IPv6 on the European Grid Infastructure

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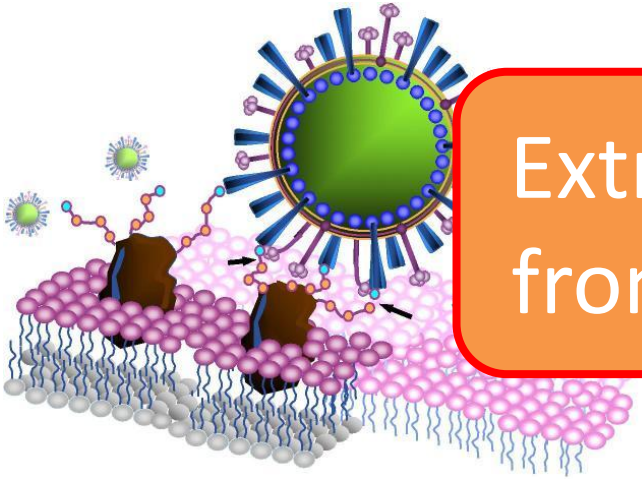
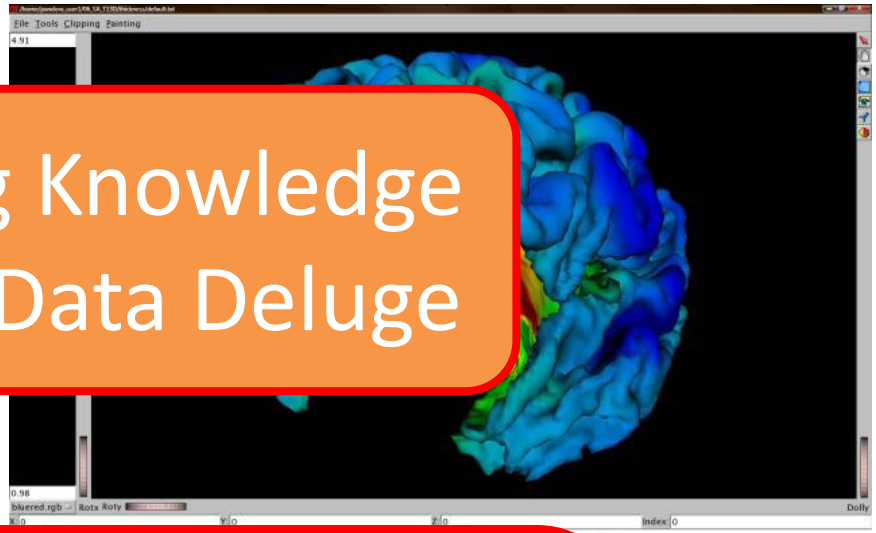
e-infrastructure

C21: Digital Research





Extracting Knowledge from the Data Deluge

Requires an ***infrastructure*** to ***share*** services and tools ***personalised*** to ***individual research communities***

Critical Definitions

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

A ***grid*** consists of distributed resources controlled by separate organisations that are systematically used securely by external users

