



# FermiGrid Project Status

## November 29, 2005

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# FermiGrid – Four Components

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## FermiGrid Common Grid Services:

- Supporting common Grid services to aid in the development and deployment of Grid computing infrastructure by the supported experiments at FNAL

## FermiGrid Stakeholder Bilateral Interoperability:

- Facilitating the shared use of central and experiment controlled computing facilities by supported experiments at FNAL
  - CDF, D0, CMS, GP Farms.

## FermiGrid Development of OSG Interfaces for Fermilab:

- Enabling the opportunistic use of FNAL computing resources through Open Science Grid (OSG) interfaces.

## FermiGrid Exposure of the Permanent Storage System:

- Enable the opportunistic use of FNAL storage resources (STKEN) through Open Science Grid (OSG) interfaces



# Common Grid Services – Status

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FermiGrid 1,2,3,4 are in operation hosting the following services:

- The “site wide” globus gateway on fermigrd1;
- VOMS / VOMRS on fermigrd2 (aka voms.fnal.gov);
- GUMS on fermigrd3 (aka gums.fnal.gov);
- Myproxy and (soon) SAZ on fermigrd4

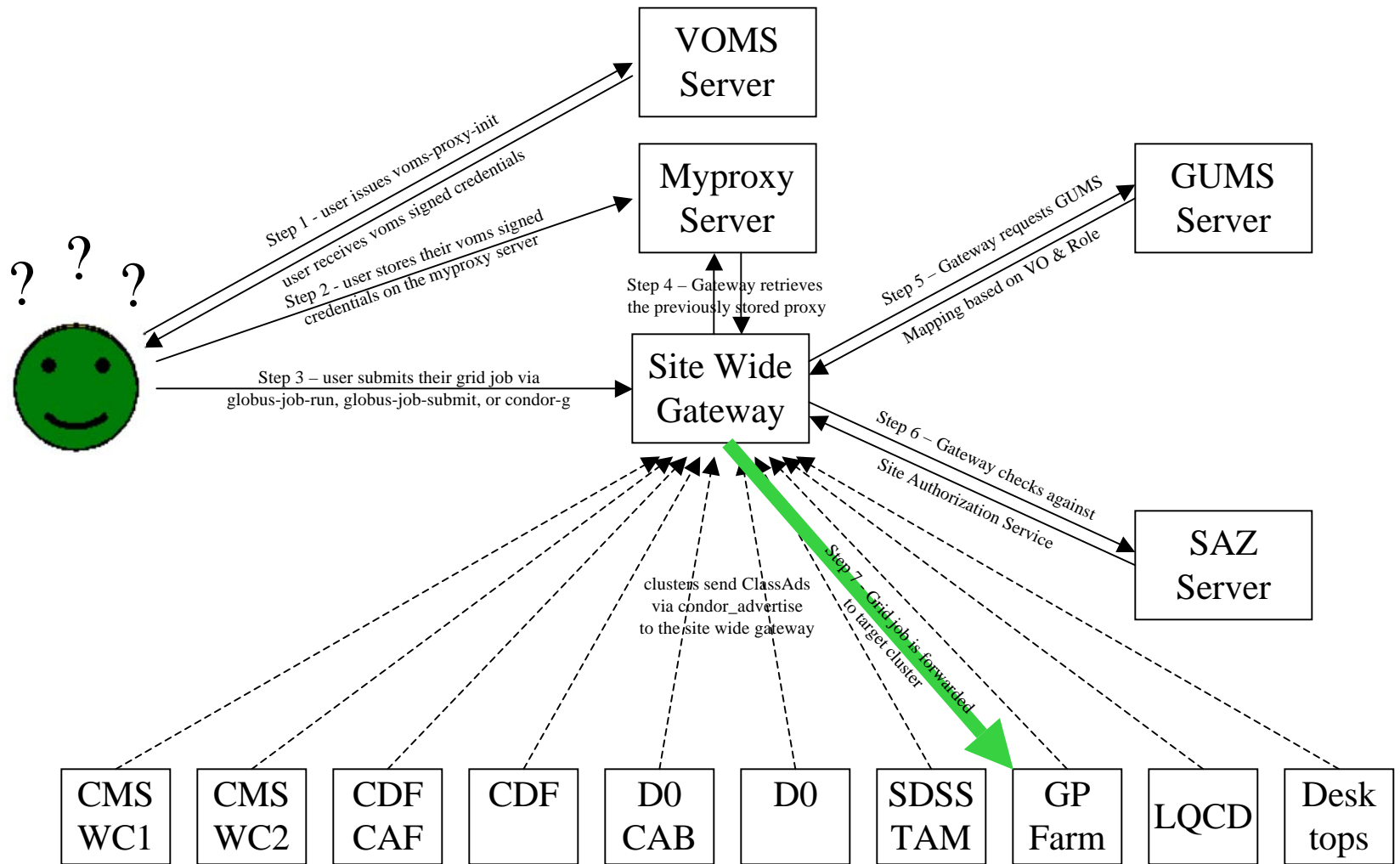
## FermiGrid Web Page:

- <http://fermigrd.fnal.gov/>
- Web pages contain both “informational” and “monitoring” content.

## FermiGrid User Guide:

- <http://fermigrd.fnal.gov/user-guide.html>
- A “work in progress” - feedback is always welcome!

# Site Wide Gateway Animation:





# Hosted Virtual Organizations

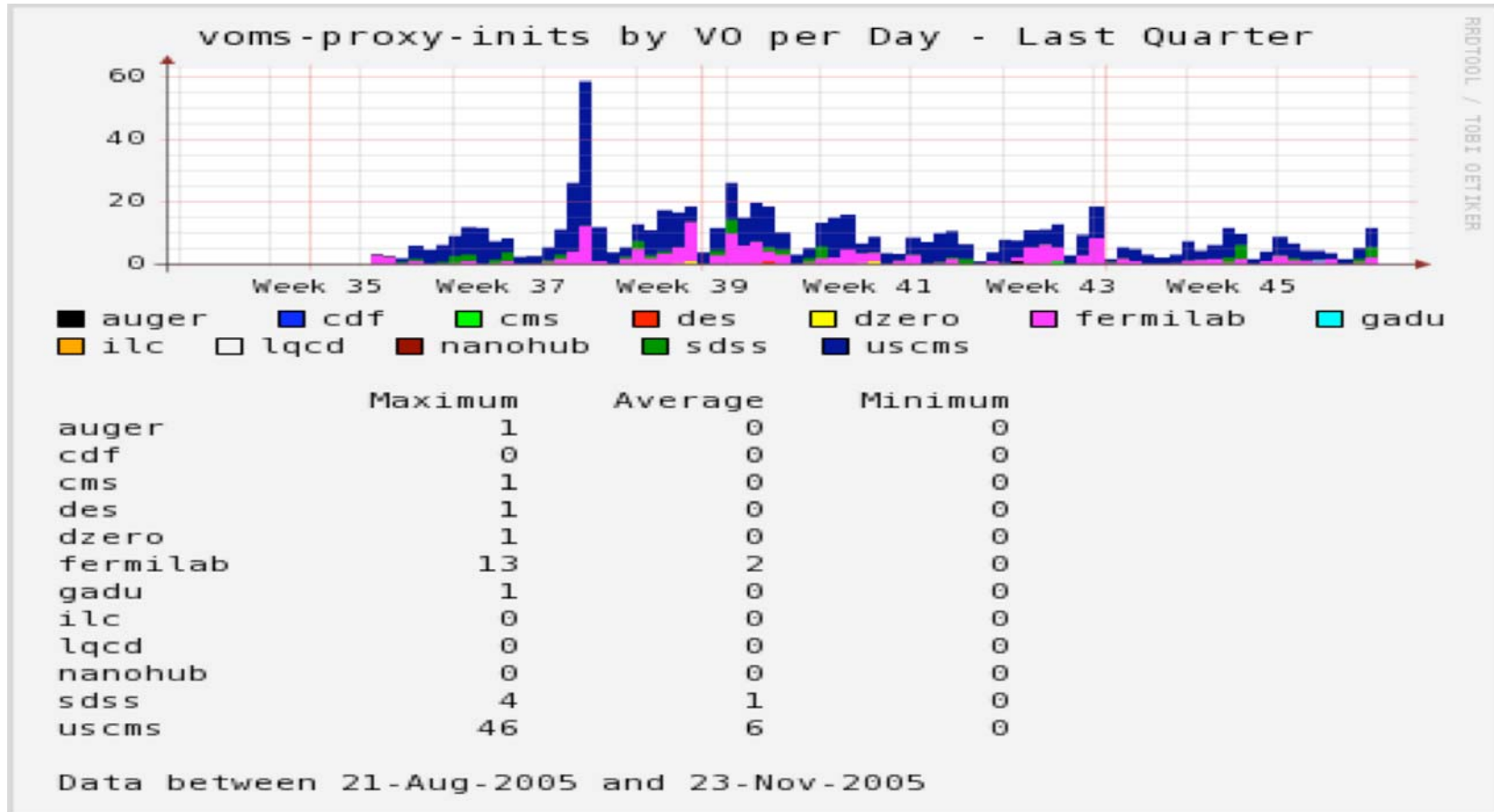
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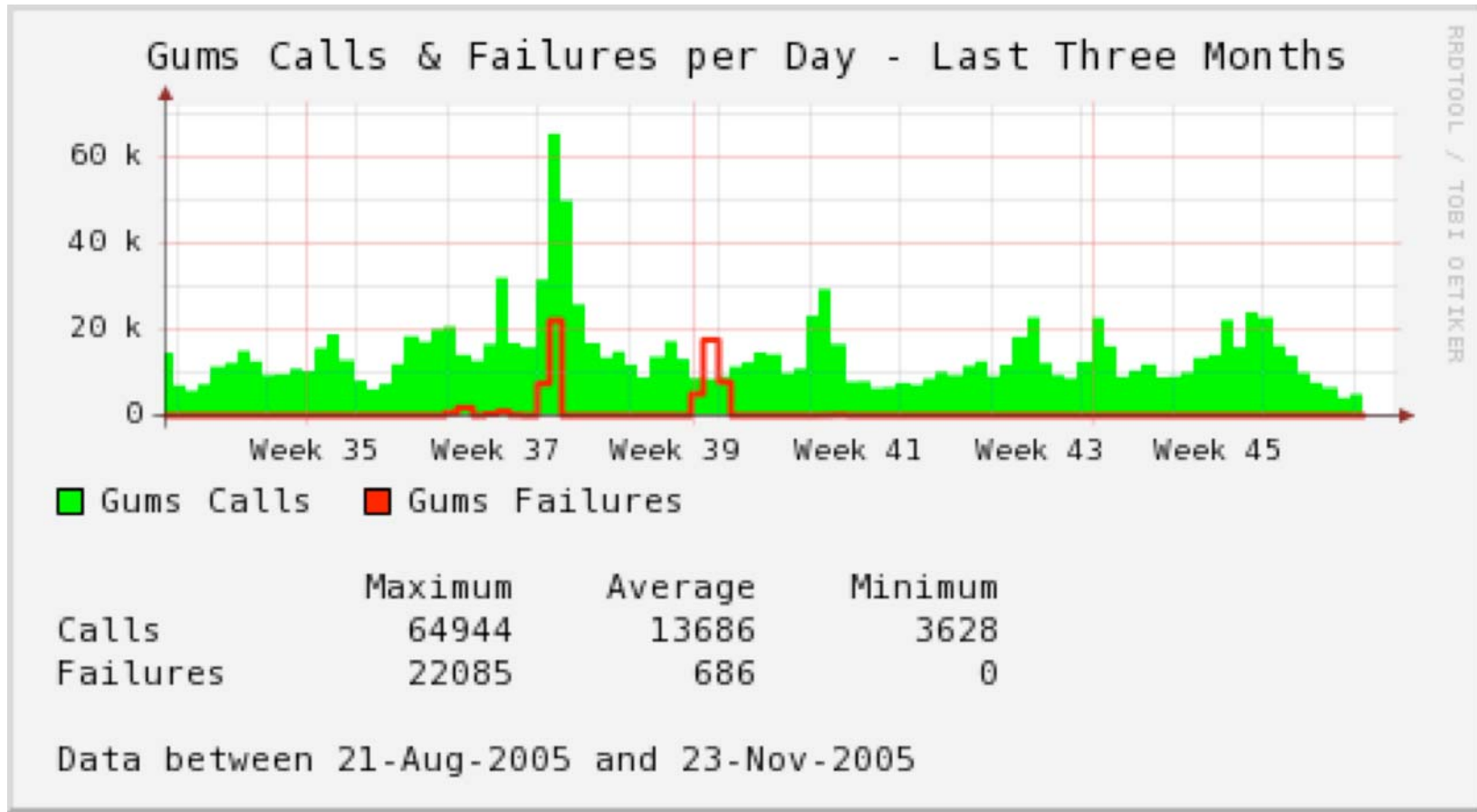
We are hosting the following VOs:

