Ilifu Online Training

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Inter-University Institute for Data Intensive Astronomy



Job scheduling & cluster management tool

- Framework : Login node & Compute nodes
- Login node
 - Accessed via ssh (\$ ssh <username>@slurm.ilifu.ac.za)
 - Submit jobs and manage work directories

• Compute nodes

- Where processes/code runs
- via Singularity Containers

• Partitions (1 node = 32 CPUs, 232 GB RAM)

Main partition	Jupyter Spawner
~80 nodes	12 nodes





SLURM <u>http://docs.ilifu.ac.za/#/getting_started/submit_job_slurm</u>







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\$ sinfo \rightarrow shows partitions and resources

 \Rightarrow squeue \rightarrow shows all jobs in SLURM queue

 $squeue -u SUSER \rightarrow shows your jobs$

\$ sbatch slurm_job_script.sh \rightarrow submit job to SLURM

\$ sbatch --help \rightarrow info. on job submission parameters

 $scancel < jobid > \rightarrow cancel running/pending job$

 \Rightarrow shows status of recent completed or running jobs



SLURM - running a job



\$ cat slurm job script.sh

#!/bin/bash



echo "Running demo job"

container

singularity exec

/idia/software/containers/python-3.6.img

\$ sbatch slurm job script.sh # submit job to SLURM queue

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Describe job parameters / resources





DEMO TIME!





\$ cat slurm_job_script.sh

#!/bin/bash

```
#SBATCH --job-name=demo_job
#SBATCH --time=00:00:10
#SBATCH --mem=4GB
#SBATCH --partition=Main
#SBATCH --output=demo-job-%j.out
#SBATCH --error=demo-job-%j.err
#SBATCH --mail-user=oarabile@idia.ac.za
#SBATCH --mail-type=BEGIN,END,FAIL,TIME_LIMIT_80
#SBATCH --account=b34-admins-ag
```

echo "Running demo job"

module load python
python job_script.py

\$ sbatch slurm_job_script.sh # submit job to SLURM queue





SLURM - Use cases



Login node SSH Run SLURM & bash commands cd, mkdir, ls, etc

Jupyter/Dev. node

Development space New code / workflows / routines Debugging / testing software

Main partition Stable, computationally

heavy processing

HighMem/GPU

For single-high memory jobs that can't be split into multiple jobs for MPI





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Do's :

- Run jobs using sbatch rather than interactive jobs
- Identify job resources requirements:
 - \circ $\:$ No. of nodes and CPUs, amount of RAM and wall-time.
- Remove files that aren't needed
 - /scratch3 folder after data processing is complete
 - Old raw data, temporary products , etc.
- Use Singularity (cannot install software on nodes)
- Use username@transfer.ilifu.ac.za for data transfers

Don't:

- Don't run software/heavy processes on login node
- Don't place large files in your home directory (/users)
- Don't transfer using scp/rsync on the login node







Thank you!

