Interoperability of Virtual Organizations on a Complex Semantic Grid
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www.inteliGrid.com || www.ve-forum.org/Grid_SIG/
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InteliGrid Newsletter

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Look to the Future

It has now been one year since the **InteliGrid** project has started. As would be expected, some interesting ideas and results are coming into existence. Feel free to browse our website (www.inteliGrid.com) to follow-up on what's new and hot related to *interoperability of virtual organisations on a complex semantic grid* (i.e. **InteliGrid**).

In this issue of our newsletter, we have made an attempt to provide an overview of different inter-enterprise collaboration typologies and as to how InteliGrid will provide a paradigm shift from the current state to the future. In short, how can Grid technology be used to enable the interoperability of distributed applications and services within a VO setting.

During our interactions with practitioners, we have time and again encountered the question, *how will Grid technology help me in my work?* In this newsletter, we respond to this question by presenting a set of usage scenarios for different industrial sectors: civil safety; aerospace; infrastructure; and building lifecycle.

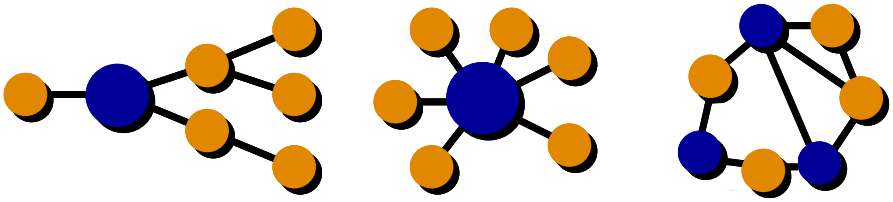
The future is not so far off. Through some realistic usage scenarios, we can see the transformation of the dream of today to becoming the norm of tomorrow.

Žiga Turk, coordinator

Current State and InteliGrid Offering

Long term, stable business relations of the past (supply chains, extended enterprises, etc.) are rapidly being replaced by ad-hoc partnerships based on sharing of competencies to deliver one-of-a-kind products and services across all industrial sectors. The virtual organisation is an organisational form supporting inter-enterprise collaboration in one-off settings where several partners may be unknown. Supporting virtual organizations has been central in grid technology development. Most of the practical results of grid technology however, only offer mechanisms for high performance distributed computation and storage.

Typical Typologies: Supply Chain, Extended Enterprise, Virtual Organisation



Supply chain:
- Clear chain of command
- Static

Extended enterprise:
- One dominant actor
- Static

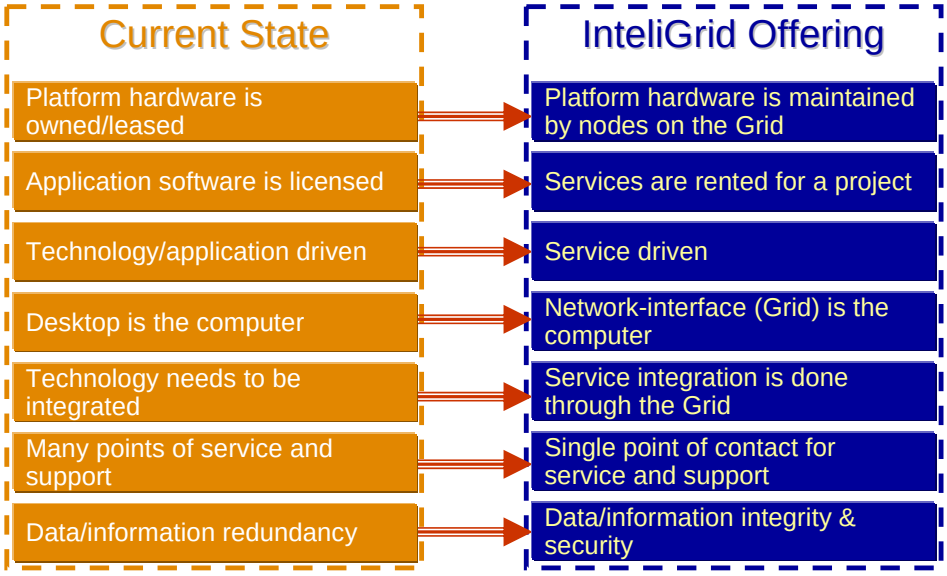
Virtual Organisation
- No dominant actor
- Dynamic

The goal of **InteliGrid** is to provide a grid-based integration and interoperability infrastructure to complex industries such as construction, automotive and aerospace. Our vision of future engineering is a flexible, secure, robust, ambient accessible, interoperable, pay-per demand access to information, communication, distributed services, and processing infrastructure. The key scientific question of **InteliGrid** is:

How can Grid technology be used to provide a mechanism to support the interoperability of software and services working with complex and semantically rich information within virtual organisational settings?

One of the major technological goals of **InteliGrid** is to make the grid infrastructure available to the small to medium enterprise (SME) companies that are providing and using engineering software and services. The core competencies of these companies are in topics such as structural mechanics or 3D solid modelling and not in the latest trends in middleware technology or interoperability platforms. The project will help SMEs to enhance their applications with grid-computing capabilities and increase efficiency provided by semantics.

