On the EGI Operational Level Agreement Framework

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EGI Chief Operations Officer

- EGI and its ecosystem
- EGI Service Infrastructure
- Operational level agreements
  - Scope
  - Negotiation
  - Reporting
- Service level agreements
- Future work and conclusions

European Grid Initiative

- A sustainable resource infrastructure supporting the computing needs of structured international research (Virtual Research Organizations)
  - Resource providers in Europe and worldwide
  - With new technologies as they mature
- Mission
  - Operate a production-quality infrastructure
  - Provide operational and user support services
  - Attract new international user communities
    - e.g. ESFRI - European Strategic Forum on Research Infrastructures

Resource Centres
   338 → +6.8%
   Europe, Asia Pacific, North and South America
   96 supporting MPI → +31.5%
 Countries
   51 (57 with integrated RPs) →+18.75%
Capacity
   240,000 CPU cores
        (339,000 with integrated and peer infrastructures)   → 24.9%
   1.89 Million HEP-SPEC 06*
   102 PB disk, 89 PB tape

* HEP-SPEC 06: Computing benchmark based on SPECCPU2006, 10 HEP-SPEC = 4 kSI2k

Layer II. Resource Provider (RP)
... responsible for ... erns the ... nfrastructure
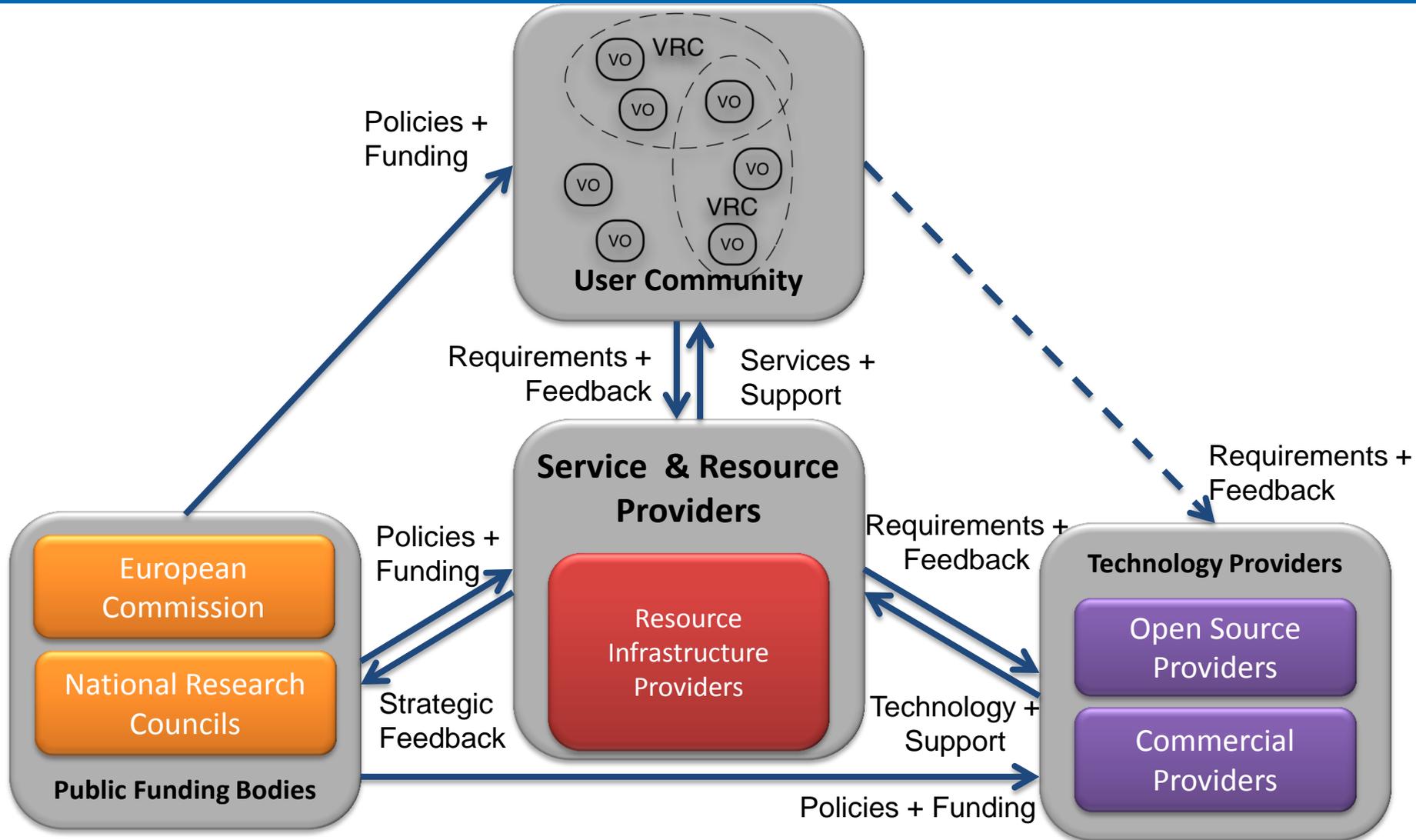
EGI Participant: National Grid Initiatives (NGIs), European Intergovernmental Research Organisations (EIROs)

