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DIESIS aims to protect European infrastructures

Sankt Augustin, April 28, 2008

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The increased pan-European dependencies of critical infrastructures carry the risk of failures or breakdowns at an international level as a result of natural disasters, acts of terrorism, human error, or information and telecommunication technology failure. In an effort to address this problem, the EU now launched the DIESIS research project to design an interoperable European federated simulation infrastructure under the leadership of the Fraunhofer Institute for Intelligent Analysis and Information Systems IAIS.

New EU project to design a European modelling and simulation infrastructure for exploring the security of dependent critical infrastructures

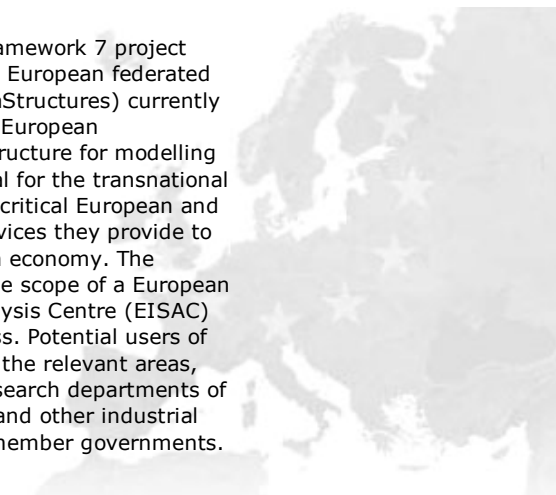
The fact that critical infrastructures such as energy, telecommunications, transport and water in Europe are becoming increasingly interdependent creates more complexity and risk of severe disruptions that hardly can be managed. The danger increases that a breakdown in one infrastructure may cascade to other infrastructures, potentially at a European scale.

Examples of European Critical Infrastructure disruption:

November 4, 2006, 22.09: Parts of Germany, France, Belgium, Netherlands, Italy, Austria, Switzerland, Croatia, Czech Republic, Morocco, Portugal and Spain remained without electrical power for up to 120 minutes affecting 15 million European citizens. The reason was that a 380 kV high-voltage power line in Germany had been temporarily shut off without proper preparations.

August 12, 2002: the cyclone "Ilse" caused a flooding of the basin formed by the rivers Elbe and Donau. In Germany, Austria and the Czech republic, the flooding disrupted several critical infrastructures, including streets, water supply, waste water systems, electrical power systems and more. In Austria alone, 250 street and rail bridges had to be completely rebuilt. The estimated economical damage was more than 12 billion Euros.

Designing an Interoperable European federated Simulation network for Critical InfraStructures What is required first to prevent such risk is analyzing the weaknesses of dependent critical infrastructures in Europe and their resulting vulnerability to certain failure and threat scenarios. Currently, the understanding of the pan-European infrastructures with their broad range of geographic and sector-specific dependencies and interaction is still underdeveloped. Studying these complex infrastructure systems demands joint interdisciplinary efforts by researchers, industrial stakeholders and governmental organisations. The research dealing with complex infrastructure systems depends on the use of models and simulation environments as a tool because disruptions and mitigating measures, for obvious reasons, cannot be studied or tested in real world circumstances. While there are very good simulators for certain infrastructures available today, there are no suitable simulators capable of simulating the interaction of multiple dependent infrastructures.



The task and objective of the EU Framework 7 project DIESIS (Design of an Interoperable European federated Simulation network for Critical InfraStructures) currently being launched is to develop a pan-European standardized e-platform and infrastructure for modelling and simulation that are fundamental for the transnational exploration of safety aspects of the critical European and national infrastructures and the services they provide to European citizens and the European economy. The platform shall be provided within the scope of a European Infrastructures Simulation and Analysis Centre (EISAC) to be established later in the process. Potential users of EISAC comprise research groups in the relevant areas, public security offices, corporate research departments of operators of critical infrastructures and other industrial stakeholders, as well as European member governments.

The benefits of EISAC and of the technical concepts developed under the DIESIS project include:

- The research activities of different groups of researchers deliver more comparable results because they all use the same technical basis and the common standards that are being developed;
- Using the EISAC e-infrastructure creates the possibility of reducing the technical effort and the costs of establishing the interoperable simulations and enables the researchers to focus on the core objectives to be achieved in a fast way;
- The EISAC e-infrastructure supports the development of transnational safety prevention concepts and helps to avoid the evolution of different national concepts that might be mutually incompatible,
- The EISAC e-infrastructure may support pan-European emergency planning for emergencies such as wide-area flooding, and long-term critical infrastructure breakdowns.

DIESIS will develop an ICT architecture (ICT = Information and Communication Technology) for a distributed European e-infrastructure ("e" standing for "electronic") that will support interoperable simulations and research of the member states on critical infrastructure protection. Establishing such a distributed e-infrastructure in more than one country requires careful preparation.

Background information:

In the course of the 24 months research project provided with a budget of over 1.5 million euros, DIESIS will perform a conceptual design study including the following steps:

- Analyse in detail the requirements for the research e-infrastructure coming from researchers, industrial stakeholders, infrastructure operators, decision-makers and governmental organisations;
- Develop an extensible common terminological basis (ontology) and communication protocols in order to define a standard for interoperable simulations in critical infrastructure protection;
- Develop concepts enabling interoperability among heterogeneous and distributed modelling and simulation technologies;
- Assess the (scientific, technical, financial and legal) feasibility and the potential (scientific and technical) impact of such an e-infrastructure;
- Implement a prototype of such an e-infrastructure as a proof of concept;
- Develop a strategy and roadmap for the deployment of an e-infrastructure, including a business model, an organisational model for the operating entity of the EISAC (European Infrastructures Simulation and Analysis Centre), a list of possible sponsors for the e-infrastructure, a list of possible services to be offered, and a list of potential users and customers.

The research e-infrastructure developed by DIESIS for all-European cooperative simulation facilities also aims at stimulating joint research activities in the area of critical infrastructure protection (CIP) by connecting various modeling and simulation communities.

Project Partners:

Besides Fraunhofer IAIS, the consortium consists of:

- Campanian Consortium for Research in Informatics and Industrial Automation (CRIA), Italy,
- Italian National Agency for New Technologies, Energy and the Environment, (ENEA),
- Imperial College London, UK
- The Netherlands Organisation for Applied Scientific Research (TNO)

Further information:

<http://www.iais.fraunhofer.de>

<http://www.diesis-project.eu>

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