Synergizing ETICS and UNICORE Software

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Outline

- Short introduction to ETICS
- UNICORE benefit: Building UNICORE software components with ETICS
- Demo: creating an UNICORE RPM package with ETICS
- ETICS benefit: Extending ETICS infrastructure with UNICORE submission service
- Demo: submitting an ETICS job with UNICORE plug-in
The ETICS Project

- ETICS stands for “E-infrastructure for Testing, Integration and Configuration of Software”
- Partially funded by the European Commission
- Started in January 2006, ended as ETICS-2 in February 2010.
- 8 partners led by CERN
- Software released in the open source community and incorporated in other projects, e.g. EMI

The ETICS software in a nutshell

- Integrated infrastructure for the automated **build**, configuration, integration, testing and **QA verification** of software
- **Scheduled** or **on-demand** build and test jobs
- Built-in **connectors** to distribute build jobs on infrastructures **locally** or **remotely** from standard job management systems to grid communities
- **Repositories** of configuration metadata, packages and build, test and quality reports
- It’s **multi-platform** and **independent** from any specific programming language, build or test tools
Authentication and Authorization

- ETICS is based on standard X.509 user and server certificates
- Every operation is authorized based on roles attached to registered user accounts (edit, submit builds or tests, manage users, etc) and ACLs on objects (projects, modules, configurations, etc)
Benefits for UNICORE - Development

- The UNICORE 6 development is centralised at the SourceForge source code repository
- UNICORE software components are maintained by state-of-the-art tools like Maven, Ant, or Subversion
- ETICS provides these tools as well, so that all common UNICORE development processes can be managed in the ETICS system
- Of course, UNICORE major development will remain at SourceForge.
- Why is it in spite of that advantageous to UNICORE to use also ETICS for development?

Synergy Effects
Building UNICORE with ETICS

- Benefits for UNICORE
  - Build components and modules on different hard- and software architectures
  - Testing components periodically on miscellaneous operating systems
  - Getting automatic quality verification and certification of the software by ETICS A-QCM plug-in
  - Creating end-user packages of components in common formats like RPM or Debian
Demo: Building a RPM package of the UNICORE command line client - UCC

- ETICS comes up with a built-in packaging system that is able to build distribution packages on several supported platforms (e.g. tar balls, RPMS, debs, MSIs)
- However, UNICORE wants to distribute the files to particular directories, so the built-in packager is overwritten by appropriate custom packaging (custom spec-file)
- ... Demonstrating the RPM build with the ETICS Web Client...

Synergy effects
Extending the ETICS system by an UNICORE-based submission service

- Originally, ETICS job submission relied on an execution system based on the NMI Metronome software
- However, during ETICS-2 the resource management logic was re-engineered to allow the integration of different job engines in the system
- As a result the new standalone ETICS Submission Web Service (ESWS) was designed providing a generic submission interface
- Goal: Open ETICS to different HPC and grid communities using their own grid middleware
ESWS Architecture

ETICS Submission Web Service (ESWS)

Plug-in Interface

- Interface to Operations
- Interface to Statuses
- Interface to Factories

Plug-in (UNICORE, NMI,...)

Submit, Get-status, or Cancel Operations

Mapping ETICS to Plug-in statuses like Running, Pending etc

Instantiate the Plug-ins

Available ESWS Plug-ins

Submission Web Service

- gLite Plug-in
- NMI Plug-in
- UNICORE Plug-in
- Amazon Plug-in

Physical Worker Nodes

- gLite Execution Engine
- NMI Execution Engine
- UNICORE Execution Engine
- Amazon Execution Engine
The UNICORE ESWS plug-in

- The UNICORE plug-in implements the job operations of the ESWS interface by calling the UNICORE Command-line Client UCC
- Typical lifecycle of a job in the plug-in:
  - connecting to a UNICORE Server
  - submit ETICS job
  - fetching job status
  - get-output when finished
- When getting the output, the ETICS job files are exported from the UNICORE worker node to the ESWS and from there to an ETICS repository

ESWS instance at Jülich

- An ESWS is installed at Forschungszentrum Jülich which is using further ETICS services at CERN and INFN (Bologna)
- ESWS instance at Jülich has got plugged in a UNICORE submitter
- Several UNICORE Servers are registered to that UNICORE submitter
- The ESWS instance is accessible from all ETICS users or services whose X.509 certificate are registered at the ESWS machine
Demo: Submitting an ETICS remote build by using the UNICORE ESWS plug-in

- The UNICORE plug-in is integrated in the release candidate of the latest ETICS version
- The demo will build the UNICORE plug-in itself with ETICS using the ETICS Web Client…