Layer III.
EGI Resource Infrastructure
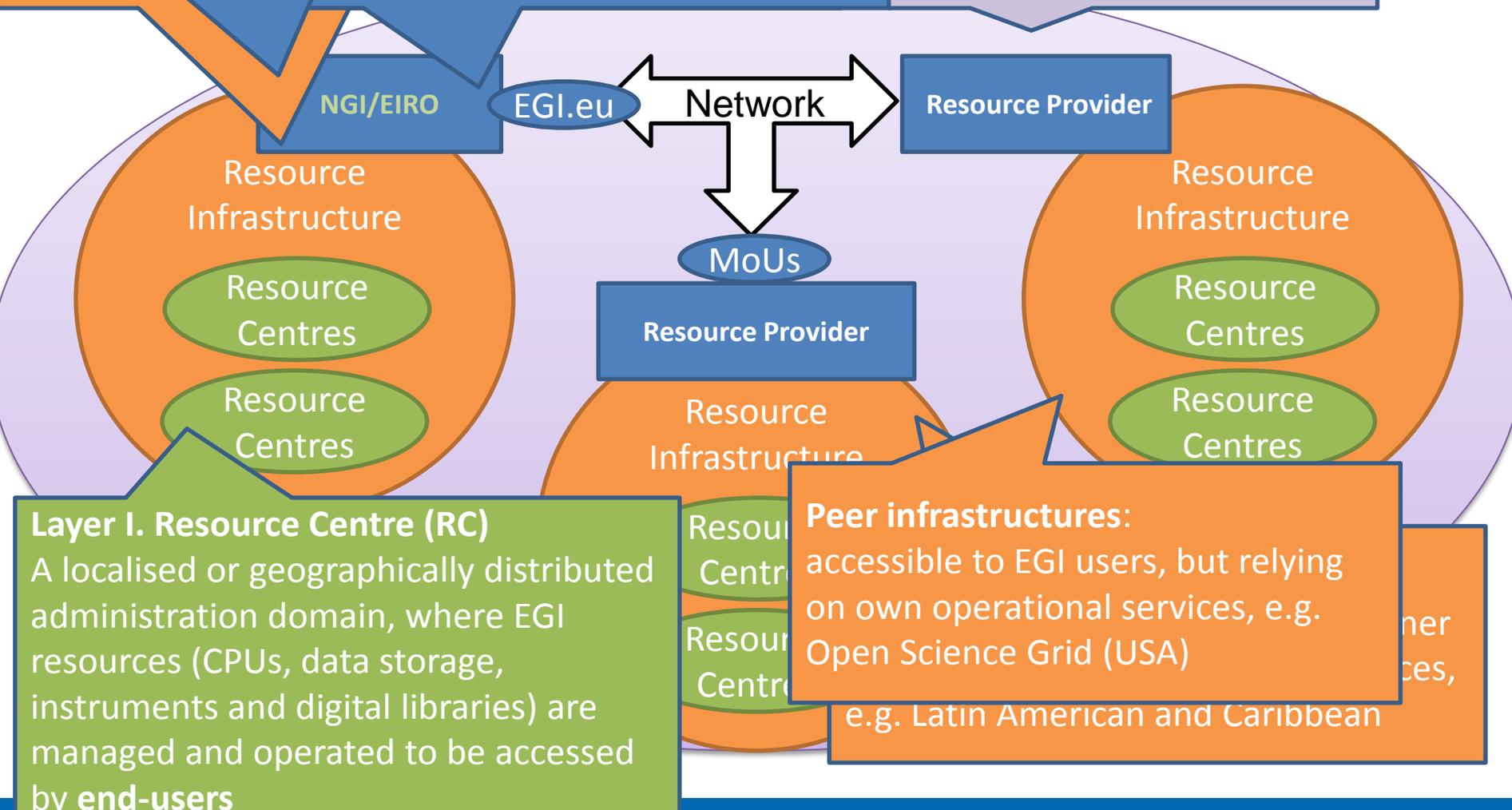
NGI/EIRO

