

EGEE Site Deployment & Management Using the Rocks Toolkit

Departamento de Informática
Universidade do Minho

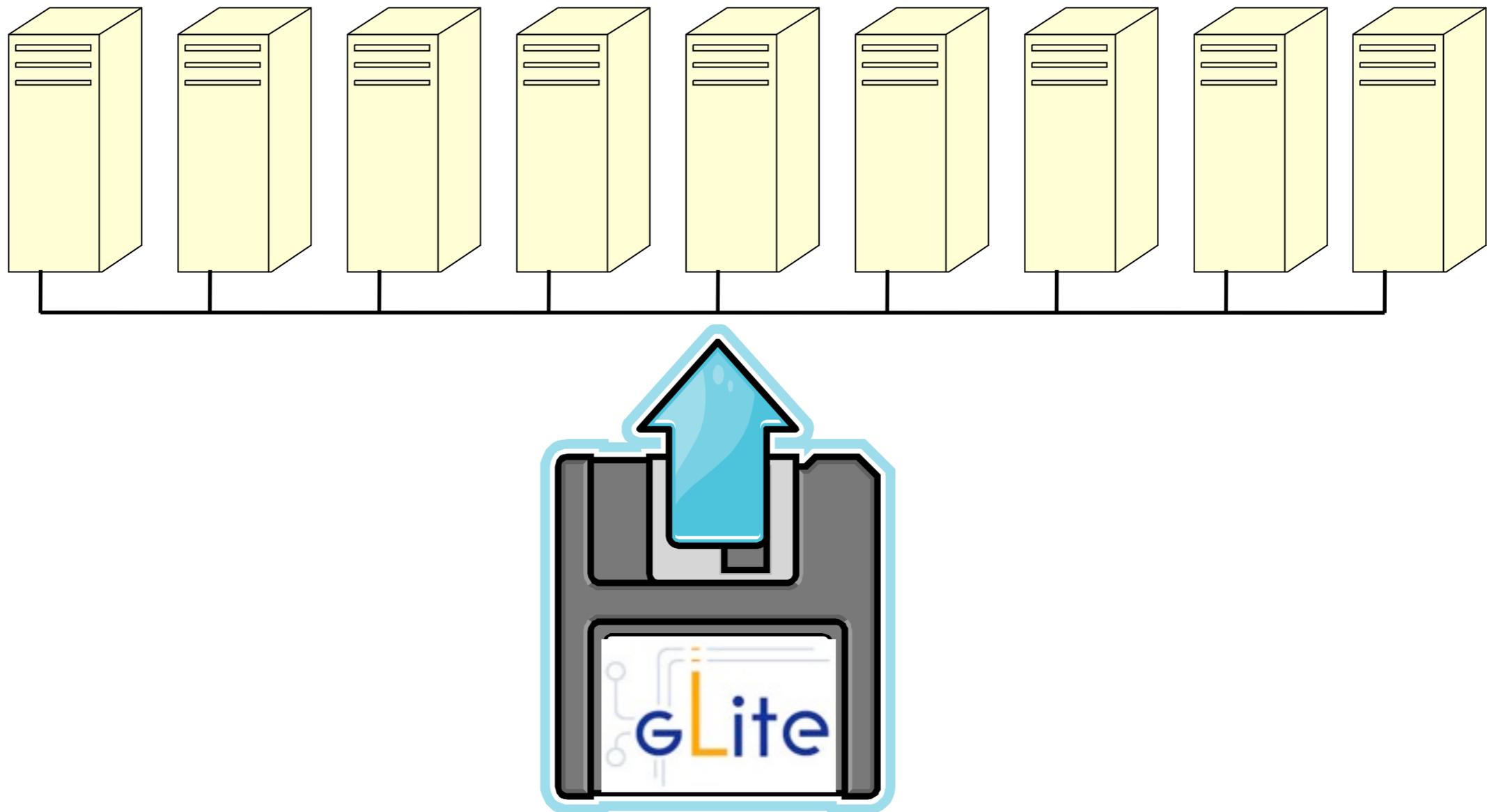
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Motivation

