

Overview of the Texas Advanced Computing Center



John Cazes

TACC

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TACC Mission & Strategic Approach

To enable discoveries that advance science and society through the application of advanced computing technologies.

- Resources & Services
 - Evaluate, acquire & operate world-class resources
 - Provide expert support via leading technology expertise
- Research & Development
 - Produce new computational technologies and techniques
 - Collaborate with researchers to apply advanced computing technologies in science projects

TACC Technology Focus Areas

- High Performance Computing (HPC)
 - Performance benchmarking, analysis, optimization
 - Linear algebra and solvers
 - CFD, computational chemistry, weather/ocean modeling, computational biomedicine
- Data & Information Analysis (DIA)
 - Scientific visualization
 - Scientific data collections management
 - Data analysis & mining
- Advanced Computing Interfaces
 - Portals & gateways
 - Middleware for job scheduling, workflow, orchestration

TACC HPC/DATA Systems

| System | Ranger | Lonestar | Longhorn |
|---------------------------|-------------------------|--------------------------|---------------------------------------------------|
| Purpose | HPC | HPC | Data Analysis |
| Nodes | 3,936 | 1,888 | 256 |
| CPUS/node x cores/CPUS | 4 x 4 | 2 x 6 | 2 x 4 + 2GPUs |
| Total cores | 62,976 | 22,656 | 2,048 |
| CPUS | AMD Barcelona 2.3GHz | Intel Westmere 3.3GHz | Intel Nehalem +NVIDIA 2.5 GHz +Quadro Plex S4s |
| Memory | 2GB/core | 2GB/core | 6GB/core (240 nodes) 18GB/core (16 nodes) |
| Interconnect | SDR IB | QDR IB | QDR IB |
| Disk | 1.7PB Lustre (IB) | 1PB Lustre (IB) | 0.2PB Lustre (10GigE) |

Storage Systems

High Speed Disk-- Corral

- 1 PB Data Direct Disk
- 800TB Lustre File System
- 200TB Data Collections
- InfiniBand interconnect
- Access: as /corral file system on ranger, lonestar and longhorn; ssh/scp; requires allocation



DDN S2A 9900 Disk

Tape Storage -- Ranch

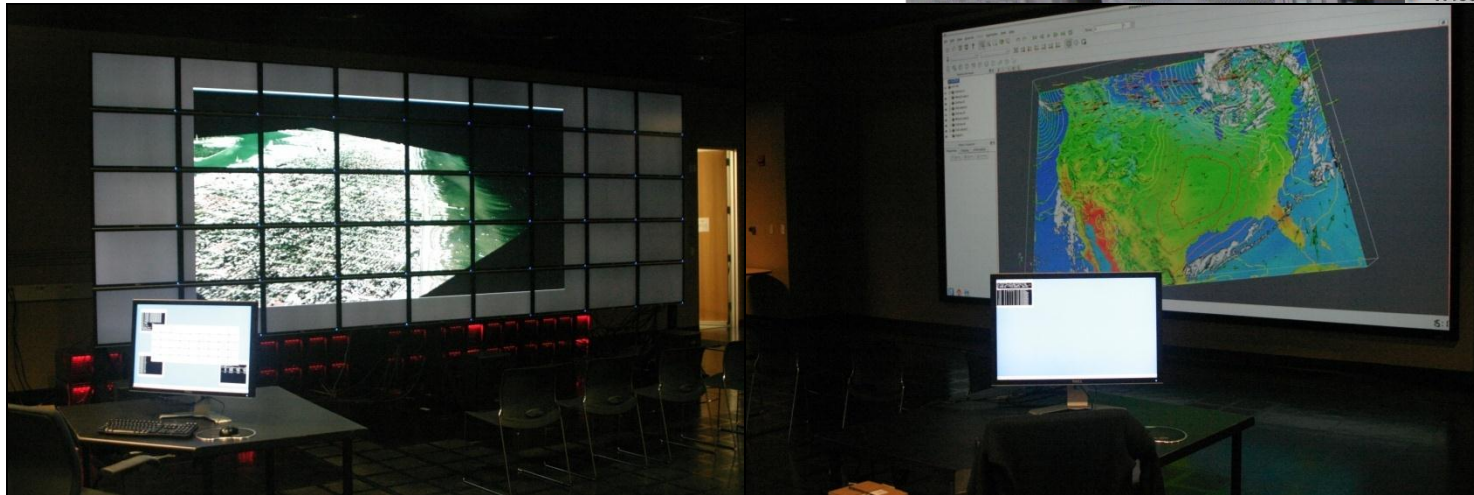
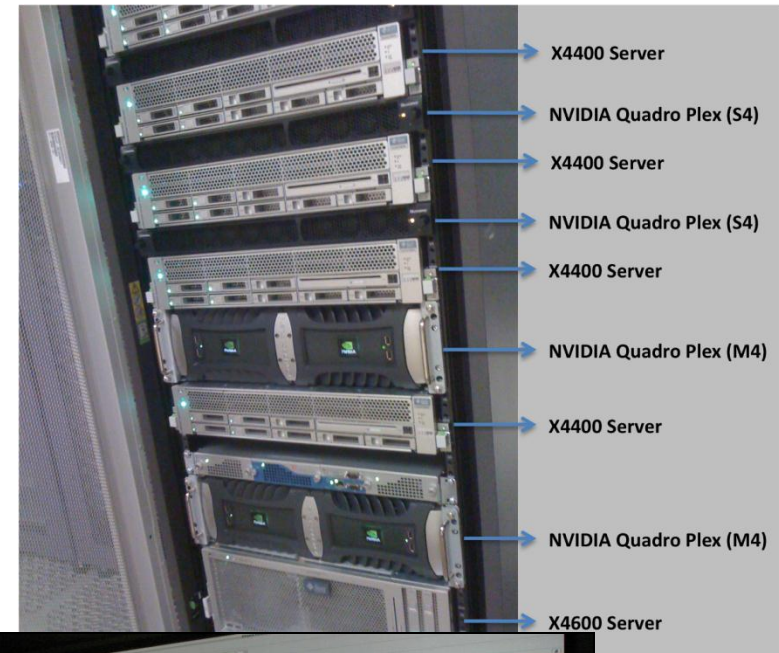
- 10PB capacity
- 70 TB cache
- 10Gb Ethernet interconnect
- Access: scp/bbcp to ranch.tacc.utexas.edu; or rsh/ssh