EGI.eu

Network

Resource Provider

Resource Infrastructure

Resource Centres

Resource Centres

MoUs

Resource Provider

Resource Infrastructure

Resource Centres

Resource Centres

Resource Infrastructure

Resource Centres

Resource Centres

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**

Peer infrastructures:
accessible to EGI users, but relying on own operational services, e.g. Open Science Grid (USA)

... her ...ces, e.g. Latin American and Caribbean

Governance

- ## EGI.eu
  - central organization for the coordination of European Grid resources and services
  - Established 8 February 2010
  - Central policy & services needed to run a grid, technical services from partners

- ## EGI Council
  - 34 National Grid Initiatives and European Intergovernmental Organizations (CERN) – participants and associated participants

EGI and EGI.eu: Supported by the EGI-InSPIRE project

EGI-InSPIRE Project

Integrated Sustainable Pan-European Infrastructure for Researchers in Europe

A 4-year project with €25M EC contribution

– Project cost €72M

– Total Effort ~€330M

– Effort: 9261PMs

Project Partners (50)
EGI.eu, 38 NGIs, 2 EIROs
Asia Pacific (9 unfunded partners)

EGI Operations

Operation of a production infrastructure

Validate new technology releases (tools and middleware)

Support end-users and Resource Centre administrators

Service Level Management, grid oversight, documentation and procedures

Operate tools, the accounting infrastructure and the EGI Helpdesk

Evolve the operational tools used by the production infrastructure
- Maintenance, development and support of national deployment
- Accounting for the use of new resources (desktop, virtualisation, storage, data, application and billing)

