XSEDE Resource Support at CHPC

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Campus Champion Institutions

- Standard – 114
- EPSCoR States – 69
- Minority Serving Institutions – 12
- EPSCoR States and Minority Serving Institutions – 10

Total Campus Champion Institutions – 205
Overview

• Current XSEDE Resources
• Signing up for an XSEDE User Portal (XUP) account
• Short Review of User Responsibility and Security
• Requesting an Allocation on XSEDE Resources
• Short review of the XSEDE Computing Environment
• Signing up for XSEDE Training
• Where to Get Help on XSEDE
XSEDE HPC Computing Resources

https://www.xsede.org/resources/overview

**TACC Stampede** Debut of Intel's new MIC technology on a massive scale. With 6400+ 16 core Intel sandybridge nodes (10PFlops) it is designed for large scale computing needs. Some nodes with GPUs and some with larger memory

**SDSC Comet - NEW** About 1950 Intel Haswell nodes, SSD local scratch. It is intended for moderately scalable parallel applications with an emphasis on improving productivity for a broad spectrum of users. Additional nodes with four NVIDIA GPUs; others have 1.5TB RAM

**SDSC Gordon** 1024 Intel SandyBridge nodes. Planned decommission August 2016

**LSU SuperMIC** Intel Ivybridge nodes with MIC coprocessors; 40% cycles to XSEDE

**NICS Darter** is a Cray XC30 system providing both high scalability and sustained performance with a peak performance of 250 Tflops.

**IU Mason** at Indiana University is a large memory computer cluster configured to support data-intensive, high-performance computing tasks using genome assembly software.


**PSC Bridges** Coming in early 2016; a connected set of interacting systems offering a flexible mix of gateways (web portals), Hadoop and Spark ecosystems, batch processing (large shared memory and GPU nodes) and interactivity. Startups now available on Phase 1 (Greenfield) – a large shared memory machine. 360 cores with 18TB memory in three nodes – usage is in GB-hrs.
Other Resources

- Science Gateways
- Extended Support
- Open Science Grid
- FutureSystems
- Blue Waters (NCSA)
- Titan (OakRidge)
- ALCF (Argonne)
- Edison (NERSC)
http://portal.xsede.org

The Portal provides a single location for information on and access to XSEDE resources

- Continually updated information about your allocations
- Access to your XSEDE accounts and allocated resources
- Interfaces for data management, data collections, and other user tasks and resources

- Access to:
  - Help Desk
  - Allocation and queue stats
  - User management
  - Documentation/training
Creating an XSEDE portal account (XUP)

- Fill in personal information
- Choose a registration key
- System will send you email with a confirmation number
- You will use the confirmation number together with passkey to verify your account
Creating an XSEDE portal account (2)

- Verify your account
  - email address
  - passkey
  - verification code
- Choose username
- Choose password
  - Must comply with password rules
Creating an XSEDE portal account

• Verify your account
  – email address
  – registration code
  – verification code
• Choose username
• Choose password
  – Must comply with password rules
User Responsibility and Security

• You are responsible for your account and for protecting your passwords.

• First time you login, you will be asked to accept User Responsibilities
  
  – Do not share passwords, do not write passwords down where they can be easily found, and do not use tools that expose passwords on the network. This includes private keys: make sure they are password-protected.
  
  – Close SSH terminals and log out of the User Portal when finished
  
  – Report Suspicious Activity. If you have any suspicion that your account or personal computer has been compromised, email help@xsede.org or call, 24/7, 1-866-907-2383 immediately.
Get an Allocation: Types of Allocations

• Campus Champion
  – Get your feet wet with XSEDE
  – < 10k core-hours
  – 2 day lead time

• Start-Up
  – Benchmark and gain experience with resources
  – Different limits per resource
  – 2 week lead time

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

• Research
  – No Limit
  – 10 page request, 4 month lead time

• Testbeds

https://portal.xsede.org/allocations-overview
https://portal.xsede.org/group/xup/allocation-policies
Campus Champion Allocation

