



Grid Accounting Service (Gratia)



JOB EXECUTION AND MANAGEMENT
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Gratia Goals and Requirements

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- “The goals of the Gratia Project is to design and deploy robust, scalable, trustable and dependable grid accounting, and to publish an interface to the services.”
- Accounting service:
 - provides a summary of resource utilization
 - allows to audit a large distributed system
 - provides means to calculate site and VO efficiency
 - is installed on all OSG sites (reports for Funding Agencies/WLCG MOU)
 - is installed on all Fermi Grid and Cloud clusters

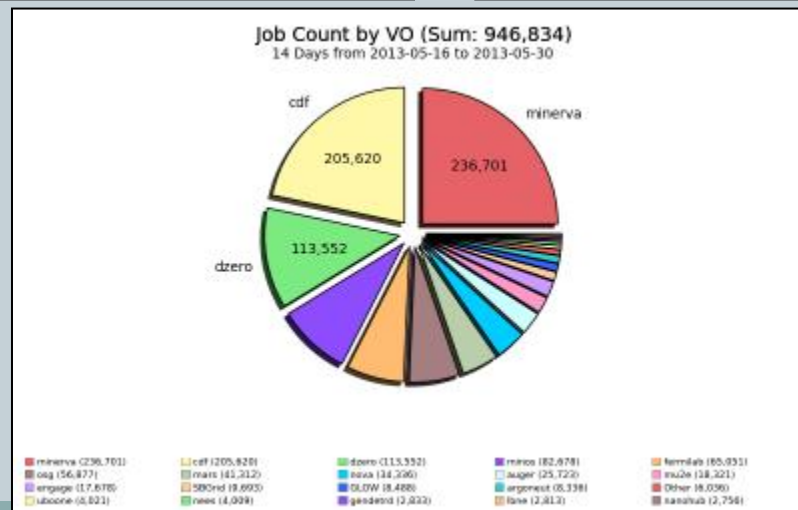
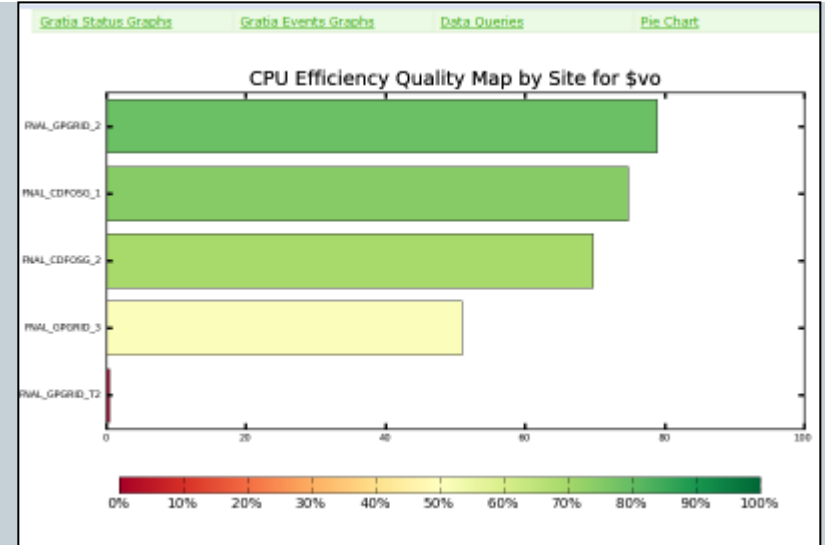
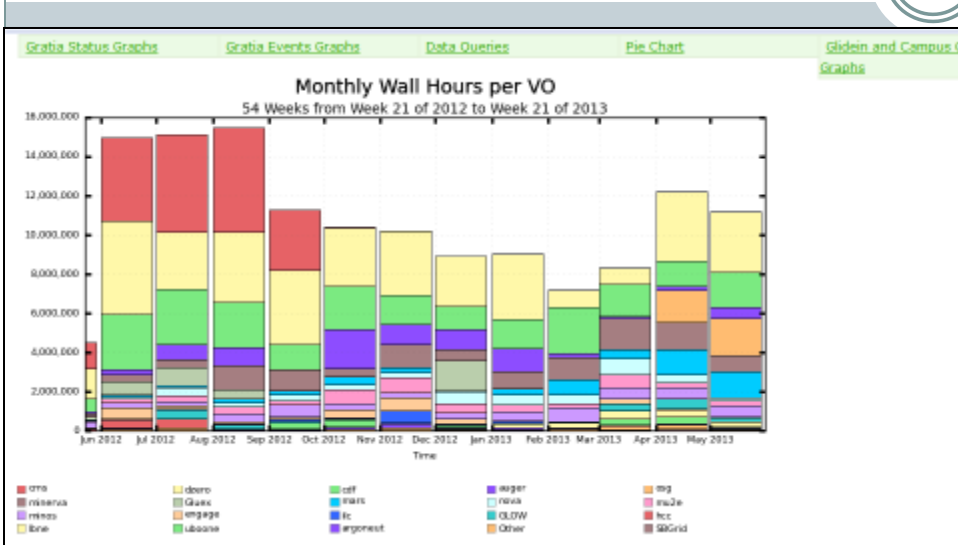
Gratia – Who needs it?

