

The EU DataGrid Testbed

The European DataGrid Project Team

<http://www.eu-datagrid.org>



Contents

❖ Overview

- Grid participants & services
- Navigating the grid

❖ Installation & Deployment

- Grouping of services
- Typical site configuration
- Software distribution & installation

❖ Further Information

Grid: System which allows **distributed, disparate** computing resources to appear as **single, coherent** computing platform on which to **efficiently** process user-defined tasks.

Grid Participants

❖ Users

- People with **computing-intensive task** who want to use grid resources to accomplish it.

❖ Virtual Organization (VO)

- Group of people with common interests and which **controls access** to certain resources.

❖ Site Administrators

- People who **manage** computing resources and who are ultimately **responsible for usage** of those resources.

❖ Outside Authorities

- People or organizations with a **financial, legal, etc. interest** in grid's resources or operation. (e.g. Police, funding agencies, ...)

Grid Services

❖ Workload Management

- Reliable Job Submission
- Matchmaking
- Logging & Bookkeeping

❖ Data Management

- Replica Management
- Metadata Management

❖ Resources

- Gatekeeper (batch interface)
- Storage (disk, tape, etc.)
- Database (SQL, ...)
- Network

❖ Information System

- Service Discovery
- Service State Information

❖ Security

- Authentication
- Authorization

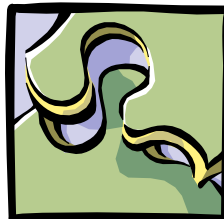
EDG Architecture



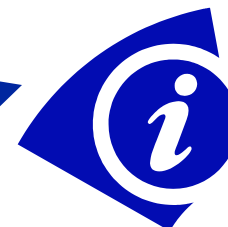
User Interface



Resource Broker

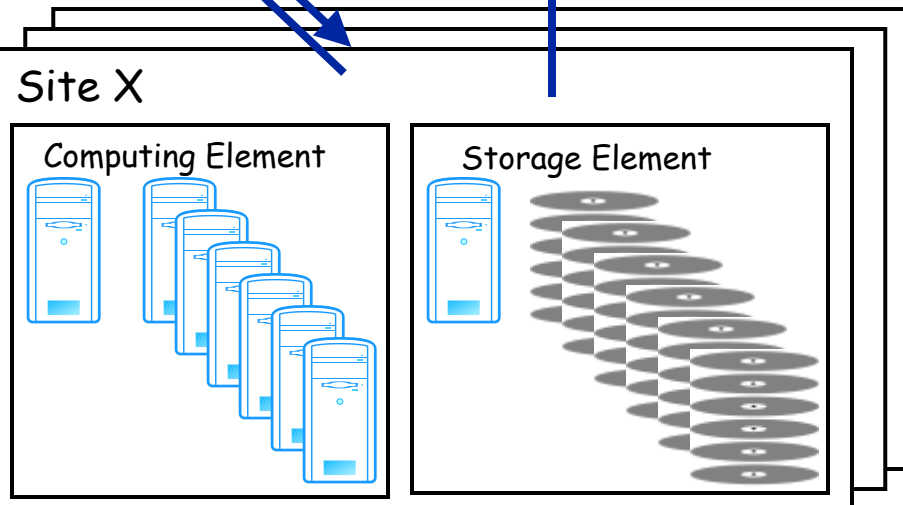


Information System



R-GMA

Replica Location Service



update credential

submit
retrieve

query

query

submit
retrieve

publish state



VOMS

Machine Types

❖ User Interface (UI) & Worker Nodes (WN)

- **Deployment: User/Site, many.**
- Contain client software to access EDG services.
- Lightweight and easy to install on existing systems.
- Neither is really part of the grid, but provide access to it.

❖ Gatekeeper (CE)

- **Deployment: Site, one per batch system.**
- Grid interface to LRMS (PBS, LSF, Condor).

❖ Storage Element (SE)

- **Deployment: Site, one per MSS type.**
- Grid interface to storage (disk, tape, etc.).

Machine Types (cont'd)

❖ Monitoring Node (MON)

- Deployment: Site, one per site.
- Site R-GMA server; site's interface to information system.
- Fabric monitoring server.
- Replica optimization server.

