

Supercomputing Resources at UCSB

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<http://www.ets.ucsb.edu/services/supercomputing>

<http://csc.cnsi.ucsb.edu>



**ENTERPRISE
TECHNOLOGY
SERVICES**

University of California
Santa Barbara



CSC

UNIVERSITY OF CALIFORNIA SANTA BARBARA
CENTER FOR SCIENTIFIC COMPUTING

Overview

- Triton Shared Computing Cluster (TSCC) at San Diego Supercomputing Center (SDSC)
- Extreme Science and Engineering Discovery Environment (XSEDE)
- UCSB Center for Scientific Computing (CSC) clusters
- Training resources and workshops

TSCC

- Encourages campus participation, allowing researchers to use time and storage space on SDSC computing and data resources.
- UCSB purchases blocks of computer hours which researchers may request from the supercomputing consultant.
- Primarily used for educational purposes, but some groups also use it for research.

TSCC

System Features

General Computing Nodes

Dual-socket, 12-core, 2.5GHz Intel Xeon E5-2680 (coming) and Dual-socket, 8-core, 2.6GHz Intel Xeon E5-2670

GPU Nodes

Host Processors: Dual-socket, 6-core, 2.6GHz Intel Xeon E5-2630v2
GPUs: 4 NVIDIA GeForce GTX 980

Interconnect

10GbE (QDR InfiniBand optional)

Lustre-based Parallel File System

Access to [Data Oasis](#)

http://www.sdsc.edu/support/user_guides/tsc.html

http://www.sdsc.edu/services/hpc/hpc_systems.html#tsc

TSCC

<http://www.ets.ucsb.edu/services/supercomputing/triton-shared-computing-cluster-tsc>

- Individuals:
 - <1000 hours/yr, used for training and startup
 - Fill the application form at website
 - XSEDE trial and startup allocations recommended!
- Research Groups:
 - Max 40,000 hrs/yr
 - Fill the application form at website
 - XSEDE research allocations and CSC recommended!
- Class accounts:
 - Generally 300-500 hours per student (supplements available)
 - Syllabus, Number of Students and CV of instructor
 - For advanced topics (GPUs, Mapreduce, Hadoop etc.) XSEDE educational allocations can be more appropriate.

XSEDE

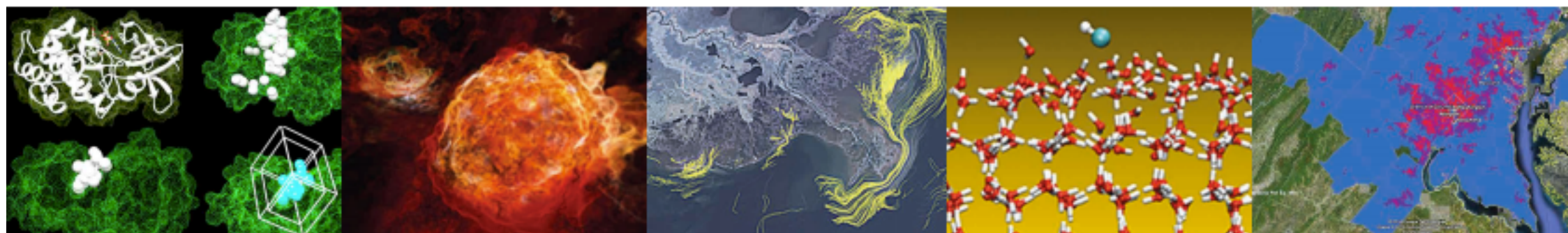
Extreme Science and Engineering
Discovery Environment

XSEDE is an NSF sponsored service organization that provides access to computing resources.

<https://portal.xsede.org>

www.xsede.org








Currently XSEDE supports more than a dozen supercomputers and high-end visualization and data analysis resources.



