**Interoperability among gLite and ARC middleware in training grid infrastructures**

**What is GRIDSEED?**

GRIDSEED (gridseed.escience-lab.org) is a full gLite+ARC Grid running entirely on Virtual Machines.

GRIDSEED is primarily used as a training facility, providing participants in training events with an up-to-date installation of major Grid services and a UI node with example code and tutorial material already available.

GRIDSEED runs on a private IP network and can be completely detached from the Internet; this allows the use of GRIDSEED also in locations where Internet connectivity is slow or not available at all.

GRIDSEED is indeed the main training facility of the EU-IndiaGRID project and been used in several GRID training events.

*This isolation feature makes GRIDSEED an optimal testbed for new and experimental services and configurations.*

**Feature Highlights**

- Private CA with simple front-end scripts to issue user and host certificates in minutes.
- Single UI sporting both gLite and ARC commands with training material pre-loaded.
- Two sites available by default in the Grid:
  - site 1 sports a gLite LCG-CE, StoRM SE and 2 WNs
  - site 2 sports a gLite CREAM CE, ARC GM front-end, DPM SE and 2 WNs
- Central services are “shared” by both Grid middlewares:
  - central VOMS and LFC server
  - Nagios monitoring of Grid services
- New nodes can be easily added, either by installing them from template machines with just OS, or by cloning existing Grid nodes.

**Interoperability Successes**

- CREAM CE and ARC GM sharing the same TORQUE batch queue system
- Users can use same personal certificate and relay on same VOMS server
- Successful deployment of ARC client commands alongside gLite UI.
- But newer ARC uses Globus 5 packages

**Interoperability Issues**

- ARC cannot talk SRM with StoRM and DPM (ARC data management commands are limited to GridFTP protocol)
- BDII/OpenLDAP versions mismatch between ARC and gLite may prevent compacting nodes further.
- In general, ARC relies on software in the EPEL repository, whereas current gLite requires disabling it. Package dependency issues always "around the corner"

**Interoperability future developments**

- Include interoperability with GARUDA Indian middleware within EU-IndiaGRID project
- Test/Import other high-level interoperability tools

Currently-installed middleware is the most up-to-date version available end of February 2010.

**Storage System**

**Job Submission**

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<th>gLite service 3.1 update 61</th>
<th>ARC services 0.8.1.1</th>
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