Accelerate Your Science: 
An Introduction to High Performance Computing

Lecture 1: HPC@IU - How does it work? What is available?

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Contents

• Organizational overview

• HPC@IU overview
  – Compute, storage, applications,...

• Access and cost

• The most important thing to remember
OVPIT / UITS / RT

- Office of the Vice President of Information Technology
  http://ovpit.iu.edu/

- University Information Technology Services
  http://uits.iu.edu/

- Research Technologies
  http://rt.uits.iu.edu/
HPC@IU Overview

- Compute
- Storage
- Software
- Consulting
- Visualization
- Services
HPC@IU Compute

• Local to IU
  – Big Red II, Quarry, Mason

• National cyberinfrastructure available to IU researchers
  – NSF Open Science Grid (OSG) and XSEDE
  – DOE INCITE
HPC@IU Compute cont’d

• Parallel apps → Big Red II
• GPU accelerated apps → Big Red II
• Data intensive problems → Big Red II
• Single core/node apps → Quarry
• Interactive use → Quarry
• Large memory → Mason
• Biology and life sciences apps → Mason
HPC@IU Computing cont’d

• Big Red II
  – Fast connection among compute nodes and to storage
  – Only one job per node

• Quarry
  – Good for running a large number of serial jobs
  – “slow” interconnect

• Mason
  – Large shared memory nodes
  – Small overall system size
HPC@IU Computing cont’d

• XSEDE
  – Help with allocation proposals

• Open Science Grid
  – Help with running on OSG

• DOE INCITE
HPC@IU Storage

• Short term storage
  – Data Capacitor II and Data Capacitor WAN

• Archive
  – Scholarly Data Archive

• Desktop use
  – Research File System
HPC@IU Storage cont’d

• Data Capacitor II
  – Short term scratch storage
  – Optimized for large files
  – Not backed up
  – Project storage available

• Data Capacitor WAN
  – Compute on data from different compute resources
HPC@IU Storage cont’d

• Scholarly Data Archive
  – Long term storage
  – Optimized for large files
  – Various ways of access available
  – Backup files from Data Capacitor II
HPC@IU Storage cont’d

• Research File System
  – Group sharing
  – Small files are OK
  – Access on your desktop and on HPC systems
HPC@IU Software

• Stat/Math software
  – Desktop and HPC systems
  – http://rt.uits.iu.edu/visualization/analytics/software.php

• Campus licensing for certain HPC software
  – Compilers, performance tools

• Applications on HPC systems
  – https://cybergateway.uits.iu.edu/iugateway/searchModulesInfo
HPC@IU Consulting

• Your gateway to RT services
• Discuss ideas
• Ask questions like:
  – How would I best go about doing xyz?
  – I was thinking about xyz, would that work on Quarry?
  – Can you help me do xyz?
HPC@IU Consulting cont’d

- Ticketing system for short term help
- Long term consulting available in different forms
- Contact us by telephone, video, in-person
- Participation in grant proposals and grants
- Presentations for research groups
- Workshops
HPC@IU Visualization

• On HPC systems
• On dedicated visualization systems
HPC@IU Services

- XSEDE research VM hosting
- Science Gateways
- IUGitHub
- NCGAS
- https://cybergateway.uits.iu.edu
Even More Information

- System support: hps-admin@iu.edu
- Application support: sciapt@iu.edu
- Data Capacitor: hpfs-admin@iu.edu
- Archive: store-admin@iu.edu
- Visualizations: vishelp@iu.edu
- General help: researchtech@iu.edu
Access

• One stop shopping
  – [https://itaccounts.iu.edu/](https://itaccounts.iu.edu/)

• No allocation proposal needed
How much does it cost?

- Services are free for basic use
- Certain use may incur costs in some form
  - SDA use can be a for pay service for non IU researchers
  - Real time computation needs require a dedicated system
  - Extensive compute use may require moving to XSEDE, OSG or INCITE
  - XSEDE VMs require an XSEDE proposal
The Most Important Thing to Remember!

Talk to us.... please!
Thank You!

Questions?