



## DELIVERABLE 5.3.9 PROJECT LEAFLET / BROCHURE

### WP5 Project Management

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Abstract: The description of the general CrossGrid project brochure and the two application brochures.



### Delivery Slip

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### Document Log

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## 1. INTRODUCTION

At the time of writing of this document, there are three brochures available for use by the Dissemination Team and the various partners of the CrossGrid project. These brochures can be and are used at all public events where there is a need to provide information about the project.

All brochures are in colour and provide addresses (standard and electronic) of CrossGrid partners that may be contacted for further information on the project.

The brochures are the following:

- the general CrossGrid brochure
- the brochure for the Floods Management application
- the brochure for the Biomedical Application

## 2. THE GENERAL CROSSGRID BROCHURE

The general CrossGrid brochure is intended for people who have at least a very basic knowledge of Grid technology and are interested in it and in distributed computing in general.

This brochure is printed in A3 format and folded along the middle. The first page contains some introductory text concerning the goals of CrossGrid.

The second and third pages contain a separate passage for each of the four CrossGrid applications. Each passage is accompanied by an indicative image.

The fourth page provides a map of Europe illustrating the origin and acronyms of each institution participating in the project. The contact information appears below the page.

The two sides of the brochure are shown here:

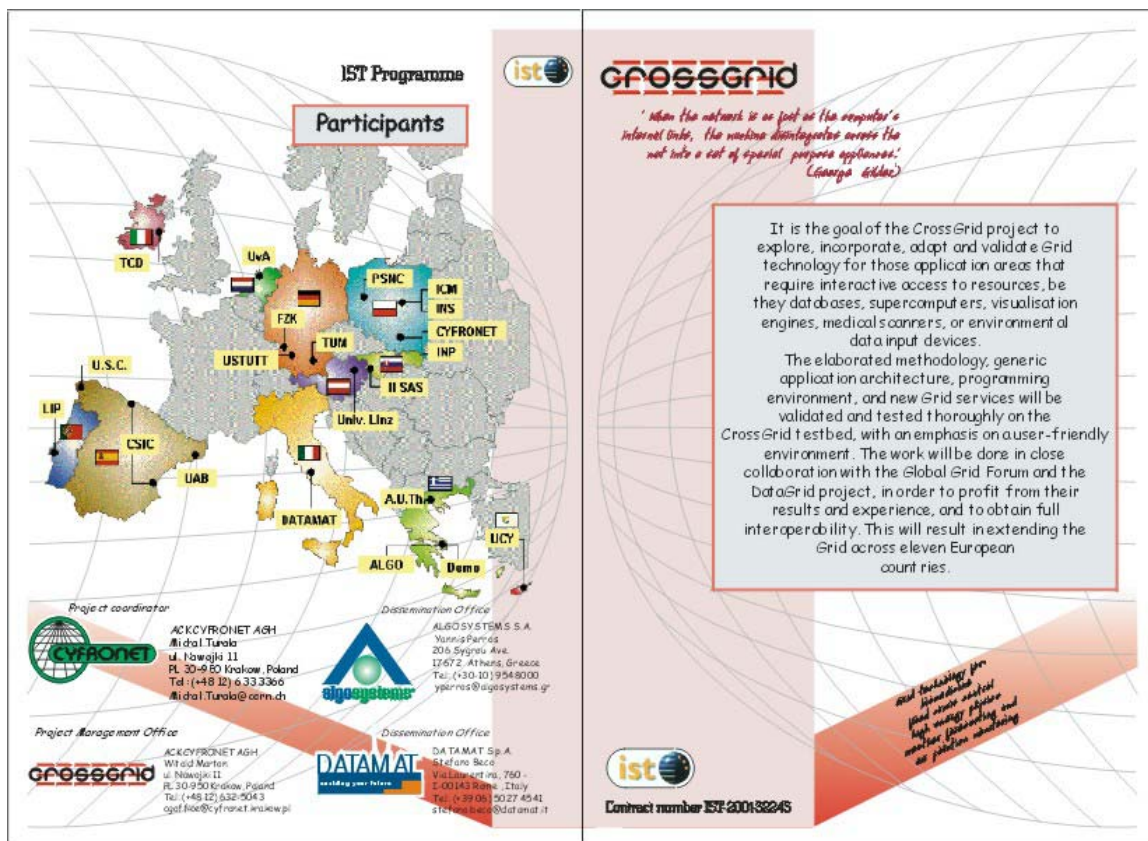


fig 1. Pages 1 and 4 of the general CrossGrid brochure



fig 2. Pages 2 and 3 of the general CrossGrid brochure

### **3. THE BROCHURE FOR THE FLOODS MANAGEMENT APPLICATION**

This is the brochure that describes the Flooding Crisis Team Support application that is being developed in the context of CrossGrid. This is intended for those people who are likely to use and benefit from such an application e.g. key personnel in environmental management services.