- EGEE sites lack complete solutions to:
 - Build managed Grid Infrastructures
 - Including: distribution, installation, configuration
- Looking for
 - Fully automated installation for fast and ease site deployment
 - Local and remote installation
- UMinho Research objectives:
 - To support European wide Civil Protection infrastructure
 - To explore the capabilities of the grid in CP applications

EGEE site - requirements

Elements and Workers



gLite middleware

- Set of software packages
 - Created and tested with ScientificLinux [Cern]
- Node types:
 - Computing Element
 - Storage Element
 - User Interface
 - MON
 - Worker Nodes

gLite installation

- Site wide configuration files
 - Global settings
 - Supported VO settings
 - Supported users and groups
- X.509 certificate files for some node types
- Install gLite package for the desired node type
- Run yaim to configure the node

Rocks

- Currently in use at Universidade do Minho
- RedHat Enterprise Linux based
 - May use any compliant distro
- Centralised installation and administration
- Cluster node's type defined by *Appliances*
- Customisable installation process
 - Based in Direct Acyclic Graphs
- Software bundles created via *Rolls*

DAG nodes & DAG

- Each DAG node is defined in a XML file
 - RPM and source packages to install
 - Pre and Post installation routines
 - Machine settings (*IP address, partition information ...*)
- DAG is defined in a XML file
 - Defines dependencies between nodes
 - Defines an installation order
- Any node in the DAG can become an Appliance

Rolls

- Roll represent a software bundle
- Add new features to standard Rocks installation
 - Provides new appliances
 - Provides new services
- Built using the rocks' cvs version

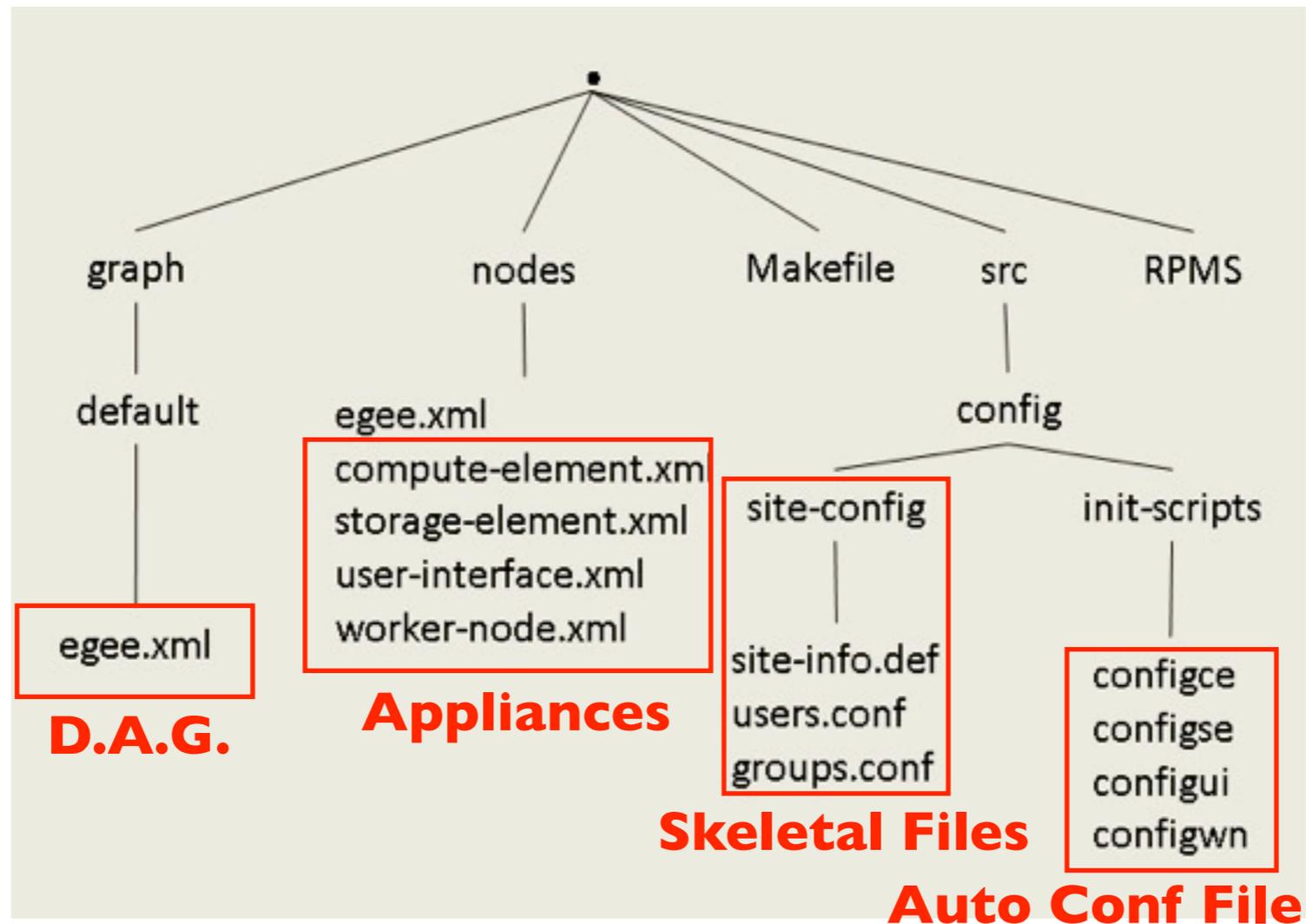
Using Rocks to install a EGEE site!

