FP6 Research Infrastructures

SEE-GRID-2

South-Eastern European Grid-enabled eInfrastructure Development 2

Deliverable D3.4

Infrastructure overview and assessment

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Abstract: Deliverable D3.4 – "Infrastructure overview and assessment" presents an overview and assessment of the progress in the regional infrastructure and operations in the life of the project. It also gives detailed overview of the infrastructure usage per country and per application.

The SEE-GRID-2 Consortium consists of:

GRNET	Coordinating Contractor	Greece
CERN	Contractor	Switzerland
CLPP-BAS	Contractor	Bulgaria
ICI	Contractor	Romania
TUBITAK	Contractor	Turkey
SZTAKI	Contractor	Hungary
ASA	Contractor	Albania
UoBL	Contractor	Bosnia-Herzegovina
UKIM	Contractor	FYROM
UOB	Contractor	Serbia
UOM	Contractor	Montenegro
RENAM	Contractor	Moldova
RBI	Contractor	Croatia

Document Revision History

Date	Issue	Author / Editor / Contributor	Summary of main changes
March 17th, 2008	ToC	Antun Balaz	Draft ToC

Preface

SEE-GRID-2 aims to advance and integrate the existing SEE Grid infrastructure and services, capitalize on the existing SEE-GRID human network to further strengthen scientific collaboration and cooperation among participating SEE communities, and ultimately pave the way for the sustainability for regional and national eInfrastructures that will endure beyond the project's lifetime. The project aims to deliver an eInfrastructure to serve the research and educational needs of the scientific communities and end-users that will be sustainable both at national and regional level in its operation and expansion, will have a multi-disciplinary nature in encouraging and supporting grid applications among diverse technology domains, and will comprise of multiple geographically-distributed resource sites per SEE country thus engaging an equally-contributing collaborative group of research and academic groups per SEE country. The project involves the established and incubating National Grid Initiatives of Albania, Bosnia-Herzegovina, Bulgaria, Croatia, FYR of Macedonia, Greece, Hungary, Moldova, Montenegro, Romania, Serbia, and Turkey.

The main objectives of the SEE-GRID-2 project are:

1. Securing Sustainable Development and Operation. Being acknowledged as the utmost priority of any developing effort in the region, sustainability is a key objective in order for the undertaken initiative to be able to last and flourish beyond the EC-supported project lifetime.
2. Achieve national government buy-in and commitment per country for the incubating NGIs.
3. Build solidarity and cooperation with research and academic organizations at national level.
4. Penetrate and engage regional and national user communities via multi-disciplinary grids, involving a range of research and academic institutes and scientific communities in all SEE countries, with emphasis on the deployment and support of a range of Grid applications.
5. Draw upon the latest deployment experience and results of other eInfrastructure projects such as the production-level EGEE/EGEE-II, as well as other regional extensions like EUMEDGRID, EUChinaGRID, BalticGrid, EELA, etc.
6. Upgrade the capacity of the SEE grid with by significantly increasing the current regional resources (e.g. processing power, storage).
7. Guarantee stability and interoperability of the grid infrastructure.
8. Liaise with SEE user communities, other grid projects' human networking activities, prospective partners beyond the R&E environment, and serve as a paradigm for bridging the digital divide in other areas of the world.
9. Carry out training events in order to raise the regional expertise and end-user adoption.
10. Carry out dissemination events to raise awareness at all society levels and attract national and regional political and financial support.
11. Provide a platform for communication and dissemination of information about SEE-GRID-2.

The expected results of the project are:

1. Project management information system established
2. Promotional package available
3. Infrastructure Deployment Plan Defined
4. Potential application groups identified
5. CA and RA guidelines for new candidates defined
6. Regional eInfrastructure projects Concentration Workshop
7. Sustainable organisational and operational approach defined
8. Portal operational across the pilot Grid
9. Final Sustainability and Impact Analysis of SEE National Grid Initiatives
10. A number of inter-disciplinary applications running on the regional Grid
11. Final plan for using and disseminating knowledge

The SEE-GRID-2 project kicked-off in May 2006 and is planned to be completed by April 2008. It is coordinated by GRNET with 12 contractors participating in the project: representatives of the NGIs of Albania, Bosnia-Herzegovina, Bulgaria, Croatia, FYR of Macedonia, Hungary, Moldova, Montenegro, Romania, Serbia, Turkey, and CERN in a consulting role and as liaison to the pan-European grid effort EGEE. The total budget is 2.028.886 €. The project is funded by the European Commission's Sixth Framework Programme for Research Infrastructures.