Available XSEDE Resources

My XSEDE Resources

 System Monitor

Resource	Status	Load	Username	My Jobs
Stampede TACC 	✓ Healthy	96%	burak	R: 0 Q: 0 O: 0
Comet SDSC 	✓ Healthy	62%	burak	R: 0 Q: 0 O: 0
Gordon Compute Cluster SDSC 	✓ Healthy	88%	burak	R: 0 Q: 0 O: 0
Maverick TACC 	✓ Healthy		burak	
Open Science Grid USC 	✓ Healthy		burak	R: 0 Q: 0 O: 0
Ranch TACC 	✓ Healthy		burak	
Greenfield PSC 	✓ Healthy		himmetog	R: 0 Q: 0 O: 0

Workhorse

General purpose,
more Big Data

Big Data

Visualization,
data analysis

High throughput

Long term storage

Large memory, big data

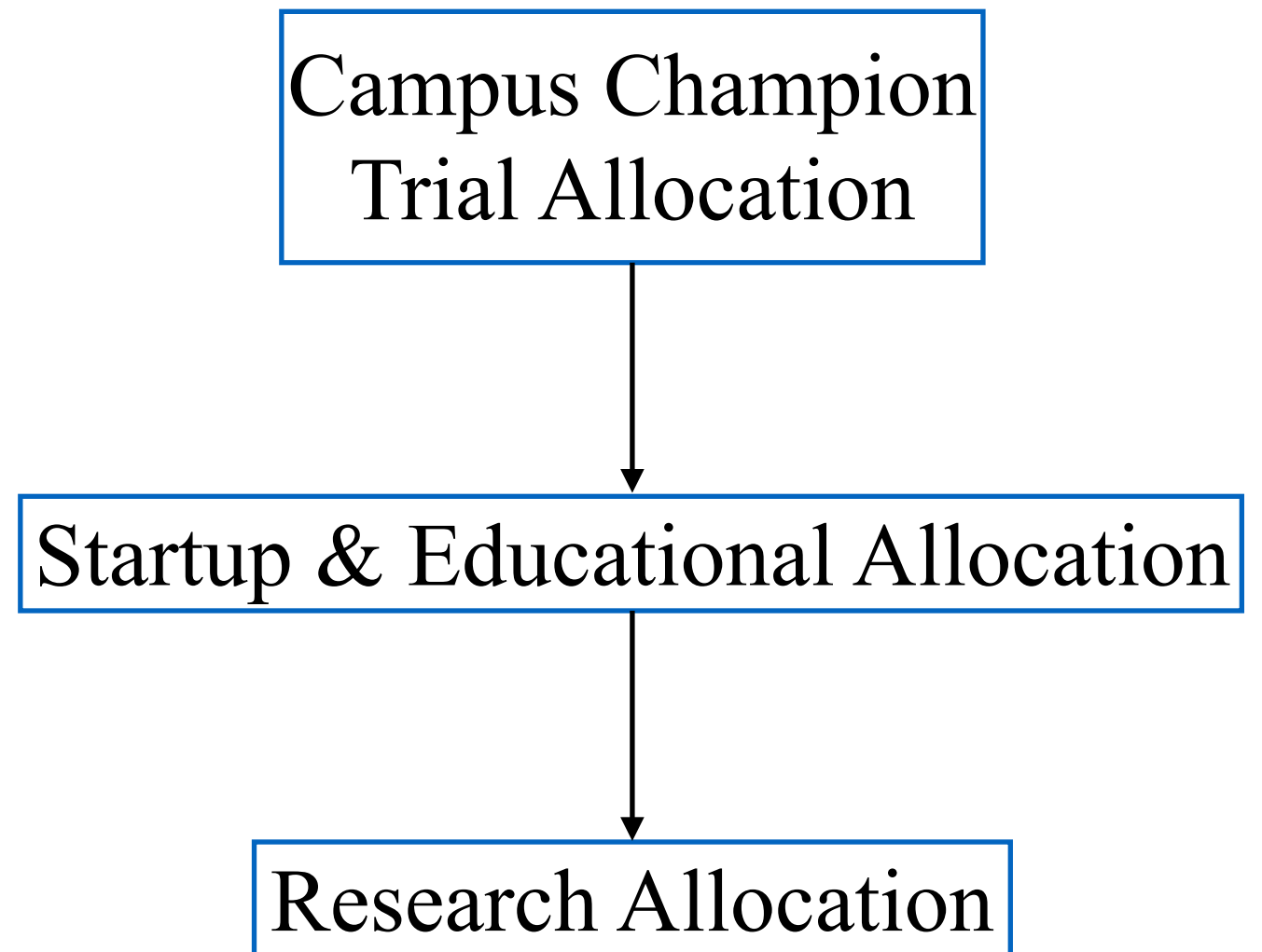
<https://www.xsede.org/resources/overview>

Campus Champions Program

Represents XSEDE on the campus

As a campus champion, I will help you:

- Understand the capabilities of HPC and get to include it as a part of your research and educational work.
- Get access to local, regional and national resources.
- Maintenance of accounts, allocations of computing time and technical expertise.
- Connect with the broader community of HPC users in your field



Allocations Overview

<https://portal.xsede.org/allocations-overview>

Trial Allocation

- Limited number of hours in XSEDE resources available to UCSB through the Campus Champion
- Getting familiar with XSEDE
- Running small tests

To get access

<https://portal.xsede.org>

- Sign up and get a username
- E-mail your username to the Campus Champion with a short description of your computational needs.