The brochure is printed in A4 format. The first page describes the class of situations - flood crises - that have necessitated the development of the application and contains some statistics, as well as some descriptive images.

The second page describes the application in more detail and the support provided by Grid technology and CrossGrid in its development. It also contains some images. As stated earlier, contacts are given at the bottom of the page.

The two sides of the brochure are shown in the following pictures:

**CrossGrid**



**A grid of computing resources for supporting flood management**

**monitoring**  
NETWORK OF RADARS

**forecasting**

**simulation**

**In July 1998, an extreme storm hit a part of eastern Slovakia. The resulting flash floods in small mountainous basins affected 10850 people in 75 villages. The flood took 47 human lives, 756 people remained homeless and 3618 people had to be evacuated. 2059 houses were flooded and 279 houses were destroyed. Over 5300 farm animals perished. Total flood damages were estimated to be more than 20 million Euros. As a consequence of this and other flood events, the performance of several current flood-forecasting methods has been evaluated.**

**Floods Devastate Europe**  
August 2002

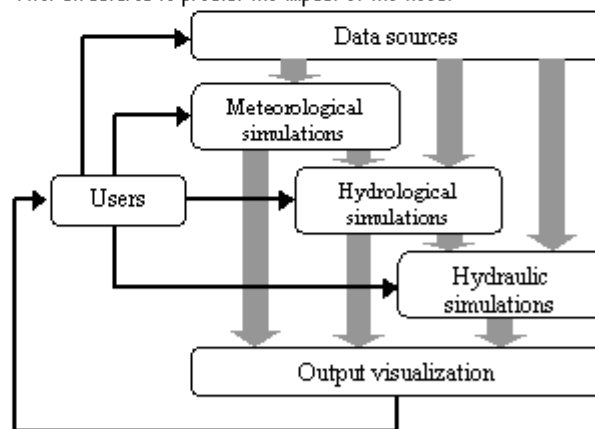
Floods have killed more than 90 people as water has swept through cities, towns and villages. Tens of thousands have been evacuated from their homes and holidaymakers have been fleeing from the devastation. Germany, Slovakia, the Czech Republic, Austria, Romania and Russia have all been hit by the floods. German officials have estimated that the damage will cost billions of Euros.



**CrossGrid, an IST Programme R&D Project Supports a Grid Infrastructure for Flood Management Decision Making**

The recent extreme floods in Europe and, in particular, Central Europe resulted in scientific and societal concerns about the reliability of short-term quantitative meteorological forecasts and flood forecasts in Slovakia. Besides the danger of flooding in large basins, flash floods present a serious threat, because of the specific physiographic conditions of the country.

Flood forecasting requires quantitative precipitation forecasts based on meteorological simulations of different resolution from the meso-scale to the storm-scale. Especially for flash floods, high-resolution (1 km) regional atmospheric models have to be used along with remote sensing data (satellite, radar). From the quantitative precipitation forecast, hydrological models are used to determine the discharge from the affected area. Based on this information, hydraulic models simulate water flow through various river structures to predict the impact of the flood.

