ATLAS Tier 3 Activities at OU

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ANL Tier 3 Workshop

May 18, 2009

Outline

- Introduction
- US ATLAS Tier 2 Center
- OU Resources and Network
- Tier 3 Setup
- Summary and Outlook

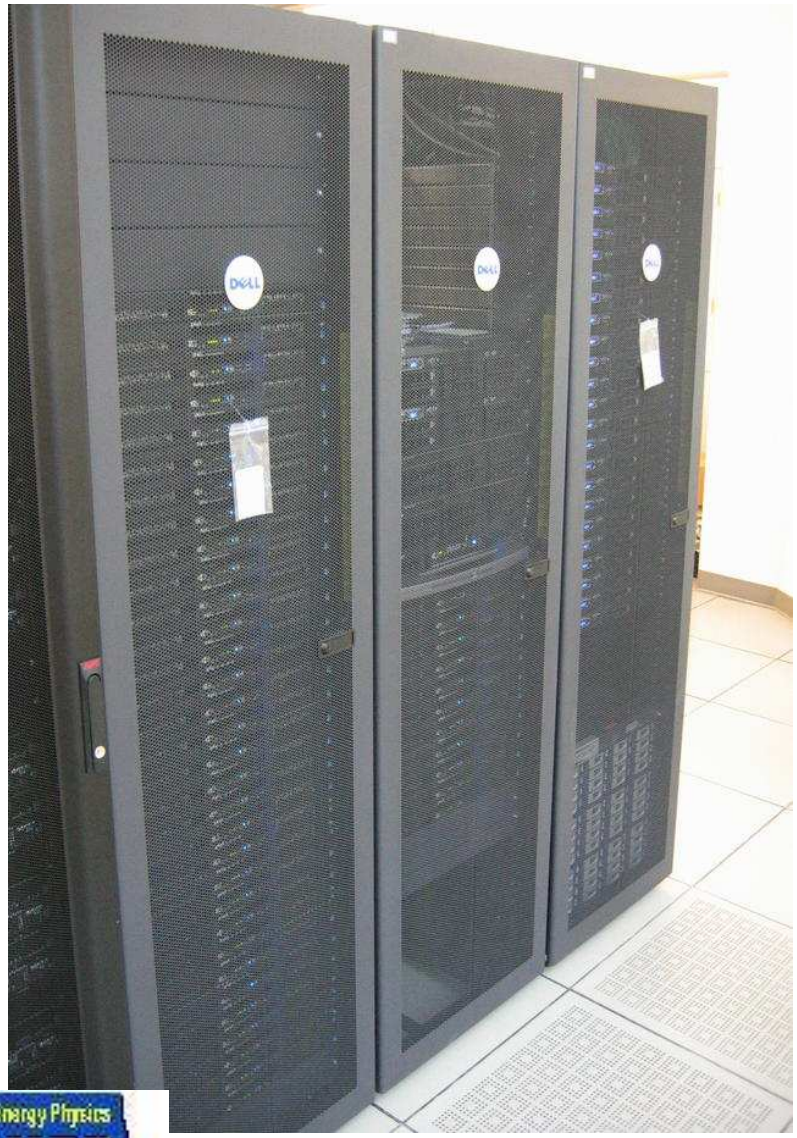
Introduction

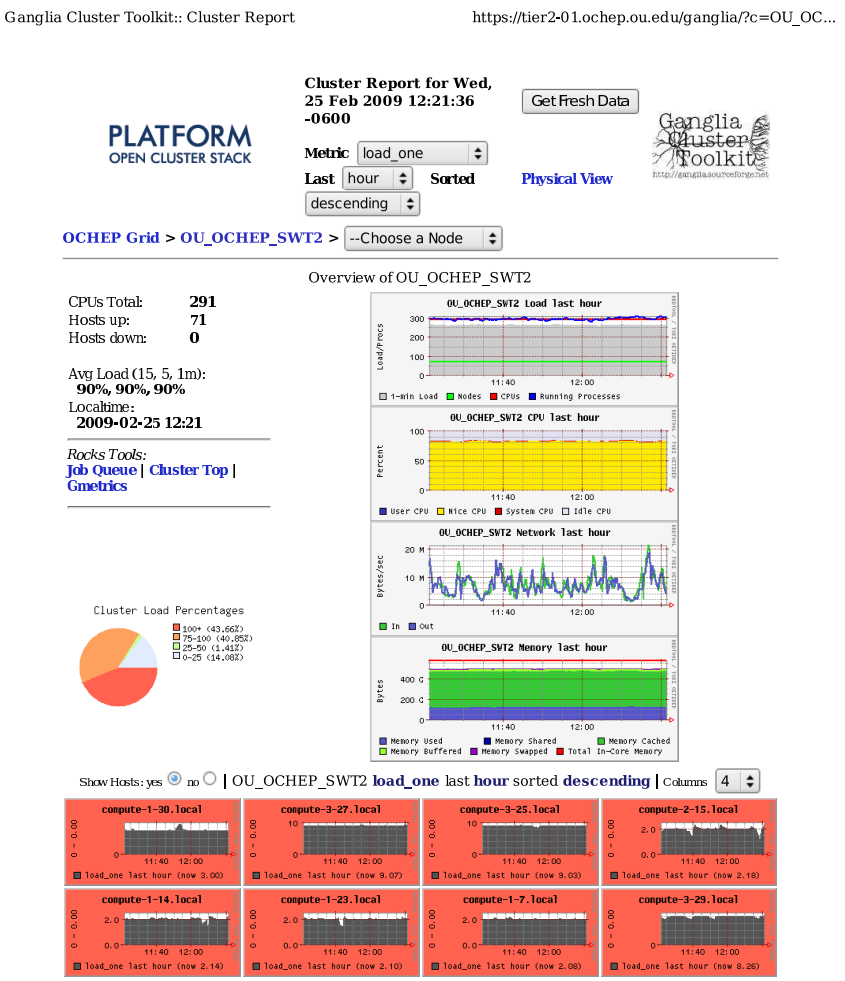
- OUHEP involved in computing efforts for both ATLAS and DØ
- Also very active in various Open Science Grid (OSG) activities in recent years
- Working closely with Langston University (LU) and OSU as part of the Oklahoma Center for High Energy Physics (OCHEP)
- Collaborating with LU, UT Arlington, and UNM as part of the US ATLAS SW Tier 2 Center
- Additionally, using OUHEP desktop cluster and large OU Supercomputing for Education and Research (OSCER) cluster as Tier 3 resources