Egee roll

- Contains an *Appliance* for each middleware node type
- Provides a skeletal site wide configuration file
- Interface used to supply site specific information
 - IP information and FQDN for machines
 - Supported VOs and number of users
 - SE disk management model
 - ...

Roll

- Create a directories structure with the relevant files



XML files

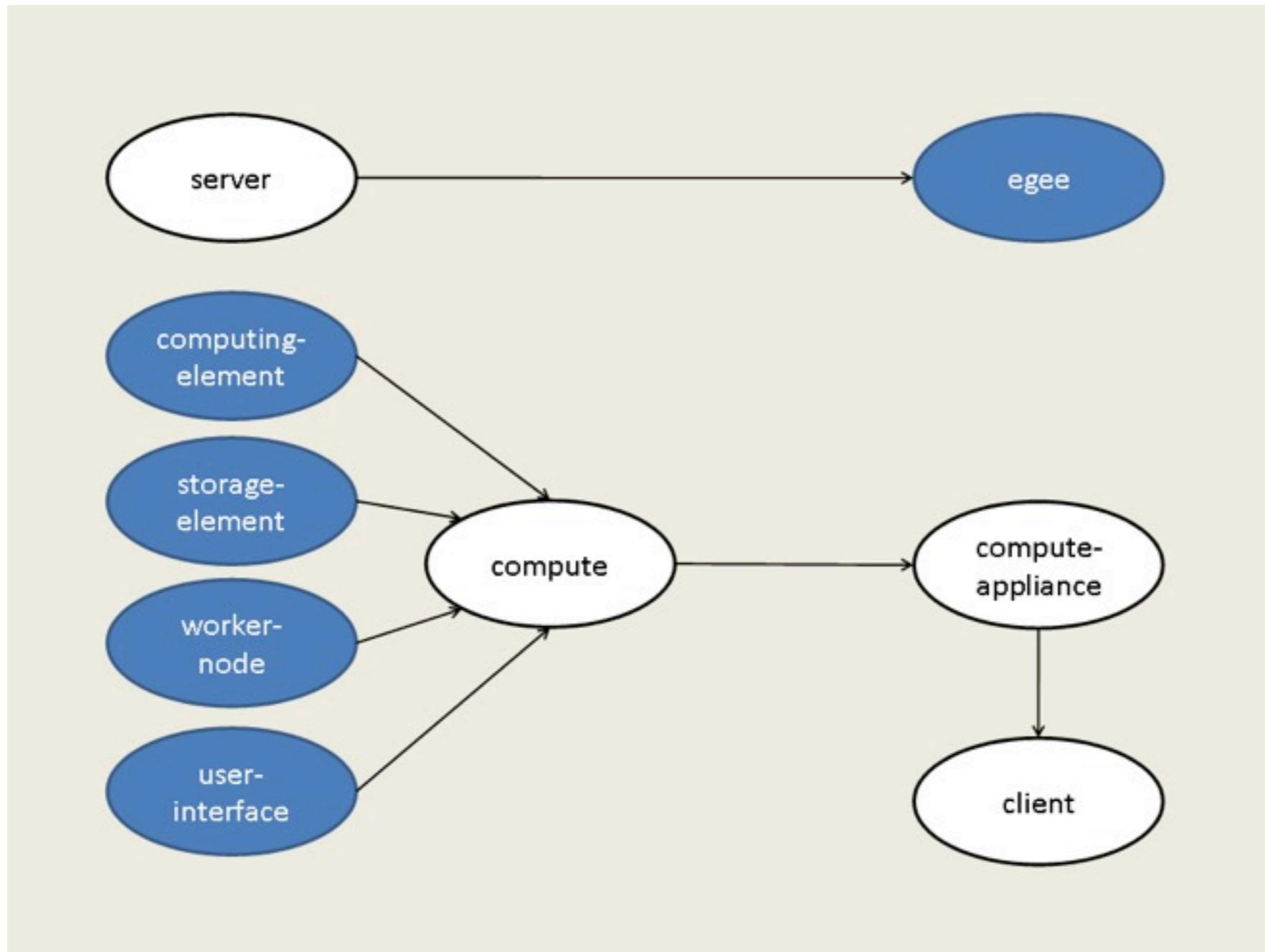
```
<?xml version="1.0" standalone="no"?>
<graph>
  <description>
    The EGEE roll
  </description>
  <!-- The main node -->
  <edge from="server">
    <to>egee</to>
  </edge>
  <!-- Computing Element -->
  <order gen="kgen" head="TAIL">
    <tail>computing-element</tail>
  </order>
  <edge from="computing-element">
    <to>compute</to>
  </edge>
  <!-- Worker Node -->
  <edge from="worker-node">
    <to>compute</to>
  </edge>
  (...)
</graph>
```