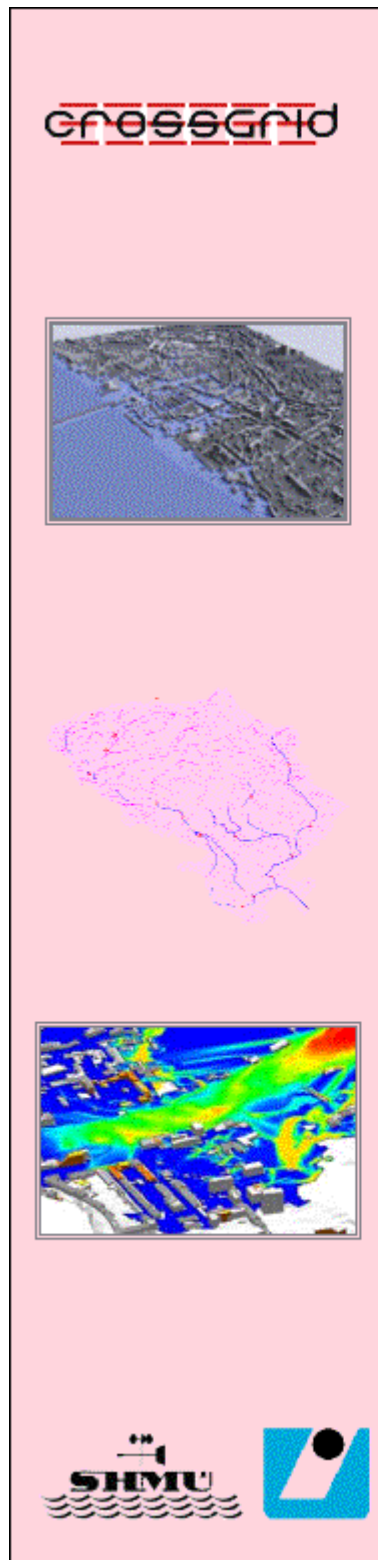


Such simulations - as decision making aids - require high-performance computing resources and infrastructure that normally aren't available locally on the appropriate scale. Grid computing is a technology that enables the sharing of computing resources across different institutional boundaries. It builds on the technology of the Internet and the Web to provide a new class of computing infrastructure. It provides scalable, secure, high-performance mechanisms for discovering and negotiating access to remote resources.



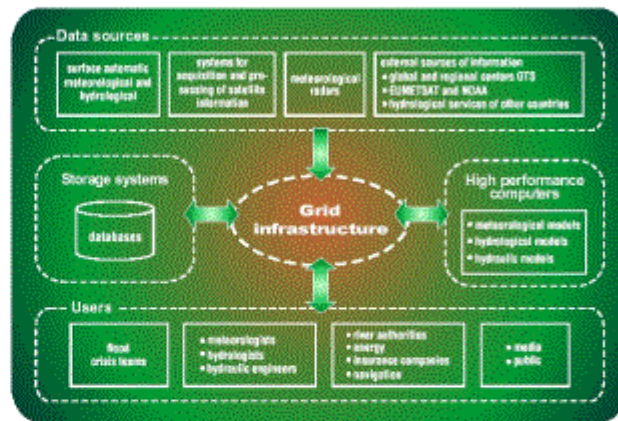
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fig 3. Page 1 of the floods application brochure



## The CrossGrid Platform Supports Flood Management Applications

The CrossGrid project addresses the development of a support system for the establishment and operation of a Grid-based Virtual Organization for Flood Forecasting, which will associate a set of individuals and institutions (different boxes in data sources represent different data providers) involved in flood prevention and protection.



The system employs the Cross Grid platform of Grid services and tools to seamlessly connect together experts, data and computing resources needed for quick and correct flood management decisions. The main component of the system will be a highly automated early warning system, based on hydro-meteorological (snow melt) rainfall-runoff simulations. Moreover, the system will integrate advanced communication techniques, allowing crisis management teams to consult various experts, before making any decisions. The experts will be able to run simulations with different parameters and analyze the impact (what-if analysis). The use of Grid resources is vital especially in the case of a flood crisis, when such simulations have to be performed under strict time limitations.

### The partnership

The Institute of Informatics of the Slovak Academy of Science, in collaboration with the Slovak Meteorological Institute, is responsible for the development of the system within the CrossGrid project.

CrossGrid, an EC-funded R&D project, involves 21 partners and is coordinated by CYFRONET, the Academic Computing Center in Krakow, Poland. The dissemination and exploitation of the results of the CrossGrid project is coordinated by Algosystems S.A., an IT company based in Athens, Greece.

### Contacts

SAS  
Dr. Ladislav Hludý  
hludyl@savba.sk

CYFRONET  
Prof. M. Tunala  
Michal.Tunala@cern.ch

SHMU  
Dr. Karol Martinka  
Karol.Martinka@shmu.sk

Algosystems S.A.  
Yannis Perros  
yperros@algosystems.gr



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fig 4. Page 2 of the floods application brochure

#### 4. THE BROCHURE FOR THE BIOMEDICAL APPLICATION

This is the brochure that describes the application for the Interactive Simulation and Visualization of a Biomedical System that is being developed in the context of CrossGrid. Again, this is intended for those people who are likely to use and benefit from such an application, primarily vascular surgeons and cardiologists.

This brochure is also printed in A4 format. The first page describes the class of situations - vascular diseases - that have necessitated the development of the application and contains some descriptive images.

The second page describes the application in more detail and illustrates the role of Grid technology and the CrossGrid infrastructure in its development. It also contains some images. As stated earlier, contacts are given at the bottom of the page.

