Introduction to XSEDE resources

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• **What is XSEDE?**
• Overview of current (and coming soon) resources
• How can I get an allocation?
• Future Development: Campus Bridging Initiative
• Simple examples
The eXtreme Science and Engineering Discovery Environment (XSEDE):

XSEDE is a NSF project to support Scientific Computing and develop and improve the research Cyber Infrastructure:

• Hardware resources (HPC, HTC, Visualization, Storage)

• Software (Campus Bridging, optimization support)

• Education (training, internships, tech support)
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Resources (https://www.xsede.org/resources/overview)

Some of the HPC resources:

Stampede (TACC): Dell PowerEdge C8220 Cluster with Intel Xeon Phi intended primarily for parallel applications scalable to tens of thousands of cores.

Gordon (SDSC): Appro with Intel Sandy Bridge Cluster designed for data-intensive applications (genomics, graph problems, geophysics, and data mining).

Blacklight (PSC): SGI SMP with Intel Xeon X7560 intended for applications that require a large shared memory for computational tasks.

Comet (SDSC): Dell Cluster with Intel Haswell Processors designed to provide cyberinfrastructure for the long tail of science, covering a diverse application base with complex workflows.
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Some of the VISUALIZATION:

Maverick (TACC): HP ProLiant compute, Xeon E5 + K40 GPU
intended primarily for interactive visualization and data analysis
jobs, or GPGPU computing (at lower priority)

HTC:

OSC (USC): virtual Condor pool made up of resources from the Open Science Grid

STORAGE:

Several short to medium term storage and archival solutions to store data generated
using the other XSEDE resources.

SCIENCE GATEWAYS
The ultimate resource: The User Portal

www.xsede.org
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Types of Allocations

• Campus Champion
  – Get your feet wet with XSEDE
  – 2 day lead time

• Start-Up
  – Benchmark and gain experience with resources
  – 200k cpu-hours
  – 2 week lead time

• Education
  – Class and workshop support
  – Short term (1 week to 6 months)

• XSEDE Research Allocation (XRAC)
  – Up to 10M cpu-hours
  – 10 page request, 4 month lead time

https://www.xsede.org/allocation
Step One – Campus Champion Allocation

• Log onto the portal and get an account
• Send “me”:
  – your portal account ID
  – We can schedule a one-on-one meeting to discuss what resources are more appropriate for your need.
• 1-2 day lead time before you can access systems
Step Two – Start Up/Education Allocation

• Apply for a startup account
  – Log into the portal
  – Go to Allocations->Submit/Review Request
  – Provide a CV
  – Submit anytime

• Takes up to two weeks for approval

• 200k cpu-hours

• Can share it will colleagues/collaborators
Step Three – Research Allocation (XRAC)

• Log into the portal
• Go to Allocations->Submit/Review Request
  – 6+ pages project description
  – CVs for all PIs
  – Current Funding
• Review occurs four times a year
• Submit one quarter, active the next (if approved)
  – You can request early access
• Up to 10M cpu-hours
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• **Future Development: Campus Bridging**
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Campus Bridging

- Initiative to bridge the gap between local resources and national infrastructure
- XSEDE Compatible Basic Cluster
- Data and Job Management Technologies
  - Globus
  - Global Federated File System
  - UNICORE

This is already happening in many of the sites.

We are planning and testing at Brandeis as well. Hopefully deploy during the summer.

For more info https://www.xsede.org/campus-bridging
These slides and Simple Examples can be found at:
https://kb.brandeis.edu/display/SCI/HPC+Workshops

Remember that this material is by no means exhaustive.
Please refer to the Xsede portal and individual sites user guides for details:
https://portal.xsede.org/user-guides

Contact me if you are interested and want to learn more!!
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