- Log onto the portal and get an account
  - http://portal.xsede.org

- Send anita.orendt@utah.edu
  - your portal account ID
  - What you want to do with XSEDE (brief!)
  - Email address

- 1-2 day lead time before you can access systems

- Up to 10K cpu-hours
Start Up and Education Allocations

• For investigators new to XSEDE
• Use the new XRAS system to submit request – anytime throughout the year
• Documents Required
  – PI CV
  – Additional information helpful
  – Education also requires course syllabus
• Takes up to two weeks for approval
• Max 200k cpu-hours (total on all resources)
• Can share it will colleagues/collaborators
Research Allocation

- Use the new XRAS system to submit request
- [https://portal.xsede.org/allocations-overview](https://portal.xsede.org/allocations-overview) for details
- Review occurs four times a year by XSEDE Resource Allocation Committee (XRAC)

<table>
<thead>
<tr>
<th>Submit Requests during</th>
<th>for the Allocation Starting</th>
</tr>
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<tbody>
<tr>
<td>Dec 15 through Jan 15</td>
<td>Apr 1</td>
</tr>
<tr>
<td>Mar 15 through Apr 15</td>
<td>Jul 1</td>
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<tr>
<td>Jun 15 through Jul 15</td>
<td>Oct 1</td>
</tr>
<tr>
<td>Sep 15 through Oct 15</td>
<td>Jan 1</td>
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</tbody>
</table>

- Documents required: PI CV, Main Document and Code Performance and Scaling
- Look at sample requests provided!
Submit Allocation Requests: XRAS

• Go to XSEDE portal and login:
  – [http://portal.xsede.org](http://portal.xsede.org)

• Go to “Allocations”, then “Submit/Review Request”

• For a step-by-step walkthrough of the allocation process see:
  – [https://portal.xsede.org/group/xup/allocation-request-steps](https://portal.xsede.org/group/xup/allocation-request-steps)
Accessing XSEDE Systems

• Go to XSEDE portal and login:
  – http://portal.xsede.org

• Go to “My XSEDE”, then “Accounts”

• Notice your usernames and the login hostname for each system
  – May be different from your XSEDE portal username!

• Click on “Login” for the system you want to access

• **NOTE**: Some sites (e.g. TACC) may email you to do account activation – check your inbox!
XSEDE Accounts

XSEDE Single Sign on Login Hub
You can SSH into any XSEDE system with your PORTAL username and PORTAL password from the convenience of your desktop.

XSEDE recommends you use the XSEDE Single Sign on Login Hub to login to XSEDE resources with your local username and password. Use a local SSH client on your desktop to SSH to login.xsede.org with your portal username and password then easily gsi-ssh to any XSEDE system you have an account on with no additional username or passwords. For more information please visit the XSEDE Single Sign on Login Hub documentation page.

<table>
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<tr>
<th>RESOURCE NAME</th>
<th>GSI-SSH LOGIN HOST</th>
<th>INSTITUTION</th>
<th>LOCAL USER NAME</th>
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<tr>
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<td>SDSC</td>
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<td>Darter</td>
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<td>NICS</td>
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<tr>
<td>Nautilus</td>
<td>gsis.sh.nautilus.nics.xsede.org</td>
<td>NICS</td>
<td></td>
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</table>
Single Sign On (SSO) Login Hub