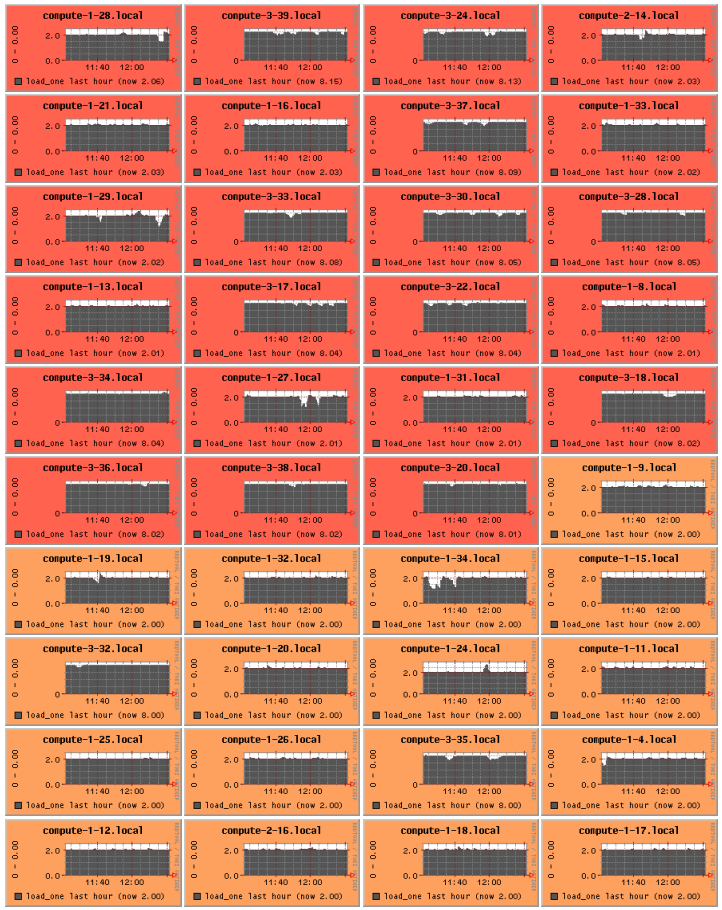
US ATLAS Tier 2 Hardware

- 61 Node (260 Core) 2.33/3.2 GHz Xeon-64
- 10 Support Nodes (5 head, 5 storage) 2.33/3.2 GHz Xeon-64
- 2 GB RAM per Core
- 16 TB of usable DDN/IBRIX3 storage (24 TB raw)
  (additional 100 TB on order)
- ROCKS 4.1 (RHEL4 64 bit)
- OSG 0.8.0
- tier2-01: head node
- tier2-02: storage transfer node (gsiftp)
- tier2-05: SRM (storage resource manager)

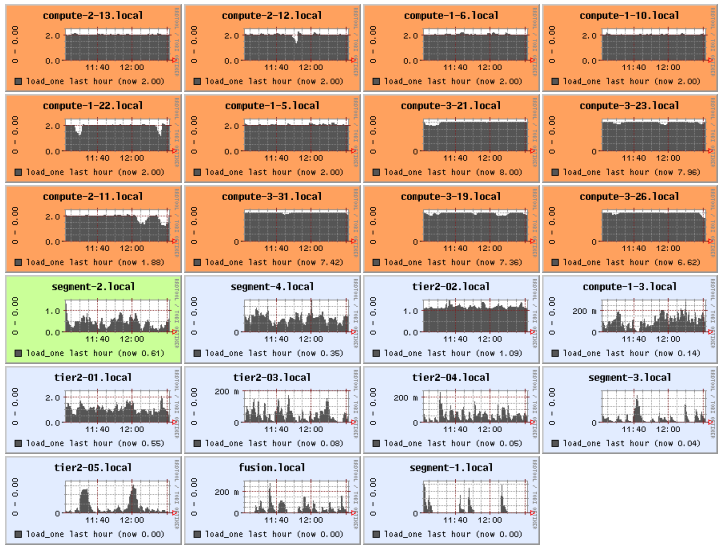
US ATLAS Tier 2 Hardware







Ganglia Cluster Toolkit:: Cluster Report https://tier2-01.ochep.ou.edu/ganglia/?c=OU_OC...

