


Understanding grid semantics for virtual collaboration

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An EU project hopes to realise the ultimate potential of Grid computing by creating a network that is intelligently aware of its components and of the domain it addresses, enabling quick and easy virtual collaboration.

With funding from the European Commission's IST programme, the project aims to deploy this type of 'smart Grid' for a complex industry like aerospace, shipbuilding or construction, where large numbers of partners need to come together for a single, one-off project.

"We hope that we can augment Grid technology to provide a stable and secure collaboration platform on one hand, and a platform into which players can plug in and get out rather quickly on the other," says Professor iga Turk, coordinator of the InteliGrid and researcher at the University of Ljubljana in Slovenia. "In addition to that, the Grid should

be providing ICT resources on demand to support the irregular requirements over the design and production cycle." For this to be effective, however, computers must 'know' what data 'means'. Humans understand what lines stand for and can make intelligent decisions about them.

"But computers don't [understand]. For computers to assist more intelligently in the design process, the design must be composed of higher-level objects, such as walls, windows and so on. Applications and services can assist humans more intelligently if working with these meaningful objects," says Prof Turk.

Similarly, the IT infrastructure for a virtual organisation is quite complex and to manage it the infrastructure itself must know what it consists of, what services are there, and what resources are available to be used. "So we need to bridge the semantics of the IT infrastructure and the semantics of the [industry] domain," Prof Turk says.

In semantic computing computers can deal with meaningful objects. It is a huge topic in Web computing right now. It will have a profound impact on society, perhaps more than the creation of the Internet itself. Information will no longer be tied simply to words that appear on the page. InteliGrid is making bold steps in semantic computing for 'virtual organisations' (VOs) in complex industries. Its concern is not so much words but models of engineering products.

The project has made a lot of progress so far, one year into its three-year cycle. "We have a very clear idea what the architecture of the system would look like and started with the development of some key components. The engineering Grid is set up, one can log into the portal, and there are some essential administration and engineering services already plugged in," says Prof Turk.

Conceptualising knowledge Currently the project is focused on the selection of appropriate ontologies of the IT environment. Ontologies are a crucial element of the Semantic Grid; they are the foundation stones upon which meaning is built. Ontologies are an agreed upon selection of related concepts that denote real world objects within a computer system or a database. A kind of furniture of the world into which real world concepts can be orderly organised.

Ultimately, InteliGrid plans to deliver a demonstration of their system in 2007, when the project ends. It could be huge but there are quite a few uncertainties. "The impact, we hope, will be quite wide. We are accumulating the knowledge, building the infrastructure and the toolkits that will allow for a broad transition of the industry towards semantic, model-based, ontology-committed collaboration," says Prof Turk.

More immediately, the InteliGrid could have a huge impact on the way engineers work. "Some studies show that engineers and designers spend over 70 per cent of their time in non-value adding activities - like finding information, converting or re-keying data. What they like to do and what they are best at is creative designing. Projects like InteliGrid will allow them to spend more time at what they are best at," says Prof Turk.

Prof Turk also believes InteliGrid will make airplanes, buildings and bridges safer and more efficient. And this will ultimately not only benefit the engineers and the architects but the entire population, he says.

Source: [IST Results](#)

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