



Cornell University
Center for Advanced Computing

Hardware Overview

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TeraGrid

- Series of interconnected HPC resources with a high speed interconnect and shared login/consulting services.

High Performance Systems									
Name	Institution	System	Peak TFlops	Memory TBytes	Status	Load	Running Jobs	Queued Jobs	Other Jobs
Kraken	NICS	Cray XT5	608.00	129.00	Up		24	5	3
Ranger	TACC	Sun Constellation	579.40	123.00	Up		297	406	100
Abe	NCSA	Dell Intel 64 Linux Cluster	89.47	9.38	Up*		194	170	136
Lonestar	TACC	Dell PowerEdge Linux Cluster	62.16	11.60	Up		40	90	1
Steele	Purdue	Dell Intel 64 Linux Cluster	60.00	12.40	Up		813	189	25
Queen Bee	LONI	Dell Intel 64 Linux Cluster	50.70	5.31	Up		119	5	1
Lincoln	NCSA	Dell/Intel PowerEdge 1950	47.50	3.00	Up		1	0	0
Big Red	IU	IBM e1350	30.60	6.00	Up*		611	903	43
BigBen	PSC	Cray XT3	21.50	4.04	Up		13	56	48
TeraGrid Cluster	NCSA	IBM Itanium2 Cluster	10.23	4.47	Up		45	4	0
Cobalt	NCSA	SGI Altix	6.55	3.00	Up		63	473	40
Frost	NCAR	IBM BlueGene/L	5.73	0.51	Up		8	0	10
Pople	PSC	SGI Altix 4700	5.00	1.54	Up		38	0	16
TeraGrid Cluster	SDSC	IBM Itanium2 Cluster	3.10	1.02	Up*		42	6	0
TeraGrid Cluster	UC/ANL	IBM Itanium2 Cluster	0.61	0.24	Up		1	0	0
NSTG	ORNL	IBM IA-32 Cluster	0.34	0.07	Up		1	0	0
Total:			1580.89	314.58			2310	2307	423



TeraGrid

- TeraGrid resources also include storage and visualization systems.

Storage Systems				
Name	Institution	System	Online Storage TB	Offline Storage TB
IU Archival Storage	IU	HPSS	N/A	28000
SDSC Tape Storage	SDSC	HPSS	N/A	25000
Ranch	TACC	Sun StorageTek Mass Storage Facility	35	5000
MSS	NCAR	Mass Storage System	N/A	2000
Data Capacitor	IU	Lustre	535	N/A
Ranger Storage	TACC	Lustre	1700	N/A
SDSC GPFS-WAN	SDSC	Global Parallel File System-Wide Area Network	700	N/A
			Total: 2970	60000

Advanced Visualization Systems						
Name	Institution	System	CPUs	Peak TFlops	Memory TBytes	Graphics Hardware
Spur	TACC	Sun Visualization Cluster	128	1.13	1.00	4 NVIDIA Quadro Plex model 4, 6 NVIDIA Quadro Plex S4. Total: 32 NVIDIA FX 5600 GPUs
TeraDRE	Purdue	Condor Pool	14000	60.00	28.00	Nvidia GeForce 6600 GT
TeraGrid Cluster	UC/ANL	Intel Xeon Cluster	192	0.61	0.38	nVIDIA GeForce 6600GT AGP graphics cards
			Total: 14320	61.74	29.38	



Teragrid Portal

The screenshot shows the TeraGrid User Portal website in a Mozilla Firefox browser window. The browser's address bar displays the URL: <https://portal.teragrid.org/gridisphere/gridsphere.jsessionid=FA3AEF56DC8DA1588618120BCA8104A7.tgup2?cid=login>. The page features the TeraGrid logo and the text "User Portal". A navigation menu includes links for Home, My TeraGrid, Resources, Documentation, Training, Consulting, and Allocations. A "Welcome" message is displayed, along with a "Logout" link and the text "Welcome, Nathaniel Woody". A "Notifications" box on the right side of the page contains a message dated Tuesday, 10 March 2009, regarding system maintenance. The main content area includes an "About" section, a "Feature Spotlight" section titled "TeraGrid User Portal Now Offers Interactive Remote Visualization on Spur", and a list of system capabilities. The footer of the page mentions funding from the National Science Foundation and lists resource providers: Indiana, LONI, NCAR, NCSA, NICS, ORNL, PSC, Purdue, SDSC, TACC, and UC/JANL.