Allocations Overview

<https://portal.xsede.org/allocations-overview>

Startup & Educational Allocation

- Requires a one-two page allocation request
- Available all year around
- Available for use ~ two weeks after submission of request
- Max Limit: 200,000 hours per request

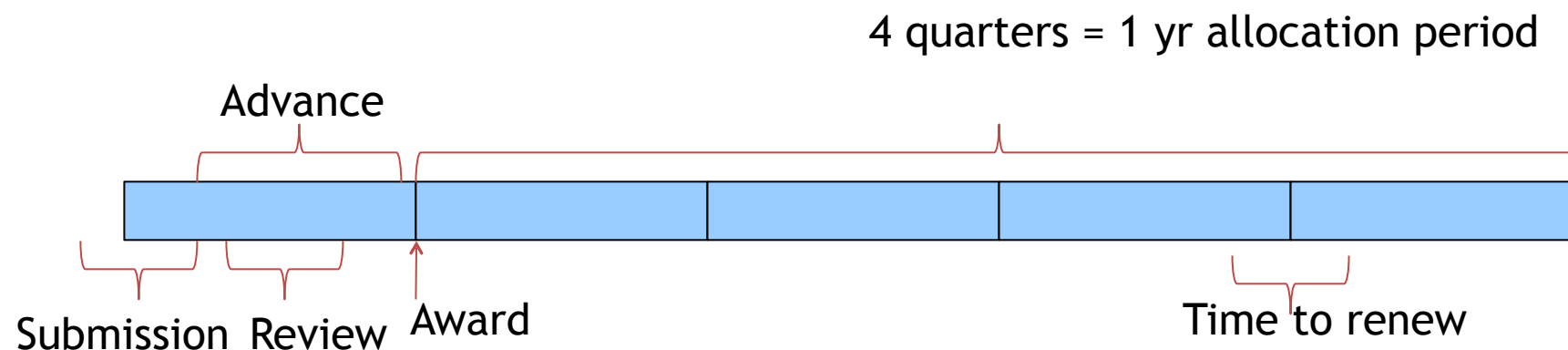
- Code development
- Scaling tests
- Training
- Users are expected to apply for Research Allocation after Startup

Allocations Overview

<https://portal.xsede.org/allocations-overview>

Research Allocations

- You can get millions of computer hours.
- One PI + researchers (added to the allocation from the portal)
- ~10 page research allocation request needs to be submitted
- Awarded 4 times a year
- Renewed each year by a progress report+renewal request



