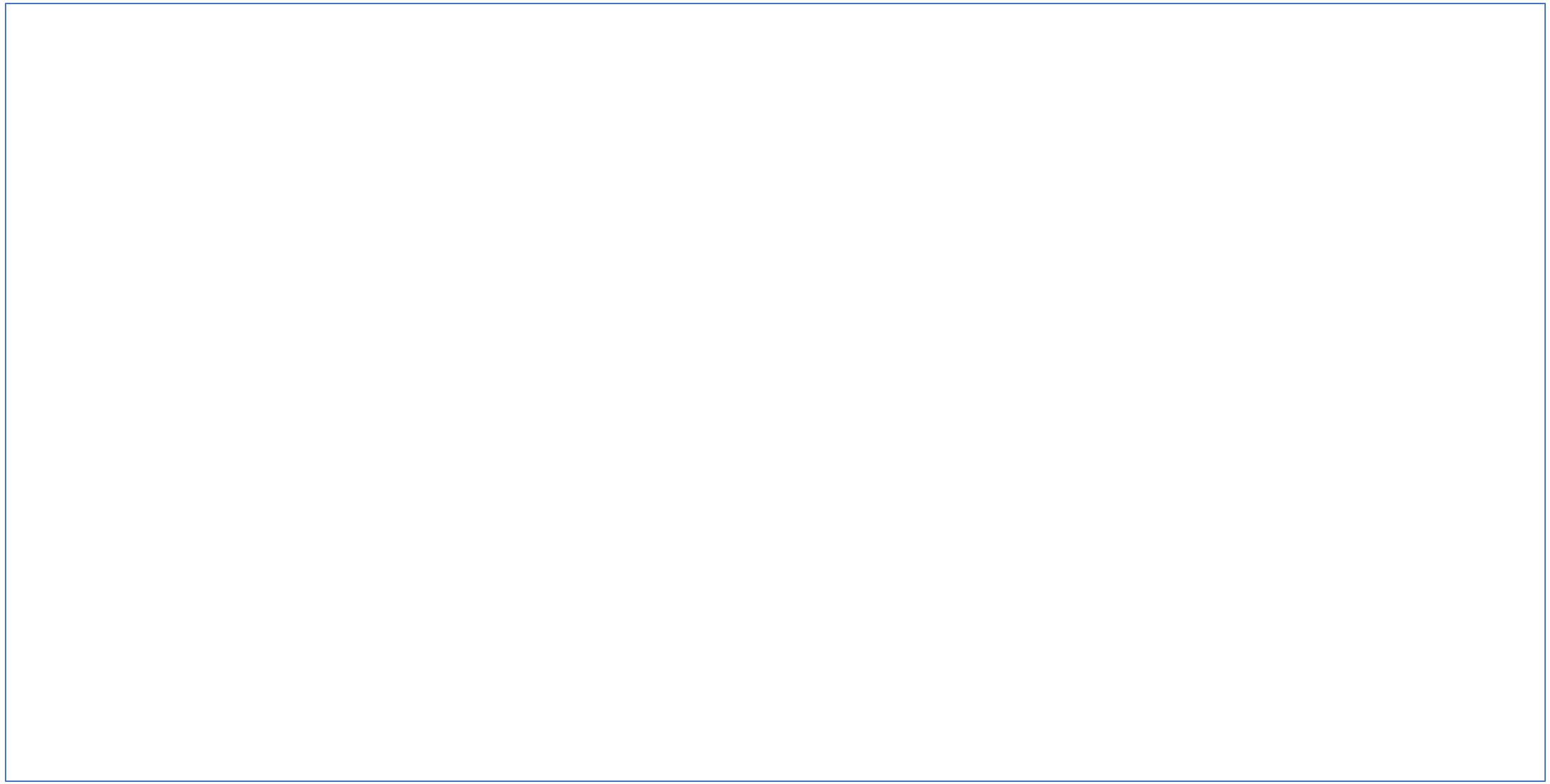
Equivalent Basic Commands across Workload Schedulers

- module load OpenMPI
- sbatch myJobScript
- squeue –u haboudj

Structure of Job Scripts

- Resource Manager (computing nodes, Memory, software application, job size)
- Scheduling Partition (time duration needs)

Examples of Programs & Job scripts (hello_world_mpi, Area_curve)



Introduction

- - Once you know what is a cluster?
- What is its architecture?
- What is it used for ?
- How to use it
  - Slurm
  - PBS (Torque)

