Introduction to High Performance Computing with CRADLE

STARTER AI Workshop 2025

MI@UTRGV

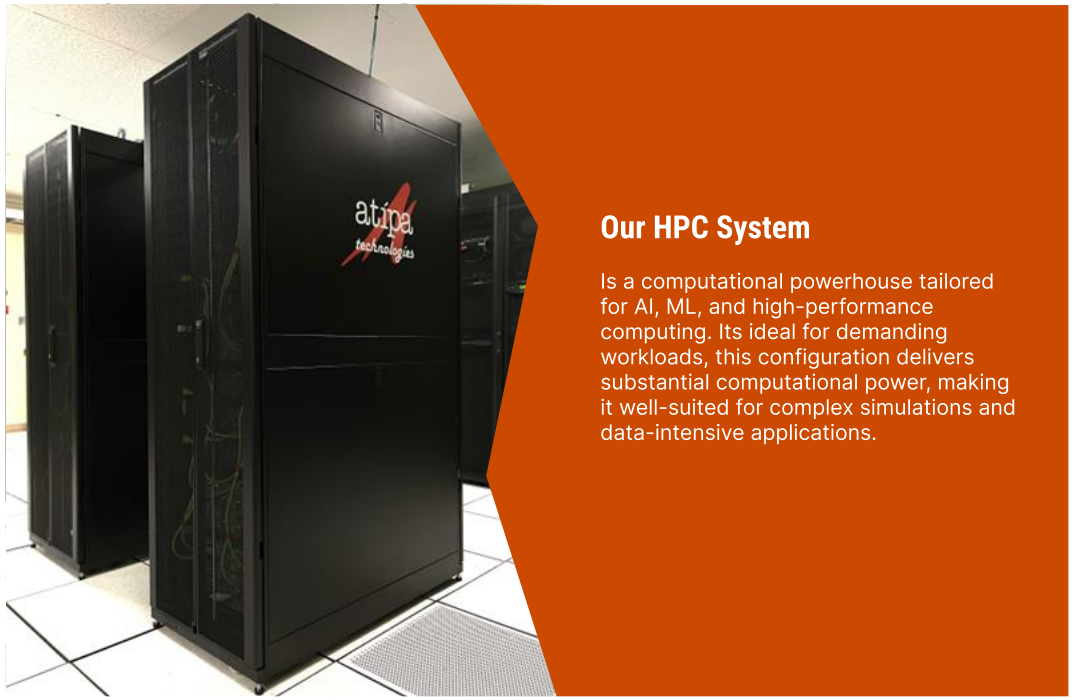
What is HPC?

- Centralized and shared resources
- High performance CPUs/GPUs and other hardware to support complex or data-intensive tasks

https://www.networkworld.com/article/3444399/high-performance-computing-do-you-need-it.html

CRADLE Cluster at UTRGV

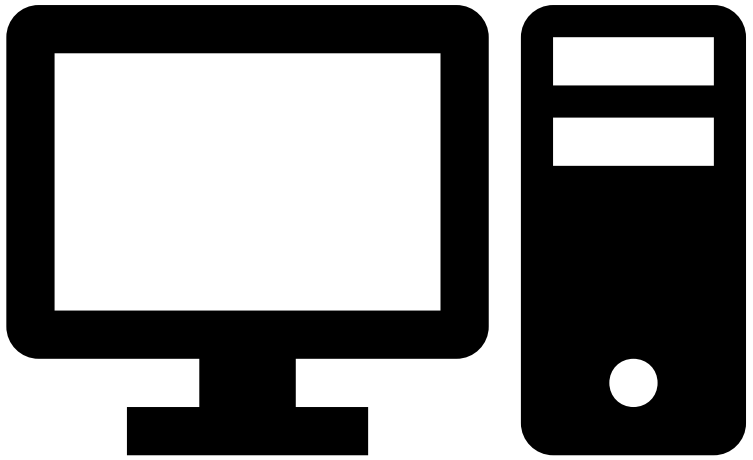
- Supercomputing Resource at UTRGV
- National Science Foundation, MRI: Acquisition of a GPU-Accelerated Cluster, High Performance Rio Grande Valley Cluster (HiRGV), grant number 2018900
- Department of Defense, HBC/MI under grant number W911NF2110169, and NSF IIS-2334389. "CAP: STARTER: South Texas AI Research, Training, and Education Resource."
- More information at **hpc.utrgv.edu**