STK SL8500 Tape Lib

TACC Advanced Visualization Systems

- *Spur*: Sun Remote Visualization System
 - 8 servers, 32 Nvidia Quadroplex GPUs
 - 1.125TB total memory, 256GB in one server
 - On Ranger InfiniBand fabric
 - Direct access to Ranger file systems
- ACES Vislab
 - 15x5 Tiled Display Wall, 307 MPixels, Nvidia GPUs
 - SONY 9MPixel Projector, 20ft x 11ft display
 - 4 Dell High-end Workstations
 - Collaboration/conference room



TACC Support Services

- Technical documentation
 - <http://www.tacc.utexas.edu/> (user guides!)
- Training
 - <http://www.tacc.utexas.edu/services/training/>
 - Taught on-site, sign up at TACC User Portal
- Or – Everything through the TACC Portal (consulting)
 - <http://portal.tacc.utexas.edu/>



XSEDE

- eXtreme Digital Resources for Science and Engineering
 - A national federation of NSF-funded advanced computing resource and service providers
- Portal: <http://portal.xsede.org>
 - Information
 - Allocations
 - Access
 - Help

Using TACC XSEDE Resources

| HPC SYSTEMS | | | ADVANCED VIS SYSTEMS | | | STORAGE SYSTEMS | | | SPECIAL PURPOSE SYSTEMS | | |
|---------------|-------------|-------------------------------|----------------------|------------------|--------|-----------------|-----------------|----------------|-------------------------|--|--|
| NAME | INSTITUTION | SYSTEM | PEAK TFLOPS | MEMORY TBYTES | STATUS | LOAD | RUNNING JOBS | QUEUED JOBS | OTHER JOBS | | |
| Kraken | NICS | Cray XT5 | 1174.00 | 147.00 | Up | | 187 | 501 | 306 | | |
| Ranger | TACC | Sun Constellation Cluster | 579.40 | 123.00 | Up | | 440 | 65 | 100 | | |
| Lonestar | TACC | Dell Linux Cluster | 302.00 | 45.00 | Up | | 434 | 84 | 139 | | |
| Trestles | SDSC | Appro AMD Magny-Cours Cluster | 100.00 | 20.25 | Up | | 1 | 14 | 0 | | |
| Steele | Purdue | Dell Intel 64 Linux Cluster | 60.00 | 12.40 | Up | | 370 | 2346 | 63 | | |
| Lincoln | NCSA | Dell/Intel PowerEdge 1950 | 47.50 | 3.00 | Up | | 27 | 25 | 0 | | |
| Blacklight | PSC | SGI UV | 37.20 | 32.00 | Up | | 60 | 147 | 1 | | |
| Dash | SDSC | Appro Intel Nehalem Cluster | 4.90 | 3.00 | Up | | 1 | 0 | 0 | | |
| Total: | | | 2305.0 | 385.65 | | | 1520 | 3182 | 609 | | |

*Indicates failure of one or more status test.
Hover mouse pointer over Resource Name, Resource Status, and headings to see additional information.

- 11 Centers
- 1.5 Billion core-hrs/yr
- Startup, Research & Instructional Allocations