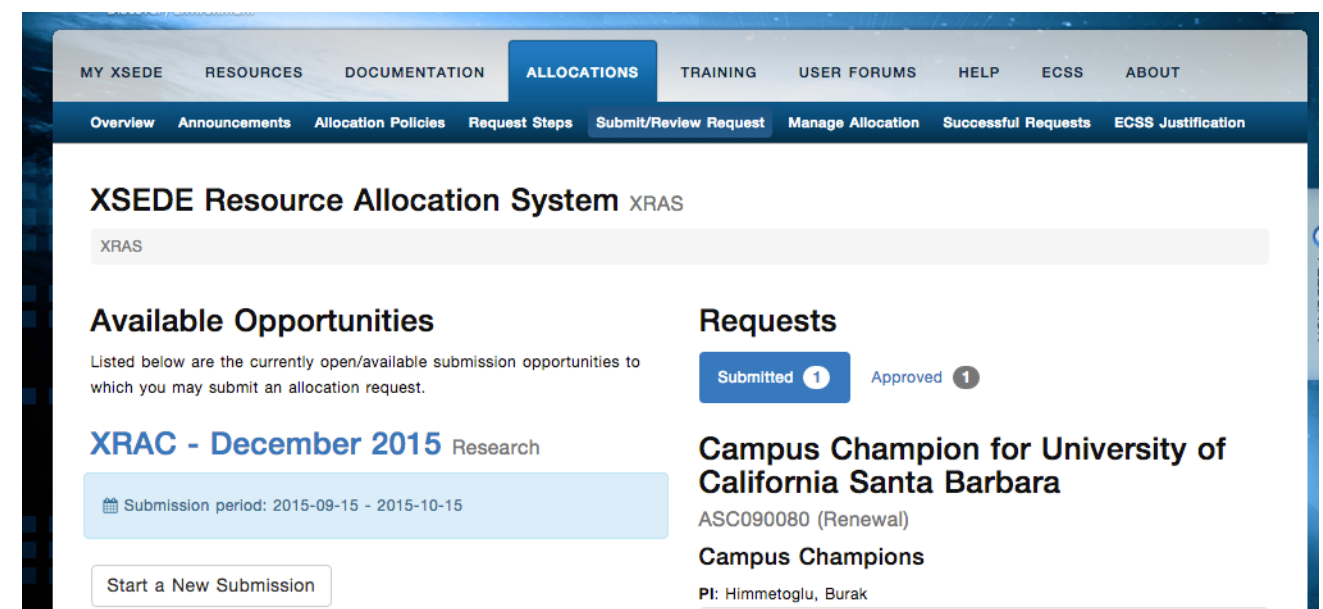
Allocations Overview

<https://portal.xsede.org/allocations-overview>

Allocation Periods

SUBMISSION PERIOD	ALLOCATION BEGIN DATE
Dec 15 thru Jan 15	April 1
Mar 15 thru Apr 15	Jul 1
Jun 15 thru Jul 15	Oct 1
Sep 15 thru Oct 15	Jan 1

Requests are submitted from the Portal



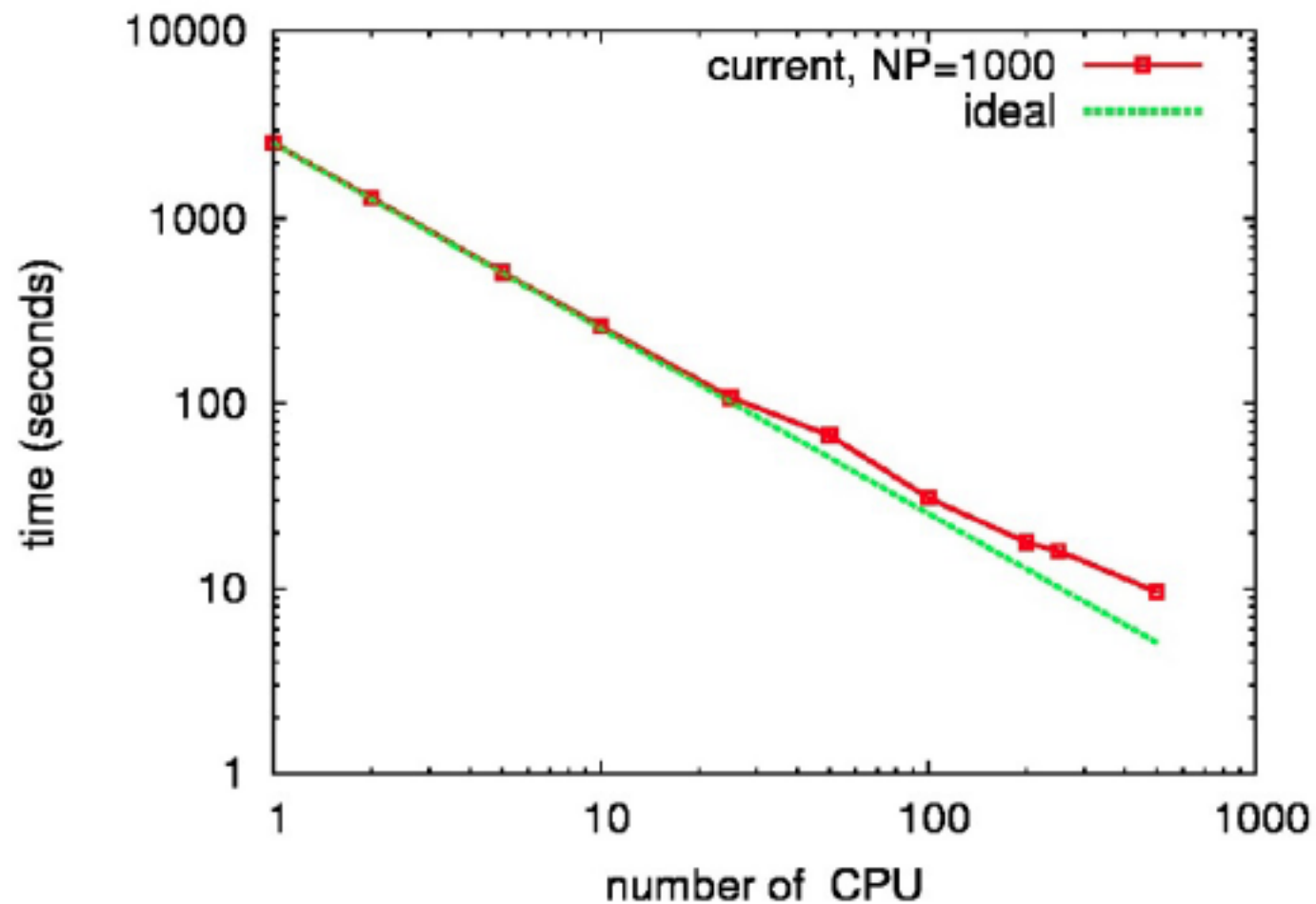
The screenshot shows the XSEDE Resource Allocation System (XRAS) portal. The navigation bar includes links for MY XSEDE, RESOURCES, DOCUMENTATION, ALLOCATIONS (selected), TRAINING, USER FORUMS, HELP, ECSS, and ABOUT. Below the navigation bar, there are sub-links for Overview, Announcements, Allocation Policies, Request Steps, Submit/Review Request, Manage Allocation, Successful Requests, and ECSS Justification. The main content area is titled "XSEDE Resource Allocation System XRAS" and features a search bar. Under "Available Opportunities", there is a listing for "XRAC - December 2015" with a submission period of 2015-09-15 to 2015-10-15 and a "Start a New Submission" button. The "Requests" section shows "Submitted 1" and "Approved 1" counts, and a specific request for "Campus Champion for University of California Santa Barbara" with ID ASC090080 (Renewal) and PI: Himmetoglu, Burak.