Graph

```
<?xml version="1.0" standalone="no"?>
<kickstart>
  <description>
    Computing Element Node
  </description>
  (...)
  <package>glite-yaim-core</package>
  <package>glite-yaim-lcg-ce</package>
  <package>glue-schema</package>
  <package>gnu-crypto-sasl-jdk1.4</package>
  <package>gpt</package>
  <package>gridsite-shared</package>
  <package>lcg-CE</package>
  <post>
    <file name="/root/site-cfg/site-info.def">
      <eval>
        cat /home/install/site-cfg/site-info.def
      </eval>
    </file>
    (...)
  </post>
</kickstart>
```

Node

Direct Acyclic Graph



Frontend installation

The screenshot shows the 'Welcome to Rocks' installation interface. At the top right is a yellow diamond logo with the word 'ROCKS'. The main content is divided into two sections: 'Selected Rolls' on the left and 'Select Your Rolls' on the right.

Selected Rolls

Roll Name	Version	Arch	Id
base	4.3	i386	Disk 1
ganglia	4.3	i386	Disk 1
kernel	4.3	i386	Disk 1
web-server	4.3	i386	Disk 1
LTS	4.3	i386	Disk 1,2,3,4
egce	4.3	i386	Disk 1

Select Your Rolls

Local Rolls

CD/DVD-based Roll

Network-based Rolls

Hostname of Roll Server:

Download

Next

Done

- Rocks Base
- Scientific Linux C
- EGEE Roll

Configuration Screens

Welcome to Rocks



Help

Fully-Qualified Host Name:
This must be the fully-qualified computing element domain name

