EGEE Site Deployment: The Uminho-CP case-study.

Departamento de Informática

Universidade do Minho

Tiago Sá, Bruno Oliveira, António Pina

{tiagosa,boliveira,pina}@di.uminho.pt

Agenda

- Motivation
- Uminho-CP Site
- Concepts
  - EGEE model
  - gLite
  - Rocks toolkit
  - DAG
  - Rolls
- EGEE Roll
- Site Architecture
- Conclusions

Motivation

- EGEE – Enabling Grids for E-sciencE
- EGEE sites lack complete solutions to:
  - Build Managed Grid Infrastructures
  - Including: distribution, installation, configuration
- Automate the deployment of the EGEE grid sites
- Migrating from a project-based model to a sustainable federated infrastructure.

UMinho-CP Site

- Currently supporting investigation at UMinho:
  - Testbed for the EGEE roll itself
  - International projects: CYCLOPS and EELA-2
  - National projects: Cross-Fire and AspectGrid, both funded by INGRID

EGEE model

- Grid middleware provides tools and configurations that allow a seamless integration of heterogeneous clusters in the EGEE infrastructure.
- Defines a set of elements with specific roles, such as:
  - Computing element
  - Storage element
  - User interface
  - MON
  - Worker nodes

gLite configuration

- 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

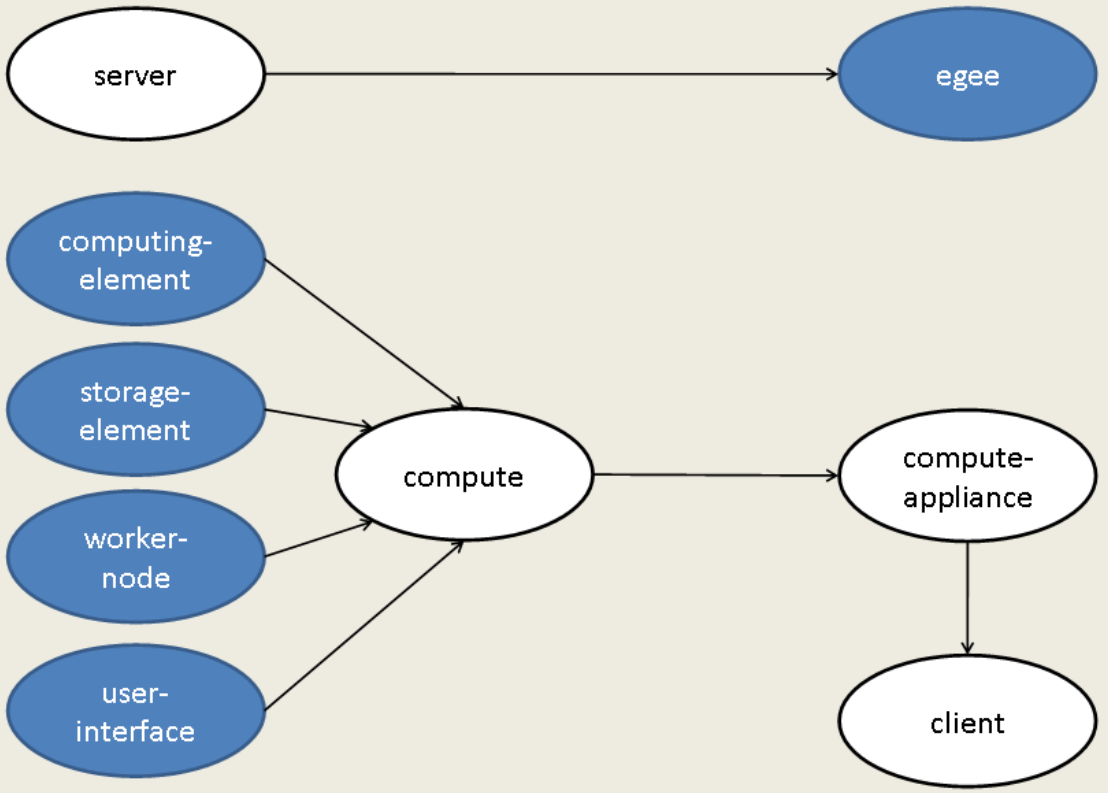
Rocks toolkit

- Currently in use at Universidade do Minho
- Aims to provide an out-of-the-box cluster solution
- RedHat Enterprise Linux based
  - May use any compliant distribution
- Centralized installation and administration
- Cluster node's type defined by *Appliances*
- Customizable installation process
  - Based in Direct Acyclic Graphs
- Software bundles created via *Rolls*

