EGI-InSPIRE Project Presentation

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Abbreviations

- VO: Virtual Organisation
- EIRO: European International Research Organisation
- ESFRI: European Strategy Forum on Research Infrastructures
- NGI: National Grid Infrastructure/Initiative
- VRC: Virtual Research Community
- SSC: Specialised Support Centre

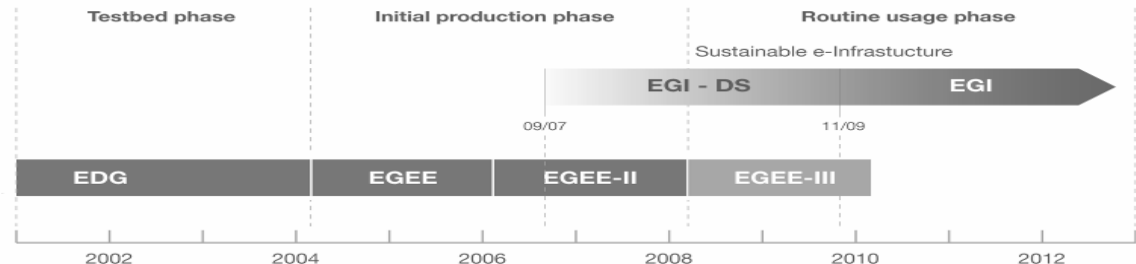# Why build a European Grid Infrastructure?

Infrastructure is the basic physical and organisational structures needed for the operation of a society or enterprise, or the services and facilities necessary for an economy to function

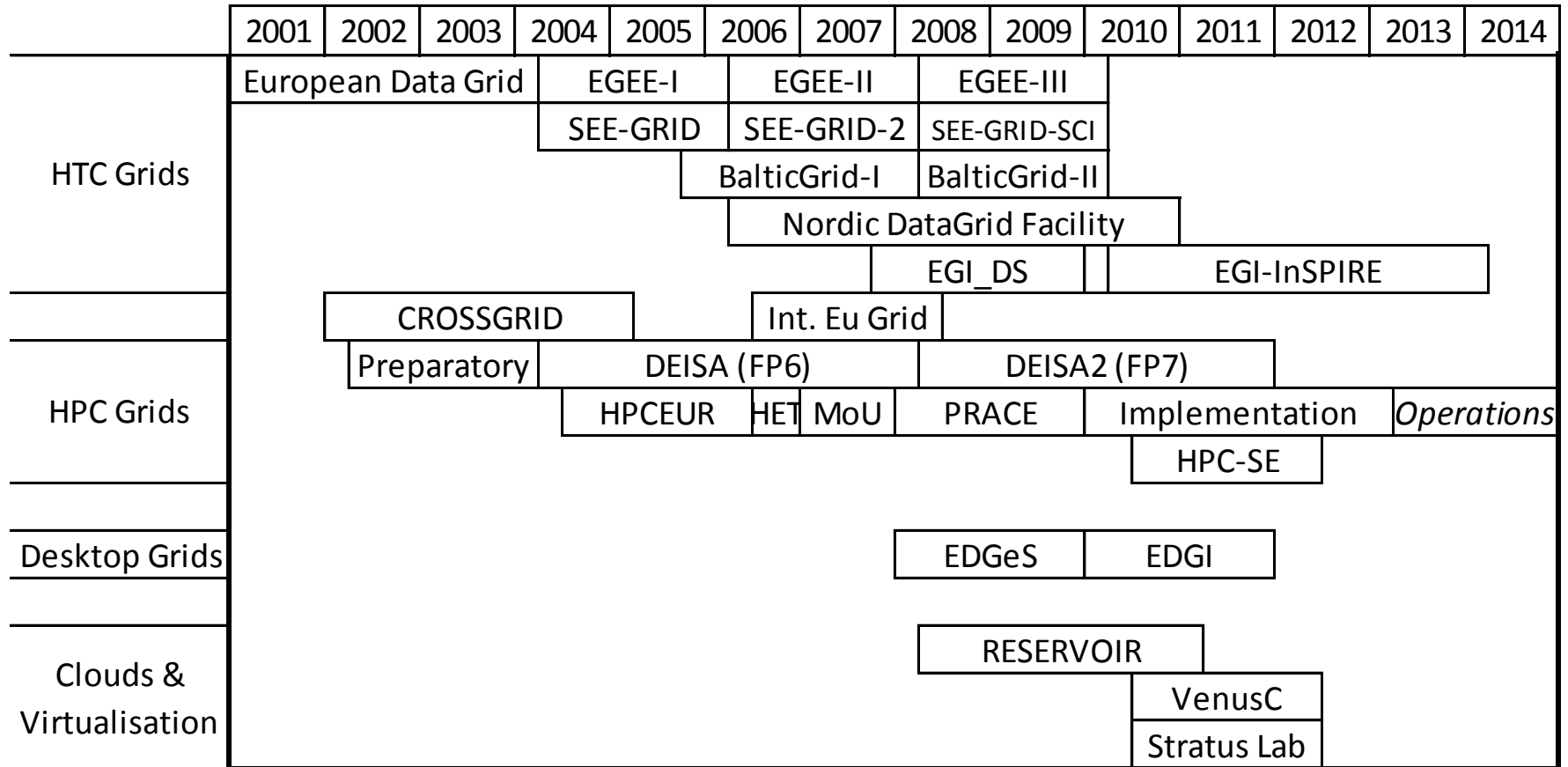The Enterprise is the European Research Area

