The Grid Quality Process

ETICS - eInfrastructure for Testing, Integration and Configuration of Software

In the Grid field, software is often developed in a distributed, collaborative environment that presents some unique challenges in producing quality software products. These challenges have been highlighted in large research projects such as EGEE, where tasks such as testing, configuration and integration have required considerable effort and made use of a range of different tools, platforms and systems.

To tackle this problem, a small consortium of partners who are expert in this field, including members of the Enabling Grid for E-science (EGEE) consortium and other leading software providers from Europe and the USA, launched ETICS: eInfrastructure for Testing, Integration and Configuration of Software, in January 2006. This highly innovative project, funded by the European Commission under the Sixth Framework programme, operates a service, operated by experts, that enables distributed research projects to integrate their code, libraries and applications, validate code against standard guidelines, run extensive automated tests and benchmarks, produce reports and improve the overall quality and interoperability of software.

ETICS customers

From its inception, ETICS had a number of clients eager to use its service. These include EGEE and its gLite middleware, a lightweight service orientated middleware distribution operated on EGEE's infrastructure, the largest multi science Grid in the world. Another early adopter is the DILIGENT (Digital Library Infrastructure on Grid Enabled Technology) project, which is pioneering digital libraries based on Grid systems for a range of scientific and cultural application areas, and building their application on top of the gLite middleware. The result of work with these early adopters will then validate the ETICS service as a solution for the many other organisations with a need for such distributed certification and testing systems. Over its lifespan, ETICS will actively recruit new customers from all parts of the Grid field through presence at major Grid events, active dissemination and the reputation it builds up through providing a reliable service.

Technical Approach

The ETICS service is a client/server application building on existing Grid technologies. A web application and a set of command-line tools allow users to model and define the different elements of a project structure (for example: projects, subsystems, components and configurations) and their dependency relationships. The user also specifies the different actions (i.e. commands) required to build and test their software as well as dependencies on the environment. From then on, ETICS can

automatically replicate the actions that developers, integrators, testers and release managers would normally do on their own machines. With this information, the ETICS service can use Grid middleware (NMI and Condor in this case) to dispatch build software modules on a wide variety of platforms, operating systems and environments, building, configuring and installing automatically, while running complex and distributed test scenarios. In the process, ETICS collects and archives a wide range of reports and metrics, such that the user can perform trend analysis on key quality indicators. The service also provides consistent and complete consolidated build and result reports.

Long term vision

In addition to its core service goals, the ETICS project has been set up with long term goals in mind. Through its service the project aims to lay the foundations for an international software certification process that will allow labelling of software build products with a recognised quality label. The project is also supporting the emergence of global Grid standards through active participation in the Global Grid Forum (GGF) standardisation efforts on the topic of Quality Assurance and Certification Processes. In the longer term, the project is also contributing to plans for sustainable future e-Infrastructures through involvement in the e-Infrastructures Reflection Group, and through providing materials for their White Paper and Roadmap documents, feeding in to the European Commission's plans for future research infrastructures for the European Research Area.

The ETICS Consortium

The ETICS consortium is composed of CERN (European Organization for Nuclear Research - leading partner), INFN (Istituto Nazionale di Fisica Nucleare), Engineering Ingegneria Informatica S.p.A, 4D Soft Ltd, University of Wisconsin-Madison.

The EGEE Project

The second phase of Enabling Grids for E-SciencE (EGEE) is an EU funded project to build a 24/7 Grid Production Service for scientific research. Already serving many scientific disciplines, it aims to provide academic and industrial researchers with access to major computing resources, independent of their location. The EGEE project is led by CERN, and involves over 90 partner institutions across Europe, Asia and the United States.

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