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- You need Gratia if you are curious about the following info:
 - How many jobs my experiment ran during last day, month, year?
 - What sites did we use and what was the efficiency of the jobs executed on each sites?
 - How many GB we are transferring per day, month, year?
 - Who else is running on this site and why they have managed to run so many jobs?
 - How many VMs we are running?
 - The same information could be obtained for the members of a VOs.

Gratia - GratiaWeb

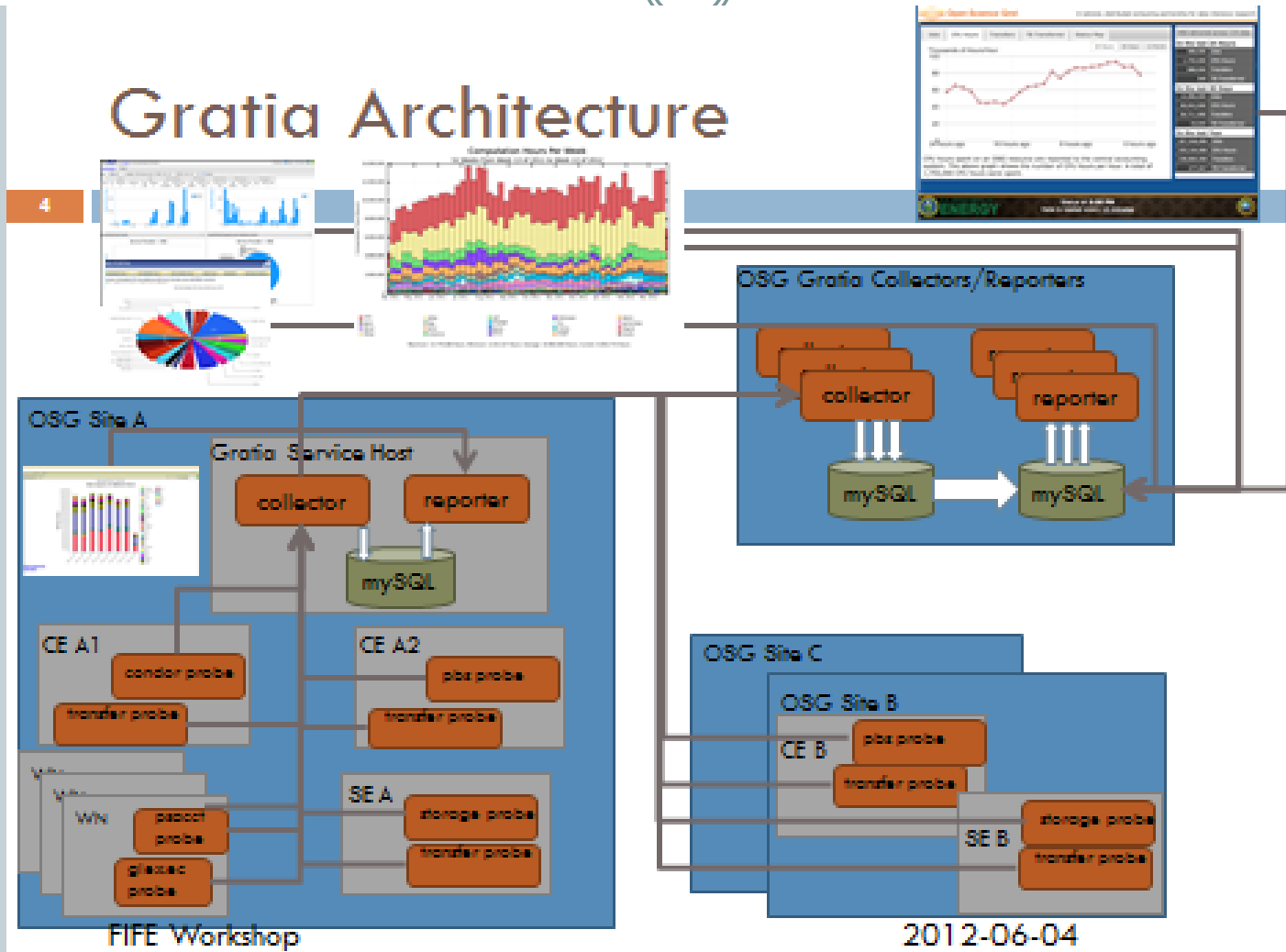
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Gratia - Overview