European Grid Infrastructure Ecosystem

National Resource Providers

MoUs & OLAs

Deployed Infrastructure Services

Used by Researchers

MoUs

Current User Communities

EGI.eu

New Technology Assessed

Gathering New Requirements

LoIs

New User Communities

MoUs & SLAs

Technology Providers

EGI Service Infrastructure
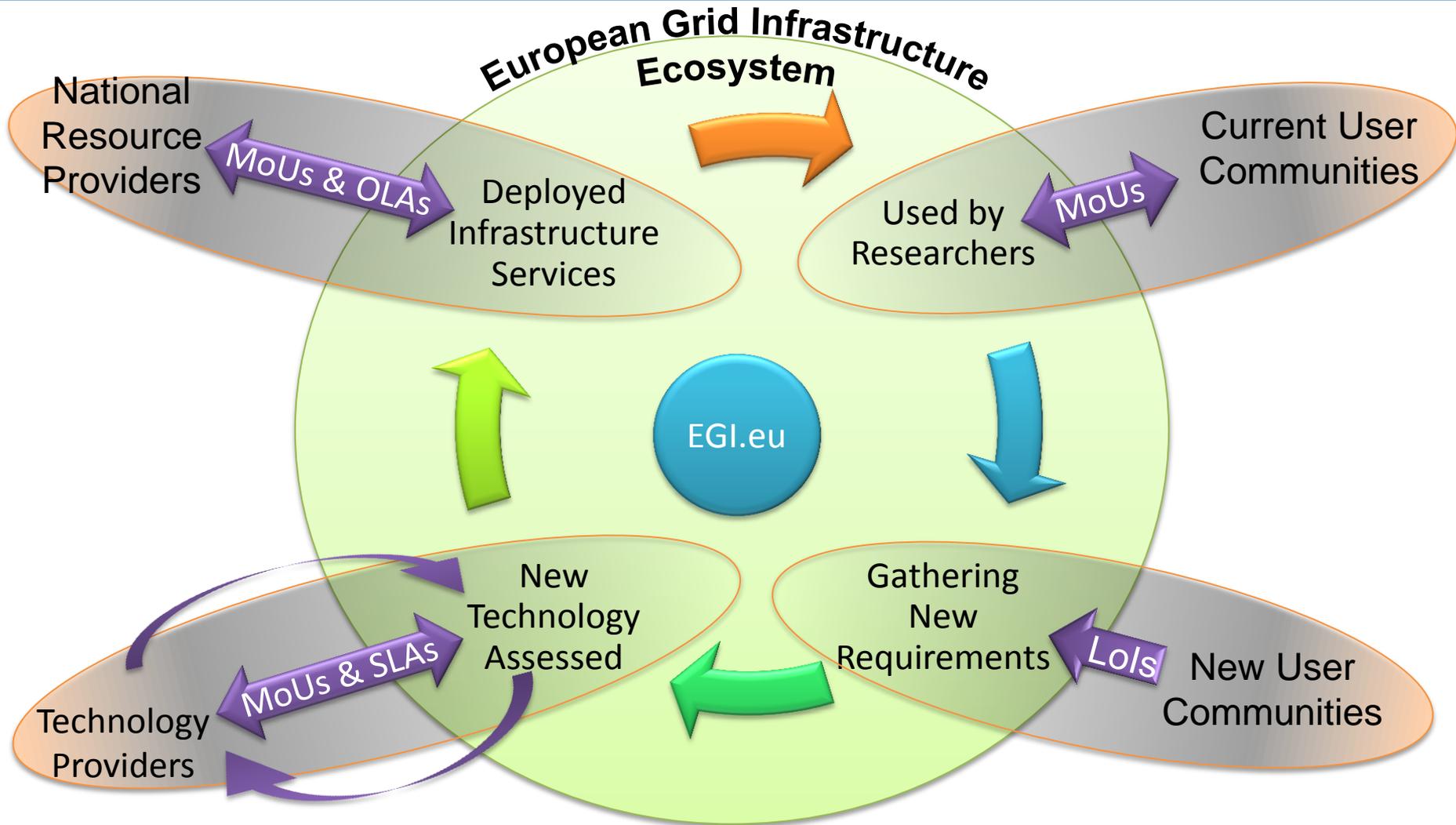
The **service infrastructure** enables secure, interoperable and reliable access to distributed resources.

EGI services are provided locally by Operations Centres and globally by EGI.eu.

and partners

Global Services

Resource Infrastructure

Resource Infrastructure

Local Services

Operations Centres
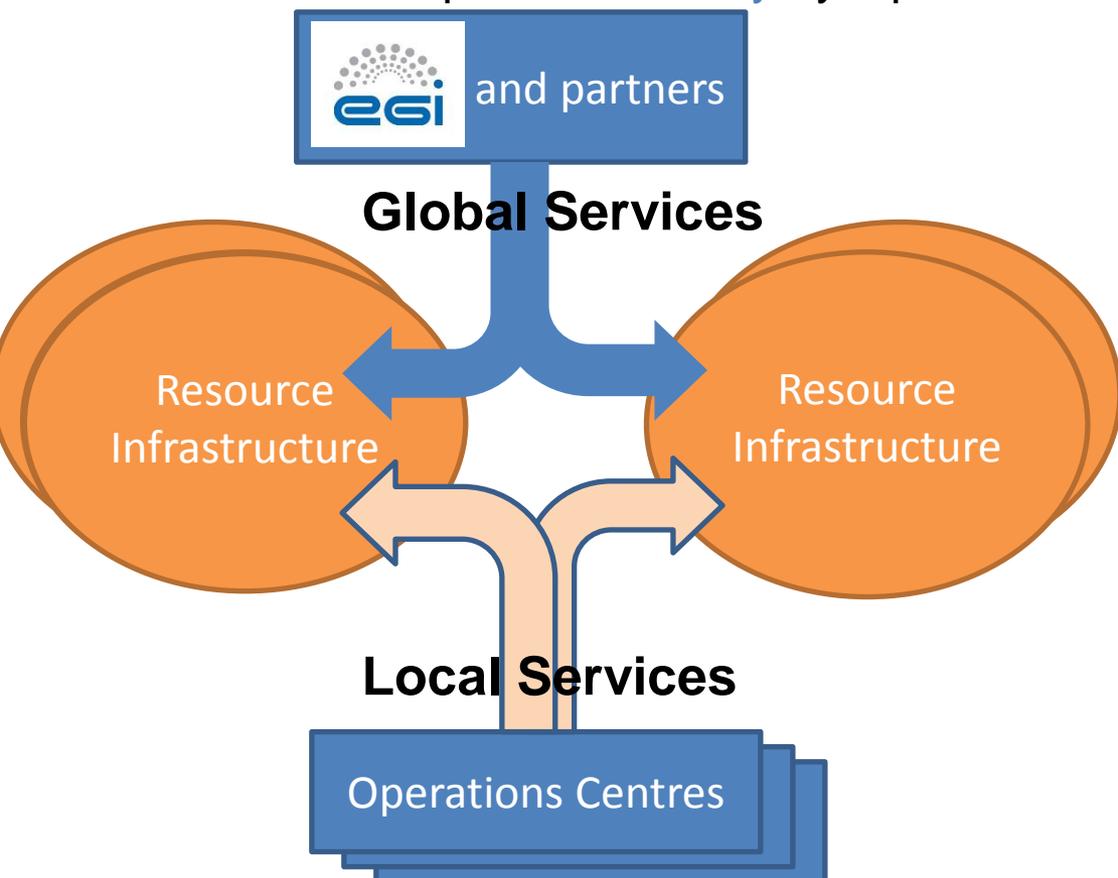
Service categories:

I. Infrastructure Services → Tools

II. Technical Services → Grid middleware

III. Support Services → Helpdesk and Support Teams

IV. Human Services → Service Level Management, security, documentation, coordination

1. <u>Resource Centre OLA</u> - *approved*
2. <u>Resource Infrastructure Provider OLA</u> (Local Services) – *in progress*
3. EGI.eu OLA (Global Services) – *to be defined*
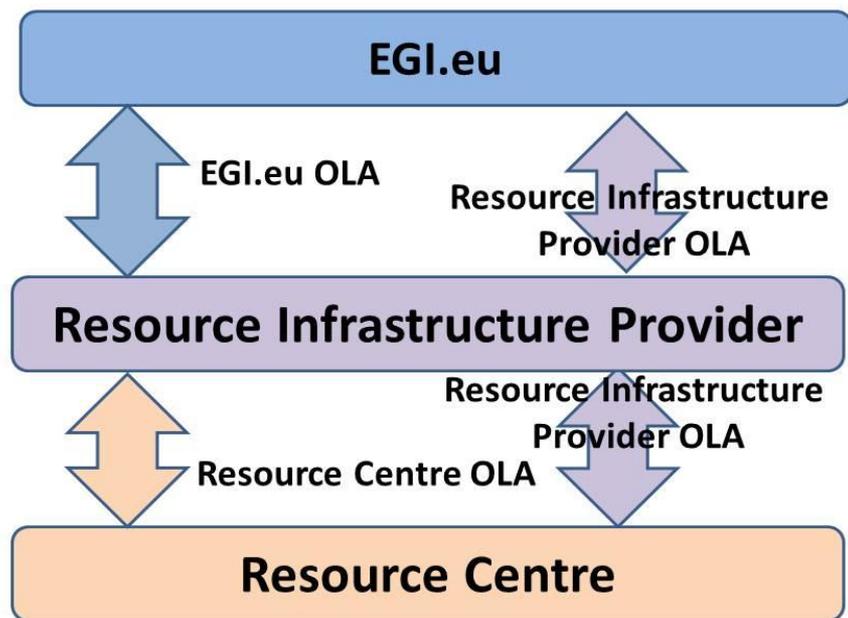
- Parties

- (Minimum set of) services exchanged

- Service hours

- Metrics and the minimum service targets

- The reporting period (where available)

- Penalties (if defined)
  - suspension

Negotiation

- The EGI OLAs can be customised by the Parties to meet local requirements, consistency must be ensured

- All OLAs and their updates are approved by the Operations Management Board (OMB)

- Resource Centre OLA
  - Its acceptance (including the updates) is a pre-requisite for being a certified Resource Centre
  - The Resource Provider is responsible of handling the negotiation and to record the agreement

- Resource Provider OLA
  - EGI participants:
    - discussion within the OMB, acceptance is a pre-requisite for integration
  - Others: negotiation is part of the Resource Infrastructure Provider MoU