*Current State and **InteliGrid** Offering*



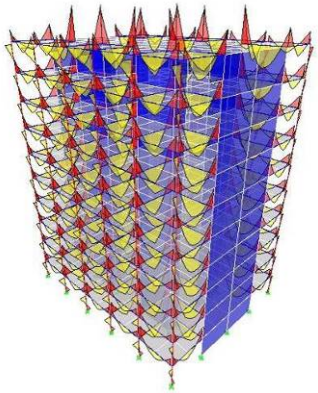
Usage Scenarios

How will Grid technology transform the way we do business today? Will it lead to better designed infrastructure? Will it cut costs without compromising on quality? Let's explore these questions through some usage scenarios that will be enabled through **InteliGrid**.

Civil Safety:

Our reliance on safe and well-built infrastructure (buildings, bridges, dams, power supplies, etc.) that can withstand both natural and manmade disasters cannot be over-stated. Methods in use today by engineers are based on numerous approximations and assumptions that form the basis of compromise between accuracy and what is humanly or computationally feasible to simulate.

Earthquake Response Analysis

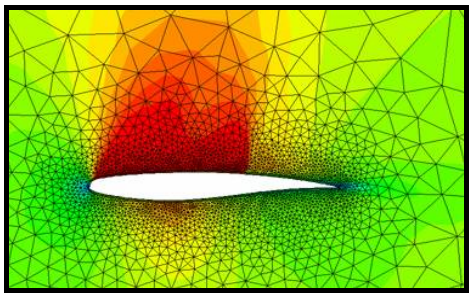


With the power of grid infrastructure, designers and engineers will be able to analyse a much broader spectrum of solutions resulting in safer design at a lower cost. Using grid technology, the **InteliGrid** infrastructure will allow engineers both functional and computational power to analyse a much broader spectrum of solutions leading to better, safer, more long lasting, and low cost infrastructure.

Aerospace:

Data sharing and information management for the collaboration in the design and production of complex products such as the Eurofigher or an Airbus is an extremely complex task and subject to security and integrity concerns. **InteliGrid** is developing technologies that will provide secure access to object-oriented data using grid standards.

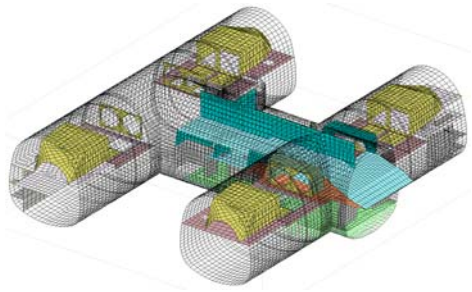
Detailed Wing Impact Analysis



Infrastructure:

Engineers are accustomed to building infrastructure grids such as water and electrical grids. **InteliGrid** acts as a building grid where engineers can co-design and manage facilities at a new level of security, interoperability and performance.

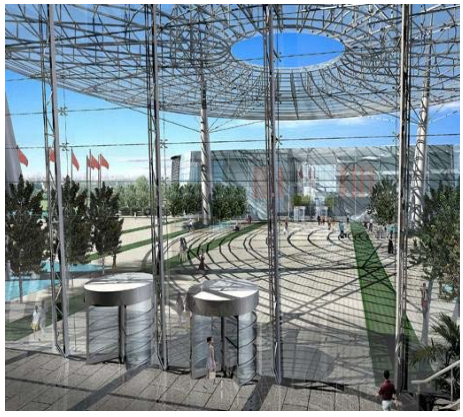
Geotechnical Design of Tunnels



Building Lifecycle:

The **InteliGrid** platform provides coordinated resource and competency sharing to the different organisations involved in the design, construction and use of facilities. It provides controlled access to shared information structured in accordance with international standards such as the ISO-STEP and IAI-IFC. **InteliGrid** provides a semantic interoperability level on top of these standards that will allow the users to use their own domain concepts when working with IT.

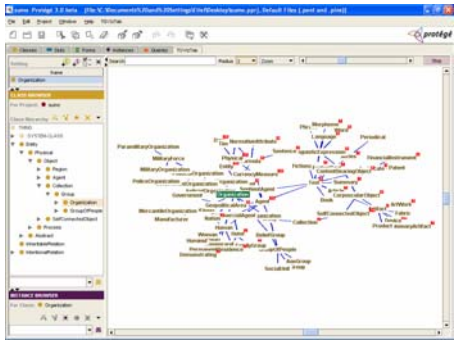
Visualisation throughout Lifecycle



Enabling Technology

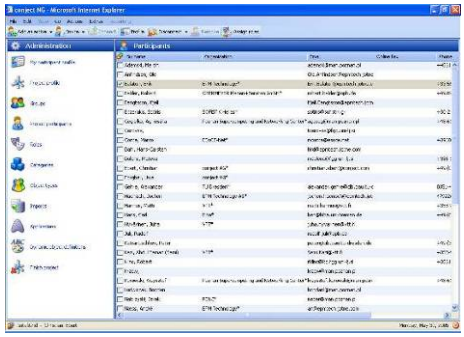
InteliGrid is creating a platform supporting various international standards (WSRF, OGSA, WS-I, etc.) for the semantic integration of distributed engineering services using intelligent ontology services to bridge the gap between technical grid concepts and engineering domain concepts.

Set-up of ICT Environment for VO



Key building blocks of this solution are the **InteliGrid** Portal, **InteliGrid** Document Management, **InteliGrid** Ontology Services, **InteliGrid** Business Object Services and several semantically annotated applications.

InteliGrid User-friendly Portal



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On our events page, you will find a listing of relevant events and meeting points where you can meet us for.

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