- `ssh <XUPlogin>@login.xsede.org`
- `>gsissh <machine-name>`
- Easy to setup host alias file
- [https://www.xsede.org/web/xup/single-sign-on-hub](https://www.xsede.org/web/xup/single-sign-on-hub)

```
[u0028729@ember1 ~]$ ssh amorendt@login.xsede.org
amorendt@login.xsede.org's password:

Welcome to the XSEDE Single Sign-On (SSO) Hub!

Your storage on this machine is limited to 100MB.

You may connect from here to any XSEDE resource on which you have an account.

To view a list of sites where you actually have an account, visit: https://portal.xsede.org/group/xup/accounts

Here are the login commands for common XSEDE resources:

Blacklight: gsissh blacklight.psc.xsede.org
Darter: gsissh darter.nics.xsede.org
Comet: gsissh comet.sdsc.xsede.org
Greenfield: gsissh greenfield.psc.xsede.org
Gordon Compute Cluster: gsissh gordon.sdsc.xsede.org
Gordon ION: gsissh gordon.sdsc.xsede.org
Mason: gsissh mason1u.xsede.org
Maverick: gsissh -p 2222 maverick.tacc.xsede.org
Nautilus: gsissh nautilus.nics.xsede.org
Open Science Grid: gsissh submit-1osg.xsede.org
Stampede: gsissh -p 2222 stampede.tacc.xsede.org
SuperMIC: gsissh -p 2222 supermic.cct-lsu.xsede.org
Wrangler: gsissh -p 2222 wrangler.tacc.xsede.org

Contact help@xsede.org for any assistance that may be needed.
```

[amorendt@gw69 ~]$
Direct login access via command line

• Traditional way of accessing supercomputing resources
• Must submit a help ticket requesting a password to that resource in order to login directly.

• `ssh <username>@<machine-name>`

Examples:

• `ssh amorendt@gordon.sdsc.xsede.org`
Data Storage and File Transfer

- SDSC Gordon
  - [http://www.sdsc.edu/services/StorageBackup.html](http://www.sdsc.edu/services/StorageBackup.html)
- NCSA Mass Storage System
  - [https://bluewaters.ncsa.illinois.edu/data](https://bluewaters.ncsa.illinois.edu/data)
- NICS HPSS
  - [http://www.nics.utk.edu/computing-resources/hpss/](http://www.nics.utk.edu/computing-resources/hpss/)
- Easy data transfer
  - In-browser SFTP or SCP clients through Portal SSH
- Standard data transfer
  - SCP to move data in/out of XSEDE systems
    - Requires SSH key setup
  - Rsync to move data in
- High performance data transfer
  - Globus Online: [https://www.globusonline.org/](https://www.globusonline.org/)
Computing Environment: File Systems

Where your data resides on XSEDE and the appropriate storage is your responsibility. XSEDE users have access to three types of storage:

- **Stand-alone Storage**: Allows storage allocations independent of compute/visualization allocation
- **Archival Storage**: (large scale persistent storage) Long term storage of large amounts of data (often tape); slower access, accessible from all sites
- **Resource File System Storage**: All allocations include access to limited disk and scratch file systems

For more info: [https://www.xsede.org/storage](https://www.xsede.org/storage)
Computing Environment: Modules

• Environment management package
• Command line interface for modifying environment variables, like PATH.
• Makes it easier to manage collections of software packages and versions.

• Syntax: `module <command>`
• A few Commands: `avail, list, load <module>, unload, help <`
Computing Environment: Modules

• Simple Modules Commands
  – module avail - lists available modules
  – module list - lists currently loaded modules
  – module help foo - help on module foo
  – module whatis foo - brief description of module foo
  – module display foo - displays the changes that are made to the environment by loading module foo without actually loading it.
  – module load foo - load module foo
  – module unload foo - unloads module foo and removes all changes that it made in the environment
Computing Environment – Running Jobs

• All XSEDE systems use some type job scheduler (batch)
  – Request number/type of nodes
  – How long to run
  – What to do with output files
  – Submit job script with these specifications

• Most XSEDE systems use either SLURM or PBS/TORQUE

• https://www.xsede.org/web/guest/user-guides
Sign up for training

• XSEDE has a large set of online and in person training (programming, visualization & code improvement)
  
  – https://www.xsede.org/web/xup/online-training
  – https://www.xsede.org/web/xup/course-calendar

CHPC offers some of the in person offerings – watch for announcements
Support Resources

• Local Campus Champions:
  – anita.orendt@utah.edu

• Student Campus Champion:
  – khalid.ahmad@utah.edu

• Centralized XSEDE help: help@xsede.org

• Extended one-on-one help (ECSS):
  – https://www.xsede.org/ecss

• Training
  – http://www.xsede.org/training
Our reach will forever exceed our grasp, but, in stretching our horizon, we forever improve our world.