ASC PSAAP Alliances Computing at Sandia National Laboratories

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Sandia Computing Resources

Clusters at Sandia

https://computing.sandia.gov/platforms

System	Project	Type	Vendor	Network	Location	Nodes/Cores	Processor	OS	Interconnect	RAM/Node	TFlops	Processor Hrs/Yr	GA Date
Red Mesa	ECIS	Capacity	Sun	ECN	SNL-NM	1,920/ 15,360	2.93 GHz Intel Nehalem QC quad processors	RHEL 5	Infiniband	12 GB	180	134,553,600	May-2010
Ebird	All	Capacity	Dell	ECN	SNL-NM	383/ 766	Dual 3.6 GHz Intel EM64T quad processors	RHEL 5	Infiniband	6 GB	5.5	6,710,160	Feb-2011
Talon	All	Capacity	Dell	SON	SNL-CA	128 /256	3.6 GHz Intel Xeon	RHEL 5	Infiniband	6 GB	1.85	2,242,560	Nov-2010
Red Sky	All	Capacity	Sun	Unclassified	SNL-NM	2,823/22,584	2.93 GHz Intel Nehalem QC quad processors	RHEL 5	Infiniband	12 GB	264	197,835,840	Apr-2010
Glory	NW	Capacity	Appro	Unclassified	SNL-NM	272 / 4352	2.2 GHz AMD Quad Core quad processors	RHEL 5	Infiniband	32 GB	38	38,123,520	Jan-2009
Blackrose	All	Viz	Dell	Unclassified	SNL-NM	128 / 512	2.8 GHz AMD dual core dual processors	RHEL 4	Infiniband	8 GB	2.8	4,485,120	Mar-2007
Goodyear	All	CEE	HP	Unclassified	SNL-NM	8 / 64	2.3 GHz AMD Quad Core	SuSE Linux	Infiniband	16 GB	0.57	560,640	Dec-2008
Tunnison	All	Capacity	HP	Unclassified	SNL-CA	190 / 380	3.4 GHz EM64T Xeon dual core	RHEL 5	Myrinet	2 GB	2.6	3,328,800	Aug-2010
Red Storm	NW	Capability	Cray	Classified	SNL-NM	9,600 / 31,680	6,240 2.2 GHz AMD Quad Core 3,360 2.4 GHz AMD Dual Core	SuSE Linux & Catamount	Cray SeaSTAR	2 GB / core	284	277,516,800	Mar-2007
Red Sky-S	All	Capacity	Sun	Classified	SNL-NM	519 / 4152	2.93 GHz Intel Nehalem QC quad processors	RHEL 5	Infiniband	12 GB	48	36,371,520	Nov -2010
Unity	NW	Capacity	Appro	Classified	SNL-NM	272 / 4352	2.2 GHz AMD Quad Core quad processors	RHEL 5	Infiniband	32 GB	38	38,123,520	Mar-2009
Whitney	NW	Capacity	Appro	Classified	SNL-CA	272 / 4352	2.2 GHz AMD Quad Core quad processors	RHEL 5	Infiniband	32GB	38	38,123,520	Mar-2009
Redrose	All	Viz	Dell	Classified	SNL-NM	264 / 528	3.6GHz Xeon dual core dual processors	RHEL 4	Infiniband	4 GB	3.8	4,625,280	June-2006

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SNL Glory Configuration

Standard Tri-lab TLCC cluster from Appro

- 38 TFlops peak
- 272 compute nodes or 4,352 processor cores (16 cores/node)
- CPU: 2.2 GHz AMD quad socket/quad core processors
- Memory: 32 GB DDR2 RAM per node; 8.7 TB RAM total
- Interconnect: Infiniband with OFED stack
- Two login nodes: glogin1, glogin2
- Note maximum wallclock time for batch jobs is up to 96 hours

Usage

- ASC resource
- 10% allocation for PSAAP (up to 317,696 processor hours per month)

Accounts and Access

- **Account Requests**
  - Through SARAPE at http://sarape.sandia.gov (from your university)
  - Request "SRN Capacity Clusters (Glory)"
  - Once approved, you will get a Sandia username and cryptocard

- **Accessing Glory on the SRN at Sandia**
  - Connect to Sandia Secure Restricted Network (SRN) via gateway: `ssh <username>@srngate.sandia.gov`
  - Read the "WARNING NOTICE TO USERS" message; then enter your cryptocard password
  - From Welcome menu, select "3" to Acquire kerberos credentials
  - Then enter "2" to establish an `ssh` connection
  - Enter Glory login system name: `glogin1` or `glogin2`
  - A WC ID is required to run batch jobs; request WC ID from your Sandia CRT, and use it as your "account" for batch jobs

