

SA1 Grid Infrastructure Operation

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Grid Infrastructure for EUFORIA

“To provide an advanced Grid-empowered infrastructure for scientific computing targeted to support the fusion activities in the European Research Area” (DoW)

□ Why are Grid infrastructures relevant for the project?

- o The community and the resources are distributed: resource optimization
- o There are Physics codes which can run in loosely coupled computing nodes (see JRA1 DoW).

□ Deployment of a common layer of resources optimized for fusion research

- o With the software tools needed by the reference applications
- o With the middleware tools supporting complex workflows

Objectives of SA1 activity

- ❑ Deploy, maintain and operate the central services necessary to run a production level Grid infrastructure capable of supporting serial and parallel jobs.
- ❑ Coordinate the deployment, maintenance and operation of the Grid testbed.
- ❑ Provide support to sites willing to integrate resources in the Euforia grid testbed: community integration
- ❑ Provide support for Virtual Organizations helping end-users and site managers to achieve their goals

Consolidating Grid in Europe

□ Interoperability

- Adopt middleware in use in other major grid projects
- Ensure interoperability with EGEE
- Use the EUGRIDPMA certification infrastructure

□ Standards

- Follow the recommendations of international bodies such as e-IRG and Global Grid Forum

□ Exploitation of grid infrastructures in Europe

- Reaching to the Fusion Community

Infrastructures

□ Infrastructures to be deployed:

○ **Production Infrastructure**

- For users and applications

- **Tutorial Infrastructure** → devoted to outreach in cooperation with NA2 activities.

Core services

□ **CSIC** (Instituto de Física de Cantabria-IFCA)

- o Nodes for core services

- RB, DBII, LFC, Myproxy, VO/VOMS, UI and RAS

□ **FZK** (Forschungszentrum Karlsruhe)

- o Nodes for core backup services

- o Central repository and build machine

□ **CIEMAT** (Centro Extremeño de Tecnologías Avanzadas, Trujillo)

- o Infrastructure monitoring services (Site Functional Test)

Sites initially committed

Site	Location	Description
IFCA	Santander	200 cores type Xeon 3.2GHz 5 TB online storage
FZK	Karlsruhe	32 cores 500 GB online storage
CIEMAT	Trujillo	50 cores 20 TB online storage
Chalmers	Gothemburg	32 cores 500 GB online storage

Data taken from technical annex

More resources/sites

- More sites interested in joining the grid testbed?
 - o We have distributed a questionnaire (SA1 Questionnaire)
- Sites without experience in deploying Grids
 - o Site admins need on-site training
 - o This can be organized at the closest location:
 - Spain
 - Germany

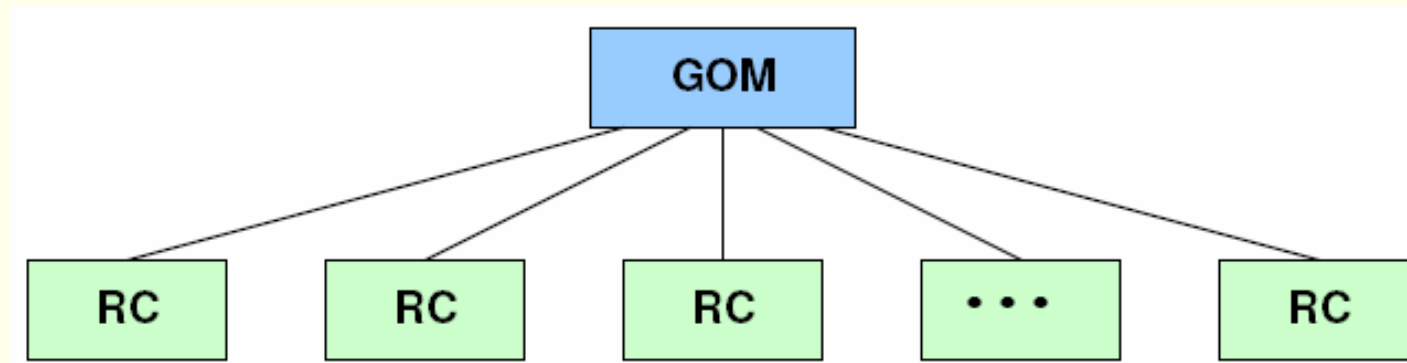
Please answer the SA1 questionnaire !!!

