HPC@IAC User Guide

Guidelines for Using the AMELIA Cluster

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Target Users

These guidelines are intended for all users of the cluster.

Usage Agreement

Using the HPC@IAC system for research purposes authorizes CNR to process personal data (name, surname, research group) and research-related data for publication on websites, official reports, and other relevant media.

Use of HPC@IAC requires acknowledgment of the computing center and the H2IOSC project in publications and conferences.

Cluster Usage Rules

- Jobs must be submitted through scheduler queues.
- Command-line usage for computation or compilation is not recommended unless authorized.
- Resources are for research and teaching only.
- Users must not share credentials.
- All activity is attributable to the account owner.
- Anything not explicitly permitted is prohibited.

Technical Specifications

- **Architecture:** Linux Cluster, Infiniband-DDR
- **CPU:** 2 × 32-core Intel Xeon Gold 6883 @ 2.00 GHz
- **GPU:** 4 × NVIDIA A30 (24 GB)
- **Nodes:** 25
- **Total RAM:** 2.0 TB
- **OS:** Rocky Linux 8
- **Scheduler:** SLURM

Storage

- 512 GB system disk per node
- 7 TB local scratch: /scratch/local
- 650 TB shared storage: /ifs/hpc

Accounts

Accounts become active upon credential delivery and expire as defined in the request form.

Use chage -l username to check account expiration.

Expired accounts can be reactivated within 12 months. Data is deleted after 24 months.

Storage Quotas

- /home/<username>: 4 GB
- Total quota: ~4 TB

First Access

Generate SSH key:

ssh-keygen

Connect using:

ssh username@clustername

ssh -l username -p port clustername

ssh -p port username@clustername

Login nodes:

- front-end1 (140.164.12.64)
- front-end2 (140.164.12.63)

Compute nodes: gnode01–gnode25

Job Submission

sbatch script.sbatch

Example Script

#!/bin/bash -l

#SBATCH -p prod-gn

#SBATCH --time=00:10:00

#SBATCH --job-name=BCM

#SBATCH --gpus-per-node=4

#SBATCH --nodes=1

#SBATCH --ntasks=4

#SBATCH --output=output.out

#SBATCH --error=error.err

#SBATCH --mail-user=user@mail.org

#SBATCH --mail-type=FAIL

module load intel/gcc-12.2.1/openmpi-4.1.6

cd /home/user/run_dir

srun ./executable

Modules

module avail

File Format Note

Convert Windows files:

dos2unix file

Monitoring Jobs

squeue -u username

scontrol show job <jobid>

sinfo

sprio

scancel <jobid>

Job Statistics

sstat --format=JobID,MaxRSS,AveRSS,AveCPU,NTask -j $JOBID --allsteps

Interactive Sessions

srun --nodes=1 --ntasks=1 --pty /bin/bash

GUI Sessions (X11)

ssh -YC username@loginnode

srun --nodes=1 --ntasks=1 --x11 --pty /bin/bash

MPI Examples

Example 1

#SBATCH --ntasks=32

#SBATCH --cpus-per-task=1

#SBATCH --nodes=4

#SBATCH --ntasks-per-node=8

Example 2

#SBATCH --ntasks=64

Example 3

#SBATCH --ntasks=8

#SBATCH --cpus-per-task=4

```
#SBATCH --nodes=4
#SBATCH --ntasks-per-node=2
```