- ## Monitoring
  - All Resource Centre services are monitored
  - Monitoring of local and global service is in progress
- ## Reporting
  - on a monthly/yearly basis depending on the metric
- ## Follow-up
  - A central support team is responsible of identifying underperforming Resource Centres, of collecting justifications and of performing suspension as needed
  - penalties for Resource Providers and EGI.eu to be defined

Service Availability Monitoring (SAM)

SAM: monitoring framework for RCs and services

- main data sources for the Operations Dashboard

- 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
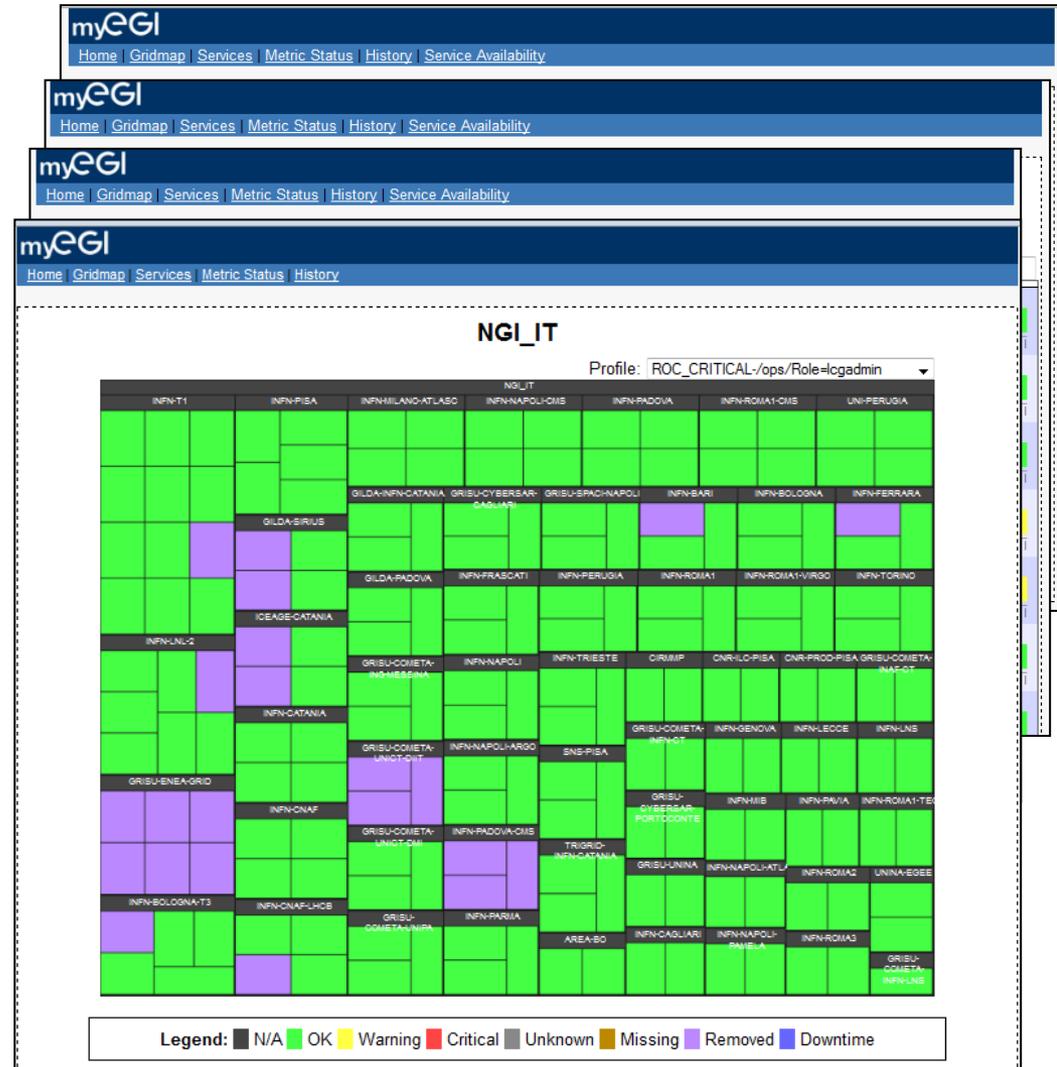
- **Availability**
  - the percentage of time that the service/RC was up and running (uptime / total time) x 100
  - minimum RC availability: 70%