What is a Grid?

- A grid consists of distributed resources controlled by separate organisations that be systematically used securely by users external to that organisation

- Resources can include:
  - Commodity or HPC clusters
  - Disk or tape storage
  - Instruments
  - Data Archives or Digital Libraries

European Grid Infrastructure

- European Data Grid (EDG)
  - Explore concepts in a testbed
- Enabling Grid for E-sciencE (EGEE)
  - Moving from prototype to production
- European Grid Infrastructure (EGI)
  - Routine usage of a sustainable e-infrastructure

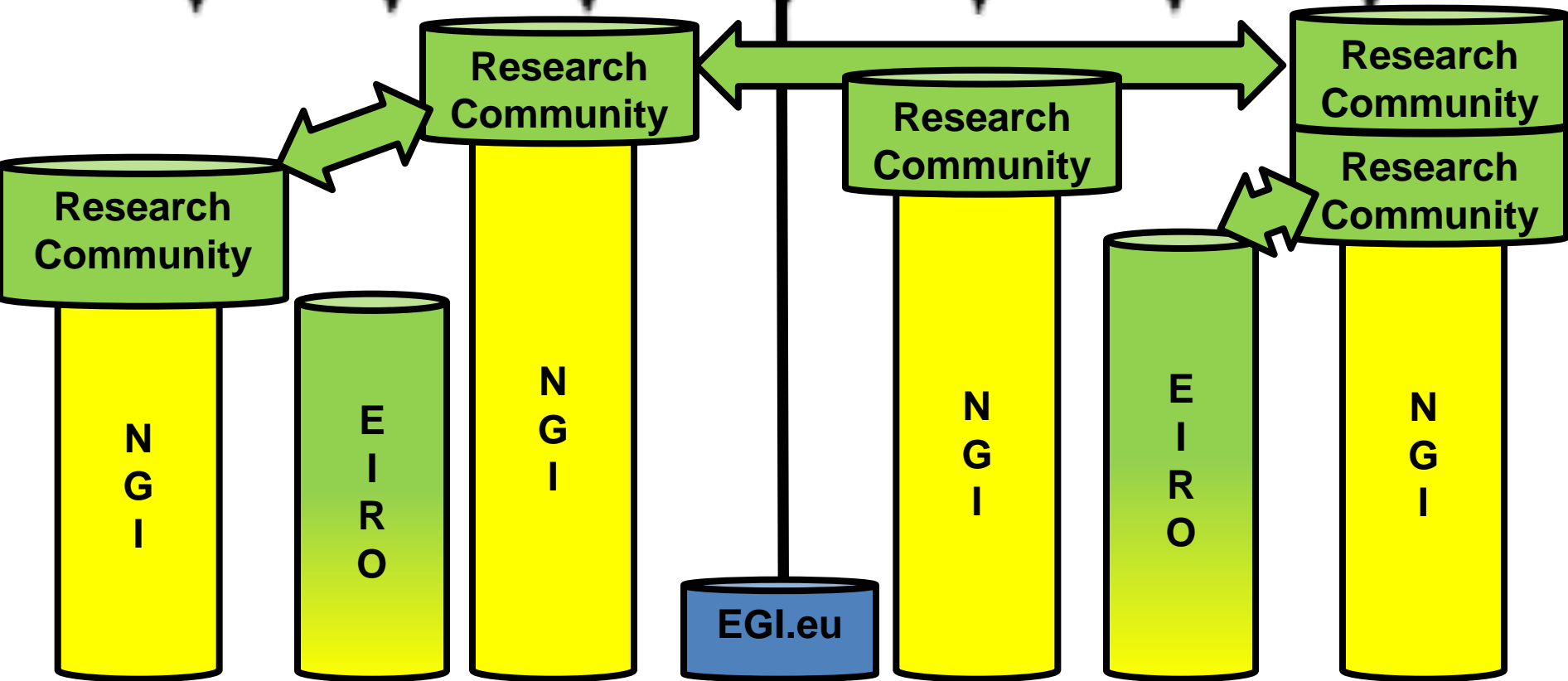|	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
HTC Grids	European Data Grid			EGEE-I		EGEE-II		EGEE-III						
				SEE-GRID		SEE-GRID-2		SEE-GRID-SCI						
					BalticGrid-I		BalticGrid-II							
					Nordic DataGrid Facility									
								EGI_DS			EGI-InSPIRE			
			CROSSGRID				Int. Eu Grid							
HPC Grids		Preparatory			DEISA (FP6)			DEISA2 (FP7)						
				HPCEUR		HET	MoU	PRACE		Implementation			*Operations*	
										HPC-SE				
Desktop Grids								EDGeS		EDGI				
Clouds & Virtualisation								RESERVOIR						
									VenusC					
									Stratus Lab					

