Grid Site Monitoring tools
developed and used at SCL

www.see-grid-sci.eu

SEE-GRID-SCI USER FORUM 2009 Turkey, Istanbul
09–10 December, 2009

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Overview

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  - GStat
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Introduction

- Grid site is a complex system
- Different subsystems and its parameters:
  - Basic hardware layer
    - temperature, voltage, fan speed
  - Operating system (OS) layer
    - CPU load, disk and memory usage
  - Grid middleware software stack layer
    - number of jobs, available CPU and storage resources, test results
  - Additional network and cooling subsystems
- Grid site administrators have to monitor and supervise each of these important attributes
- SCL use several monitoring tools – some of them developed by SCL for its specific needs
Cumulative Grid Monitoring Tool – CGMT (1/4)

- Set of scripts accompanied by the simple web interfaces
- Provide Grid site monitoring and integrated presentation of the results provided by various monitoring tools
Main web page of CGMT tool
Cumulative Grid Monitoring Tool – CGMT (3/4)

CGMT cluster page
Cumulative Grid Monitoring Tool – CGMT (4/4)

- Node info page
- Node temperature page
Workload Management System (WMS) is one of the key Grid services of the gLite middleware software stack.

WMSMON provides a site independent, centralized, uniform monitoring of gLite WMS services.

Properties of WMS that can be monitored:

- Load averages
- Job queues properties
- File system properties
- Log file properties
- Availability/responsiveness of gLite services/daemons
WMSMON web portal presents information from different WMS sources in a unified way.

Data is shown in simplified way with the emphasis on WMS services identified not to work properly.

Pages with detailed information and graphs for each monitored WMS service.
WMSMON (3/3)

### wmsmon

<table>
<thead>
<tr>
<th>WMS Hostname</th>
<th>Timestamp</th>
<th>Load</th>
<th>Jobs</th>
<th>File system</th>
<th>Log files</th>
<th>gLite daemons</th>
</tr>
</thead>
<tbody>
<tr>
<td>wms.phy.bg.ac.yu</td>
<td>Sun, 08 Feb 2009 20:25:01 +0100</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>wms-aegis.phy.bg.ac.yu</td>
<td>Sun, 08 Feb 2009 20:25:01 +0100</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>c16.grid.esrf.net</td>
<td>Sun, 08 Feb 2009 20:30:01 +0100</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Jobs

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Running Jobs</td>
<td>534</td>
</tr>
<tr>
<td>Number of Idle Jobs</td>
<td>4378</td>
</tr>
</tbody>
</table>

![Graph showing running and idle jobs](image)

- WMSMON web portal
WatG Browser (What is at the Grid Browser) is a web-based Grid Information System (GIS) visualization application.

Provides detailed overview of the status and availability of various Grid resources in a given gLite-based e-Infrastructure.

Information sources:
- Local resource information system (GRIS)
- Grid site information system (site BDII)
- Top-level information system (top-level BDII)

Allows quick and easy navigation through entries and objects of the LDAP tree retrieved by the specified query.
WatG (2/3)

- Supports partial refreshes and desynchronization of a web page
- Developed with Google Web Toolkit (GWT) open source Java software development framework
- Operational tool in the framework of the SEE-GRID project
- Will be integrated into GStat EGEE tool
WatG (3/3)

WatG front end
Pakiti (1/2)

- Provides a monitoring and notification mechanism for checking the patching status of installed packages on an RPM-based Linux system
- Client/server model
- Exchanging information using HTTP(S)
- Through a cron job Pakiti on client checks if new patches are available and report them to the relevant Pakiti Server(s)
- Helps the system administrator keeping multiples machines up-to-date
SCL Pakiti main web page
Scalable distributed monitoring system for high-performance computing systems (clusters and Grids)

Currently in use on thousands of clusters around the world

Gives fast and reliable overview of the status of site nodes

Client–server based system

- gmond daemon working on each monitored node collecting various data about OS
- gmetad daemon on server side collects gmond outputs and publishes them on the web interface

Easy to add new custom monitored parameters data into gmond daemon on ganglia clients
Ganglia (2/2)

SCL Ganglia main page
Service Availability Monitoring
Framework used in EGEE for the monitoring of production Grid sites
It consists of:
- Set of probes submitted at regular intervals
- Database that stores test results
Valid certificate is needed to access web portal
In addition, access can be granted for specific IP address
SAM main page
Service Availability Monitoring - CE

c664.ipb.ac.rs - AEGIS01-IPB-SCL (SouthEasternEurope)

2009/11/13 - 09:43:45

SAM results web page
BBmSAM (1/4)

- SEE–GRID alternative to the EGEE SAM framework
- Web application implemented in PHP relying on MySQL database
- Main features of BBmSAM are:
  - Use of unaltered client and sensor components of EGEE SAM system
  - Synchronization with central HGSM service
  - Use of free and open source technologies
  - Enabling more efficient access by mobile and small screen devices
- Main components of BBmSAM are:
  - Database server
  - Synchronization service
  - BBmSam web services
  - BBmobileSAM
  - BBmSAM portal
BBmSAM system performs:

- Periodical synchronization of local HGSM database with central HGSM database performed each 10 minutes
- Regular SAM test submission performed each 3 hours for interactive tests (job based) and each hour for non-interactive tests
- Publishing of interactive test data each 20 minutes
- Calculating hourly uptime/availability each hour (for SEE–GRID–2 compatible SLA)
- Calculating service instance uptime (for continuous time SLA calculations in SEE–GRID–SCI)
- Generating information for end–users of portal on demand basis
BBmSAM front web page
BBmSAM (4/4)

BBmSAM test results page
GStat (1/3)

- Application designed to monitor EGEE/LCG compatible Information Systems
- Its purpose is to detect faults, verify the validity and display useful data from the Information System
- Relies on queries to site GIISes/BDIIs and not to any submitted job
- GStat covers the following areas:
  - Site and service information
  - Usage information
  - Information integrity
- Depends on the data found in the GOCDB
- GStat runs on a single server
GStat main page
GStat (3/3)

SEE-GRID-SCI USER FORUM 2009 Turkey, Istanbul, 09–10 December, 2009
Presented tools are used for overseeing two large Grid sites at SCL

Considered vital for Grid operations

Provide essential information about Grid sites' and services' health to site administrators and end-users

Tools developed at SCL are provided to all interested site administrators through SCL’s SVN and RPM repository