SA1 Organization

Deliverables

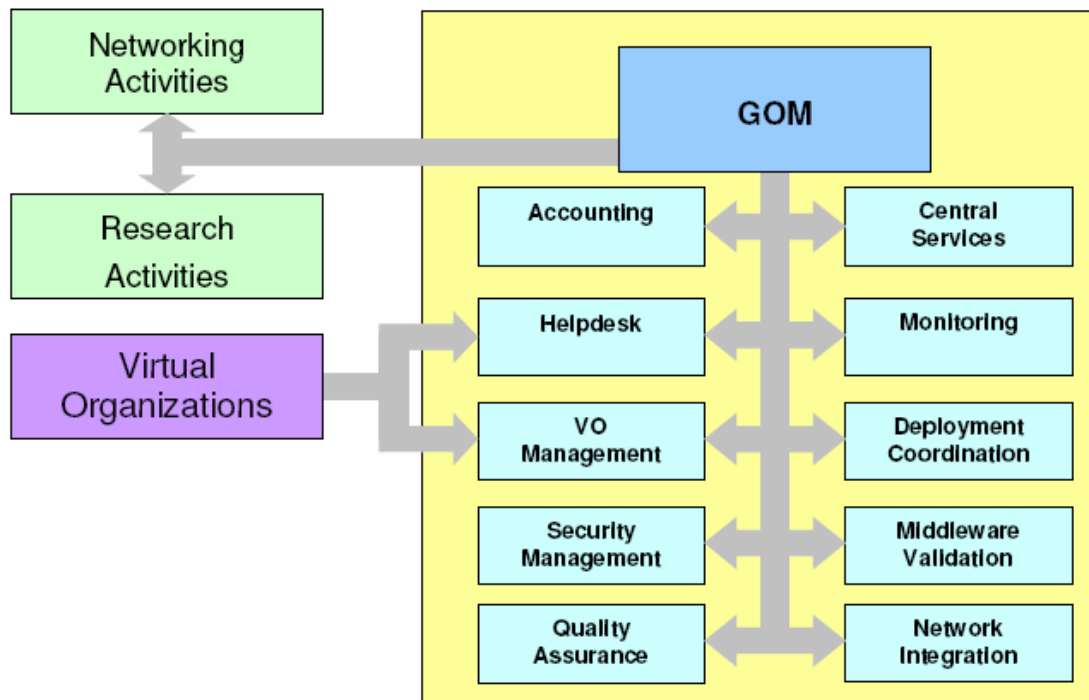
Deliverable	Deliverable title	Delivery date	Nature	Level
DSA1.1	Initial testbed operation status report Document describing the experience with the initial testbed deployment. Middleware repository	June 08	R	PU
DSA1.2	Infrastructure operation status report (capabilities, reliability and usage)	June 09	R	PU
DSA1.3	Operation report running applications in an advanced framework – Report on the Grid Appliance .	Dec 09	R	PU
DSA1.4	Final Report on GRID use and experiences	Dec 10	R	PU

Structure of the Grid Infrastructure



- The Grid Operations Management is the body that coordinates and operates the grid infrastructure
 - Resource centres (computing and storage)
 - CSIC, FZK, CIEMAT and Chalmers Univ. so far.
 - Core services
 - CSIC, FZK and CIEMAT

Operations organization



□ The GOM:

- o interacts with NA1, NA2, SA3 and JRA1
- o Includes 10 services aimed at specific operational areas
- o Two services aimed at the VOs for support and coordination

The management of GOM will be a shared responsibility:
CSIC and FZK

SA1 Distribution

Task	Participants
GOM general coordination	CSIC, FZK
Accounting	CIEMAT
VO management	CSIC
Security management	FZK
Core services	CSIC, FZK, CIEMAT
Monitoring	CIEMAT
Deployment coordination	CSIC, FZK

VO management

- ❑ Coordination of resource provisioning and infrastructure operation with the virtual organizations
- ❑ Management of the authorization aspects of the infrastructure (VOMS etc)
- ❑ Assist in establishing and enforcing agreements between VOs and resource providers
 - Service Level Agreements (SLAs)
- ❑ Provide VO specific services
- ❑ Setup of new VOs

Central services

- ❑ Deploy and operate core grid services:
 - RB, DBII, catalogues, RAS, VOMS, Myproxy, etc.
- ❑ These are critical services that require:
 - Continuous operation and careful management
 - Close monitoring
 - Fault tolerance if possible
- ❑ Provide support for:
 - Core services issues
 - Site issues related with the core services and troubleshooting
- ❑ Most central services will be operated by IFCA, FZK and CIEMAT

Monitoring

- Deploy and operate an infrastructure monitoring system:
 - o Infrastructure management
 - o Troubleshooting and support
 - o Resource selection

- How:
 - o Monitoring of grid services and site availability (Mapcenter, NAGIOS, gridlce etc)
 - o Execution of site and service tests (SFT)
 - o Freedom of choice tool or similar

Deployment coordination

- ❑ Coordinate deployment of releases and bugfixes in the infrastructures
 - o Production
- ❑ Plan deployment in coordination with the VOs, SA1 services and other activities
- ❑ Consolidate and prepare documentation, profiles and tools to assist on the deployment
- ❑ Assist sites in the deployment
- ❑ Help to deploy new sites and certify them
- ❑ Close interaction with JRA1 and other projects

Things to do ...