The EGI Model

EGI Collaboration

Research Community

Research Community

Research Community

Research Community

Research Community

NGI

EIRO

NGI

NGI

EIRO

NGI

EGI.eu

EGI.eu

- Coordination for European Grid resources
  - Established February 8th 2010
  - Central policy & services needed to run a grid
  - Sustainable small coordinating organisation
- Based in Amsterdam
  - Coordinating core (~20 people) in Amsterdam
  - Technical services from partners (~20 people)

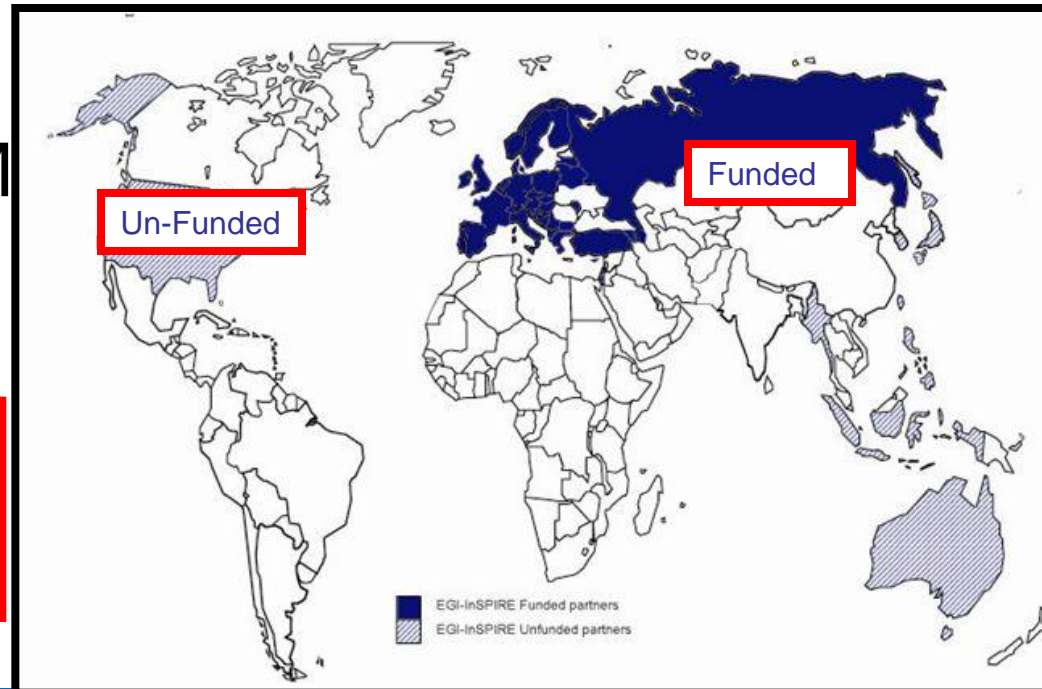EGI and EGI.eu supported by EGI-InSPIRE project

- EGI.eu established as non-profit foundation
- Governance & ownership by its participants
  - Participants:
    - European NGIs
  - Associated participants:
    - Other groups willing to agree with EGI.eu objectives
- EGI Council contains all participants
  - Votes linked to fees

Integrated **S**ustainable **P**an-European **I**nfrastructure for **R**esearchers in **E**urope

- A 4 year project with €25M EC contribution
  - Project cost €72M
  - Total Effort ~€330M
  - Effort: 9261PMs

Funded

Un-Funded

EGI-InSPIRE Funded partners
EGI-InSPIRE Unfunded partners

Project Partners (51)
- EGI.eu, 40 NGIs, 2 EIROs
- Asia Pacific (8 partners)

EGI-InSPIRE Project Objectives

- Continue towards a sustainable production infrastructure
  - With infrastructure providers in Europe and around the world
  - With new DCI technologies as they mature
- Provide support to current structured international research communities
  - Sustain current domain specific services
  - Attract new user communities (e.g. ESFRI)