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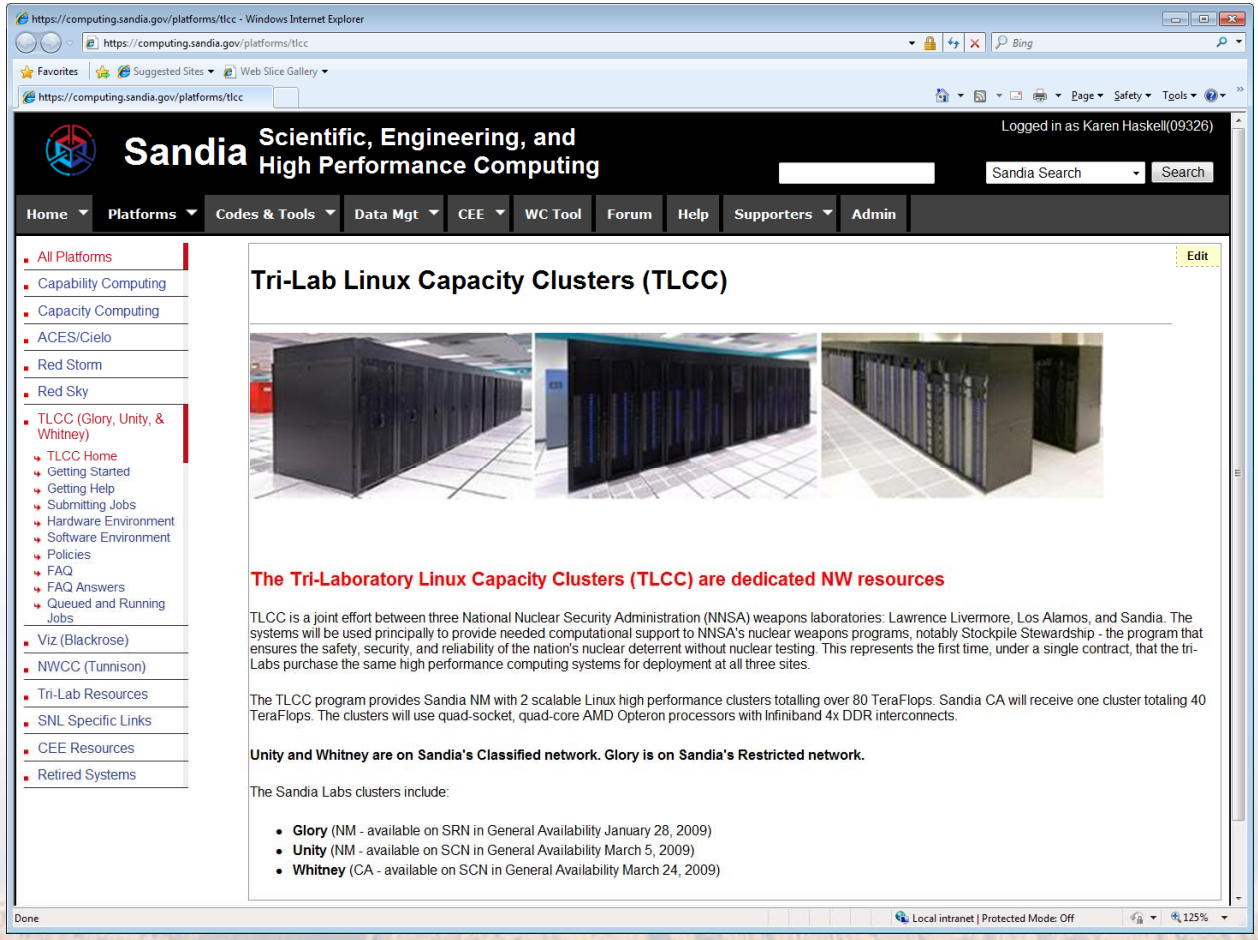
Documentation and Help

- For documentation: https://computing.sandia.gov/platforms/tlcc



National Nuclear Security Administration

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Software Environment

- **Standard TOSS software stack based on Red Hat Linux**
  - PGI, Intel, and gnu compilers
  - OpenMPI and MVAPICH
- **Modules**
  - Software environment and much optional software are controlled using modulefiles
  - A default environment is loaded for the user: PGI compilers and OpenMPI
  - To see what is currently loaded: `module list`
  - To see what is available: `module avail`
  - To add to the environment: `module load <modulefile>`
  - To change the environment: `module swap <module1> <module2>`
- **SLURM and Moab Batch Submission**
  - Example submission scripts can be found in /home/samples/tlcc directories
  - Batch: `sbatch –N# --walltime=96:00:00 --account=FY11nnnn <script>`
  - Interactive: `salloc –N# --walltime=04:00:00 --account=FY11nnnn`