Direct Acyclic Graph

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

Direct Acyclic Graph



Rocks – 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

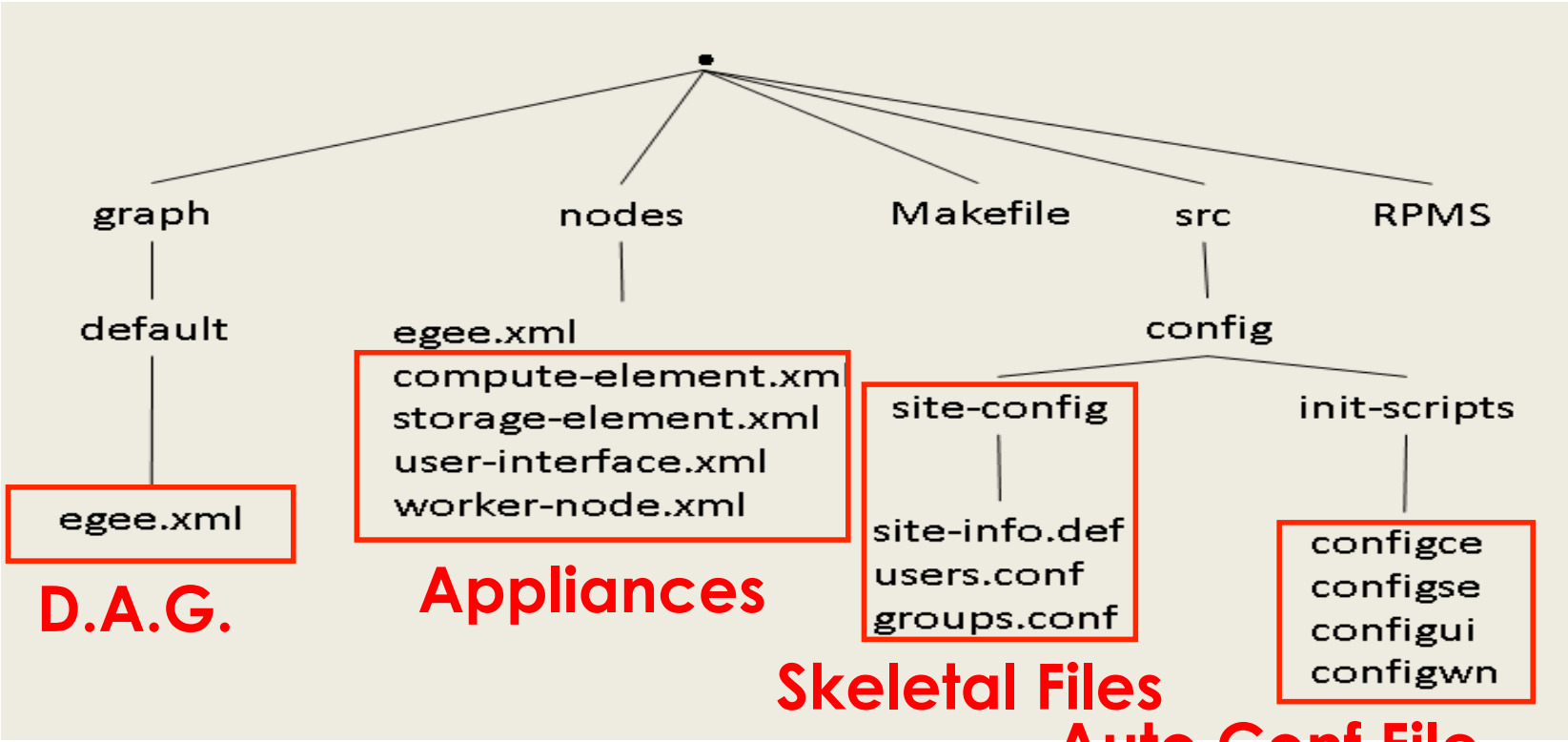
Rolls

- Roll represents a self-contained package that provides:
  - Software (generally using RPM technology)
  - Configurations and settings
- Adds new features to standard Rocks installation
  - New appliances
  - New services
- Internally, defines a graph where each graph's node can define software and configurations