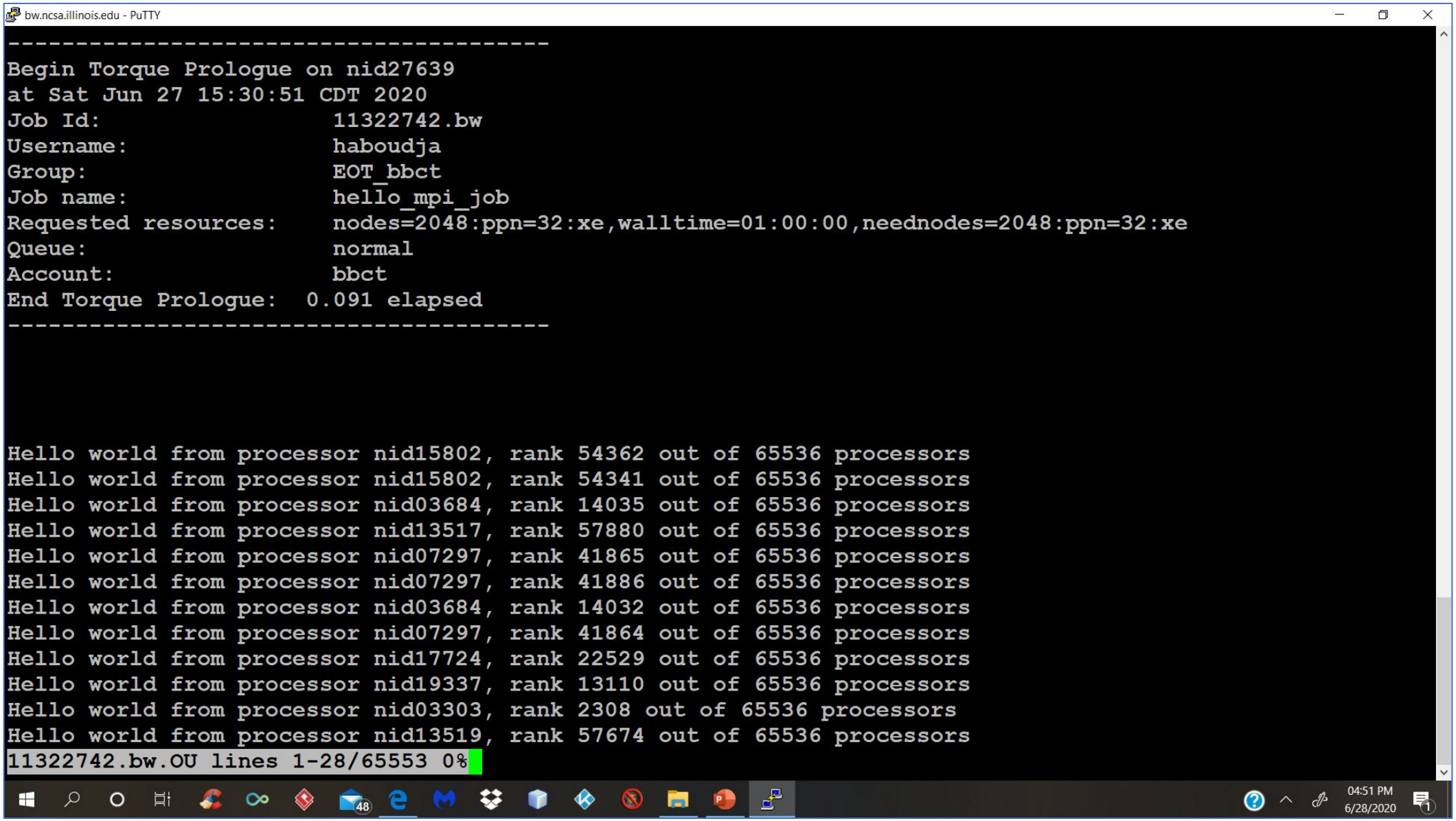
SLURM (Simple Linux Utility Resources Manager)