File Systems

File System	Description	Backup?	Purge?
/home directories	NFS mounted; 5 GB quota	Yes	No
Parallel filesystem /gscratch2	Lustre; no quotas	No	Yes
/storz	Sun hardware/software solution	No	No

File Transfer Agents

•Coming very soon: Lynx

Archive storage

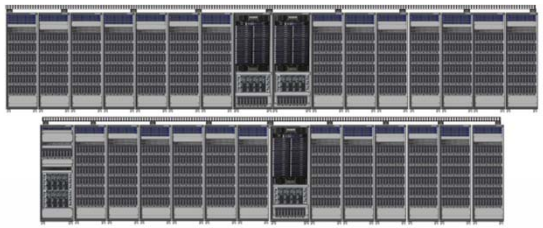
•Users can archive files to Sandia Mass Storage System (SMSS)
•Sign up for SMSS via SARAPE, and choose "Restricted Sandia Mass Storage System (RSMSS)"
•Documentation on SMSS and data management tools at https://computing.sandia.gov/data_management/smss

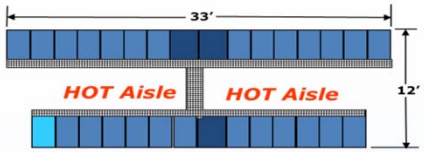
ECN Ebird

- **Ebird is a portion of the old Tbird cluster, re-deployed on the Sandia External Collaborative Network (ECN)**
- **Hardware configuration**
  - 5.5 TFLOPS
  - 383 nodes (766 total cores)
  - Dual 3.6 GHz Intel EM64T processors
  - 6 GB RAM per node (3 GB per core)
  - InfiniBand high-speed interconnect
  - No parallel filesystem
- **Resource available to approved foreign nationals**
- **Request accounts through SARAPE at http://sarape.sandia.gov (from your university)**

TLCC2@ SNL: Configurations

- **Two Clusters in NM:**
  - "**Pecos**"- SRN: 10 SU running at ~490 TeraFLOPs
    - 1,540 compute nodes, 24,640 compute cores, 49 TB RAM (2 GB/core)

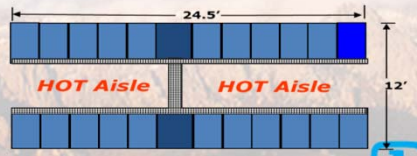




Thirty (30) 42U Racks, each with one PDU
1,540 x Compute Nodes (1 x QDR Appro Blades)
Sixty (60) Gateway nodes (2 x QDR Blades)
Forty (40) 48-port Ethernet Switches
Three (3) 648 port IB Switches (partially populated)
Ninety (90) 36-port QDR IB Switches
Ten (10) RPS GreenBlade™ 8200 Blades
Ten (10) LSM GreenBlade™ 8200 Blades
One (1) Rackmount Monitor

- "**Chama**" - SCN: 8 SU running at ~390 TeraFLOPs
  - 1,232 compute nodes, 19,712 compute cores, 39 TB RAM (2 GB/core)

Twenty Four (24) 42U Racks, each with one PDU
1232 x Compute Nodes (1 x QDR Appro Blades)
Forty-Eight (48) Gateway nodes (2 x QDR Blades)
Thirty-Two (32) 48-port Ethernet Switches
Two (2) 648 port IB Switch (fully populated)
Seventy-two (72) 36-port QDR IB Switches
Eight (8) RPS GreenBlade™ 8200 Blades
Eight (8) LSM GreenBlade™ 8200 Blades
One (1) Rack Mount Monitor



TLCC2 @SNL: Delivery and Deployment Schedule

- **Phase one:**
  - (~616 nodes, ½ of Chama) delivery Oct. 2011
  - Developer/Friendly user access in Nov-Dec
- **Phase two and three:**
  - deliveries in Nov.-Jan.
  - Remaining Chama nodes and all of Pecos
- **Limited availability is targeted for Feb-Mar 2012**
- **General Availability date is TBD**

Support

- **Sandia HPC OneStop Portal at https://computing.sandia.gov**
  - Notices and Alerts
  - FAQs
  - Software and Hardware documentation

- **Contact HPC OneStop Service Desk**
  - By phone: (505)845-2243 Option 8, or (505)844-9328
  - By email: HPC-Help@sandia.gov
  - Webform: at https://computing.sandia.gov/help