❖ Information Catalog (IC)

- Deployment: Sites?, one per grid.
- Registry of all information producers & consumers on grid.

❖ Replica Location Service (RLS)

- Deployment: VO, one per VO.
- LRC and RMC servers.

Machine Types (cont'd)

- ❖ Virtual Organization Membership Service (VOMS)
 - Deployment: VO, one per VO.
 - Contains VO's membership and authorization information.

- ❖ Resource Broker (RB)
 - Deployment: VO?, few per grid.
 - Contains matchmaking service.
 - Reliable job submission service (CondorG).
 - Logging & Bookkeeping for job state information.
 - Cache for job input and output "sandboxes".

Finding Resources

❖ User Interfaces:

- ccedgui.in2p3.fr
- gppui04.gridpp.rl.ac.uk
- testbed010.cern.ch (for those with CERN AFS account)

❖ UI command line:

- CEs: `"edg-rgma -c 'latest select * from GlueCE' "`
- SEs: `"edg-rgma -c 'latest select * from GlueSE' "`
- Services: `"edg-rgma -c 'latest select * from Service' "`

❖ Web browser:

- Allows browsing contents of information system (schema & info).
- Interactive queries (without needing SQL).
- <http://gppic05.gridpp.rl.ac.uk:8080/R-GMA/>