- auger, cdf, cms, des, dzero, fermilab, ilc, lqcd nanohub, gadu, sdss, uscms
- cdf and cms VOs are replicas of the official VO.
- We will be mirroring the ilc VO hosted at Fermilab for the OSG with the ilc VO hosted at DESY for LCG
- fermilab VO has the following groups (sub-VOs):
  - /fermilab/accelerator
  - /fermilab/astro
  - /fermilab/hypercp
  - /fermilab/ktev
  - /fermilab/miniboone
  - /fermilab/minos
  - /fermilab/numi
  - /fermilab/patriot
  - /fermilab/theory
  - /fermilab/cdms
  - /fermilab/test

See: <http://fermigrid.fnal.gov/voms-service.html>

# voms-proxy-init's by VO

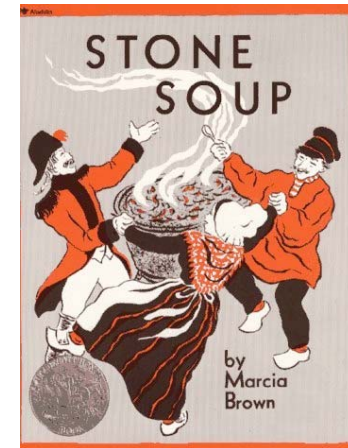




# Stakeholder Discussions

FermiGrid stakeholder meetings are regularly taking place on every other week in FCC1 on Mondays at 3:00pm (following the CD computer room planning meeting).

Work is progressing on stakeholder bilateral interoperability:



Stakeholder Resources

	CDF	USCMS	D0	GP Farms	OSG	Fermilab Storage	
<u>CDF</u>	✓	✓	✗	✓	i	✓	
<u>USCMS</u>	✗	✓	i	✓	✓	✓	✓ Task Completed & Interoperability Verified
<u>D0</u>	✗	✓	✓	✓	i	✓	i Task In Process
<u>GP Farms</u>	✗	✓	i	✓	i	✓	✗ Task Not Completed or Interoperability Not Present
<u>OSG</u>	✗	✓	i	✓	✓	i	

Stakeholder





## Software Installation Caches

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At the request of Ruth Pordes, FermiGrid started maintaining a cache of the pacman distribution and periodic snapshots of selected VDT toolkit distributions at:

<http://fermigrid.fnal.gov/cache.html>

Instructions for using the FermiGrid caches are on the above web page.

