EGI Operations

Tiziana Ferrari/EGI.eu
EGI Chief Operations Officer
Outline

• Infrastructure and operations architecture
  – Services
  – Monitoring and management tools

• Operations
## Installed Capacity

<table>
<thead>
<tr>
<th>Logical CPUs</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGI-InSPIRE and Council Participants</td>
<td>306,000</td>
</tr>
<tr>
<td>Including integrated and peer RPs</td>
<td>429,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Storage</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disk (PB)</td>
<td>155 PB</td>
</tr>
<tr>
<td>Tape (PB)</td>
<td>150 PB</td>
</tr>
</tbody>
</table>

![Map showing installed capacity](image-url)
## EGI Resource Infrastructure Providers

<table>
<thead>
<tr>
<th>Resistance Centres</th>
<th>Including integrated RPs</th>
<th>351</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supporting MPI</td>
<td></td>
<td>87</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Countries</th>
<th>EGI-InSPIRE &amp; EGI Council members</th>
<th>43</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Including integrated RPs</td>
<td>59</td>
</tr>
</tbody>
</table>

**Integrated EGI-InSPIRE Partners and EGI Council Members**

- **Internal/External Resource Providers (being integrated)**
- **External Resource Providers (integrated)**
- **Peer Resource Providers**
Distribution of compute resources
## CPU Usage

### Usage metrics Nov 2012

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU wall clock time</td>
<td>Million hour/day</td>
</tr>
<tr>
<td>Jobs</td>
<td>Average Job/day (Million)</td>
</tr>
<tr>
<td>Distribution of usage (main disciplines)</td>
<td></td>
</tr>
<tr>
<td>High-Energy Physics</td>
<td>88.23%</td>
</tr>
<tr>
<td>Astronomy and Astrophysics</td>
<td>2.00 %</td>
</tr>
<tr>
<td>Life Sciences</td>
<td>1.11%</td>
</tr>
<tr>
<td>Remaining disciplines</td>
<td>8.40%</td>
</tr>
</tbody>
</table>

EGI InSPIRE RI-261323

EGI Operations, TF-NOC 12-12-2012

www.egi.eu
Layer I. Resource Centre (RC)
A localised or geographically distributed administration domain, where EGI resources (CPUs, data storage, instruments and digital libraries) are managed and operated to be accessed by end-users.

Layer II. Resource Infrastructure
The federation of Resource Centres, which are interconnected by the National Research and Education Networks (NRENs) and GÉANT.

Layer III. EGI Resource Infrastructure
EGI Operations, TF-NOC 12-12-2012
Operations services

• Central operations services provided by EGI.eu in collaboration with National Grid Initiatives
  – Operations coordination
  – Central operations tools
  – User and administrator support
  – Reporting, accounting

• National operations services provided by the National Grid Initiatives (NGIs)
  – Some NGIs share operations services

• EC support through the EGI-InSPIRE project until April 2014
Security operations

Security Coordination Group coordinate overall EGI security activities

- **EGI CSIRT**
  - Incident Response Task Force (incident handling and coordination)
  - Security monitoring (Pakiti, Security Nagios, Security Dashboard)
  - Security drills
  - Training and dissemination

- **Software Vulnerability Group**
  - Handling reported vulnerabilities, vulnerability assessment, secure coding education

- **Security Policy Group**
  - Develop and maintain security policies

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EUGridPMA

External software providers (EMI/IGE/...)

