Digital Research Alliance of Canada: Project Manuals, Tutorials, and User Guides

Manual B: High-Performance Computing (HPC) User Guide

Overview: This manual introduces utilizing HPC resources provided by the Digital Research Alliance of Canada, guiding users from account setup to job submission.

The purpose of the tutorial: is to help researchers onboard and utilize Canada's HPC resources.

Contents:

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1. Getting Started

Register via CCDB and complete Multi-Factor Authentication.

Systems Available:

- Niagara (Toronto)
- Cedar (SFU)
- Graham (Waterloo)
- Narval & Béluga (Québec)

2. SSH and File Transfer

Sample SSH Command:

```
ssh youruser@narval.alliancecan.ca
```

Copy Files with SCP:

```
scp yourfile.txt youruser@narval.alliancecan.ca:~/projectdir/
```

3. Writing a SLURM Job Script

```
#!/bin/bash
#SBATCH --job-name=fake-news-detection
#SBATCH --time=02:00:00
#SBATCH --gpus=1
#SBATCH --mem=16G

module load python/3.10
source ~/envs/fakenews/bin/activate
python train_model.py
```

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4. Monitoring and Efficiency

- Check jobs: `squeue --me`
- Performance summary: `seff JOBID`

Use GNU Parallel for efficiency:

```
parallel -j 4 < tasks.txt
```

5. Best Practices

- Use $HOME for critical files, $SCRATCH for temporary data.
- Avoid over-requesting resources.
- Keep job scripts and logs version-controlled (e.g., Git).