



# **Comparison of European Grid Projects**

**Falk Zimmermann (NEC)**

**Project:**

GEMSS

**Area:**

Testbeds and Network Infrastructure

## Table of Contents

<b>1.Introduction.....</b>	<b>3</b>
<b>1.1.Objective and Structure.....</b>	<b>3</b>
<b>1.2.Uniform description.....</b>	<b>3</b>
<b>2.Testbeds and Network Infrastructure.....</b>	<b>4</b>
<b>2.1.General.....</b>	<b>4</b>
<b>2.2.Details .....</b>	<b>4</b>
<b>2.3.External.....</b>	<b>7</b>

## 1. Introduction

### 1.1. Objective and Structure

This document is one of thirteen templates that have common goal to gather information related to main European Grid Projects in order to make their accurate comparison in the framework of GRIDSTART initiative. We believe that the participation of particular projects members in preparation of this document will allow comparing all activities in a credible and exhaustive way.

The proposed structure of the description consists of two parts. The former is concerned with the general overview and architecture together with the contents of layers (the first template). The latter includes the main components of the Grid infrastructure (remaining 12 templates). Since information regarding the project architecture is to be quite general, more detailed description should be provided in the review of the main aspects of the Grid infrastructure. In order to prepare uniform description for each project, we identify the important issues that have to, should or can be included into particular components. Common issues for all components and these specific for this component are briefly described in the next section.

We ask you to proceed according to this schema. However, a feedback is obviously welcome. For some projects the document has been partially completed on the basis of descriptions found at the official web pages. In this case, we ask you to revise already filled in sections, correct and complete them if necessary.

You should take into consideration future plans while you fill in particular sections. Actually they are even more important then the current state of the project components. If you are not going to design some elements in the scope of the project at all, please, note it in the proper section.

### 1.2. Uniform description

All the descriptions of the Grid infrastructure components are divided into three parts: **General** section includes main requirements and functionality, **Details** section relates to the issues specific for particular component and **External** defines its connections with other components and users.

As it was mentioned above, some of the issues are common for all components or at least repeat for many of them. Such issues, appearing for many or even all areas are shortly characterized below.

In **General** section:

**Main requirements** determine the objectives and requirements of the workpackage or the software module responsible for the design of functionality related to the particular domain of the Grid infrastructure.

**Functionality** contains a set of operations provided by the project in the given area.

In **External** section:

**Interfaces** define services, SDKs, APIs and so forth which can be used in order to access the functionality of the component.

**Low level Grid middleware** is the middleware providing basic Grid functionality as for example Globus or UNICORE.

**Relations with other components** determine components that utilize or are utilized by component being described as well as data and information flow between them.

Issues that are specific for this particular domain of the Grid infrastructure are presented in the sequel. Some of them, which we consider to be clear, have been skipped, however, if they turn out to be vague, please, contact the authors of this document ([ariel@man.poznan.pl](mailto:ariel@man.poznan.pl)).

The **Details** section describes network resources available or required in the framework of the project and testbeds that enable developing, testing and refining the new technology.

**Network resources** include information such as bandwidth or types of networks belonging to the whole infrastructure. The map or the schema presenting the network infrastructure can be attached as well.

**Integration and collaboration** is concerned with a cooperation of workpackages, components and institutions within the project. It may include, for example, methods for software integration.

**New network protocols** section include **Requirements** and/or **Design** of protocols such as, for instance, IPv6 or TCP modifications.

**Requirements in Geant network** can describe needs for the new services such as *Bandwidth on Demand* or *Virtual Private Networks*.

**Security in Other issues** paragraph should contain all security issues (including Certification Authorities information) applied in the testbed.

## 2. Testbeds and Network Infrastructure

### 2.1. General

The GEMSS design is still being discussed by the project and not all issues have been finalized yet.

1. **Main requirements**
2. **Functionality**

### 2.2. Details

- **Infrastructure**

  - **Countries**

    - Austria

    - Germany

  - **Computational centers**

    - ISS Center in Vienna, Austria

    - NEC CCRLE in Sankt Augustin, Germany

- **Computer resources**

1. **Machines**

1. Linux PC Cluster, 32 nodes, 2 processors (Athlon MP1900+ 1600MHz)

2. Linux PC Cluster, 16 nodes 1 processor (Pentium 4, 3 GHz)
  3. Linux PC Cluster, 16 nodes, 4 processors (Pentium 3 XEON 700 MHz)
- 2. Available memory**
    1. 1GB per node
    2. 2GB per node
    3. 2GB per node
  - 3. Storage**
    1. 20/40 GB
    2. + 3. RAID 5 system 480 GB (home) + 120 GB (system).
  - 4. Computational power**
    1. ~ 3200 MFLOP peak
    2. ~3000 MFLOP peak
    3. ~2500 MFLOP peak
  - **Network resources**
    1. Myrinet 2000+ 2 x Fast Ethernet
    2. Gigabit + Fast Ethernet
    3. Myrinet 2000
  - **Heterogeneity**

#### **Operating systems**

Linux (Redhat 7.3)

#### **Hardware architectures**

- **Integration and collaboration**
- **Communities of users and developers**  
The testbed is used exclusively by GEMSS project members
- **Project requirements**

#### **Software at nodes**

Standard Linux software

#### **Network**

#### **Requirements for day-to-day project work**

These kind of requirements are fully covered by the standard Internet.

- **Dedicated connections**
- **Advance network resource reservation**
- **Quality of Service demands**
- **Throughput**
- **Latency**

- **Jitter**
- **Packet loss**

### **Requirements for production and demo work**

- **Dedicated connections**  
Currently no user requirements for dedicated connections
- **Advance network resource reservation**  
Some of the partners need to reserve in advance the network for data transfers of larger sizes (> 100MB)
- **Quality of Service demands**  
Currently not addressed
- **Throughput**  
Not relevant, since we have no dedicated network
- **Latency**  
Not relevant, since we have no dedicated network
- **Jitter**  
Not relevant, since we have no dedicated network
- **Packet loss**  
Not relevant, since we have no dedicated network

### **Future requirements (in 2-3 years time)**

This will be addressed in the exploitation work at the end of the project.

- **Dedicated connections**
- **Advance network resource reservation**
- **Quality of Service demands**
- **Throughput**
- **Latency**
- **Jitter**
- **Packet loss**

- **New network protocols**

#### **Requirements**

**No further requirements like IPv6.**

#### **Design**

- **Geant network**

This is beyond the financial scope of the project.

#### **Existing infrastructure usage**

#### **Requirements for the future**

- **Other issues**

- **Security**

- Addressed at higher software levels

- **Accounting**

- Not currently planned but may need to be addressed if the file transfers become large.

- **Other**

## 2.3.External

- **Liaisons with other testbeds and networks**

- Nothing planned here so far.