Sites Using EDG Software



❖ Projects using EDG SW

EDG

CrossGrid

DataTag

LHC Computing Grid

National Grid Projects

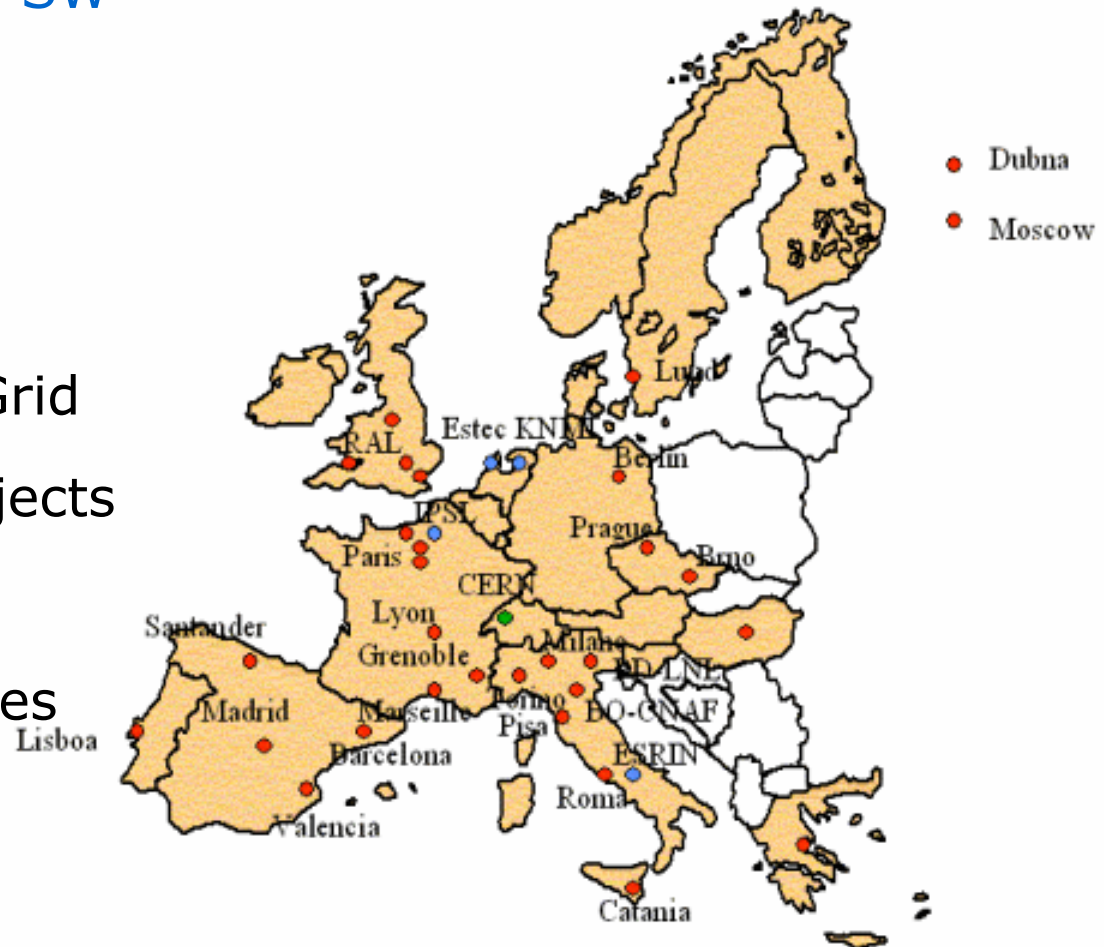
❖ Diffusion

~40 European sites

Asia

North America

Middle East



EDG Testbeds

- ❖ **GriDis Dissemination Testbed (tutorials and demonstrations)**
 - Software: Certified release (2.0.21)
 - State: Open to all; small testbed with limited resources.
- ❖ **EDG Application Testbed (evaluation by end-users)**
 - Software: “Stable”, certified release (2.0.21)
 - State: Open to all; supported during working hours.
- ❖ **EDG Development Testbed (integration of new releases)**
 - Software: Release candidates and test releases (2.1.x)
 - State: Open to early evaluators; unstable, frequent changes.
- ❖ **Middleware Testbeds (testing, development of middleware)**
 - Software: Bleeding-edge, unreleased middleware.
 - State: Developers only; varies, controlled by MW work packages.

EDG Application Testbed



Site	Country	MON	GK	WN	SE	RB	RLS	IC	UI	PX
Birmingham	UK	●	●	0	●	-	-	-	-	-
Bristol	UI	●	●	0	●	-	-	-	-	-
Cambridge	UK	●	●	0	●	-	-	-	-	-
CC-IN2P3	FR	●	●	6	●	-	-	-	●	●
CERN	CH	●	-	-	●	-	-	-	●	-
CNAF	IT	●	●	4	●	-	-	-	-	-
CPPM	FR	●	●	1	●	-	-	-	-	-
FZK	D	●	●	2	●	-	-	-	-	-
Imperial Coll.	UK	●	●	2	●	●	-	-	-	-
IFAE	ES	●	●	5	●	-	-	-	-	-
NIKHEF	NL	●	●	138	●	●	●	-	-	-
Padova	IT	●	●	6	●	-	-	-	-	-
RAL	UK	●	●	6	●	-	●	●	●	-
RAL-PP	UK	●	●	0	●	-	-	-	-	-
Roma	IT	●	●	6	●	-	-	-	-	-

Sites: 15

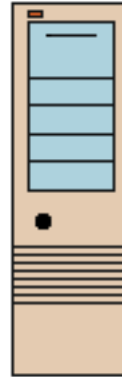
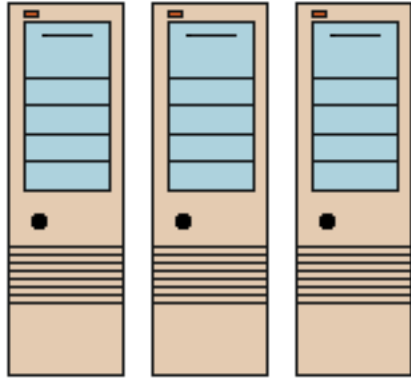
Countries: 7

CPUs: 175

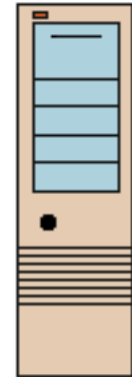
Typical Testbed Site



Mass Storage System (0+)