PRACE/XEDE/OSG/...
• **Federated offering of compute and storage resources**
  – **Transparent** access to heterogeneous computing batch systems, disk and tape
  – **Highly distributed**
  – **User authentication and authorization**
    • X.509 certificates
    • Virtual Organization membership
    • Experimenting federated identify provisioning and translation of user credentials into short term X.509 certificates (on-line CAs)
    • Integrated compute – data management services through delegation of user credentials
Services 2/2

- Data access (file based)
- Data transfer and replication
- File catalogues to track the location of copies of data
- Job submission
- Workload management for the distribution of compute resources
- VO membership service
- Authentication and authorization
- Information discovery system
Service Availability Monitoring (SAM)

SAM (CERN, SRCE, AUTH) monitoring framework for RCs and services
- main data sources for the Operations Dashboard
- Messaging network
- data source to generate Availability/Reliability statistics
- local/central components:
  1. test submission framework: based on the Nagios system and customised by the Nagios Configurator Generator
  2. databases for storage of information about topology (Aggregated Topology Provider), metrics (Metrics Description DataBase) and results (Metrics Results Store)
  3. visualisation tool GUI: MyEGI
Operations Portal

Operations Portal (development and operation by CNRS) provides a single access point to information, tools and facilities for various actors (NGI Operations Centres, VO managers, etc.)

Central operations dashboard (with NGI national views)

Modules:
- Broadcast tool for communication across NGI operators, resource administrators and users
- VO Id Card and VO Management
- Operation Dashboard
- (new) Security Dashboard
- (new) VO Operations Dashboard
**GOCDB (STFC/UK)**

EGI relies on a central configuration database to record:

- Authoritative service end points
- Status of services (in production, testing, in maintenance, …)
- Resource centre administrators
- NGI operators, security officers
- NGI operations managers
• **EGI Helpdesk (KIT/DE)**
  - Distributed system with a central component (Global Grid User Support - GGUS) interfaced local helpdesks
  - 1\textsuperscript{st} and 2\textsuperscript{nd} level support provided centrally by EGI.eu
  - 3\textsuperscript{rd} level support provided by technology providers (SLAs)
  - Seamlessly interfaced to technology provider helpdesks
Accounting and service level management

- Central gathering of accounting information and central availability/reliability reporting system
  - Only a small set of NGIs keeping a local registry of accounting data
NGI operations structure

• **Roles**
  – NGI operators on duty → providing support to national administrators and users
  – NGI security officer
  – NGI operations manager

• **Coverage**
  – 9:00-17:00, 5 days per week
  – Central operations tools → 24/7
    • Notification mechanisms in case of failure outside office hours (in progress)

• **How are the NGI operations organized?**
  – Mostly centralized, some distributed, outsourcing across NGIs is common practice

• **Tools**
  – Integrated/interoperating tools across all NGIs
Front end

- **What types of users are using your network and services?**
  - Various scientific disciplines
  - EC-funded projects and spontaneous collaborations → Virtual Organizations

- **Minimum availability/reliability guaranteed by all Resource Centres**
  - User SLAs being developed
  - Resource Centre OLA
  - NGI OLA
  - EGI.eu OLA

- **Communication and user registration**
  - User community board (EGI level policy board)
  - Broadcast tool to all VO managers/VO users
  - VOs are centrally registered
  - User VO membership registered through the VOMS services (distributed, one VO can be served by multiple instances for HA)
Inter-NGI communication

- **NGI-level communication**
  - Weekly meetings, NGI-specific support channels and mailing lists and documentation

- **EGI-level communication**
  - Centrally maintained documentation, wiki, broadcast
  - Operations management board for EGI-level coordination of operations

- **Inter-NGI communication**
  - Broadcast tool, wiki, mailing lists, discussion forum
Documentation

• What information does EGI document?
  • Technical guides for service administrators
  • User documentation
  • Procedures
  • Policies
  • FAQs

• Which tools are used to create and update documentation?
  • Wiki and DocDB
Collaborations

• DANTE-EGI.eu MoU recently finalized
  – Network support services
    • Performance tuning (PERT)
    • Troubleshooting
    • PerfSONAR MDM
  – Integration of helpdesks will be investigated
Summary

• Federation of NGI operations
  – EGI.eu operations central services
  – NGI operations services

• Tightly coupled operations model facilitated by the availability of a limited set of technology providers
  – Integration of heterogeneous software stacks is possible

• One system of integrated or interoperating operations tools