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IST 004664

Interoperability of Virtual Organizations on Complex Semantic Grid

Data management and the InteliGrid user scenarios

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Content

- InteliGrid project overview
 User scenarios

 Generic engineering process
 Example user scenario

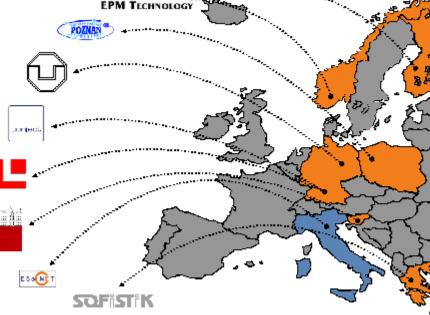
 Data management

 Requirements
 - Extensions to OGSA-DAI



InteliGrid project overview

- Sept 2004 Feb 2007 (30 months)
 - Effort 360 person months
 - Partners 9 / 6 countries: research, infrastructure, ASP, industry, users
 - InteliGrid vision: Grid as a semantic collaboration platform
 - Semantic: grid committed to an ontology combining IT and professional concepts
 - Collaboration: secure, shared access to grid resources for members of the highly dynamic VO
 - Platform: shared toolkit code
 - on servers and clients for grid access; committed to the ontology



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InteliGrid difference

- Not dealing specifically with high performance computing
 - Industrial orientation
 - 4 industrial partners, 1 industrial association
 - technology push / pull
 - several industrial domains
- Complex products
 - series of one or few
 - described not in documents but in highly structured databases
- Production process
 - unique, on of a kind
- Virtual organizations
 - highly dynamic (SMEs)
 - specific end user requirements









User scenarios

- Several engineering domainsGeneric engineering process
- Basic steps:
 - find object to work on (with the aid of semantics)
 - match object to tool (with the aid of semantics)
 - work on the object with the tool
 - store work results (semantically annotated)



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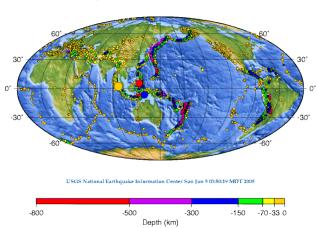
The story:

(1)Engineer doing a design in a earthquake area.

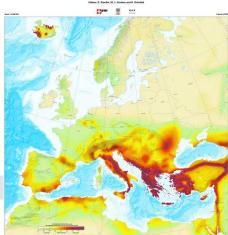
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- (3) Evaluate and select an optimal design of a building.
- (4) Evaluation through non-linear static and dynamic structural analysis.
- (5) Results are semantically annotated and stored on a grid.
- (6) Parametric analysis to determine actual performance and safety level.
 - (a) Determining hazard functions.
 - (b) Selecting representative earthquake accelerograms.
 - (c) Running a parametric analysis on a high-throughput grid resource
- (7) Workflow semantically annotated and stored for future re-evaluation



Earthquakes in 2005, Located by the NEIC



EUROPEAN-MEDITERRANEAN SEISMIC HAZARD MAP



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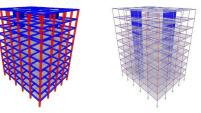


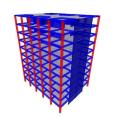
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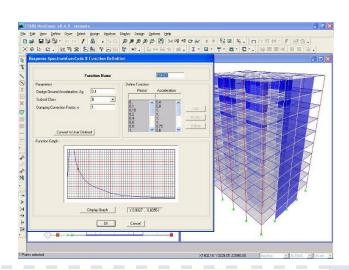
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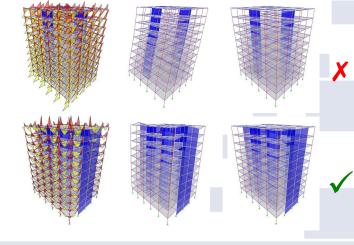
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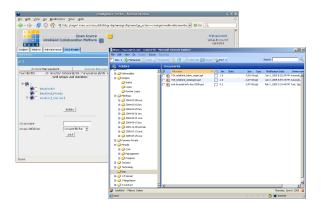
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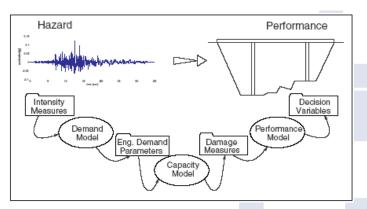
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The analysis is performed according to PEER (http://peer.berkeley.edu/) performance-based engineering framework.

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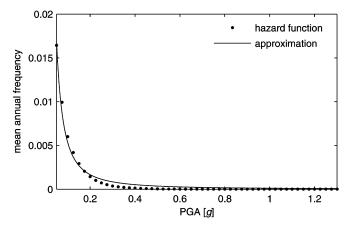
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A hazard function for the region is determined according to different parameters, for example intensity and frequency of earthquakes in the region.