- Short description of research
- Justification of requested hours
- Scaling tests

Allocations Overview

Successful allocation requests:

<https://portal.xsede.org/successful-requests>



Other useful aspects of XSEDE

A nice portal

XSEDE USER PORTAL
Extreme Science and Engineering Discovery Environment

Search XSEDE...

MY XSEDE RESOURCES DOCUMENTATION **ALLOCATIONS** TRAINING USER FORUMS HELP ECSS

Summary Allocations/Usage Accounts Jobs Profile Publications Tickets Change Password Add User

Share your feedback on XSEDE Extended Collaborative Support Services with a quick 5 question survey!

Welcome, Burak!
Last login: Mon 10/26/15 at 09:52:16 AM CST

Profile Allocations Accounts Training

NEW! Share your XSEDE Science Achievements

Publications: [Full List]

You have entered 3 publication(s).

Add a Publication

In The Past 7 Days

XD SUs Charged: Total: by Field of Science

Field of Science	SUs Charged
Biophysics	13,810,857.0
Materials Research	12,810,857.0
Fluid, Particulate, and Hydraulic Systems	7,112,000.0
Astronomical Sciences	6,540,000.0
Earth Sciences	6,402,111.0
Molecular Biophysics	5,011,439.0
All 75 others	32,148,348.0
Gravitational Physics	3,784,348.0
Extragalactic Astronomy and Cosmology	4,104,100.0
Elementary Particle Physics	4,378,907.0
Chemistry and Molecular Structure and Function	3,112,000.0
Molecular Spectroscopy	2,112,000.0
Elementary Particle Physics	1,112,000.0

View Gallery

My XSEDE Resources System Monitor

Resource	Status	Load	Username	My Jobs
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- Get a username from the portal
- Go to allocations tab, and below you can ask for 1000 hrs from Comet

RESOURCE	TRIAL ALLOCATION LIMIT	REQUEST A TRIAL ACCOUNT
Comet	1000 SUs, 6 months	Please submit an XSEDE help-desk ticket

- Send me your username
- A short description of your computing needs
- You will get limited trial time from any resource!

