

Virtual Organizations Group in OSG

Abhishek Singh Rana

Feb 5, 2009

Area Coordinators Meeting

At-Large Consortium Stakeholder Forum

Outline: Vision and Focus

ALICE	X	Latchezar Betev, Federico Carminati, Ron Soltz
ATLAS/USATLAS		Torre Wenaus, Rob Gardner, Michael Ernst
CDF	X	Donatella Lucchesi, Rick Snider, Dennis Box
CMS/USCMS		Frank Wuerthwein, Ian Fisk, Burt Holzman
CIGI	X	Shaowen Wang, Anand Padmanabhan
CompBioGrid	X	Ion Moraru, Jeff Dutton, Jim Schaff
DES	X	Nickolai Kouropatkine
DOSAR	X	Dick Greenwood, Horst Severini
Dzero	X	Adam Lyon, Qizhong Li, Joel Snow
Engage	X	John McGee, Mats Rynge
Fermilab	X	Keith Chadwick, Steve Timm
fmRI	X	Jed Dobson
Geant4	X	John Apostolakis, Patricia Mendez
GLOW	X	Sridhara Dasu, Dan Bradley
GPN	X	David Swanson
GRASE	X	Russ Miller, Steve Gallo
GUGrid	X	Arnie Miles, David Cafaro
I2U2	X	Tom Jordan
IceCube	X	Steve Barnett
ILC	X	Lynn Garren
LIGO		Kent Blackburn, Britta Daudert
Mariachi	X	Helio Takai, John Hover
nanoHUB	X	Gerhard Klimeck, Steve Clark
NWICG	X	Kevin Colby
NYSGrid	X	Russ Miller, Tom Furlani, Steve Gallo
OSG-VO	X	Ruth Pordes, Chander Sehgal, Chris Green
GridEx		Alan DeSmet
MIS + OPS		Rob Quick, GOC
OSG-EDU	X	Mike Wilde, Alina Bejan
SBGrid	X	Piotr Sliz, Ian Stokes-Rees
SDSS	X	Nickolai Kouropatkine
STAR	X	Tim Hallman, Jerome Lauret, Levente Hajdu

Virtual Organizations in OSG Consortium

Edited: 01/06/2009
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Active, doing Science
Resource Provider, primarily
OSG specific
Inactive, likely to slow down operations
Inactive, likely to be ramping up
X = Focus of At-large Consortium Stakeholder Forum

Categories of At-large Stakeholders:

- Active, doing Science.
- Resource Provider or Campus Grid.
- OSG specific.
- Inactive, likely to slow down.
- Inactive, likely to ramp up.
- Potential new entrants.

Focus and Objectives in VO Group:

- Maintain strong OSG bilateral relations with external collaborators across Consortium periphery.
- Work with stakeholders to improve OSG utilization (Site resource provisioning, Workflow Efficiency, Job Volume, Data/Storage, Security, End-to-end Accounting).
- Expedite problem-solving for stakeholders through GOC and all OSG groups.
- Provide an avenue for operational, organizational, and scientific discussions with each at-large stakeholder.
- Facilitate stakeholder participation in the OSG software engineering lifecycle.
- Enable tactical methods for sustenance of communities that have a newly formed VO.
- Provide a platform for OSG Storage group to work directly with all stakeholders, and thus to strengthen Data-Grid capabilities of OSG.

Key Principle:

- Build and maintain strong bidirectional channels with VO representatives, further relying on a VO's own internal organization to interface with individual users.

VOs with Shifting Priorities

ALICE	X	Latchezar Betev, Federico Carminati, Ron Soltz
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Little activity. In contact. **CompBioGrid** is deploying its site; and trying to regain activity.

Is **fMRI** no longer an official VO?

GPN may change focus to be a training VO.

GRASE is changing focus to be a research VO.

Little activity. Last contact, 3 months ago. Have asked **Mariachi** to send an update.

Is **SDSS** to be kept an official VO?

GADU is no longer an official VO. It has conveyed intent to regain activity in future.

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Major Accomplishments since Last Report