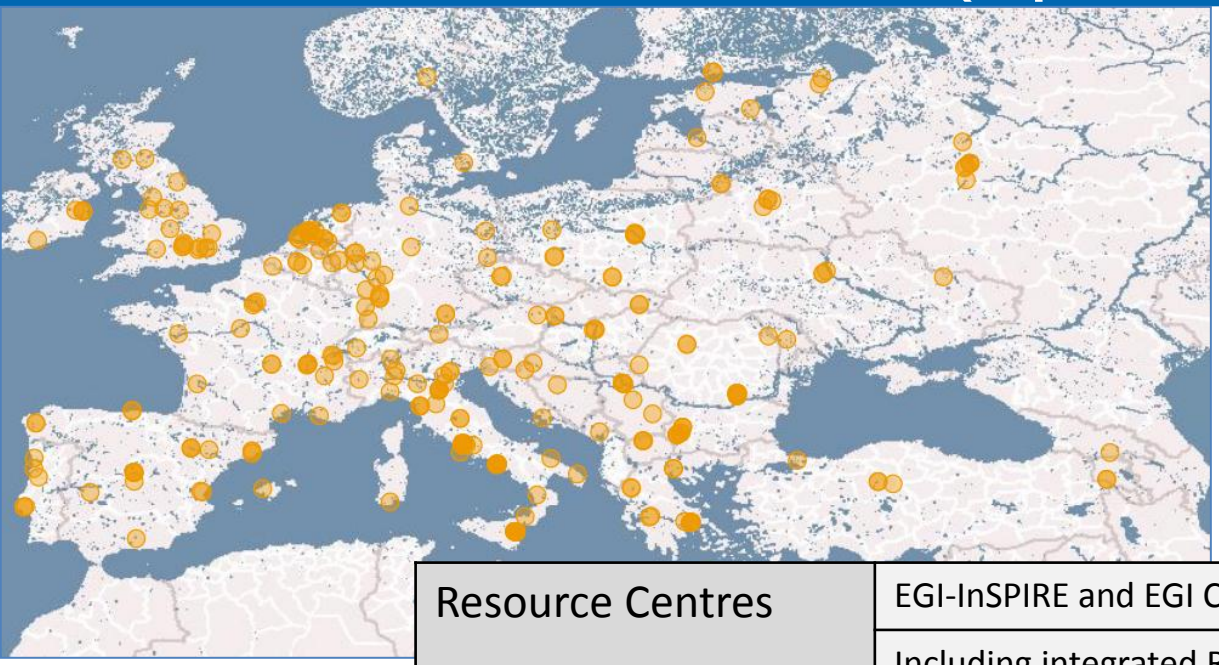
Vision

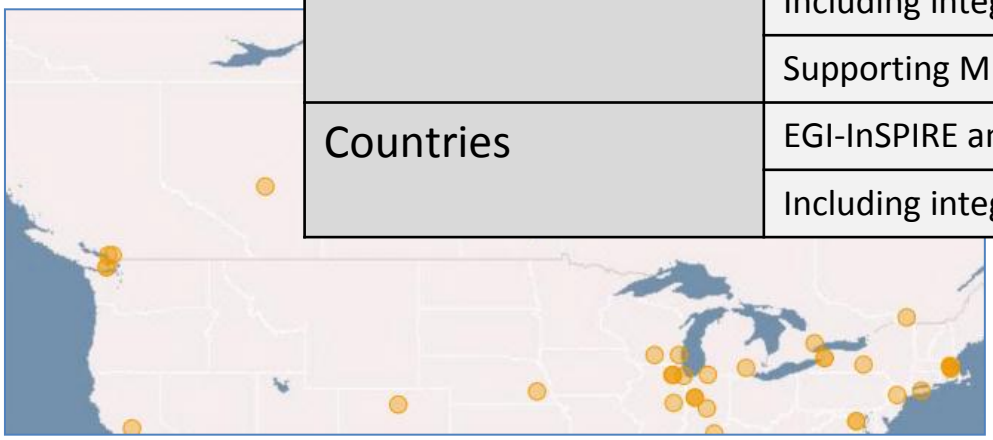
To support the digital European Research Area through a pan-European research infrastructure based on an open federation of reliable services that provide uniform access to national computing, storage and data resources.