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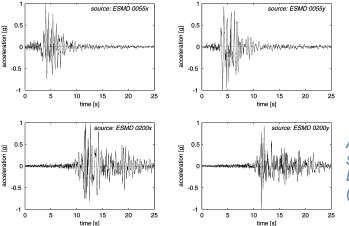
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A number of representative accelerograms are selected from the European Strong-Motion Database (ESMD) access on the Web (http://www.isesd.cv.ic.ac.uk/).

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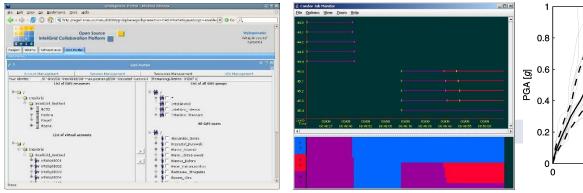
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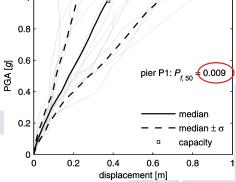
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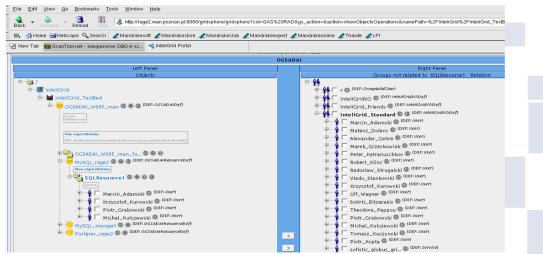
Data management requirements

- 1.Security2.Heterogeneous data sources3.Availability, virtualization, data location
- independence
- 4.Personalised
- 5.End-user way of working must/should not change



Security

- OGSADAI WSRF is secured by Grid Authorization Service (GAS, GridLab)
- Operations:
 - whether user is allowed to access OGSADAI WSRF service
 - whether user is allowed to list OGSADAI WSRF resources
 - whether user is allowed to perform some action on OGSADAI WSRF resource



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Heterogeneous data sources

- Data sources
 - databases: RDBMS, PMS (OODBMS), XML
 - file systems: local, remote (WebDAV)
 - Internet: http/https, FTP, GridFTP, ...
- OGSA-DAI
 - Enable access to diverse data sources
 - Low level data access technology
 - Extended to support WebDAV and PMS
 - Additional delivery activities



OGSA-DAI / WebDAV

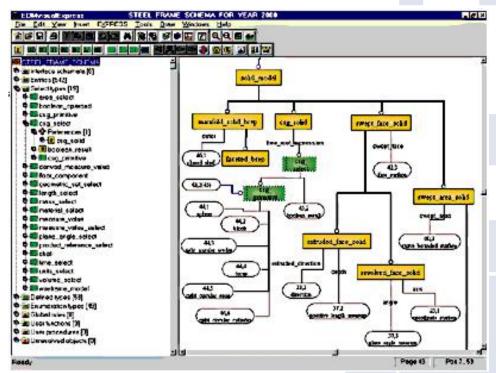
- WebDAV data source
 - similar to file activities in OGSA-DAI
 - integration with OGSA-DAI deployment mech.
- WebDAV delivery activities
 - deliverToWebDAV, deliverFromWebDAV
 - security consideration

```
<deliverToWebDAV name="putWebDAVFile">
  <fromLocal from="dataSink"/>
  <toWebDAV
    host="http://localhost:8090/slide/"
    file="/slide/files/test.txt"
    username="root"
    password="root" />
  </deliverToWebDAV>
```



OGSA-DAI / PMS

- OGSA-DAI integration with product model servers
 - non-standard SDAI implementations
 - make it first work for EDM
 - business objects
- to be available January 2006



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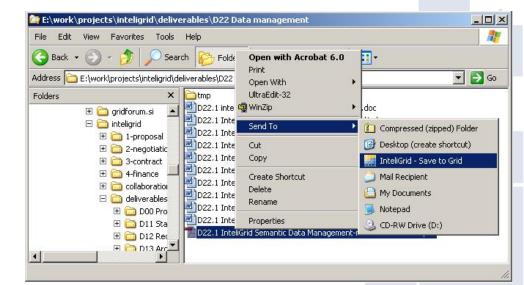


End-user way of working

- should not changed
- support of Windows platform
- grid enable Windows applications (save, load)

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Conclusions

End user / industry driven work

- Not a typical grid project
- Almost no HPC involved
- Data management
 - OGSA-DAI middleware
 - OGSA-DAI extensions
- Ontology services
 - support virtualization, data location independence
 - Personalization

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The end