Joint SBGrid-OSG Taskforce

- Started in mid Sep'08.
- Goal: Complete SBGrid transition to a production-ready state in OSG.
- Extensive work accomplished:
- Brought up SBGrid resource infrastructure to production level high stability.
 - Taskforce's CE team (TerrenceM, SteveT, IanL, IanSR) brought CE RSV status from near 0% to sustained 100%.
 - Taskforce's SE team (JeffP, AlexS, IanL, IanSR) brought SRM RSV status from near 0% to sustained 100%.
- Ported the SBGrid MolRep/CCP4 science workflow from SGE to Condor.
 - Taskforce's Science-workflow team (GregT, IanSR) ported the SBGrid application, conducted data-staging/submission/execution tests on GLOW site, then expanded operations to UCSD and FermiGrid, as well as to the local SBGrid-East site.
- Expedited all OSG-wide operational matters for SBGrid.
 - Collected bug-reports and relayed to OSG Storage and VDT team for quick action.
 - Collected feedback on documentation and relayed to Site coordination group.
- Suggestions provided to SBGrid on different technological models to assist in making short-term and long-term practical choices. E.g.,
 - Science workflow Workload management (JobRouter, glideinWMS).
 - Science workflow Dataset management (OSG_DATA GridFTP pre-staging, SRM).
 - Site CE and SE services topology (Distribution of subsets across hardware).
 - Site software upgrades (Clean practices).
- Closed in early Dec'08.
- SBGrid site RSV status sustained near 100%. Operating with high confidence.
- SBGrid science sustained its peak utilization, ~2000 hours/day(/site), in Jan'09.

Joint ALICE-OSG Taskforce

- Introductions and bootstrapping in Oct'08.
- Started in Nov'08.
- Goal: Enable ALICE's specialized AliEn framework on OSG Facility.
- Work accomplished:
 - Successfully enabled AliEn job submissions from a VO-Box at NERSC using OSG 1.0 stack.
 - Preliminary evaluation of a hybrid VO-Box approach was also done, using remote submissions from this VO-Box to LBNL and GLOW sites on top of different batch systems.
- Currently in pause, to collect a consensus view from ALICE.
- Work to resume with:
 - Certificate renewal mechanism on OSG: Preference of service certificates over a central ALICE MyProxy Server for US operations.
 - Increase of ALICE resource allocation at NERSC. Resources are not part of OSG allocation. Hence, ALICE plans to send request directly to NERSC.
 - To be followed by stress-testing exercise conducted by taskforce.
 - Expansion to LLNL as the next site. To be followed by other ALICE sites in the US and Brazil.
- ALICE may prefer to use only official ALICE sites in the US, and not the other sites opportunistically. Hybrid model may not be used, near term.

Joint nanoHUB-OSG Taskforce

- Started informally in Oct'08.
 - Resolved long-standing job accounting discrepancies (nanoHUB view as compared to OSG view) with Philippe/Gratia, Preston/Purdue-sites, SteveC/nanoHUB.
- Shifted plan and started formally in mid Nov'08.
- Final Goal: Enable nanoHUB production to high job volume high efficiency.
- Multi-stage Problem Analysis:
 - **1. Site Validation:** Historically, a globus-job-run probe was run at a low frequency, 6/day, on almost 42 sites.
 - **2. Site Validation Results:** Historically, the results were available mainly to the nanoHUB team, and regular site-failure plots were on a private webserver.
 - **3. Site Selection:** It is likely that the workflow doesn't match jobs well to sites, e.g., on memory requirements, preemption policy, etc.
 - **4. Workflow Sensitivity to Queuing:** It is likely that after a specific time window, all in-queue jobs at a site are auto-canceled and resubmitted to another site.
 - **5. Job Failure Naming Convention:** Job cancellations attributed to the previous logic in workflow are tagged as failures.
- Work accomplished so far:
 - **1.** Agreement now reached with nanoHUB to design and run a new probe, using CondorG submission at high frequency, 24-48/day, on only 4 taskforce-sites initially.
 - **2.** Site-validation results now hosted on a public webserver (for the first time). Facilitating diagnosis. Current focus is to diagnose failures and certify sustained stability on 4 taskforce-sites.
 - **5.** A premature agreement with nanoHUB now exists: Job cancellations and re-submissions due to workflow logic should be tagged differently from actual failures.
- Currently active, work is in progress.
- Expected timeline to reach final goal is 3-6 months.

Ongoing Activities in VO Group

- In regular communication with all VOs that are understood to be active and doing Science. Includes all VOs using OSG in production.
- In sporadic communication with most inactive VOs.
- Close collaboration and excellent partnership provided by all peer OSG Areas.
- **Weekly VO Forum Meetings:**
 - Coordinated jointly by **Britta Daudert** and **Marcia Teckenbrock**.
 - Scope is highly-focused technical discussions with each VO.
 - Ongoing attendance from **CDF, D0, DES, Engage-VO, Fermilab-VO, ILC, nanoHUB, NYSGrid, OSG-VO, SBGrid**.
- **Bi-monthly VO Forum Meetings:**
 - Stakeholder virtual Round-table.
 - Second such forum being organized in Jan/Feb'09, in two parts over two weeks.
 - General Plans and Reports from **CIGI, D0, DOSAR, DES, Engage-VO, IceCube, STAR** were presented last week.
 - This week, **CDF, CompBioGrid, Fermilab-VO, GRASE, ILC, nanoHUB, NYSGrid**.
- **Storage:** SE sites' community building with OSG Storage. Maintenance of opportunistic storage for **D0**. Provisioning of opportunistic storage for **CDF**.
- **Security/Policy:** General RP/AUP/CA certificates management by VOs.
- **Accounting:** Identifying issues related to sites' configuration and VOs' usage patterns.
- **Assessment of New VO Requests and Plans:**
 - **IceCube** – SteveB/IceCube has started to join meetings. Has a phased ramp-up plan of 1-6 months.
 - **MINERvA** – Doing work in production as a subgroup of Fermilab-VO.