The two sides of the brochure are shown in the following pictures:

**CrossGrid**

A CT scanner

Stenosis or narrowing of an artery

Viewing the arterial structure in an immersive 3D environment

*The IST Programme Develops  
Virtual Arteries - a Grid  
Infrastructure for Surgical Planning*

Vascular diseases are a major medical problem, particularly in the developed countries and are of major concern in Europe. Treatment often involves surgery. Two common procedures are the placement of a bypass to lead the blood around clogged (stenosed) arteries and the placement of so-called stents that provide support to weakened (aneurysmal) arteries. A surgeon plans these interventions on the basis of 3D images obtained from MRI or CT scans. Both stents and bypasses aim to improve blood flow and for both procedures there are often various alternatives. Besides considerations such as accessibility, the attainable improvement in blood flow will determine which alternative is best for a particular patient.

Information systems that support vascular surgeons in their preoperative decision making for certain interventions in the vascular system can benefit from advanced simulation and visualisation tools. Such tools require access to vast computational resources.

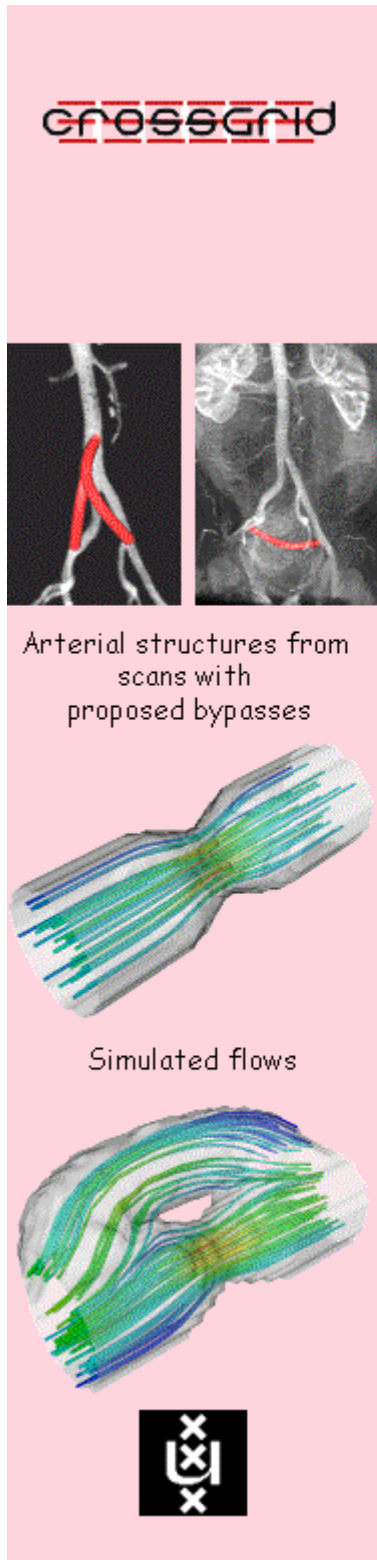
Grid computing provides a modern way of addressing problems of this kind, by linking together hundreds or even thousands of geographically distributed computers to harness their total processing potential.

A prototype system for pretreatment planning in vascular interventional and surgical procedures is included as an application of Grid computing in the CrossGrid project. This prototype relies upon the CrossGrid infrastructure for its operation, advancing medical technology on a European scale.



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fig 5. Page 1 of the biomedical application brochure



## **CrossGrid Provides a Grid-based Approach for Virtual Arteries**

The CrossGrid Virtual Arteries application aims to support the surgeon in making decisions by predicting blood flow, on the basis of the observed geometry of the arteries, the proposed intervention and other relevant data to be provided by the expert user.

Interactive 3D visualisation is used to present the results to the surgeon and to define the proposed interventions in a clear and intuitive manner.

### **The role of the Grid**

Advanced Grid-based simulation and interactive visualisation techniques require transparent and secure user access to distributed resources and high computing performance. The CrossGrid infrastructure allows the medical scanners and data, the visualisation environment and the computational resources required for the flow computations to be in separate geographical locations and in distinct administrative domains. The use of the Grid allows the application to access the high performance computing resources at short notice, without requiring a large capital investment.

### **The partnership**

The Computational Science Section of the University of Amsterdam, Netherlands, is responsible for the development of the biomedical application within the CrossGrid project.

CrossGrid, an EC-funded R&D project, involves 21 partners and is coordinated by CYFRONET, the Academic Computing Center in Krakow, Poland. The dissemination and exploitation of the results of the CrossGrid project is coordinated by Algosystems S. A., an IT company based in Athens, Greece.

### **Contacts**

University of Amsterdam  
 Prof. P. M. A. Sloot  
 sloot@science.uva.nl

CYFRONET  
 Prof. M. Turala  
 Michal.Turala@cern.ch



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Algosystems S.A.  
 Yannis Perros  
 yperros@algosystems.gr

fig 6. Page 2 of the biomedical application brochure