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Gratia Architecture



Gratia - Components

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- **Gratia Service consists of several subsystems:**
 - Collector
 - Reporter (WEB UI for user and admins)
 - Database
 - Email reports generating scripts
- **Information is generated by various probes and sent to Gratia collectors via Gratia API. Probes collect information about:**
 - Batch and glide-in jobs (condor, lsf, pbs, sge)
 - Linux process accounting and glxexec (deployed at Fermilab)
 - Various Metrics (RSV probes)
 - File transfers
 - Storage Usage and Allocation
 - Cloud accounting (deployed at Fermilab)
- **Gratia supports multiple collectors. It permits hierarchical forwarding & filtering between collectors.**

Gratia – Implementation and Installation

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Software implementation details:

- Tomcat
- JMS Queue
- Hibernate, Database (MySQL)
- Java , JSP, python, perl, shell
- **Packaging: rpm**
- **Installation:**
 - OSG 1.3.x repo
 - Central Fermi collector can be used or install local collector
 - Appropriate probes should be installed on a CE (batch probe, transfer probe), and worker nodes (glexec).

Gratia – Fermi Accounting Scoreboard

Ongoing development: Fermilab Accounting Scoreboard (Resource usage for each Fermilab Experiment)

Exp Name	Liaison/Contact	Use Grid	Grid Quota	#Jobs	delta #Jobs	Wall Hours	delta Wall Hours	Average # Slots	Average # Waiting Jobs	Use Cloud	#VMs	delta #VMs	Wall Hours	delta Wall Hours	Use Storage	Use GPCF
Accelerator	Jean-Paul Carneiro	True	500	18,599	0	43,118	0	57	221	False	0	0	0	0	False	False
ArgoNeut	Michael H Kirby/Mitch Soderberg	True	200	5,611	-39,498	17,027	-41,781	23	1	False	0	0	0	0	False	False
Auger	Paul Lebrun/Eun-Joo Ahn	True	500	23,426	16,598	74,222	66,081	454	27	False	0	0	0	0	False	False
CDF	Stephan Lammel	True	800	154,614	-38,513	1,292,636	-307,402	1,860	16	True	8	2	3,713	1,892	False	False
CDMS	Donald J Holmgren/Lauren Hsu	True	500	5,671	-8,626	11,719	-63,958	11	5	False	0	0	0	0	False	False
CMS	Lothar A Bauerdick	True	400	1,271	-1,609	446	-522	1,752	715	True	1	0	720	-23	False	False
COUPP	Gabriele Garzoglio/Stephen Brice	False	200	0	0	0	0	0	0	False	0	0	0	0	False	False
Darkside	Michael H Kirby, Ruth Pordes/Jonghee Yoo	False	0	0	0	0	0	0	0	False	0	0	0	0	False	False
DES	Elizabeth Buckley-Geer/Nikolai Kuropatkin	True	980	2,113	957	27,372	4,688	36	0	True	2	-1	1,690	1,570	False	False
Dzero	Qizhong Li/Mike Diesburg	True	1,200	437,360	319,423	3,305,943	2,579,832	4,551	141	True	6	1	7,176	503	False	False
Fermilab	Keith Chadwick	True	25	78,588	-18,594	1,055	849	2	0	True	202	48	122,223	-2,586	False	False
Geant4	Hans Wenzel	False	25	0	0	0	0	0	0	True	4	1	1,434	-51	False	False
GENDETRD	Adam Para	True	200	1,062	0	1,368	0	1	0	False	0	0	0	0	False	False
gm2	Adam L Lyon	True	200	8,885	-25,798	6,885	-30,680	9	1	True	4	1	1,435	-51	False	False
Holometer	Chris Stoughton/Aaron Chou	False	0	0	0	0	0	0	0	False	0	0	0	0	False	False
ILC	Lynn A Garren	False	100	0	-68	0	-18	0	0	False	0	0	0	0	False	False
LBNE	Eileen F Berman, Anne Heavey/Tom Junk	True	500	26,621	-16,310	302,048	60,882	397	12	True	4	1	1,435	-52	False	False
LQCD	Jim Simone	False	25	0	0	0	0	0	0	False	0	0	0	0	False	False
LSST	Stephen M. Kent/Gabriele Garzoglio	False	25	0	0	0	0	0	0	True	1	0	720	-25	False	False
MAP	Tom Roberts	False	200	0	0	0	0	0	0	False	0	0	0	0	False	False
MARS	Nikolai Mokhov	True	1,525	60,485	5,882	750,660	494,713	1,025	25	False	0	0	0	0	False	False

Find: requirements Next Previous Highlight all Match case

Gratia - Documentation

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- **Documentation**

- Home Page:

- <https://twiki.grid.iu.edu/bin/view/Accounting/WebHome>

- Installation Guide:

- <https://www.opensciencegrid.org/bin/view/Documentation/Release3/InstallGratiaService>

- **Repository: SVN** <http://sourceforge.net/projects/gratia/>

- **Ticket tracking:**

- Development, feature requests

- <https://jira.opensciencegrid.org/browse/GRATIA>

- Production OSG GOC <https://ticket.grid.iu.edu/goc/submit>

- Fermilab Service Now