



ETICS: eInfrastructure for Testing, Integration and Configuration of Software

Thursday 2 March 2006 16:50 (15 minutes)

A broad range of projects from a spectrum of disciplines involve the development of software born from the collaborative efforts of partners from geographically spread locations. Such software is often the product of large-scale initiatives as new technological models like the Grid are developed and new e-Infrastructures are deployed to help solve complex, computational-intensive problems.

Recent experience in such projects has shown that the software products often risk suffering from lack of coherence and quality. Among the causes of this problem we find the large variety of tools, languages, platforms, processes and working habits employed by the partners of the projects. In addition, the issue of available funding for maintenance and support of software after the initial development phase in typical research projects often prevents the developed software tools from reaching production-level quality. Establishing a dedicated build and test infrastructure for each new project is inefficient, costly and time-consuming and requires specialized resources, both human and material, that are not easily found.

The ETICS effort aims to support such research and development initiatives by integrating existing procedures, tools and resources in a coherent infrastructure, additionally providing an intuitive access point through a web portal and a professionally managed, multiplatform capability based on Grid technologies. The outcome of the project will be a facility operated by experts that will enable distributed research projects to integrate their code, libraries and application, validate the code against standard guidelines, run extensive automated tests and benchmarks, produce reports and improve the overall quality and interoperability of the software.

ETICS objectives are not to develop new software but to adapt and integrate already existing capabilities, mainly open source, providing other research project with the possibility to focus their effort in their specific research field and to avoid wasting time and resources in such, required, but expensive, activity.

Throughout the duration of the project the ETICS partners will investigate the advantages of making use of the ETICS services, the technical challenges relates to running such a facility and its sustainability for the future.

The vision and mission of ETICS will be accomplished through the following objectives:

- Establish an international and well managed capability for software configuration, integration, testing and benchmarking for the scientific community. Software development projects will use the capabilities provided by ETICS to build and integrate their software and perform complex distributed test and validation tasks
- Deploy and if necessary adapt best-of-breed software engineering tools and support infrastructures developed by other projects (EGEE, LCG, NMI) and other open-source or industrial entities and organize them in a coherent, easy-to-use set of

on-line tools

- Create a repository of libraries that project can readily link against to validate their software in different configurations conditions
- Leverage a distributed infrastructure of compute and storage resource to support the software integration and testing activities of a broad range of software development efforts.
- Collect, organize and publish middleware and applications configuration information to facilitate interoperability analysis at the early stages of development and implementation
- Collect from the scientific community sets of test suites that users can apply to validate deployed middleware and applications and conversely software providers can use to validate their products for specific uses
- Raise awareness of the need for high-quality standards in the production of software and promote the identification of common quality guidelines and principles and their application to software production in open-source academic and research organization. Study the feasibility of a “Quality Certification” for software produced by research projects
- Promote the international collaboration between research projects and establish a virtual community in the field of software engineering contributing to the development of standards and advancement in the art

From the perspective of Grid application developers, the ETICS service should provide them with the means to automate their build and test procedures. In the longer term, via the ETICS service, users will be able to explore meaningful metrics pertaining to the quality of their software. Further, as Grid application level services (most concerned by providers of Grid turn key solutions), the ETICS service will also offer a repository or already built components, services and plug-ins, with a published quality level. Furthermore, the quality metrics provided by the ETICS services and available for each artifact in the repository will help guiding the user in selecting reliable software dependencies. Finally, the repository will also contain pre-build artifacts for specific hardware platforms and operating systems, which will help the developers to assess the platform independence of their entire service, including each and every dependency the service is relying on.

In conclusion, most Grid and distributed software project invest in a build and test system in order to automatically build and test their software and monitor key quality indicators. ETICS takes requirements from many Grid and distributed projects and with the help of Grid middleware, offers a generic yet powerful solution for building and testing software. Finally, building software via such a systematic can provide a rich pool of published quality components, services and plug-ins, on which the next generation of Grid and distributed applications could be based on and composed of.

Author: BEGIN, Marc-Elia (CERN)

Co-author: DI MEGLIO, Alberto (CERN)

Session Classification: 2d: VO tools - Portals

Track Classification: VO management - Portals