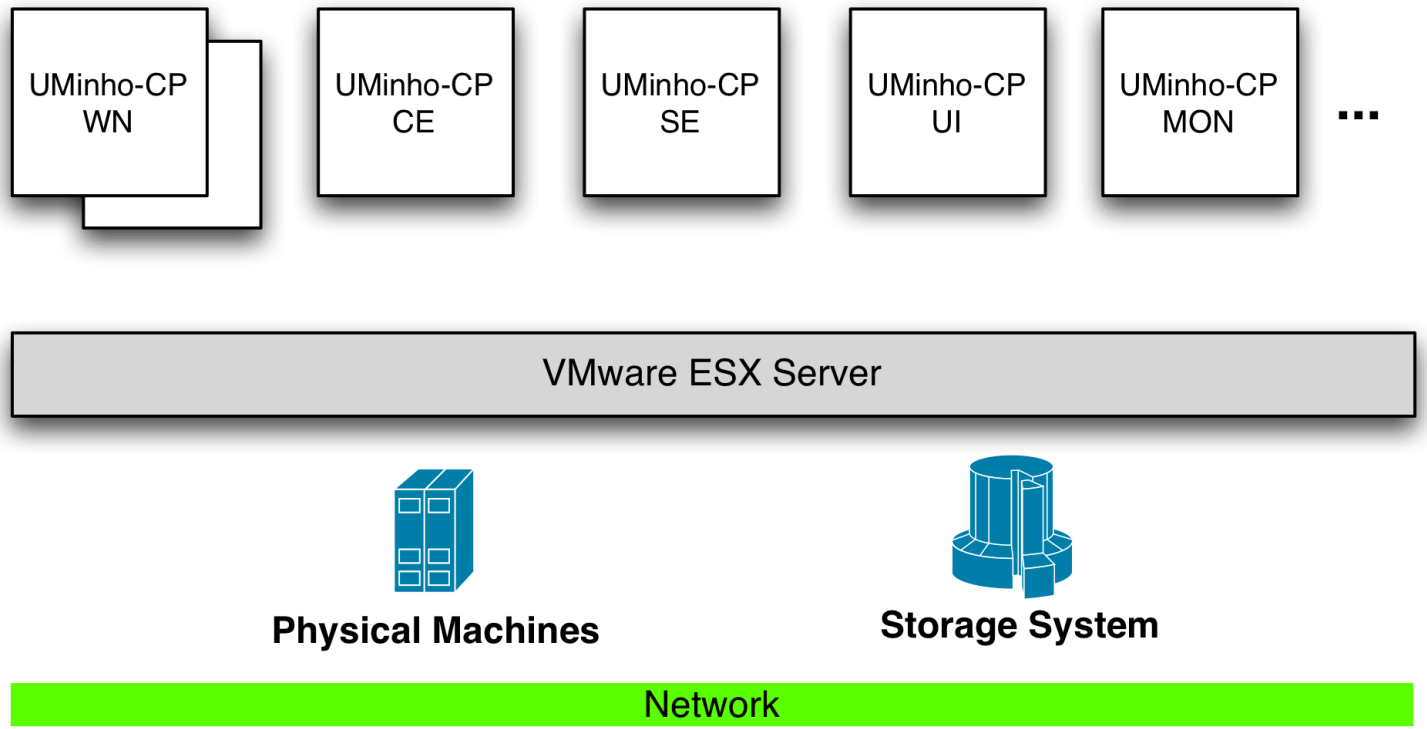
EGEE Roll

- Contains an Appliance for each middleware node type
- Provides skeletal site wide configuration file
- Interface used to supply site specific information