The project plans to issue the following deliverables:

Del. no.	Deliverable name	Nature	Security	Planned Delivery
D1.1	Project management information system and contractual relationships	R	CO	M01
D5.1	Internal and external web site, docs repository and mailing lists	R, O	CO	M02
D5.2a	Promotional package	R	PU	M03
D1.2a	3-Monthly progress report	R	CO	M03
D3.1a	Infrastructure Deployment Plan	R	PU	M04
D4.1	User community survey and applications expansion	R, O	PU	M04
D3.2	CA and RA guidelines for new candidates	R	PU	M05
D1.2b	3-Monthly progress report	R	CO	M06
D2.1	Regional and National Organisational and Policy Schemes	R	PU	M06
D3.3	Portal specifications and functionality	R	PU	M06
D5.3	Regional eInfrastructure projects Concertation Workshop	R, O	PU	M07
D1.2c	3-Monthly progress report	R	CO	M09
D2.2	Sustainable organisational and operational approach	R	PU	M09

D1.2d	3-Monthly progress report	R	CO	M12
D2.3a	Sustainability and Impact Analysis of SEE National Grid Initiatives	R	PU	M12
D4.2	Application deployment and support	R	PU	M12
D5.4a	Regional & National Dissemination events report	R	PU	M12
D5.5a	Regional & National Training events report	R	PU	M12
D1.3a	First period progress reports	R	CO	M13
D5.2b	Promotional package	R	PU	M13
D5.6a	Draft plan for using and disseminating knowledge	R	CO	M13
D3.1b	Infrastructure Deployment Plan	R	PU	M14
D1.2e	3-Monthly progress report	R	CO	M15
D1.2f	3-Monthly progress report	R	CO	M18
D4.3	Developer's Guide for Porting to the Grid	R	PU	M20
D1.2g	3-Monthly progress report	R	CO	M21
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D1.3b	Final period progress reports	R	CO	M24
D2.3b	Sustainability and Impact Analysis of SEE National Grid Initiatives	R	PU	M24
D4.4	User community engagement and Applications assessment	R	PU	M24
D5.4b	Regional & National Dissemination events report	R	PU	M24
D5.5b	Regional & National Training events report	R	PU	M24
D5.6b	Final plan for using and disseminating knowledge	R	CO	M24

Legend: R = Report, O = Other, PU = Public, CO = Confidential (only for members of the consortium incl. EC).

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[1] Project SEE-GRID-2 – 031775 – Annex I – Description of Work

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UKIM

2.4. GStat

GStat is a BDII (information system) monitoring tool developed by Min Tsai for EGEE/LCG compatible information systems. GStat's primary goal is to detect faults and verify the accessibility of the information system on a per-site basis, and display useful data from the information system. GStat tests the information system every few minutes and the results are published on the GStat web page (http://goc.grid.sinica.edu.tw/gstat/). The test does not rely on any submitted job, but rather on queries to site GIISes/BDIIs. This is done to gather information and perform so called sanity checks to point out any potential problems with individual sites. The test covers the following areas:

- Site and service information: Provide information about the site, services, software and VOs supported at that site.
- Usage information: Provides the statistics on job slots, jobs, storage space.
- Information integrity: Checks if the Information system is publishing data that is meets specific syntax and value rules.

In addition, short and long term histories are kept for the published resources and their utilization. GStat author has created a separate GStat view showing only SEE-GRID resources (Figure 1) (http://goc.grid.sinica.edu.tw/gstat/seegrid/).

This view shows overall status of all sites (OK, Warning and Error) and aggregated information on resources (total CPUs, jobs, storage). Some detailed information for every site is also available (LCG version, number of CPUs, jobs, storage available, some tests). By clicking on the site name all details for the site can be seen.

GStat gets the list of SEE-GRID-2 sites from the top level BDII configuration file generated by HGSM. This file contains lines with (site name, site BDII URL) pairs so it is perfectly suited for GStat. If the site also exists in GOCDB, then GOCDB information will take precedence. This is the case for SEE-GRID-2 sites that are also part of the EGEE grid. As more and more project start using different site databases it would be interesting to decide on a common interface designed to collect site information for monitoring as this would make it easier for the monitoring tool developers.