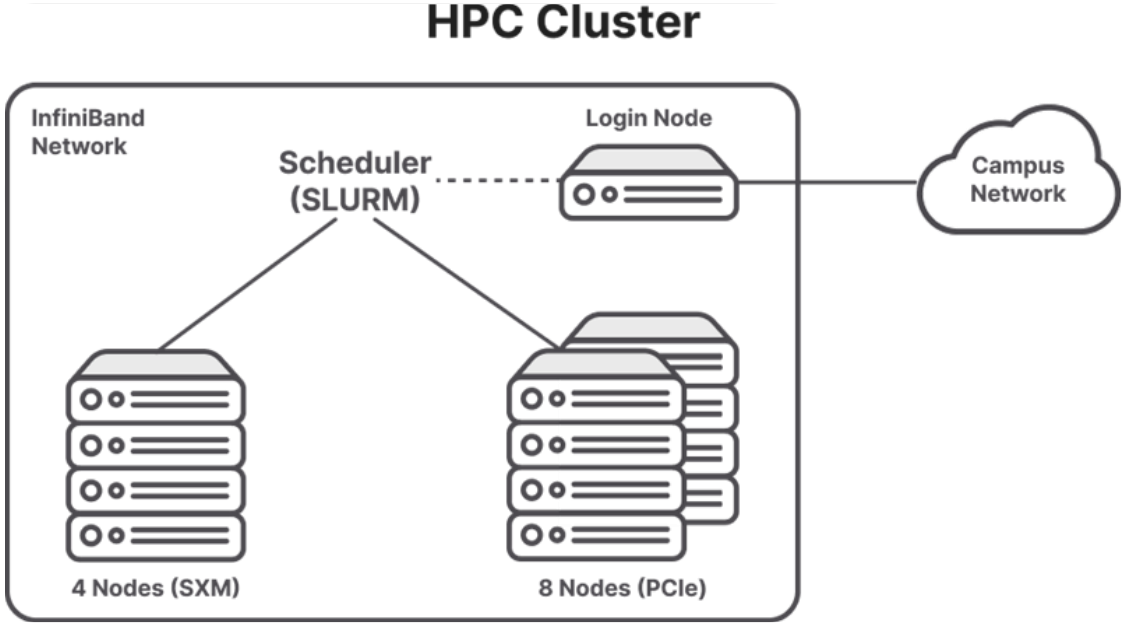


Our HPC System

Is a computational powerhouse tailored for AI, ML, and high-performance computing. Its ideal for demanding workloads, this configuration delivers substantial computational power, making it well-suited for complex simulations and data-intensive applications.

Cluster vs. Local Device





Cluster vs. Local Device

Local

- Code runs interactively
- Limited by your machine's resources
- Data stays on your machine
- Graphical/web/command line UI is usually up to you

Cluster

- Code "jobs" are submitted to a scheduler which runs them on your behalf
- Resources are requested from a pool of shared access and can be scaled
- Data may need to move across nodes to utilize all resources
- May require command line interface

Ladder to HPC

1. Solidify your project idea
2. Run tests locally or on an accessible cloud resource such as Google Colab
3. Optimize data and code for parallel processing
4. Design your scaled-up experiment for target cluster resource
5. Carry out experiments on cluster

Quick Demo

- https://hpc.utrgv.edu/getting-started

Get Access to HPC Now!

NSF Access - access-ci.org