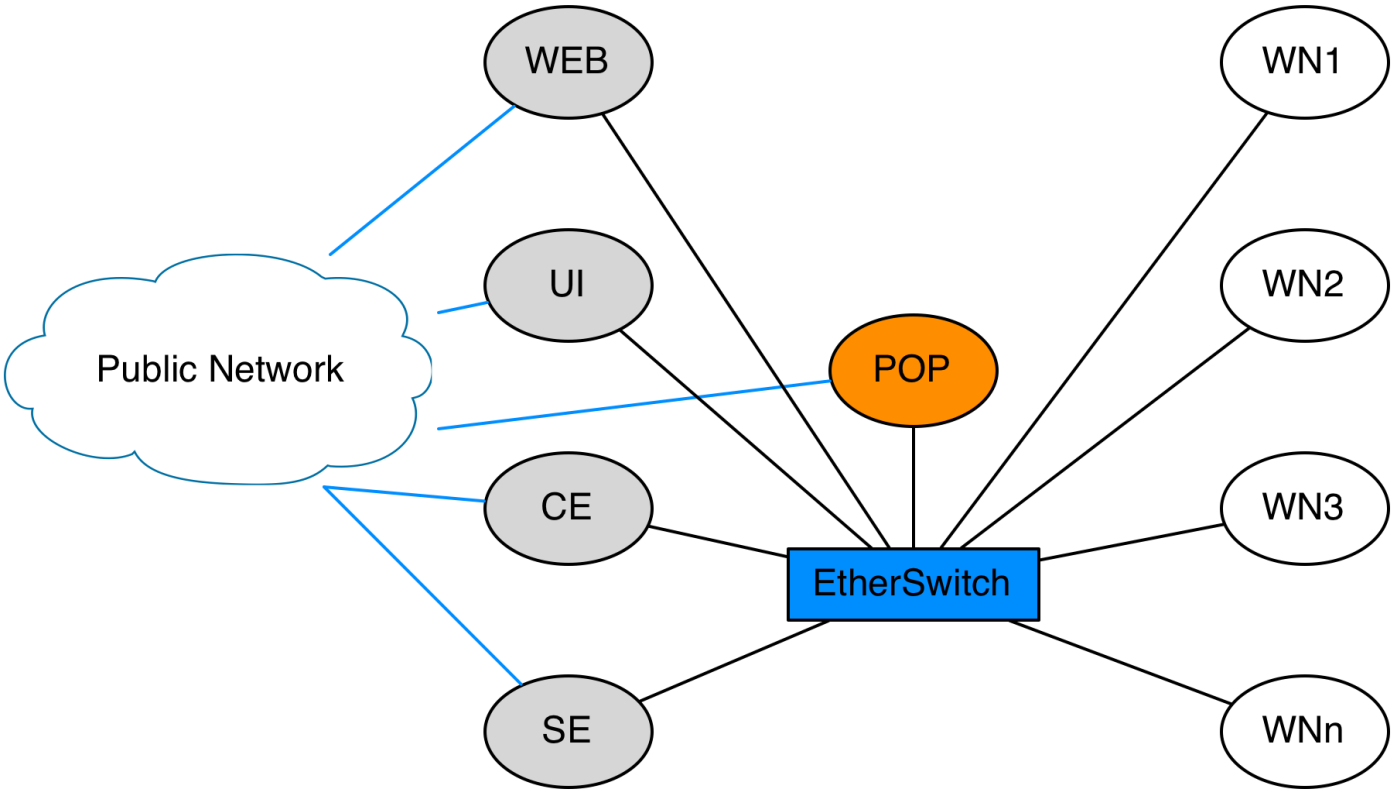
EGEE Roll - Structure



Site Infrastructure - Physical



Site Architecture - Logical



EGEE Roll – New developments

- First Version:
  - Installation and initial configuration of a minimum EGEE site
- EGEE site constantly evolving. Main tasks performed by admins:
  - Middleware updates
  - Virtual Organization management
- Today:
  - Currently working to provide administrators with an intuitive and easy to use tool to perform common administration tasks.

EGEE Roll – New developments

- Today:
  - Site administration using *egeecli*
  - Transition to gLite 3.2
  - Denyhosts
  - Adding new Appliances

Conclusion

- Faster and easier installation process
  - Lower expertise requirements for system admins
  - Automatic installation of multiple WorkerNodes
- Centralised Management
- New features added to the EGEE roll, covering administration tasks

End

- Questions?