Notifications

Tuesday, 10 March 2009

On Tuesday, 10 March 2009, the TeraGrid User Portal will undergo system maintenance between 9 a.m. and noon (CST).

Users are not expected to experience any downtime but a minor downtime may be necessary if any unexpected problems occur.

Please submit any questions you may have via the Consulting section of the TeraGrid User Portal.

<http://portal.teragrid.org/consulting>

Feature Spotlight

TeraGrid User Portal Now Offers Interactive Remote Visualization on Spur

The TeraGrid User Portal team is pleased to announce the transition of the user portal's Remote Visualization feature from Maverick to the new TACC Visualization resource, Spur. The remote visualization service offers interactive visualization capabilities through a remote VNC desktop session for users needing to analyze very large data sets residing on Spur or Ranger, and requires only a Java-capable browser, an active Spur allocation, and a VNC password set on Spur. The transition to Spur will greatly increase the performance and capability of this service. Spur system configuration includes a Sun Fire X4600 server (master node) with:

- 8 dual-core CPUs (16 cores)
- 256 Gigabytes of Memory
- 4 NVIDIA Quadro FX5600 GPUs

7 Sun X4400 servers (visualization nodes), each with:

- 4 quad-core CPUs (16 cores)
- 128 Gigabytes of Memory
- 4 NVIDIA Quadro FX5600 GPUs

Total system capability: 128 cores, 1 Terabyte aggregate memory, 32 GPUs

TeraGrid User Portal users may access this service as before, by logging into the portal, visit the 'Resources' area and select the 'Remote Visualization' to use the Spur Remote Visualization service.

The TeraGrid project is funded by the National Science Foundation and includes eleven resource providers:
Indiana, LONI, NCAR, NCSA, NICS, ORNL, PSC, Purdue, SDSC, TACC and UC/JANL.



Ranger

- Ranger – Sun Constellation Linux cluster, in production since February of 2008





Ranger

- 3,936 AMD Opteron (Barcelona) Nodes
 - Four socket, quad-core (62,976 cores, 2.3 GHz)
- 579 TFlops Peak Performance
- 125 TB Memory (2GB/core)
 - 32 GB/ Node
- 1.7 PB Storage (Lustre Parallel File System)
 - Broken into several different file systems
 - An tape storage device provides 10PB offline storage
- InfiniBand Interconnect (2x 3456-port switches)
 - 1GB point to point connection



Ranger Data

- No local disk storage (booted from 8 GB compact flash)
- User data is stored on 1.7 PB (total) Lustre file systems, provided by 72 Sun x4500 I/O servers and 4 Metadata servers.
- 3 mounted filesystems, all available via Lustre filesystem over IB connection. Each system has different policies and quotas.

Alias	Total Size	Quota (per User)	Retention Policy
\$HOME	~100 TB	6 GB	Backed up nightly; Not purged
\$WORK	~200 TB	350 GB	Not backed up; Not purged
\$SCRATCH	~800 TB	400 TB	Not backed up; Purged every 10 days



Ranger Software Configuration

- Rocks-based (4.1) Linux
 - 2.6.18.8 Linux kernel
- Compilers
 - Intel 9.1 and 10.1, PGI 7, SunStudio 12, gcc 4.2 &4.3
- Numeric libraries
 - ACML, MKL, FFTW, scalapack, gotoblas,gsl, numpy
- MPI
 - Mvapich1 and 2
- Debugging/etc tools
 - mpiP, DDT, Tau, Papi



Spur

- Spur is the new visualization resource attached to Ranger
- 8 Compute nodes
 - 128 GB RAM
 - 1 Node has 256 GB
 - 4 NVIDIA FX5600's
 - 6 of the nodes via a QuadroPlex 2100
 - 1 via 2 QuadroPlex 1000s
 - 1.5GB GDD3/GPU
 - 77GB/s Memory Bandwidth.
- Spur shares the IB connection with Ranger and has all file systems mounted.
- Ranger data can be visualized without having to move simulation results off of Ranger.