Virtual Organizations

□ Implementation

- o VOMS: VO management service providing
 - Tools for user enrolment and management

□ Actions

- o Supporting on our testbed the EGEE **Fusion** VO.
 - Support batch sequential job execution
- o Creation of **euforia** VO
 - Advanced application support (parallel MPI, visualization and complex workflows) which will not be present in EGEE testbeds



The screenshot shows the VOMS web interface for the i2gtest VO. The page title is "Welcome to the i2gtest VO". The main content area says "Welcome to VOMS!" and provides information about the Virtual Organization Membership Service. The page also includes a navigation menu with sections for "FOR VO USERS" and "FOR VO MANAGERS". The "FOR VO MANAGERS" section includes links for "Administer the VO", "Handle requests", and "Check audit data". The "CONFIGURATION" section includes "Configuration information" and "List all VOs on this server". The page footer shows the user is logged in as "*/C=PT/O=LIPCA/OU=LIP/OU=Lisboa/CN=Jorge Gomes" and is certified by "*/C=PT/O=LIPCA/CN=LIP Certification Authority".

Virtual organizations

□ Project VOs

- o Main – site admins
 - very restricted resources in production
- o Monitoring – restricted set of infrastructure managers
 - slots reserved for monitoring and testing
- o Tutorial – tutorial and training sessions
 - only some production sites will provide support for it

□ Application VOs

- o euforia
- o Fusion (EGEE)

Deployment & installation

See Site questionnaire

- o Identify resources in detail for planning

Define an installation method

- o As automatic as possible
- o Installation from central repository at FZK (Marcus)
- o Common profiles

Research

- o Using Xen for developing the Grid appliance

Monitoring

Several tools needed

- o perform set of tests (SFT like)
- o monitor resources and infrastructure (gridice like)
- o monitor grid services availability

Evaluate tools, select and deploy

R-GMA will be necessary

Quality Assurance metrics

□ Jobs

- o Total Jobs (via RB and direct via GRAM)
- o Jobs ok / Jobs failed (per job type)

□ VO

- o Total users registered: Users registered / Users active
- o Used computational resources for the period
- o Used SE space per VO for the period

□ Infrastructure

- o Uptime of sites and services
- o Downtime

Interaction with other Work Packages

SA3 User Support

User registration through SAFE

- o Using the Grid implies accessing resources via registration in a VOMS server
 - Include a link to the VOMS server in SAFE ?

Helpdesk

- o Route SA1 tickets to the operations team
- o Track status of tickets

Accounting work: collaboration with the grid monitoring systems

JRA1 Grid applications support

Grid Applications Questionnaire

Feedback to JRA1 and SA1

- o Adequate application support

Answers to the Applications Questionnaire

- o Expectations from infrastructure

- CPU
- Storage requirements
- Usage of Migrating Desktop

- o Type of Jobs

- How many in order of magnitude
- Sequential versus Parallel

JRA3 middleware compatibility

□ Maintaining compatibility is important

- Catch EGEE users from the fusion VO
- Allow easy migration of applications
- Take advantage of good EGEE infrastructure
- Not reinvent the wheel

□ Developments on top of glite middleware:

- **Migrating Desktop and Roaming Access Server**
 - We need to deploy a RAS machine and a backup.
- **Workflow management using Kepler**
 - Integration of Kepler in RAS keeping glite interoperability

Plan for the first six months

January – February 2008

Setting up mailing list:

euforia_grid@savannah.fzk.de

(SA1 + JRA1 + JRA3)

Deployment of core services

- VOMS server
- Core services
- First 64 cores

Feedback from users

- JRA1 and JRA3 teams join the virtual organization and test the infrastructure

March-June 2008

Testbed deployment

- Backup core services
- Monitorization services
- Extension to > 256 cores

Feedback from new sites willing to join the testbed

- Site resources questionnaire

Feedback from Applications

Questionnaire