Grid-based Problem Solving Environment for Flood Forecasting

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Abstract: This paper presents a prototype of the Collaborative Problem Solving Environment for Flood Forecasting. Flood forecasting is a complex problem that requires cooperation of many scientists in different areas. To enable this cooperation in a manner comfortable to hydrometeorological experts, a part of the CrossGrid project is aimed towards developing a Virtual Organization support system, whose prototype is described here. The software consists of a cascade of simulation models, a storage system for computed and measured data and other used datasets, a web-based portal with collaboration tools and a powerful computation facility. The whole system is tied together by Grid technology and is used to support a virtual organization of experts, developers and users.

Key words: Problem Solving Environment, Simulation, Virtual Organization, Grid Computing.

1   Introduction

Over the past few years, floods have caused widespread damages throughout the entire Europe. They have affected most of the European population and resulted in heavy material losses. The need for better flood protection has become imminent.

In this paper we present the prototype of a problem-solving environment (PSE) [1] for the establishment and support of a virtual organization for flood forecasting (VO) [5]. The VO is intended to connect individual users as well as organizations involved in weather prediction and river management. The system uses Grid technology [2] to distribute meteorological, hydrological and hydraulic simulations across VO resources to minimize computing time and to shorten responses to VO members' requests.

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