



## Open Science Grid use of and contributions to Software Developments

The investment in OSG contributes to the functionality and quality of the software developed by the NSF and DOE community in the following ways: Our requirements guide the software developers; Our testing and deployment exposes bugs and limitations; By working closely with the software developers we make sure that what we and the communities involved in OSG need are communicated back to the providers; We work with the providers to make sure that these requirements are implemented and the bugs resolved; Additionally, as software integrators, we identify opportunities and limitations in software interpretability. We:

1. Build, unit test, and deploy of software components requested by the OSG stakeholders that are included in the Virtual Data Toolkit for use across the OSG sites and users.
2. Port the software to new and different platforms.
3. Perform System, application and performance testing on the Integration TestBed.
4. Implement improved tools and configurations that affect the performance and robustness of the underlying software (e.g. NFS Lite).
5. Feedback results and contribute to the fixes and improvements.
6. Engage technically in discussion of requirements, functionality, design, and operational aspects of extensions to the software.
7. Pay attention to security issues in the coding, deployment and operations of the software.
8. Provide specific effort in the extension, hardening, testing and/or generalization of software components.

The organized activities and efforts of OSG, such as the integration testbed, the common software, security and operations activities, provide a focal point for the distributed system work of many other projects to cooperate in a coordinated way to the software developers. This includes the application communities (VOs: LIGO, US ATLAS, US CMS software and computing projects, D0, CDF, STAR, SBGrid etc.), the NSF DISUN project, and many site administrators. All evidence is that such activities will continue as the scale and capabilities of the stakeholders infrastructures continue to evolve.

During the period of September 2006 through March 2008 (phase I of the OSG project) we have made contributions to the following software.

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Sponsor	Software Component	Activity	Stakeholder Uptake
DOE SCiDAC-2	Center for Distributed Petascale Science (CEDPS) MOPS	Advanced inclusion of the Globus 4.2 MOPS enhanced GridFTP into VDT for OSG 1.0	
	CEDPS Troubleshooting	Feedback on proposed common logging format. Testing of the syslog-ng troubleshooting infrastructure on the ITB. Inclusion of the CEDPS troubleshooting software in VDT for OSG 0.8.0	ATLAS, OSG
	CEDPS Scalable Services	Testing of scalable services/ Virtual Machine workspaces on University of Chicago Teraport OSG Site.	STAR
DOE ASCR	LBNL Storage Resource Manager - Bestman	Inclusion of new versions of BestMan in VDT and OSG software releases. Support of deployments on OSG sites with a variety of underlying storage systems: Lustre file system, GPFS, xrootd. Funding of extensions to include OSG authorization and accounting interfaces. SRM tester as the testing infrastructure for six implementations of SRM on the WLCG.	ATLAS, CMS, STAR
	ESNET DOEGrids CA	OSG dependence on Certificate Authorities a key component of the OSG Security infrastructure. RAs obtain majority of the certificates used on OSG through the DOEGrids CA. Extensions to DOE Grids CA to meet LIGO requirements. Development of scripts for site administrators to request host certificates in bulk.	All VOs <sup>1</sup>
	Network monitoring tools	Discussing with ESNET and Internet2 deployment of common monitoring tools and use in OSG operations.	Planned for all VOs
NSF & DOE	Globus Web-Service GRAM (WS-GT4)	Inclusion in VDT and OSG software releases with support for deployment on OSG sites. Extensive testing of the performance and robustness of many versions of WS-GRAM. Work with the CDIGS project to identify the cause of problems and discuss technical fixes.	LIGO, Education, Planned for all VOS
	Globus pre-web-	Improvements for performance on large scale deployments and use.	All VOs

<sup>1</sup>NYSGRID,CIGI,CDF,CMS,CompBioGrid,DZero,DES,DOSAR,Engage,Fermilab,geant4,GUGrid,GPN,GLOW,GRASE,i2u2,ILC,LIGO,Nanohub,NWICG,OSG,OSGEDU,MIS,Ops,SDSS,STAR,SBGrid,USATLAS

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	service GRAM (Pre-WS-GRAM)	Testing of response of pre-WS-GRAM to denial of service attacks and feedback of problems found to the Globus team. Testing of response of GRAM job managers to proxy certificates (seems jobs can be executed using proxies which does not follow spec).	
	Globus Authorization and Security Components	Joint project between European Enabling Grids for EScience (EGEE) gLite team, CDIGS and OSG VO services project to provide interoperability between the three implementations of grid authorization, in preparation for reducing the number of implementations by adopting specific components from each others toolkits.	Production planned for 8/2008
	Globus Auditing	Rigorous testing of early pre-releases of the software.	
	Common middleware with TeraGrid	Common patches and versions of Condor and Globus between CTSS and VDT.	
NSF	Condor Project Components	Improvements in core components capability and performance. Collaboration on requirements and testing for pilot job based Glidein job submission and execution components. Collaboration on use of Condor-cron implementation for OSG Resource and Site Validation (RSV) operations software. Extensions to Condor for accounting and troubleshooting. Inclusion of new versions in VDT and OSG software releases.	ATLAS, CDF, CMS, Engage, Fermilab, Minos
	Pegasus workflow management	Requirements, inclusion in VDT and OSG software releases;	LIGO
	Swift workflow management	Use of and support for Swift in the Education training and grid schools.	Education
European Commission	gLite VO Management (VOMS) Software	Adoption, rigorous testing and support of new versions of the VOMS and VOMS-ADMIN software in the VDT and OSG software releases.	All VOs
	gLite information publishing (CEMON)	Adoption, rigorous testing and support of generalized information publishing module.	CMS, D0, Engage, OSG
	glexec	Adaptation and extension of glexec module for secure change in Unix ID on sites to support "pilot" mode job submission and execution.	ATLAS, CDF, CMS,

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		Inclusion of glexec into the VDT and OSG software releases	Fermilab, Minos, OSG
DESY Fermilab	dCache storage manager	Inclusion of new versions of dCache and its SRM interface into the VDT and OSG software releases. Support of deployments on OSG sites. Development and documentation of testing infrastructure, extensions to the scripts to ease installation, configuration, debugging and support. Provision of a testbed for testing of new versions and performance. Implementation of information publishing for management of spaces.	ATLAS, CDF, CMS, D0, DES, SDSS
US ATLAS & US CMS S&C Brookhaven & Fermilab	Gratia accounting	Requirements, inclusion in VDT and OSG software releases; Adoption of the transport mechanism for the OSG Site and Resource Validation (RSV) operations software. Debugging, operations support and report extensions	All VOs
	Authorization Components – GUMS, Prima, gPlazma	Requirements, inclusion in VDT and OSG software releases.	All VOs
US ATLAS	Panda workload management system	Support for extensions and generalization of ATLAS PANDA workload management system including integration of glexec, condor components, security components, monitoring tools, use by OSG VOs. Inclusion of first general component from PANDA in VDT.	ATLAS, OSG
DOE & US CMS S&C	MonaLisa	Inclusion of MonaLisa in the VDT.	ATLAS, CMS, STAR
Internet2	Perfsonar network monitoring tools	Discussing with ESNET and Internet2 deployment of common monitoring tools and use in OSG operations.	Planned for All VOs