Other useful aspects of XSEDE

Numerous Training sessions, most of them broadcasted from the web

Training classes

SEARCH:

START DATE ▼	END DATE ▼	CLASS NAME	REGISTERED
11/24/2015	11/24/2015	nvidia OpenACC Course (October 1 - November 24, 2015)	Download
11/13/2015	11/13/2015	R HPC Training 11.13.2015 (Texas Advanced Computing Center)	REGISTER
11/13/2015	11/13/2015	R HPC Training 11.13.2015	REGISTER
11/12/2015	11/12/2015	nvidia OpenACC Course (October 1 - November 24, 2015)	Download
11/05/2015	11/05/2015	Data sharing from Comet and Gordon clusters using SeedMe.org	REGISTER
11/04/2015	11/04/2015	Data sharing from Comet and Gordon clusters using SeedMe.org	REGISTER
11/03/2015	11/03/2015	nvidia OpenACC Course (October 1 - November 24, 2015)	Download
11/03/2015	11/03/2015	XSEDE HPC Monthly Workshop - November 3, 2015 - Big Data (Pittsburgh Supercomputing Center)	SIGN UP FOR WAITLIST
11/03/2015	11/03/2015	XSEDE HPC Monthly Workshop - November 3, 2015 - Big Data (Lehigh University)	REGISTER
11/03/2015	11/03/2015	XSEDE HPC Monthly Workshop - November 3, 2015 - Big Data (University of Houston - Clear Lake)	REGISTER
11/03/2015	11/03/2015	XSEDE HPC Monthly Workshop - November 3, 2015 - Big Data (Harvey Mudd College)	REGISTER
11/03/2015	11/03/2015	XSEDE HPC Monthly Workshop - November 3, 2015 - Big Data (University of Iowa)	REGISTER

CSC Clusters

Campus available clusters:

QSR (32 node, 4 core Opteron)

Knot (110 node, ~1400 core) system

4 'fat nodes' (256/512 GB RAM)

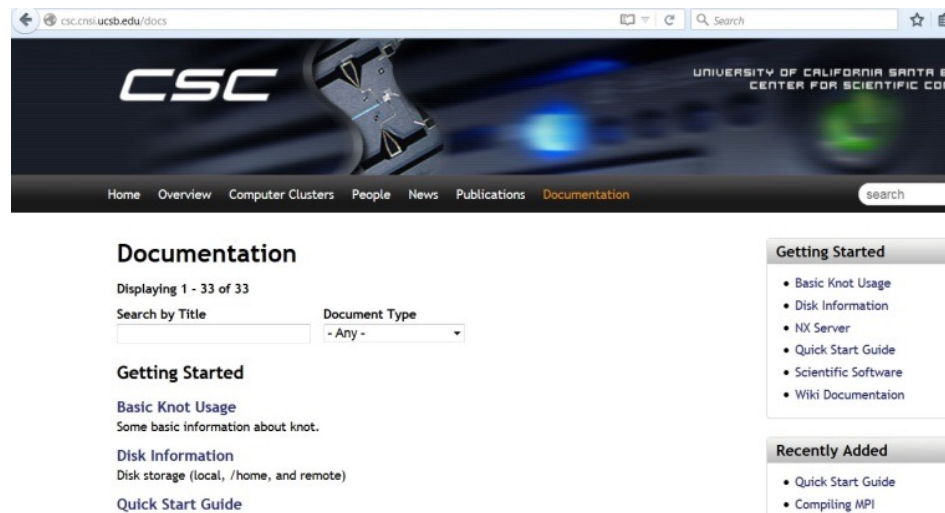
GPU nodes (12)





