

# IPv6 test methodology

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*IPv6 meeting – 2007-02-19 @ GARR (Rome)*

- **A bit of history;**
- **Purpose of the activity:**
  - What it should be;
  - What it should not be;
- **Current vision;**
- **Current status:**
  - Description of the methodology;
  - Testbed architecture;
- **Conclusion**

- **IPv6 was not a big concern in the Grid community:**
  - Global deployment of IPv6 and (interest in?) still remarkably low;
  - Very little identified added value for the Grid infrastructure and the Grid applications (e.g. no mobility);
  - No shortage of IPv4 address in this community;
- **However, “political” interest:**
  - To become a major player in the Grid middleware “market”, gLite must be IPv6 enable;
  - A likely concern if collaborations with Asia-Pacific become widespread;
  - Investment from the EU on IPv6;
- **EGEE deliverable DJRA4.3: “Report on implications of IPv6 usage for EGEE Grid”**
  - <https://edms.cern.ch/document/603955/>

- **IPv6 support in gLite supposed to be poor:**
  - According to the study done for DJRA4.3;
  - Confirmed by more recent work carried out by EUChinaGrid;
- **Effort has to be invested to enable IPv6 in gLite:**
  - From the developers;
  - From the certification & testing team;
  - From the networking activities;
- **Our role is:**
  - To provide them with an IPv6 environment;
  - To provide them with features to test their modifications even if they bring a still partial IPv6 support;
  - To provide them with a methodology to test (certify?) a software component in an IPv4/IPv6 environment.

- **It should not become:**
  - A comprehensive IPv6 mini-grid;
  - A comprehensive study of all the gLite components;
  - A tool to measure the performance in an IPv6 environment;
    - Involve too much layers: from the network equipments to the operating systems to the network services (e.g. DNS) to the gLite components;
    - Too complex to achieve.
  
- **It should become:**
  - A tool for developers and certification & testing teams;
  - Hand over later to SA3/ETICS;
  - A short lived tool, being replaced later by the SA3/ETICS platform (based on our work).

- **Testing software needs:**
  - A working IPv6 environment;
  - A methodology to follow.
- **Requirement for a testbed:**
  - Pure IPv6 connectivity,
  - IPv4/IPv6 connectivity,
  - Availability of different translation or migration mechanisms:
    - To be able to test a modified server with a still IPv4 only clients (ability of doing regression tests).
- **Possible use cases:**
  - Test of a single external component from an IPv6 client;
  - Test of a distributed gLite component from an IPv6 client;
  - Test of a distributed gLite component from an IPv4 client through the translation mechanism;

- **A proposed methodology to test a component:**
  1. Look for IPv6 incompatibilities and modifications of the code;
  2. Installation on IPv4;
  3. Test on IPv4;
  4. Switch on IPv6 and test if the component is still running on IPv4;
  5. Switch off IPv4 and put the component in a pure IPv6 environment;
  6. Test on IPv6 with IPv4 clients, via the translation mechanism;
  7. Test on IPv6 with the IPv6 client if available;
  8. Test the component in a dual stack environment (IPv4 and IPv6 clients without translation).
  
- **Each successful step grants an IPv6 compliance level.**

- **A document has been drafted:**
  - Described the methodology and the testbed;
  - Distributed before this meeting;
  - <https://edms.cern.ch/document/810278/>
  - Comments and inputs are more than welcome!
- **A prototype testbed is in place:**
  - Shared across Italy (GARR) and France (CNRS);
  - See further details in the next talks;
- **Needs some further work:**
  - Finalization of the document;
  - Feedbacks from other activities (JRA1/SA3/ETICS);
  - Next steps & timeline should be defined and agreed.