EGI-InSPIRE Project Activities

- ## NA1: Project & Consortium Management
  - Project Office and Quality Assurance
- ## NA2: External Relations
  - Policy Development and Dissemination
  - Community Building Events
- ## NA3: User Community Coordination
  - EGI.eu and NGI support teams
  - Supporting Technical Services for Virtual Research Communities
- ## JRA1: Support for Operational Tools
  - Maintenance and Development
  - Support for new resources and their accounting

EGI-InSPIRE Project Activities

- SA1: Reliable Operation of the production infrastructure
  - Monitoring, accounting, operational security
  - Helpdesk & NGI Support teams
  - Validation of new technology & operational tools
- SA2: Provisioning the Software Infrastructure
  - Definition of software coming from external projects
  - Validation of delivered software
  - Software repository and support tools
- SA3: Support for Heavy User Communities
  - Services & tools for all users of the infrastructure
  - Domain specific support for current heavy users

What will EGI do?

EGI means Innovation

- **Deploy Technology Innovation**
  - Distributed Computing continues to evolve
    - To include: Grids, Desktops, Virtualisation, Clouds, …

- **Enable Software Innovation**
  - Provide reliable persistent technology platform
    - Tools built on gLite/UNICORE/ARC/Globus

- **Support Research Innovation**
  - Infrastructure for data driven research
    - Support for international research (e.g. ESFRI)

User Support & Services

- Support User Communities
  - Researchers in International Collaborations
  - National Research Collaborations through the NGI
  - Scale up from the single VO to a community
- Provide a federated Helpdesk linking:
  - Discipline specific support (e.g. Bio Apps)
  - National Grid Infrastructures
  - Generic services (e.g. Training)
- Provide core services to support users
  - Manage VOs, Application DB, Training DB

Other Activities

- **Dissemination**
  - With NGIs, VRCs, SSCs and other projects
- **Support for Heavy User Communities**
  - General & community specific services
- **Events**
  - Two Annual meetings: Users & Technology
- **Technology Assessment and Integration**
  - Liaison with software providers
  - Definition and verification of requirements

Technology Innovation

- Will come from outside EGI
  - Moving research technologies into production
- Partnership with technology projects
  - EMI (European Middleware Initiative)
  - IGE (Initiative for Globus in Europe)
  - EDGI (European Desktop Grid Initiative)
  - StratusLab
  - VenusC

Software Innovation

- Will also come from outside EGI
  - EGI is a neutral platform for applications
- EGI cannot support all services in its core
  - Every community needs something different
- Foster innovation within different 'sectors'
  - Digital Libraries
    - gCube from D4Science

Research Innovation

- An infrastructure to support European Researchers
  - Within the EU27
  - Geographical Europe
  - Interoperability worldwide for collaboration
- Work with Virtual Research Communities
  - Groupings of aligned Virtual Organisations
  - Enable their community specific support activity:
    - Support, training, consultancy, requirements etc.

Future Plans

What will EGI do?

- Continue with a secure reliable infrastructure
  - Integrate resources based on gLite, UNICORE, ARC, Globus, ...
  - Continue the transition to national structures
- Support its user communities
  - Maintain user services & tools
  - Engage with structured (virtual) user communities
    - Encourage structuring in unstructured user communities
    - Defined representatives within EGI bodies
  - Engage with the ESFRI projects

Be a Neutral Infrastructure

- Consider IP network providers
  - Supports traffic from different communities
  - Customised solutions within a generic framework
  - Standards drive integrated deployment
- And for sustainable e-Infrastructures?
  - Any application, any domain, any technology
  - A platform for domain specific innovation & use
  - Integration of any compliant resource

In the Future…

- Improve the efficiency of the infrastructure
  - The jobs, users & data will continue to increase
  - Effectiveness of the resources needs to match
- User input into upper middleware layers
  - VOs decide what services are deployed where
  - VOs manage their own deployed infrastructure
  - Empower the VOs to meet their own needs
    - Flexibility and responsibility

Can we learn from others?

- Grids have benefited from commoditisation
  - Hardware: HTC & HPC affordable to all
  - Networking: GBs can be moved over WAN
  - Software: Open source software comes of age
- Impacts of commodity virtualisation…
  - For transactional models →
    - The 'Cloud': A model based on compute not data
  - For large distributed data-oriented models →
    - The emergence of true 'function shipping'?

Consensus
Openness
Balance
Transparency

- Data Layer
  - Secure reliable data movement
  - Access to data resources
- Virtualisation Layer
  - Span trust domains within agreed policies
  - Monitoring as important as lifecycle control
- Service Layer
  - The services that go into the virtual machine
  - Avoid domain specific silos & promote reuse

- EGEE:
  - Demonstrated a production e-infrastructure
- EGI:
  - Provide a sustainable production e-infrastructure
- EGI.eu established in Amsterdam
  - Supported transition through EGI-InSPIRE
- Contact: director@egi.eu