IP Address:
The Computing Element IP Address

Torque Batch System:
Use TORQUE batch system

SGE Batch System:
Use SGE batch system

Condor Batch System:
Use CONDOR batch system

Computing Element Configuration

Fully-Qualified Host Name

IP Address

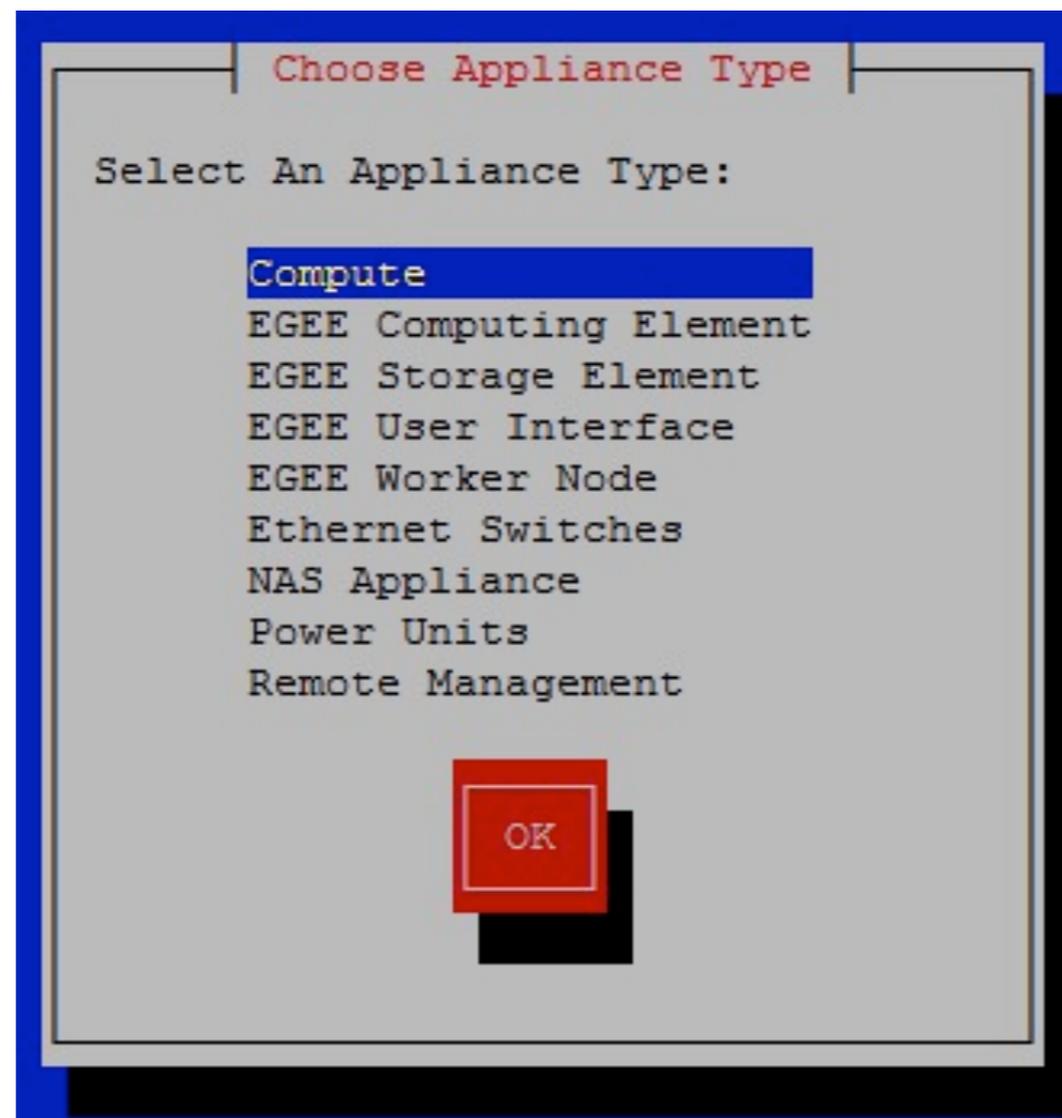
Torque Batch System

SGE Batch System

Condor Batch System

Nodes Installation

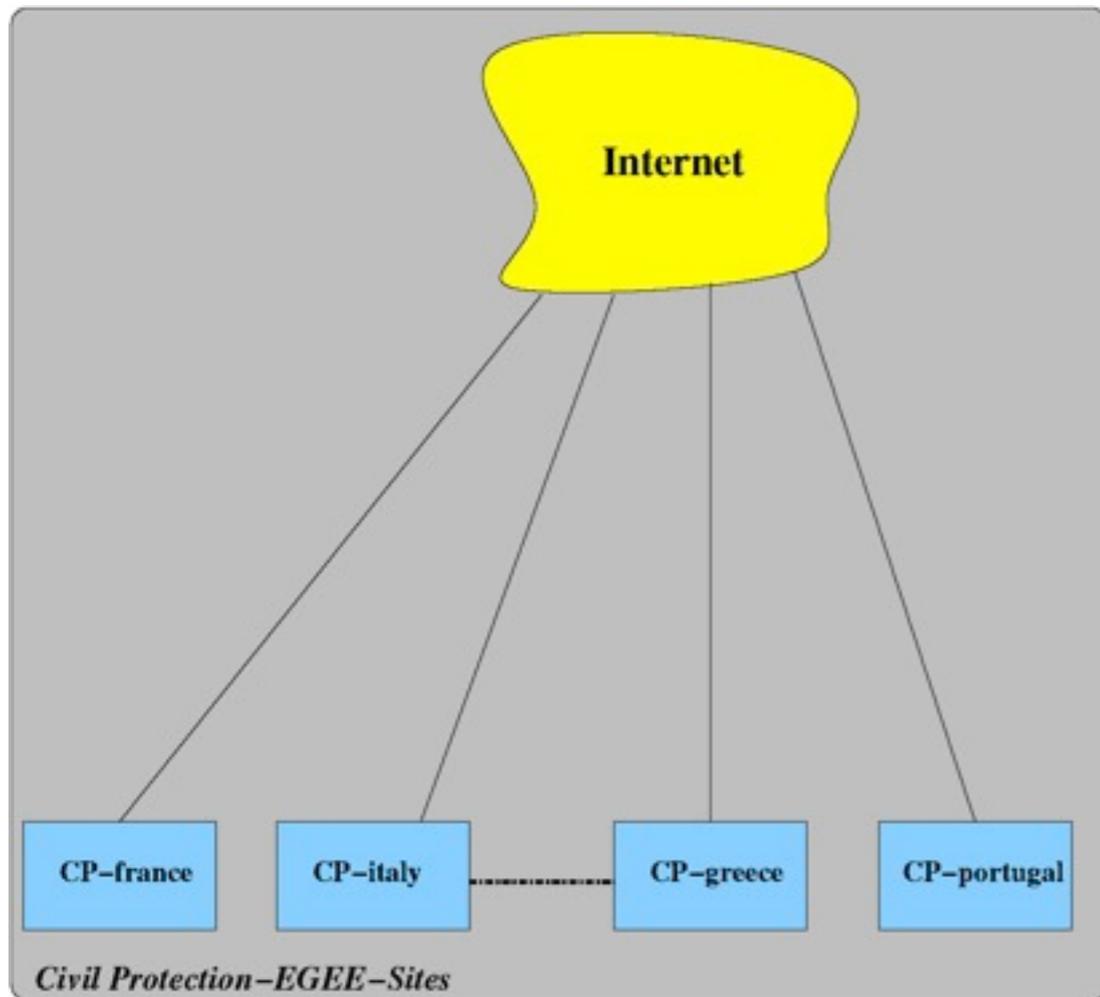
- Run insert-ethers from the Frontend



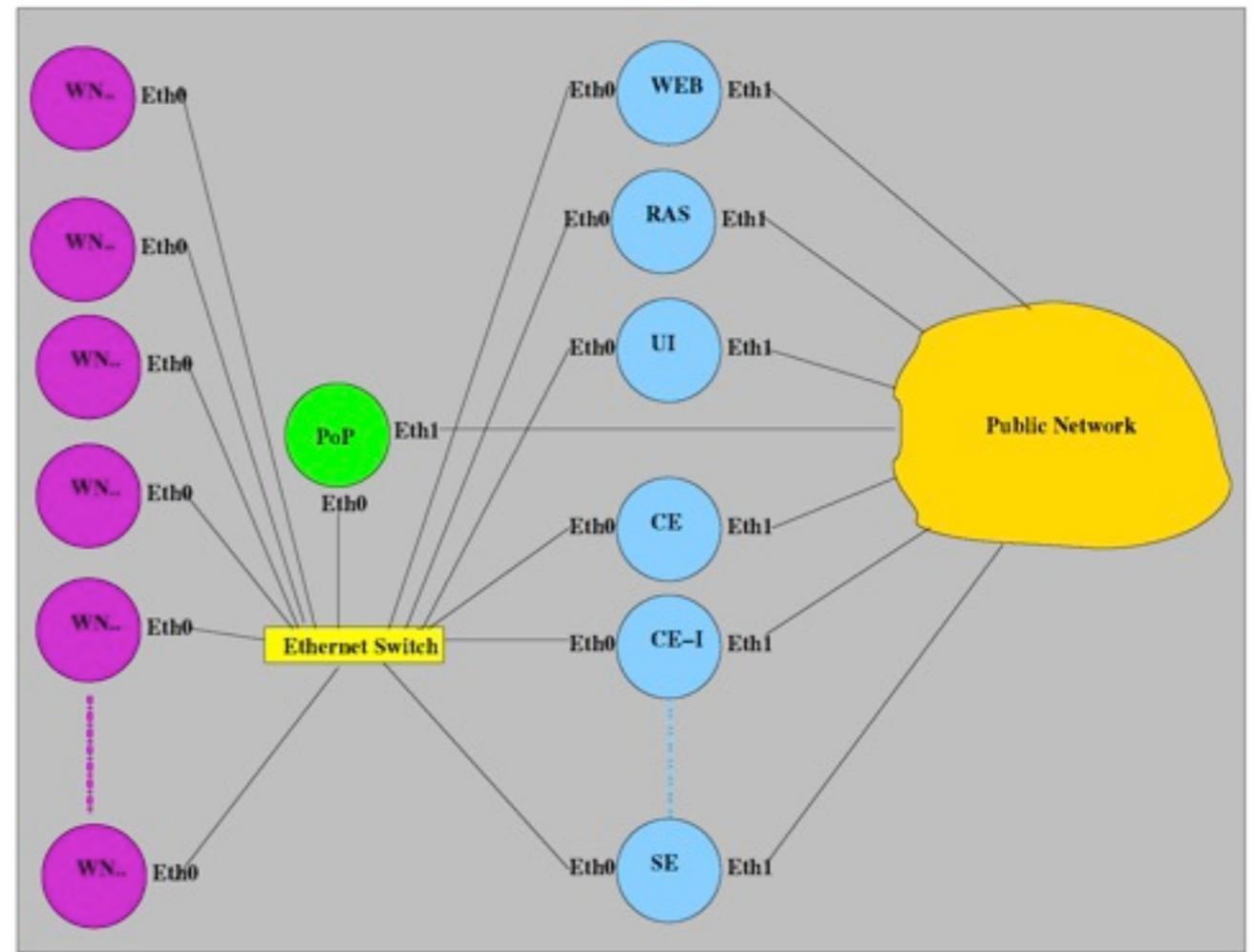
Manual intervention

- After the installation of the Roll administrator must
 - Copy certificates into the frontend machine
 - Set site wide files according to site specificities
 - Use the insert-ether mechanism to install the nodes
 - To guarantee security

Civil Protection



Virtual Organization



Site Architecture

SITE Replication

- Civil Protection sites requirements
 - World wide
 - Interoperability
 - Full customisation
 - Reduced overall time for deployment
- Rocks frontend
 - Point-of-Presence (POP) for the each site
 - Central repository for the VO
 - WAN mechanism for site replication

Results

- Faster and easier installation process
 - Lower expertise requirements for sys administration
 - Automatic installation of multi-Worker nodes
- Centralised Management
 - Local management (users, computers)
 - VO management (homogenous sites)

UMINHO-CP

- Supports the investigation at UM's DI
 - Testbed for the roll itself
 - Support to Cross-Fire project
 - Support to the VO's: CP and EELA

Further/Current work

- Installation and configuration of MPI
- Update to latest gLite version
- Inclusion of AMGA appliance and DenyHosts package
- Creation of a command line tool for EGEE management

Questions?