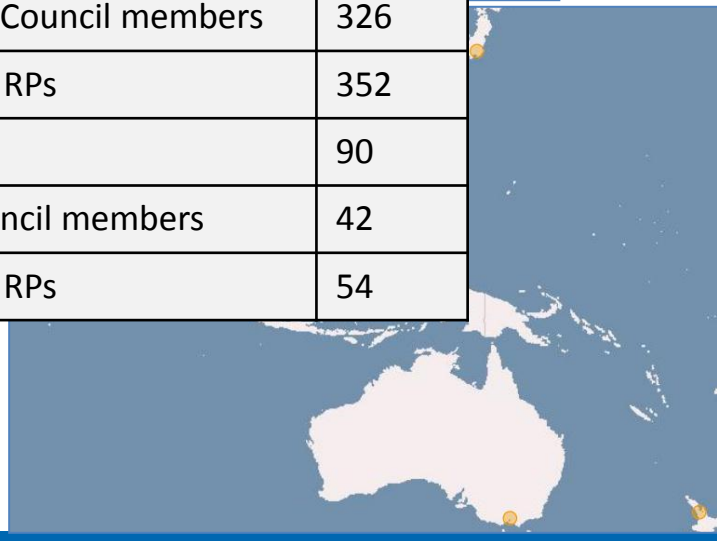
EGI Collaboration

- European
  - Over 35 countries
- Grid
  - Secure sharing
- Infrastructure
  - Computers
  - Disk and tapes
  - Data Archives
  - Instruments
  - Digital Libraries
  - ….

EGI Resource Centres (April 2012)







Resource Centres	EGI-InSPIRE and EGI Council members	326
	Including integrated RPs	352
	Supporting MPI	90
Countries	EGI-InSPIRE and Council members	42
	Including integrated RPs	54

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 partners)

Project Objectives

- A sustainable production infrastructure
  - With resource providers around the worldwide
  - With new technologies as they mature
- Support structured international research
  - Sustain current domain specific services
  - Attract new research communities (e.g. ESFRI)

Required IPv6 Support

- IPv6 in each NRENs and GEANT
  - Under control by the networking community!
- IPv6 at each individual resource centre
  - 350+ centres connected through NREN
- IPv6 to each server
  - 350K+ cores, 100K+ servers
- IPv6 in the software stack & services
  - **Many external providers**

Technology Providers

- EMI (European Middleware Initiative)
- IGE (Initiative for Globus in Europe)
- EDGI (European Desktop Grid Initiative)
- StratusLab
- SAGA

IPv6 Software Support

- IPv6 support has been a goal for 4+ years
  - Static code compliance checker
  - Small scale verification testbed 2008-10
- Previous activity
  - FR & IT provided previous dual stack testbed
  - More interest from AsiaPacific than Europe
- New focus over the last year
  - Collaboration between EGI & HEPIX groups

WG activity: Software & Tools IPv6 Survey

- An “Asset” survey is now underway
  - A spreadsheet to be completed by all sites and the LHC experiments
  - Includes **all** applications, middleware and tools
  - Tickets to be entered for all problems found
- If IPv6-readiness is known, can be recorded
- Otherwise we will need to investigate further
  - Ask developer and/or supplier
  - Scan source code or look for network calls while running
  - Test the running application under dual stack conditions

WG activity: Distributed Dual Stack Testbed

A place where to gain real experience

Implemented on real networks, in a distributed environment as close as possible to production

Open to anyone in WLCG

To test applications over IPv6 but also in the dual-stack cohabitation

Software with IPv6 problems

- Need to check many things
  - Break when installed on a dual-stack node?
  - Does it bind to both stacks?
  - Is IPv6 preferred?
  - Can it be configured to prefer V4 or V6?
- Already found a few problems

Proposed IPv6 testbed

- Bosnia-Herzegovina NGI_BA
- Bulgaria NGI_BG
- Czech Republic NGI_CZ
- Finland NGI_FI
- France NGI_FR
- Germany NGI_DE
- Greece NGI_GR
- Italy NGI_IT
- Lithuania NGI_LT
- Montenegro NGI_ME
- The Netherlands NGI_NL
- Slovenia NGI_SI
- Switzerland NGI_CH
- Taiwan NGI_TW

IPv6 testbed use

- General purpose testing (not certification)
  - UMD components and application software
  - Installation and configuration tools
  - Tools and services to operate the infrastructure
  - Training on software and security issues
- Testbed architecture
  - Focus on core site services
  - Adopting dual stack approach
    - However, need to include some pure IPv6 centres

Summary

- IPv6 becoming a focus
  - Again!
- Collaboration on software
  - Infrastructure (EGI)
  - High Energy Physics (HEPiX)
- IPv6 & virtualisation?
- EGI Technical Forum 2012
  - http://tf2012.egi.eu
  - IPv6 related sessions