General Concerns & Risks

- Need to track stakeholder requirements for OSG software.
 - At-large requirements collected Nov'07 to Mar'08.
 - <https://twiki.grid.iu.edu/bin/view/VirtualOrganizations/VOApplicationsRequirements>
 - Aggregation and tracking mechanisms are needed, before attempting to open a new phase in '09.
- An increase in LHC activity will lead to a decrease in resource availability for at-large VOs.
- Scale of potential effect is unknown.
 - Old Focus: Encourage at-large VOs to increase grid utilization.
 - New Risk: An at-large VO may want to consume more than an LHC site is willing to provision, leading to abrupt shifts in resource availability on a given day.

Specific Concerns & Risks

- nanoHUB Taskforce timeline will be longer than expected. 3-6 months.
- ALICE Taskforce will wait to restart, till an outline of EU and US common requirements is available. Resultant delay of 3-5 weeks.

General Plans and Reports from VOs in ongoing Bi-monthly Forum (Part-I)

IceCube

- HEP neutrino telescope observatory located at the South Pole.
 - 3 branches of use:
 - Filtering data from instrument.
 - Simulation of particle interactions.
 - Data analysis.
 - 3 science applications:
 - ROOT analysis tool.
 - In-house filtering package.
 - In-house simulation package.
- Simulations are expected to represent most of the heavy utilization. Plan is 6 months away. Plans for pilot usage are upcoming next month.
- Dependencies of getting started to use OSG are internal to IceCube. No current requirements for OSG to help in bootstrapping operations.
 - Has local expertise, but open to working with Engagement if recommended by VO Group as needed.
- Primarily a science VO. May later also become a resource provider.

CIGI

- A science VO in Geo-spatial domain. Not a resource provider.
- Has staff with TeraGrid experience, trying to run Agent Based Modeling (ABM) jobs. These are simulations similar to MonteCarlo.
- Running jobs at 3-4 sites. Has a local ITB site for testing.
- Plans to ramp up in 3-6 months.
 - Will need more sites to run, but will need no specialized storage.
 - Estimated consumption after ramping up is O(5000) hours/day.

DES

- Runs MonteCarlo simulations. Plans two runs of 10-15 days each on FermiGrid. Uses mass storage at Fermilab and needs no more.
- Uses dCache and SRMv2 with dedicated space.
- Estimated usage during runs:
 - Each job will run 4-8 hours; each job is 1GB.
 - Wallclock estimate is not certain.

D0

(a) MC Production (b) Analysis

- Uses OSG primarily for D0-MonteCarlo production.
 - MC Production going well. Weekly issues arise at sites. These are actively resolved by OSG.
 - Running at almost 25 sites.
 - Needs consistently high availability of CE batch slots at LHC sites.
 - Decreased resource availability at LHC sites can affect D0 production.
- Working to start using OSG-TeraGrid Gateway.
 - FermiGrid has arranged for D0 credentials to submit jobs at the new Intelx86/64 site at NCSA. Old Itanium/64 site was not usable.
 - Problems still exist. Troubleshooting in progress.
- Discussions with D0 started to understand D0-Analysis on OSG.

DOSAR

- As a resource provider.
 - Making progress on bringing up Condor pools. Had interest in collaboration in South Africa last year, but not much progress.
- As a science VO, current focus is to train staff at OU to use the science application code.
 - These are MPI applications, running only at local sites. On MPI, willing to work with Engage-VO if needed.

STAR

- Production model in active design and development.
- Planning on simulation production, and on staging out files at site onto local worker node while doing reconstruction.
- Can only run at STAR-dedicated sites.
 - 1000 jobs, 23 hours each.
 - Raw data: ~1 hour, Reconstruction: ~22 hours.
- Will first try to run at a STAR virtual cluster. If unsuccessful, will shift to PDSF/NERSC usage on OSG.
- All resources are EC2.
- Expected need is 16days@50 nodes, 8 days@100 nodes.
- If the reconstruction model can be included in jobs, it will increase grid utilization. Dependencies internal to STAR. No related requirements for OSG.

**CDF, CompBioGrid, Fermilab-VO,
GRASE, ILC, nanoHUB, NYSGrid**

- Expected in Part-II of the ongoing Bi-monthly VO forum.