XSEDE Allocation Requests

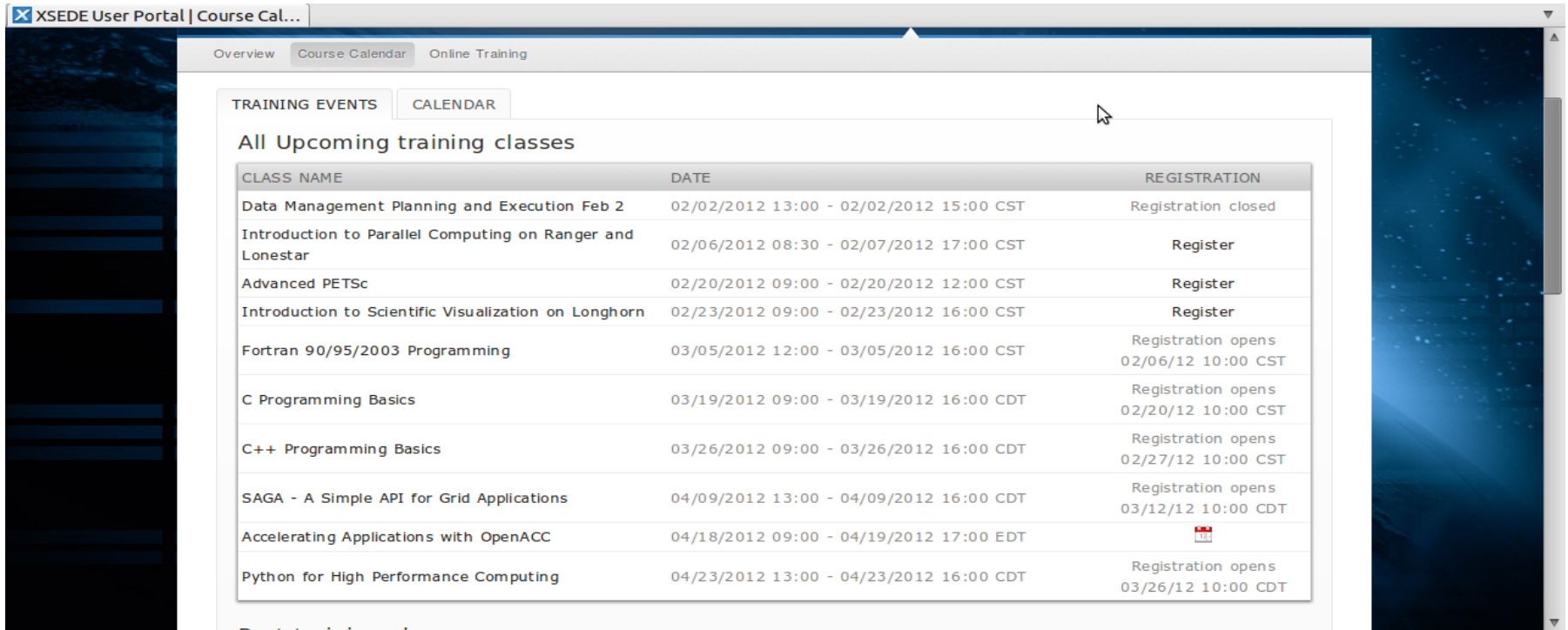
Types of Projects

- Startup *Development/testing/
porting/benchmarking* Up to 200,000 core-hrs., for 1yr
Submit Abstract, Awarded/2 wks
- Research *Program (usually funded)* Unlimited core-hrs, for 1yr
10 page Request,
Awarded/quarter
- Education *Classroom, Training* Up to 200,000 core-hrs, for 1 yr
Submit Abstract, Awarded/2 wks


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

XSEDE Training

<https://portal.xsede.org/course-calendar>



The screenshot shows the XSEDE User Portal Course Calendar page. The page has a navigation bar with 'Overview', 'Course Calendar', and 'Online Training'. Below the navigation bar, there are two tabs: 'TRAINING EVENTS' and 'CALENDAR'. The main content area is titled 'All Upcoming training classes' and contains a table with the following data:

| CLASS NAME | DATE | REGISTRATION |
|-----------------------------------------------------------|-----------------------------------------|-------------------------------------------------------------------------------------|
| Data Management Planning and Execution Feb 2 | 02/02/2012 13:00 - 02/02/2012 15:00 CST | Registration closed |
| Introduction to Parallel Computing on Ranger and Lonestar | 02/06/2012 08:30 - 02/07/2012 17:00 CST | Register |
| Advanced PETSc | 02/20/2012 09:00 - 02/20/2012 12:00 CST | Register |
| Introduction to Scientific Visualization on Longhorn | 02/23/2012 09:00 - 02/23/2012 16:00 CST | Register |
| Fortran 90/95/2003 Programming | 03/05/2012 12:00 - 03/05/2012 16:00 CST | Registration opens 02/06/12 10:00 CST |
| C Programming Basics | 03/19/2012 09:00 - 03/19/2012 16:00 CDT | Registration opens 02/20/12 10:00 CST |
| C++ Programming Basics | 03/26/2012 09:00 - 03/26/2012 16:00 CDT | Registration opens 02/27/12 10:00 CST |
| SAGA - A Simple API for Grid Applications | 04/09/2012 13:00 - 04/09/2012 16:00 CDT | Registration opens 03/12/12 10:00 CDT |
| Accelerating Applications with OpenACC | 04/18/2012 09:00 - 04/19/2012 17:00 EDT |  |
| Python for High Performance Computing | 04/23/2012 13:00 - 04/23/2012 16:00 CDT | Registration opens 03/26/12 10:00 CDT |

More About TACC:

Texas Advanced Computing Center

www.tacc.utexas.edu

info@tacc.utexas.edu

(512) 475-9411