2.5. SEE-GRID accounting portal

IPP

2.6. Nagios

IPP

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TUBITAK

2.8. MonALISA

ICI

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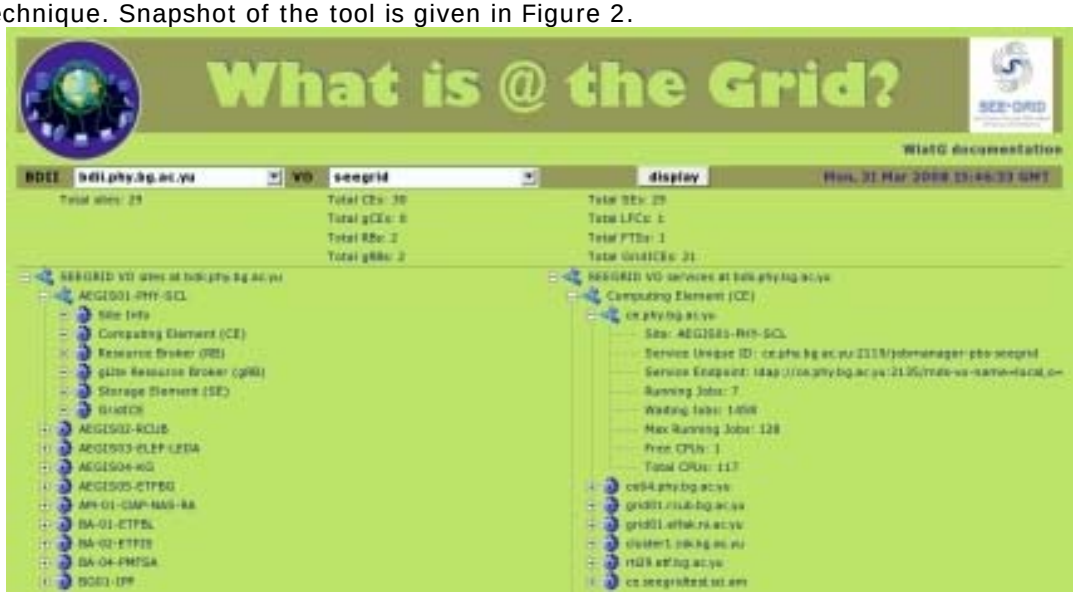
TUBITAK

2.10. WiatG

The WiatG (What is at the Grid) (http://bdii.phy.bg.ac.yu/WiatG/pl/WiatG.pl) is a web application for visualization of BDII information. It is highly responsive tool because it supports partial refreshes and asynchronization of a web page. These features were

enabled using the AJAX (Asynchronous JavaScript and XML) web development technique. Snapshot of the tool is given in Figure 2.



A partial refresh of WiatG application means that when an interaction event fires – for example, click on plus icon of site or service tree – the server processes the information and returns a limited response specific to the data it receives – only the names of sites or available services at BDII for selected VO. One may notice that WiatG server does not send back an entire page, like the conventional "click, wait and refresh" web applications. Instead, WiatG client updates the page based on the response. This means that only part of the page is updated. In other words, WiatG's initial page is treated like a template: WiatG server and client exchange data and the client updates parts of the template based on the data that client receives from the server. One way to think about this is that the WiatG application is driven by events and data, whereas conventional web applications are driven by pages.

