EGI Report

Mario Reale

mario.reale@garr.it

NGI IT / GARR

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Outline

- EGI and IPv6
- Outcome of the IPv6 Survey for NGIs
- Testbed
  - collaboration JRA1 and HEPiX IPv6 WG
- How to include IPv6-only resources
- How to move on: IPv6 roadmap

IPv6 impact: what do we need

- **IPv6 compliant Middleware** and **Operation tools**
- An EGI IPv6 repository for Middleware and Operation Tools
- IPv6 support at the network infrastructure level
  - LAN is the key issue
    - GEANT and almost all NRENs are already IPv6 enabled
- IPv6 compliant installation and configuration tools
- IPv6 security enforced/managed at all levels
  - Sites might need support on this issue
- An IPv6 testing infrastructure and testing tools
  - To perform general purpose testing using IPv6

IPv6 and EGI Operations

- All Operations tools need to be **IPv6 compliant**
  - S/w repos for IPv6 enabled m/w reachable in IPv6
  - Documentation
    - web sites, ops portal and wiki reachable in IPv6
  - Configuration tools (YAIM)
  - Monitoring (SAM-NAGIOS)
  - Accounting; Messaging
  - Support (GGUS)
- IPv6 security enforced at the Grid Site level
- IPv6 compliant middleware
  - Requires involving Technology Providers

Issues related to IPv6

- How many IPv6-only sites/resources are there ?
  - IPv6 survey carried out to answer this point
- Do we need to support applications/VOs/VRCs in expressing their IPv6-related requirements ?
- Chicken-and-egg problem
  - Not required by users ? → not worth spending manpower
  - Nothing available for IPv6 → no users

10 questions on IPv6

About the current IPv6 deployment level and know-how on IPv6 by NGIs

- Within your NGIs, are you aware of any site (or planned future site) providing resources accessible **only in IPv6** (**IPv6- only** internet stack configuration) [Y/N] ?
- Do you have any site **TODAY implementing IPv6 stack** connected to the IPv6 Internet [Y/N] ?
- Do you have sites which are **planning** to implement the IPv6 stack and, if yes, on which time scale [Y/N] ?
- How many sites in your NGI have **IPv6 network connectivity** available?
- Is your NREN providing IPv6 connectivity [YES or NO] ?
- In case you are deploying IPv6, what is the **main motivation** for you to use it? (lack of IPv4 addresses, will to take advantage of IPv6 protocol specific features, …) – [please specify]
- Do you think organizing tutorials on **IPv6 in general** for site admins would be useful [Y/N] ?
- Do you think organizing tutorials on **IPv6 security** for site adminis would be useful [Y/N] ?

About the desired involvement of NGIs in IPv6-related activities and tasks

- Are you available to participate to a global IPv6 **testbed** for testing the IPv6 readiness of the operations related tools and the deployed Grid Middleware [YES or NO] ?
- Are you available to directly participate to an IPv6 **task force** aimed at identifying the EGI priorities for IPv6, write an IPv6-action plan, and report to the OMB about the results by means of a written report [YES or NO] ?

Outcome of the IPv6 survey

NGIs/EIROs who answered : **29** (71% of total # NGIs/EIROs (41))
NGI available to join distributed IPv6 testbed:**14** ☺
NGIs available to join Task Force on IPv6: **2** ☹
NGIs which do/will deploy an **IPv6-only** site: **1**(NGI_BA) ☺
NGI in favour of IPv6 tutorials : **25**
NGIs in favour of IPv6 security tutorials: **24**

Various different answers provided on reasons for IPv6 adoption

Full listing of answers available at
https://wiki.egi.eu/wiki/IPv6

Why NGIs adopt IPv6

- Lack of IPv4 addresses
- Benefit from IPv6-specific advanced features
  - Address auto-configuration, improved support for multicast and QoS,…
- Testing and future proofing
- Getting ready to connect to collaborating sites reachable only in IPv6

Wrap up of Survey

- Setting up EGI sites using IPv6:
  - 1 NGI (Bosnia-Herzegovina) NGI-BA plans to set up an IPv6-Only site
  - Activities related to a new project on IPv6 site set up going on in Czech Republic (METACENTRUM) at FZU
    - FZU will join the EGI IPv6 testbed
- IPv6 Testbed:
  - many NGIs are available to provide resources for an EGI IPv6 testbed
- IPv6 Tutorials
  - Majority of NGIs would see with favor tutorial on IPv6 in general and IPv6 security
    - Many however would like to have them framed/tailored for Grid Sites

NGIs available for an EGI 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 Nederlands NGI_NL
- Slovenia NGI_SI
- Switzerland NGI_CH
- Taiwan NGI_TW

What will be the EGI IPv6 testbed for ?

- General purpose testing using IPv6 of
  - middleware (UMD components)
    - EMI-ES, IGE, CREAM CE, ARC CE, UNICORE CE,
  - install and config tools
    - YAIM, repository
  - operations tools (JRA1)
    - Nagios, Accounting, GOCDB, ….
- It will not be a full fledged certification testbed for any component
  - At this stage at least no NGI committed to that
  - Can support and complement what done by Tech Providers

Collaboration on IPv6

- EGI Network Support collaborates with
  - HEPiX IPv6 Working Group
    - Liaising EGI to HEPiX communities
    - Providing volunteering sites for their testbed
    - Complementary approach:
      - HEPiX focuses on HEP applications and m/w
      - EGI focuses on general m/w and tools
  - EGI-Inspire JRA1
    - Testbed
      - Sites
      - IPv6 know how

How to include IPv6-only resources

- Dual Stack is the way to go at all level; Before infrastructure (services) and middleware gets fully Dual Stack : **how to include IPv6-only resources ?**
- 1) Protocol translation at the site level ?
- 2) Gateway towards IPv6-resources in the IPv4 infrastructure (and vice versa) ?
  - Would need to span all functional levels
  - Requires development of a Gateway solution
    - Adding protocol translation to a Broker/job/data transfer dispatcher ?
    - Development effort still to be quantified / design needed
  - Single point of failure in a global architecture ?
  - EGI would still be partitioned in 2 IP protocols

EGI IPv6 steps ahead (1/2)

- Tech Providers and EGI NetSup focus on core site services for the UMD – to start with
  - Site Resources Information System – Global new information system
  - Computing Element (ARC, gLite, UNICORE)
  - IGE site components
  - Storage (DPM, dCache)
- EGI NetSup coordinates with NGIs for assigning tasks on general purpose testing
  - For ARC SWITCH/SWING gave some availability
  - For gLite GARR is available
  - FZU gave their availability
  - Need to identify volunteering NGIs for UNICORE, IGE and dCache
  - Many NGIs gave their principle availability
    - Requires further coordination and NGIs to show up a bit more

EGI IPv6 steps ahead (2/2)

- Tech Providers start thinking/prototyping what should be done to include IPv6 in their certification process
  - EGI Net Support available to provide support on this
    - For example in EMI an IPv6 metric is already available
- EGI Network Support
  - calls a general VideoConf on IPv6 to discuss tasks for testbed and testing IPv6 in December
  - further investigates if/how to propose a Gateway approach
- The EGI testbed for IPv6 is set up in December/January 2012
- The situation is re-assessed and updated at the end of January – beg February 2012