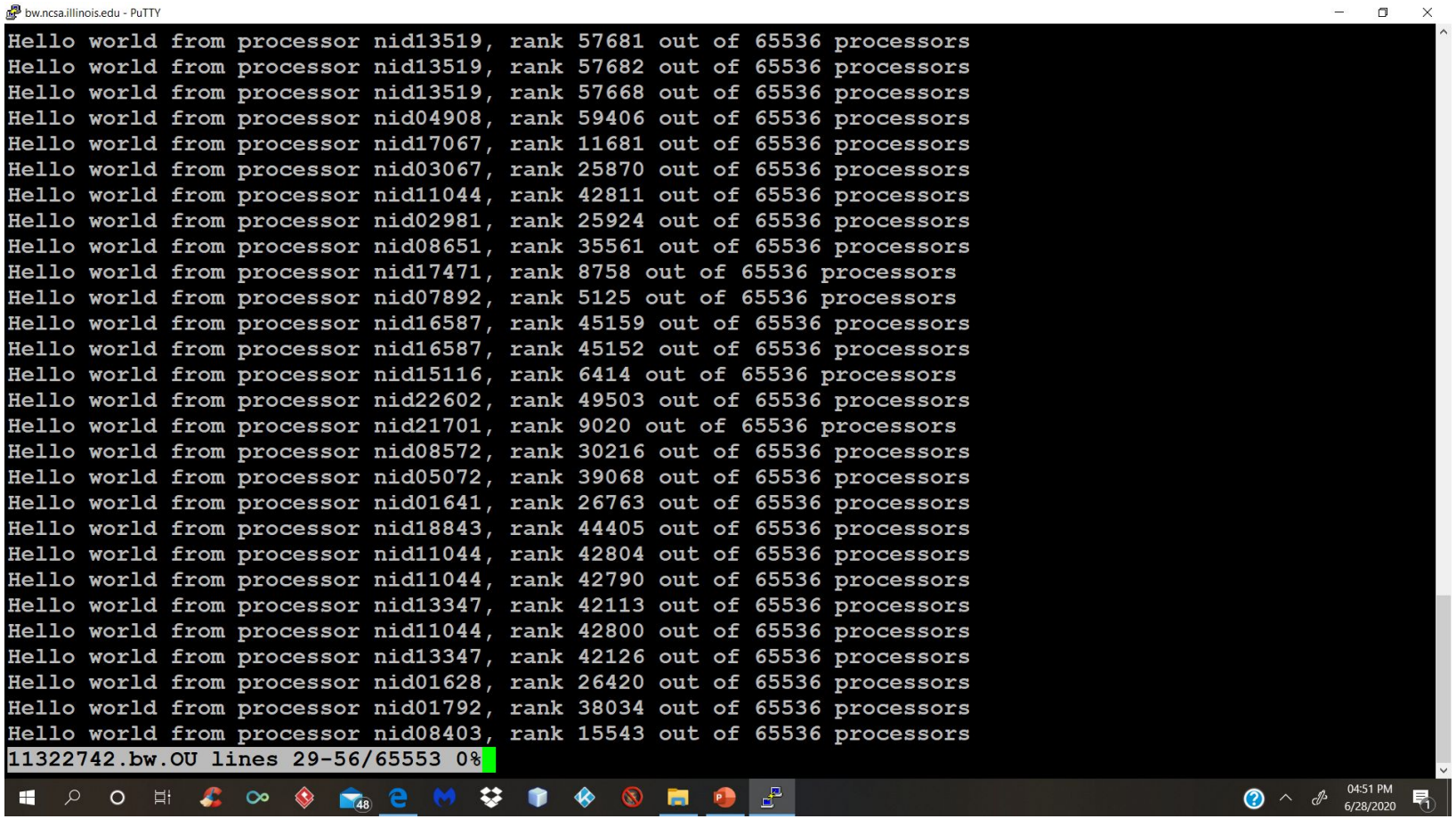
- Open Source, cluster resource management and job scheduler system for small and large Linux computers clusters connected as HPC(High Performance Computers)

Batch Scheduler and Resource Manager

- In SLURM system, both the resource manager and the job batch scheduler (work load manager) work hands in hands to run and complete the job request of the user.
- Job Batch Scheduler: identifies, allocate in optimized time the requested resources and launch to run and complete the job.

Screenshots




bw.ncsa.illinois.edu - PuTTY
Hello world from processor nid13519, rank 57681 out of 65536 processors
Hello world from processor nid13519, rank 57682 out of 65536 processors
Hello world from processor nid13519, rank 57668 out of 65536 processors
Hello world from processor nid04908, rank 59406 out of 65536 processors
Hello world from processor nid17067, rank 11681 out of 65536 processors
Hello world from processor nid03067, rank 25870 out of 65536 processors
Hello world from processor nid11044, rank 42811 out of 65536 processors
Hello world from processor nid02981, rank 25924 out of 65536 processors
Hello world from processor nid08651, rank 35561 out of 65536 processors
Hello world from processor nid17471, rank 8758 out of 65536 processors
Hello world from processor nid07892, rank 5125 out of 65536 processors
Hello world from processor nid16587, rank 45159 out of 65536 processors
Hello world from processor nid16587, rank 45152 out of 65536 processors
Hello world from processor nid15116, rank 6414 out of 65536 processors
Hello world from processor nid22602, rank 49503 out of 65536 processors
Hello world from processor nid21701, rank 9020 out of 65536 processors
Hello world from processor nid08572, rank 30216 out of 65536 processors
Hello world from processor nid05072, rank 39068 out of 65536 processors
Hello world from processor nid01641, rank 26763 out of 65536 processors
Hello world from processor nid18843, rank 44405 out of 65536 processors
Hello world from processor nid11044, rank 42804 out of 65536 processors
Hello world from processor nid11044, rank 42790 out of 65536 processors
Hello world from processor nid13347, rank 42113 out of 65536 processors
Hello world from processor nid11044, rank 42800 out of 65536 processors
Hello world from processor nid13347, rank 42126 out of 65536 processors
Hello world from processor nid01628, rank 26420 out of 65536 processors
Hello world from processor nid01792, rank 38034 out of 65536 processors
Hello world from processor nid08403, rank 15543 out of 65536 processors
11322742.bw.OU lines 29-56/65553 0%
04:51 PM
6/28/2020

References

- https://slurm.schedmd.com/quickstart.html
- https://hpc.llnl.gov/banks-jobs/running-jobs/slurm-commands