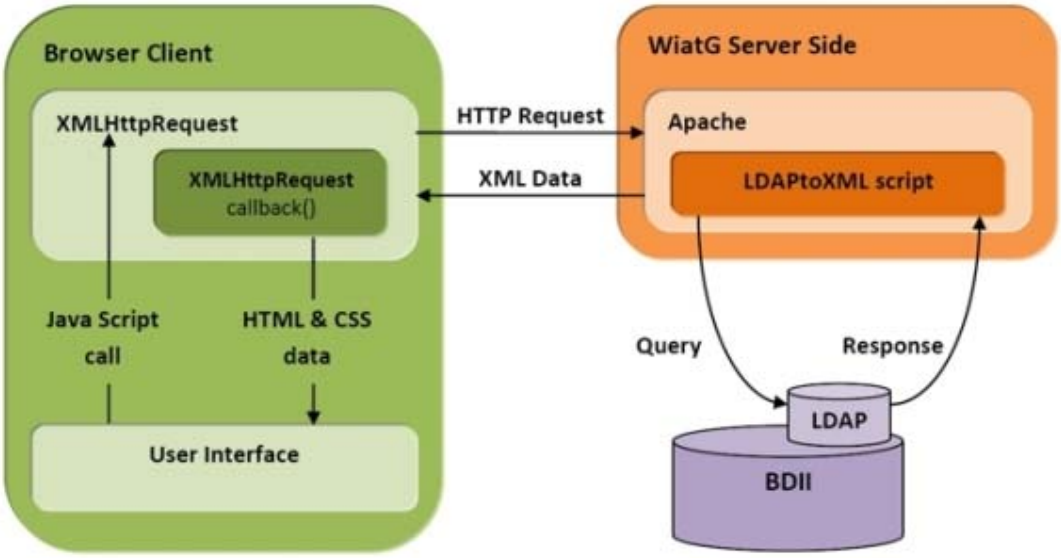
Asynchronization of the WiatG tool means that after sending data to the server, the client can continue processing while the server does its processing in the background. This means that a user can continue interacting with the client without noticing a lag in the response. For example, a user can click on any plus or minus icons even if loading notification is visible and in that way she can create other requests. The client does not have to wait for a response from the server before continuing, as is the case for the traditional, synchronous approach.

Following technologies are included in the WiatG:

- Perl is used for LDAP connection to BDII and generation of HTML and XML data.
- XML, the format for sending data from the web server to the client.
- Cascading Style Sheets (CSS), a markup language used to define the presentation style of a page.
- JavaScript, a scripting language. One element of JavaScript technology that is key to Ajax is
- XMLHttpRequest, an object that is used to exchange data between web client and web server.
- Document Object Model (DOM), which provides a logical view of a web page as a tree structure.

Figure 3 illustrates how these technologies work together to handle a user action that triggers a WiatG response. After user's event on the WiatG client – that results in a JavaScript technology call – JavaScript technology function creates and configures an

XMLHttpRequest object on the client side, and specifies a JavaScript technology callback function. Then previously created XMLHttpRequest object makes a call – an asynchronous HTTP request – to the WiatG server. Perl script at the server side processes the request, sending the LPAD query to the BDII and then generates XML document that contains the result. Afterwards, client processes the result in a JavaScript technology callback function and updates the DOM representing the page with the new data.



Current version of the WiatG application at selected BDII for a determined VO seeks for sites and following Grid services:

- Computing Elements (CE)
- gLite Computing Elements (gCE)
- Resource Brokers (RB)
- gLite Resource Broker (gRB)
- Storage Elements (SE)
- LCG File Catalogs (LFC)
- File Transfer Services (FTS)
- GridICEs

The WiatG tool provides detailed information on retrieved sites and services as well as total number of them.

WiatG is developed as an operational tool in the framework of the SEE-GRID project, but it is used by other regional Grid projects. At the moment, apart from SEE-GRID, WiatG supports the following projects:

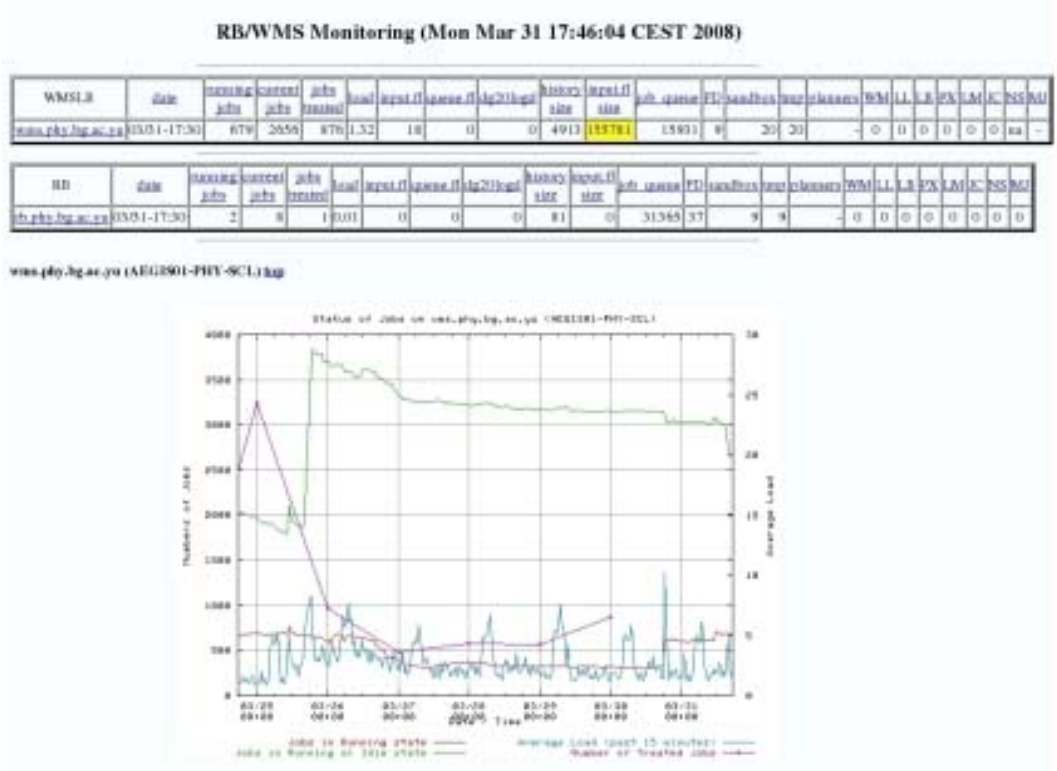
- EUMEDGRID (BDII: bdii.isabella.grnet.gr)
- EUChinaGrid (BDII: euchina-bdii-1.cnaf.infn.it)
- EELA (BDII: lnx112.eela.if.ufrj.br)
- BalticGrid (BDII: bdii.mif.vu.lt)
- Health-e-Child (BDII: hec-maat-server16.maat-g.com, hec-maat-server17.maat-g.com)

as well as four LHC experiments with their primary BDIIs.

Further development will be focused on the creation of a unique tool able to cross check real (BDII) and expected (GOCDB/HGSM) information at the Grid.

2.11. RB/WMS monitoring tool

The RB/WMS Monitoring is a tool for RBs and WMSs monitoring. It is developed by Yvan Calas and optimized for usage outside of CERN and packaged by Dusan Vudragovic. Snapshot of the tool is given in Figure 4.



The tool contains two parts: rbwmsmon-server and rbwmsmon. The rbwmsmon should be installed at RB or WMS and it collects monitoring information and provides DN based access from rbwmsmon-server to RB/WMS. The rbwmsmon-server can be installed at any Grid machine and it collects information from monitored RBs/WMSs, generates pictures and provides collected services' information in HTML. SEE-GRID instances of RB/WMS Monitoring tool are available at http://wiki.egee-see.org/index.php/RB/WMS_Monitoring. More technical details is available at https://twiki.cern.ch/twiki/bin/view/LCG/RBWMSMonitoringToolHowTo.
Installation instructions are available at http://wiki.egee-see.org/index.php/RB/WMS_Monitoring.

2.12. SEE-GRID repository service

The SEE-GRID linux and software repository is a storage location from which RPMs may be retrieved and installed. This repository provides mirror of latest Scientific Linux versions, software packages created in SEE-GRID, as well as other RPMs that are useful for SEE-GRID administrators.

In the SEE-GRID project large number of partners from different institutions provide RPMs and they should be able to access to the repository. This problem can be solved with a creation of shared file systems (such as AFS) for example, but for many reasons (security, credence) this is not the good solution. Especially in Grid regional projects where all participants have their own DN certificates and where credence's hierarchy is

already established. Considering all this, user should be able to upload created RPM to the repository using DN certificate. For this reasons dwarf is created.

Dwarf is framework for DN based RPMs uploading and the creation of APT and YUM repositories. It is created in the framework of SEE-GRID and for its purposes.

Tool is developed as PHP script with some JavaScript functions, and MySQL is used for database backend.

Current version (dwarf-1.0.0-1) of dwarf provides following possibilities:

- creation of repository structure followed by description of each part of the repository
- adding new user's DNs and defining parts of the repository that will be accessible by each DN
- RPMs uploading
- preview of repository structure

Further development should include following topics:

- creation of dwarf command line interface
- creation of user groups
- multiple RPMs uploading
- integration with VOMS server

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UOB-IPB

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UOB-IPB

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SZTAKI/GRNET-AUTH/RBI/TUBITAK/UOB-IPB

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UOB-IPB/GRNET/TUBITAK/IPP/ICI

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UOB-IPB