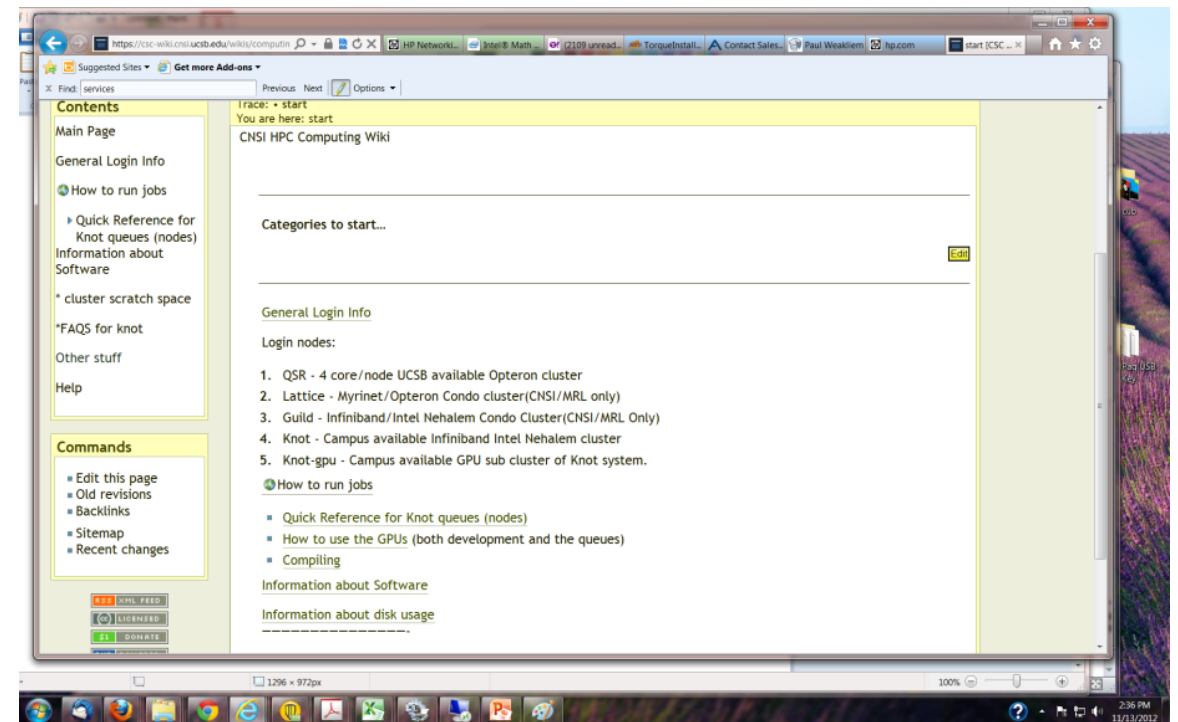
- Free!!

We acknowledge support from the Center for Scientific Computing at the CNSI and MRL: an NSF MRSEC (DMR-1121053) and NSF CNS-0960316.



<http://csc.cnsi.ucsb.edu>

- Look for wiki
- search



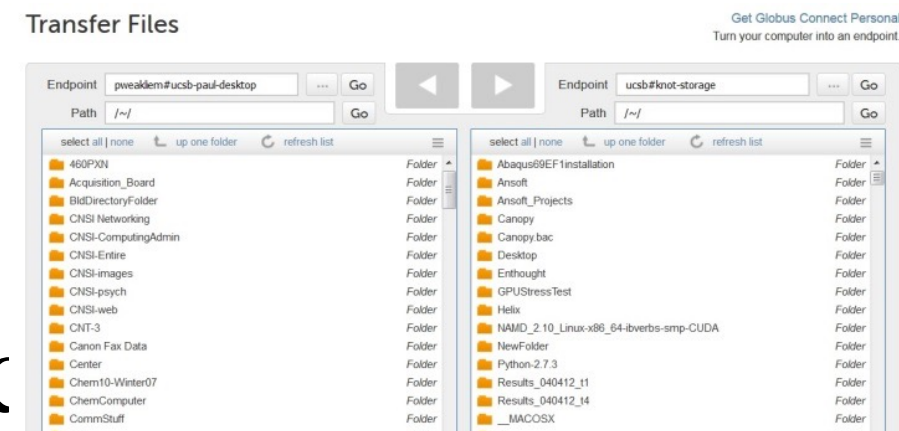
- ‘Condo clusters’
 - PI’s buy nodes in the clusters
 - ❑ Lattice (62 node Opteron)
 - ❑ Guild (60 node Nehalem)
 - ❑ Braid (70 node IvyBridge/Haswell and GPUs)
- Groups buy nodes in the cluster, CSC handles infrastructure (disk, network, etc.) and management





- /csc/central for temporary storage
- Globus endpoint (<http://globusonline.org>)
 - Look for ucsb#knot-storage (can then navigate to /home, /csc directories)

- Move large quantities of c connections



- Local clusters good for development work, ‘smaller’ jobs.
- Once you exceed the resources, work with Burak to use SDSC, XSEDE resources



Training Sessions at UCSB

- Intel Xeon Phi training will take place in January (2 days)
- Using Python and R in parallel (planned)
- Big Data related subjects: SDSC staff can be invited
- Other requests (e.g. cuda, hadoop etc.) ?
- Questions ?