At the moment, the VDT cache is captured via pacman -snapshot.

- This is inefficient, but works.
- Will transition to pacman -mirror once Saul Youssef officially releases the functionality.

The FermiGrid caches have already been used to cover cache outages.



## Permanent Storage System

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Equipment ordered on requisition CD98216 (5U, 7TB file server) has been delivered to Fermilab.

Discussions are underway with Rob Kennedy and Gene Oleynik on the steps and timetable to add this system to the public dcache to serve as the FermiGrid public storage element (SE) on the OSG.

In addition to the dcache system, the FermiGrid budget request for FY2006 included \$100K for the start of a site wide high performance file server which would be available for all FermiGrid participating clusters to store “reasonable” amounts of files in a posix compliant form (ex: OSG user home areas and \$APP). The decision has not been taken as to the actual implementation - Panasas and IBRIX are certainly leading contenders...



## Development Systems

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Tanya Levshina is currently using fermigrid4 for her VOMRS/VOMS testing and development.

Requisition CD98958 for a FermiGrid development machine and hot hardware spare has been submitted.

We also have a request in with Bob Tschirhart for 4-6 dual P4 2.4GHz nodes from the LQCD retirement to use as our testbed systems for the OSG ITB. These systems will be located in offices in Wilson Hall.



## What is Next ?

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The hardware (fermigrd4) to host the new SAZ service is present and operating.

### Need to implement SAZ:

- A minimal SAZ implementation (always says “yes”);
- Logging SAZ implementation (always says “yes” and loads database);
- Active SAZ implementation (default is “yes”, and uses database).

Valery Sergeev is currently taking a Java programming course (this week), he will be working on the necessary SAZ modifications starting next week.



# FermiGrid – Milestones & Time Line

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- End Feb 2005: Hardware installation.  
Begin software installation and initial configuration.
- May 2005: Common Grid Services (CGS) available in non-redundant mode (VOMS, GUMS, Condor, etc.).
- July 2005: “Gridified” the GP Farms to work with the FermiGrid CGS and open the GP Farms to the OSG through the Globus Gatekeeper on FermiGrid1.
- Aug-Sept 2005: Forwarding Gateway Implemented.  
Metrics  
Work on FY2006 FermiGrid plan.
- Dec 2005: SAZ Modifications and Deployment  
Participation in OSG 0.3 ITB, OSG 0.4 release.
- Jan 2006: CDF Grid Farm (?) Integration.  
FermiGrid OSG SE.
- Ongoing: Work with other Fermilab resources to integrate them into the FermiGrid CGS.



Any questions?



## FermiGrid - Job Forwarding Gateway Technique:

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FermiGrid uses technique that is closely adapted from a technique first used at GridX1 in Canada to forward jobs from the LCG into their clusters.

We begin by creating a new Job Manager script in:

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$VDT_LOCATION/globus/lib/perl/Globus/GRAM/JobManager/jobmanager-condorg
```

This script takes incoming jobs and resubmits them to Condor-G on fermigrd1

Condor matchmaking is used so that the jobs will be forwarded to the member cluster with the most open slots.

Each member cluster runs a cron job every five minutes to generate a ClassAD for their cluster. This is sent to fermigrd1 using condor\_advertise.

Credentials to successfully forward the job are obtained in the following manner:

1. User obtains a voms-qualified proxy in the normal fashion with voms-proxy-init
2. User sets X509\_USER\_CERT and X509\_USER\_KEY to point to the proxy instead of the usercert.pem and userkey.pem files
3. User uses myproxy-init to store the credentials, using myproxy, on the fermilab myproxy server myproxy.fnal.gov
4. jobmanager-condorg, which is running as the uid that the job will run on under fermigrd, executes a myproxy-get-delegation to get a proxy with full rights to resubmit the job.
5. Documentation of the steps to do this as a user is found in the Fermigrd User Guide: <http://fermigrd.fnal.gov/user-guide.html>