

# Overview of the Texas Advanced Computing Center



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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)

\* Replacement of present Lonestar in Jan. 2011

# 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

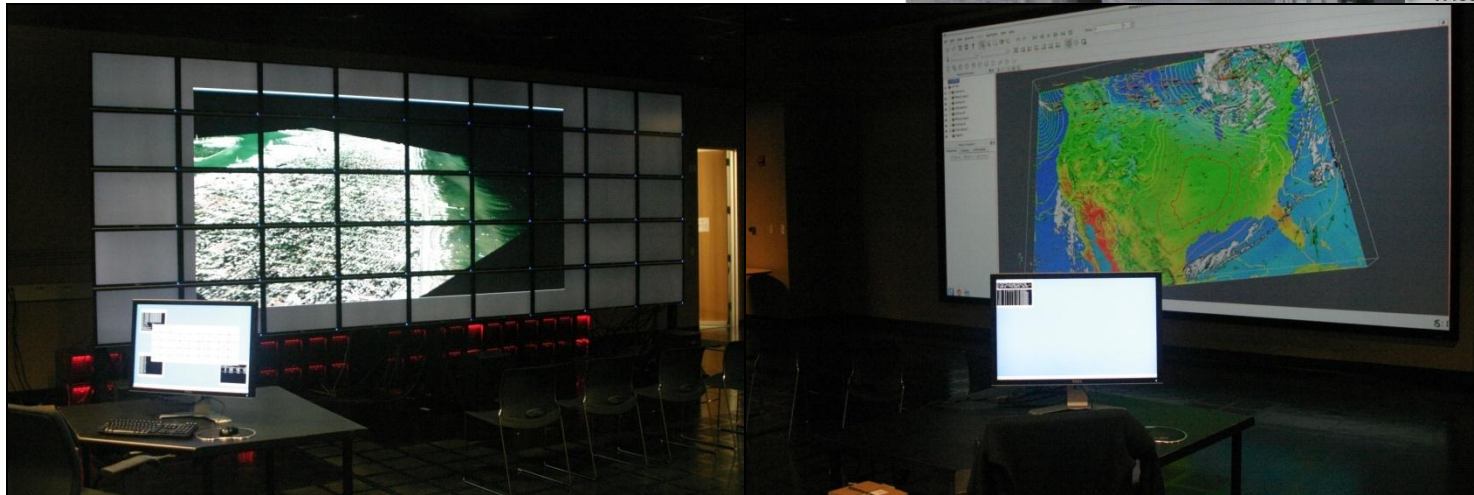
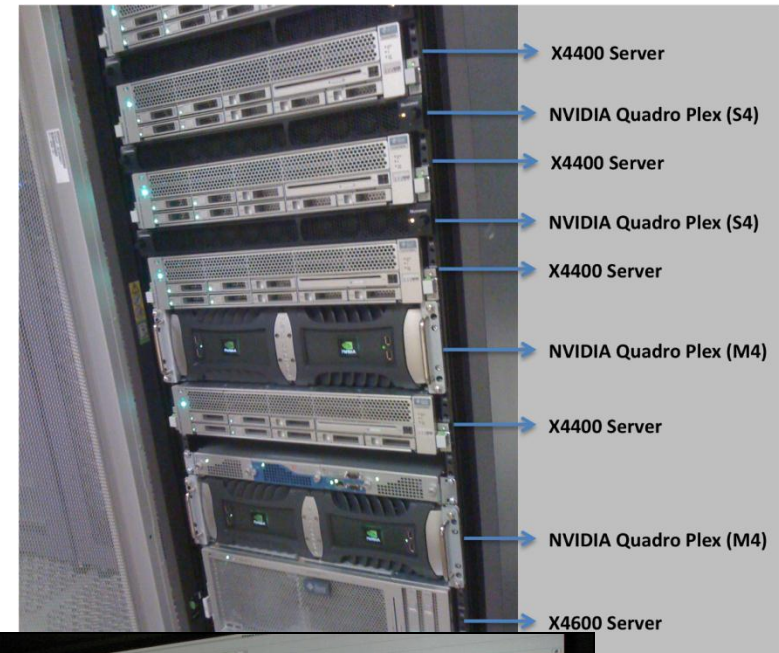
- 10PB capacity
- 70 TB cache
- 10Gb Ethernet interconnect
- **Access:** scp/bbcp to ranch.tacc.utexas.edu; or rsh/ssh



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
- New 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		
<b>Total:</b>			<b>2305.0</b>	<b>385.65</b>			<b>1520</b>	<b>3182</b>	<b>609</b>		

\*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>



- **Webcast**
- **September 15, 2011, 1PM CDT**
- **<https://www.xsede.org/web/xup/course-calendar>**



# What is Globus Online?

- **Initial implementation of XSEDE User Access Services (XUAS)**
- **Reliable data movement service**
  - High performance: Move terabytes of data in thousands of files
  - Automatic fault recovery
  - Across multiple security domains
- **Designed for researchers**
  - Easy “fire and forget” file transfers
  - No client software installation
  - New features automatically available
  - Consolidated support and troubleshooting
  - Works with existing GridFTP servers
  - Ability to move files to any machine (even your laptop) with ease



*"We have been using Globus Online to move files to a TeraGrid cluster where we analyze and store tens of terabytes of data... I plan to continue using GO to access these resources within XSEDE to easily get my files where they need to go."*

*-- University of Washington user*



*"The service is reliable and easy to use, and I look forward to continuing to use it with XSEDE. I've also used the Globus Connect feature to move files from TeraGrid sites to other machines -- this is a very useful feature which I'm sure XSEDE users will want to take advantage of."*

*-- NCSA user*

# More About TACC:

## Texas Advanced Computing Center

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