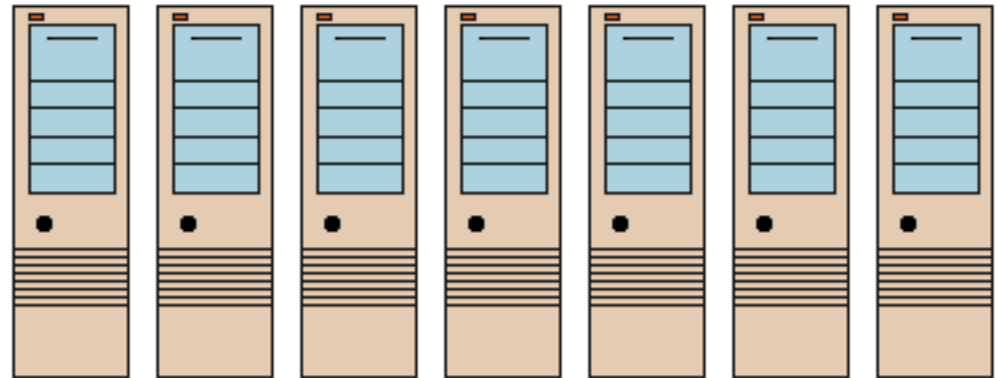
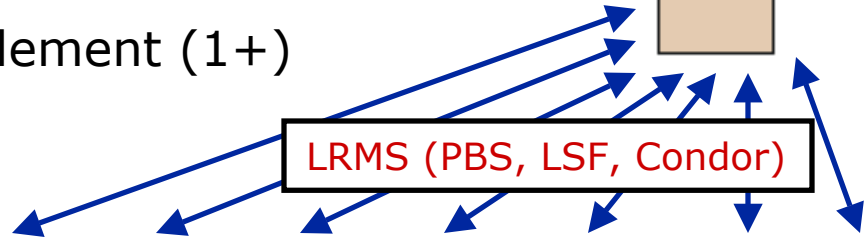


Gatekeeper (1+)

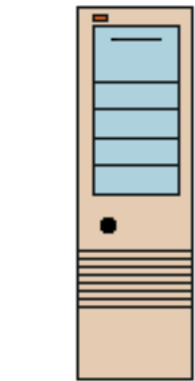


Storage Element (1+)

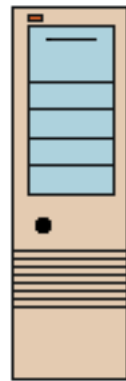
LRMS (PBS, LSF, Condor)



Worker Nodes (0+)



LCFGng (1)



"MON" (1)

Obtaining EDG Software

- ❖ Software covered by EDG License (allows commercial use)
- ❖ Release Management (edg-release module)
 - Complete RPM lists for all machine types
 - LCFGng Configuration for all machine types
- ❖ Sources available from CVS (datagrid.in2p3.fr)
- ❖ Binary packages available from package repository
 - RedHat 7.3 & other external packages
 - VDT 1.1.8-* (Globus 2.2)
 - EDG packages
- ❖ Download
 - Recommended: Caching script in edg-release for LCFGng.
 - Available: "wget" lists by EDG release and machine type

Joining EDG Testbed

❖ Everyone welcome! But...

- Willingness to act as first-level support for local users.
- Respond to hardware, configuration, etc. problems promptly.
- Can obtain host certificates from an EDG-recognized CA.
- Have at least 4 machines available.

❖ To join...

- Setup LCFGng server.
- Successfully install one LCFGng client.
- Obtain host certificates for machines.
- Install CE (GK & WN's), SE, MON.
- Test installation (edg-site-configuration package).
- Contact Iteam.

Summary

- ❖ Overview of EDG services
- ❖ Deployment of services
- ❖ Obtaining EDG software
- ❖ Joining testbed

Further Information

❖ Users' Guide

- Introduction to EDG services and simple examples using major grid services.
- <http://marianne.in2p3.fr/datagrid/documentation/>

❖ Installation Guide

- Instructions on installing and configuring all of the EDG and supporting services. Mainly via LCFG, but manual installation for UI.
- <http://marianne.in2p3.fr/datagrid/documentation/>

❖ LCFG Server Installation

- Cookbook for installing an LCFGng server.
- <http://datagrid.in2p3.fr/distribution/datagrid/wp4/edg-lcfg/documentation>