FermiGrid in 10 minutes

Steven Timm
FermiGrid Services Group
NuComp workshop
Oct 14, 2009

What is FermiGrid

- FermiGrid is a meta-facility that comprises
  - Common Grid Services
    - Site globus job gateway, VOMS, GUMS, SAZ, Squid, etc.
  - Stakeholder Bilateral interoperability
    - All major stakeholders (CDF, D0, CMS, General Purpose) can run on each other's clusters
  - Open Science Grid Interfaces both inbound and outbound
  - Permanent Storage System interfaces
    - Enstore/dCache available via grid interfaces.

Any OSG Site has the following:

- Temporary $OSG_DATA area mounted to all worker nodes
  - ideal for data that has to be accessed multiple times.
  - Can pre-stage data to this area before the job
- $OSG_APP area mounted to all worker nodes
  - ideal for pre-loading an application once instead of transporting it every time.
- $OSG_GRID area with basic client applications visible from each worker node.
  - Allows for pulling data straight to the worker node once you land on a job.
- Temporary $OSG_WN_TMP local to each worker node
  - Automatically cleaned up at end of job, usually
- MOST but not all OSG sites also have a Storage Element which supports SRM protocol.

FermiGrid in 10 Minutes
Steven Timm—NuComp Workshop

FermiGrid gives following extras:

- OSG_APP, OSG_DATA, OSG_GRID areas served from usually reliable high-performance Bluearc NFS appliance. Commonly known as /grid/app, /grid/data, /usr/local/grid
- You can interactively examine and check contents of above partitions from our interactive nodes.
- Extra experiment-specific NFS mounts possible as well.
  - /minos/data, /minos/scratch, /cdf/code, /des/sim, /ilc/*
- UPS/UPD products on nodes
- Site job gateway fermigridosg1 directs jobs to clusters with idle nodes to minimize wait time.
- /grid/fermiapp is read-only mounted to the worker nodes for local Fermilab-based applications

The Fermilab VO

- Fermilab VO deals with Open Science Grid management for those Fermilab-based experiments or groups who don't have enough manpower to make a VO on their own.
- Each experiment forms a "Group" in the Fermilab VO
- Current groups:
  - Accelerator, astro, cdms, hypercp, ktev, miniboone, minos, mipp, numi, patriot, theory, nova, minerva, mu2e, grid, test
- Groups that expressed interest to us to join:
  - Muon g-2, argoneut
- New "Grid Trust Procedure" is now in draft pending approval by CSExec.
- That document also gives guidance for projects that are only partially Fermi-affiliated.

The General Purpose Grid

- This is "home cluster" of all non-CDF, non-D0, non-CMS work at Fermilab.
- Allocations on General Purpose Grid are determined by Deputy Computing Division head in accord with needs of lab scientific program.
- Registered groups of Fermilab VO have a set number of slots that is non-preemptable.
- It is possible to fill up the rest of the cluster with "opportunistic" jobs which can be pre-empted if priority users want to run.
- "opportunistic" jobs have 24hr to finish once given the pre-emption signal.

CDF and D0 clusters

- CDF and D0 clusters have all the FermiGrid special bluearc volumes mounted there as well.
- Any computing that can be done on GP Grid should be possible on CDF and D0 clusters.
- This year both have been quite busy and not as many opportunistic cycles are available. Both will experience net loss of nodes this year due to node retirements.
- D0 nodes have smaller scratch space (4-10GB) than the rest of FermiGrid does.
-

CMS Tier 1 cluster

- CMS cluster is also available for opportunistic use by any members of Fermilab VO
- Expect that free slots will go to zero once LHC turns on.
- /grid/data, /grid/app, etc. not mounted there
- They do have their own OSG_DATA area, you can gridftp your data into it via gridftp to cmsosgce3.fnal.gov. But capacity is small.
- Current investigations in Grid dept. are looking at the CMS model of data flow and bluearc usage, which is working well for them, we may copy some of what they do.

Running on OSG outside Fermilab

- Sometime during FY2010 we will fill all clusters up and will not have the total requested number of slots.
- Those who are ready to run opportunistically on the OSG at that time will be able to grab cycles that nobody else can.
- Good candidate for Monte Carlo jobs.

Grid Dept. projects that affect Intensity Frontier

- FermiCloud (S. Timm, lead)—investigation of cloud provisioning and deployment.
- Storage investigations (G. Garzoglio, lead) trying to find good patterns of data flow for the grid jobs of today to stabilize the problems we have seen on Bluearc.
- GlideinWMS(B. Holzman, CMS, lead)   This is used currently by CMS, CDF, MINOS as a front-end to the Grid.   Envisioned as key technology in GPCF
- GPCF (See S. Fuess talk).
-

Helpful web pages

- http://fermigrid.fnal.gov/fermigrid-metrics.html
- http://fermigrid.fnal.gov/fermigrid-school.html
-