- **Reliability**
  - the percentage of time that the service/RC was up and running, excluding periods of scheduled interventions

    [uptime / (total time – scheduled time)] x 100
  - minimum RC reliability: 75%

- **Suspension policy**
  - RC availability < 50% for 3 consecutive months
  - 6 RCs suspended
  - stricter policy from PY2: from 50 to 70%

Overall PY1 EGI availability: 92.73%
Overall PY1 EGI reliability: 93.85%
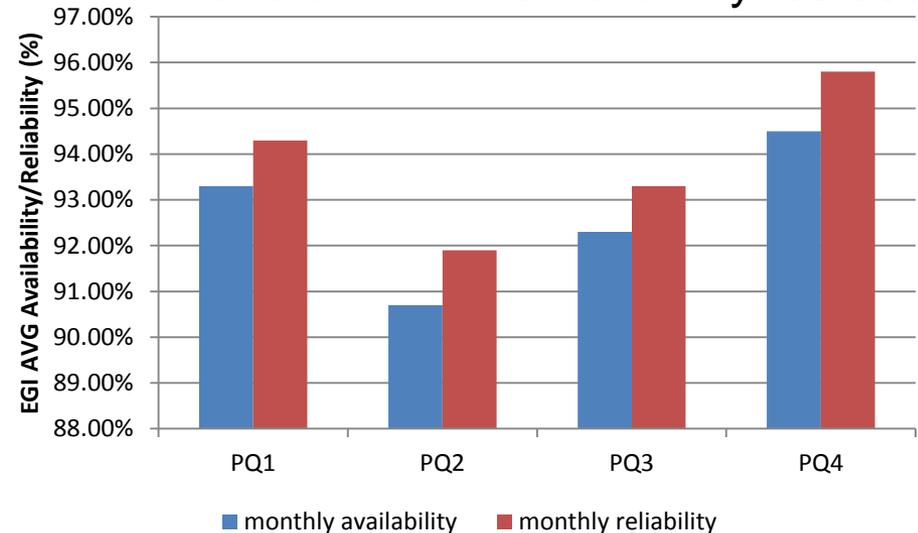
- **Reporting**
  - monthly performance reports per RC
  - new ticket-based procedure for monitoring of underperforming RCs

EGI Service Level Agreements

- **Steering the EGI software evolution**
  - Publish the Unified Middleware Distribution (UMD) Roadmap
  - Collect and prioritise strategic requirements
  - Engage with external Technology Providers
- **Provision software for the EGI community**
  - Ensure the quality of delivered software
  - Provide a software repository for UMD and other components
  - Provide 2nd level support for the deployed middleware

MoU

SLA

Technology Providers ⟷ MoUs & SLAs ⟷ New Technology Assessed

- **Software component delivery**
  - release plan, release delivery and format

- **Quality Assurance**
  - Acceptance criteria and test plans

- **Issue management**
  - Issue management infrastructure
  - Issue resolution

- **Vulnerability management**

- **Performance measurement**
  - Target date
  - Estimated time of availability
  - Metrics

- **Problem management and escalation**

Agreements with software providers

- 4 MoUs signed with:
  - European Middleware Initiative   http://go.egi.eu/483
  - Initiative for Globus in Europe   http://go.egi.eu/484
  - Simple API for *Grid* Applications (SAGA)   http://go.egi.eu/485
  - StratusLab Project   http://go.egi.eu/448

- 3 SLAs signed with:
  - EMI   http://go.egi.eu/461
  - IGE   http://go.egi.eu/442
  - SAGA   http://go.egi.eu/449

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- Improvement of the RC performance

- Finalization of the OLA framework (2011)

- Monitoring: extension of the Service Availability Monitoring framework and of the reporting system for

  - monitoring of new services (e.g. EGI.eu central services)

  - customisation of service level targets

- Reporting: increasing automation

- Follow-up: automated proactive control systems fully relying on the existing incident management system and processes

- Development of a SLA framework involving the end-users

Conclusions

- Increasing focus on sustainability of EGI services

- OLA framework being consolidated

- A complete EGI service business model is a pre-requisite for the finalization of the SLA and OLA frameworks