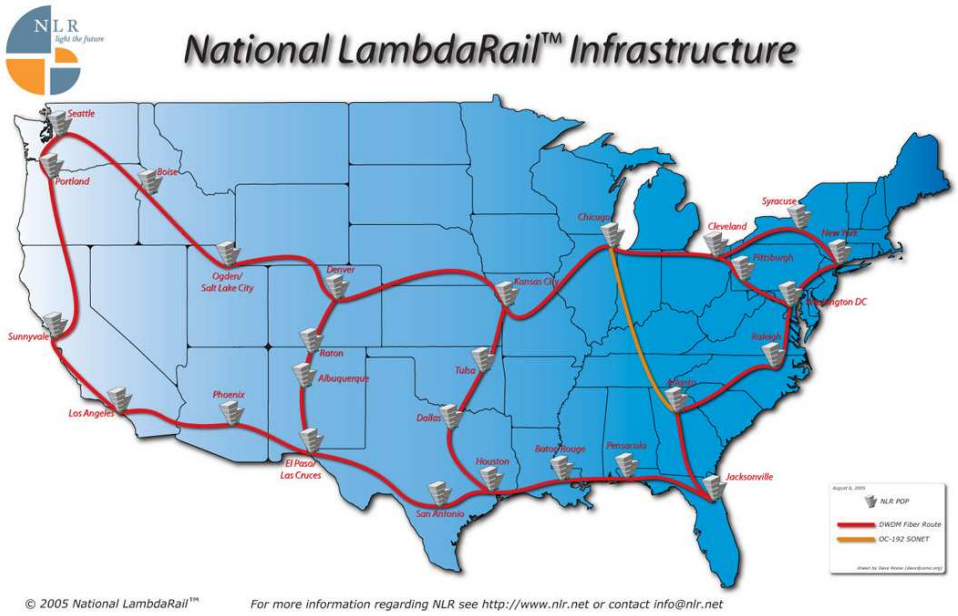


(Nodes colored by 1-minute load) | Legend

Gmetad Web Frontend version 2.5.7 Check for Updates.
Gmetad Web Backend *(gmetad)* version 2.5.7 Check for Updates.
Downloading and parsing ganglia's XML tree took 0.0709s.
Images created with RRDTool.

OU Network

- OU connected at 10 Gbps to NLR and I2 via OneNet
- OU Campus back bone at 10 Gbps
- 10 Gbps connection straight from machine room
- 3-4 Gbps from Tier 2 cluster to BNL
- Tier 3 clusters at 1 [illegible]s



OUHEP Tier 3 Resources

- Desktop Cluster: 43 Node 60 CPU) ≈ 2 GHz PIII/P4, 10 TB storage (additional 12 TB on order)
  - OSG Production site, OSG Integration site, OUHEP (DØ) SAM station, OSG SAM station, and ATLAS Distributed Data Management services (LFC)
  - Used for DØ SAMGrid production, ATLAS MC, OSG and SAMGrid integration testing, and local theory calculations

OSCER Tier 3 Resources

- OSCER cluster, Sooner
  - 534 Node (4272 core) 2.0 GHz Xeon-64
  - 150 TB storage
  - General Purpose Cluster;Used for ATLAS and DØ computing as available
- 750 Node Condor Pool:
  - 3.0 GHz P4, 1 GB RAM, 40 GB HD, 100 Mbps network
  - Distributed over Campus PC labs
  - WinXP Host OS with CoLinux and Condor inside
  - Currently used for DØ computing

Tier 3 Setup

- OSG 1.0 Installations on all head nodes
- Bestman-Gateway prototype, not deployed yet
- LFC services on the OUHEP cluster (and Tier 2 cluster)
- DQ2 site services run by UTA for us
- Currently, Tier 3 Analysis jobs only running on OUHEP cluster
- Tier 2 Production and Analysis jobs run on Tier 2 cluster
- OSCER cluster currently used for Tier 2 production overflow
- Working on using new dq2 client tools for local data movement

Tier 3 Setup (cont.)

- Panda jobs get input files with dq2-get from Tier 2 SE to OSCER compute nodes
- Deliver output files with dq2-put back to Tier 2 SE
- Registers output files to OU LFC
- Registers output files to UTA DQ2
- Problems: various dq2 and osg wn client bugs
- Also, setup incompatibility between OSG, DQ2, and Athena
- Working with Paul Nilsson and Mario Lassnig to fix these issues
- Similar setup planned at OUHEP for Analysis jobs, once working

Summary and Outlook

- OUHEP major contributor to ATLAS and DØ computing, Particularly many aspects of Grid and Distributed computing
- Tier 2 working well, Tier 3 needs more work to bind into ATLAS architecture
- To do
  - Grow Tier 2 cluster by order of magnitude; start with storage – hopefully by the end of this month
  - Utilize OSCER cluster better (for both ATLAS and DØ Computing)
  - Get dq2-put fully functional for OSCER-OCHEP transfers