

Virtual organization for flood crisis team support*

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Abstract

In this paper we propose a general architecture of a flood warning system based on the Grid technology. We describe a virtual organization founded in order to solve several complicated tasks, ranging from basic data collecting through computationally intensive simulations to issuing warnings to official authorities. We propose a specific realization utilizing web-based portal and several cascaded distributed simulations based upon the Globus grid middleware.

1 Introduction

This article deals with the design of a support software system for a virtual organization for flood forecasting and prevention. The system proposed here is a part of a nation-wide project, aimed towards better coordination of resources in weather prediction, hydrological situation monitoring and flood forecasting.

The article is composed of several chapters. The first chapters describe general theory of virtual organization creation and management and problem solving environments as a means of software support for such virtual organizations. There is also description of the specific properties of a problem solving environment for weather prediction and flood forecasting. In the fourth chapter is explained technology, needed for such problem solving environment. The next chapter uses the terms explained there for the specification of our own problem solving environment.

2 Virtual organizations

The virtual organizations are based on the Grid concept [1][2], what is a coordinated resource sharing and problem solving in dynamic, multi-institutional environment. The sharing includes access to computers, software, data, and other resources, as is required by different problems

existing in science and industry. Grid computing has emerged as an important new field, distinguished from conventional distributed computing by its focus on large-scale resource sharing.

The main advantage of Grid technologies is that they connect distributed resources into one virtual organization in a way that greatly simplifies their use and is transparent to the end user, thus allowing users to focus on the core of their work and freeing them of negotiating access to remote resources every time they are needed.

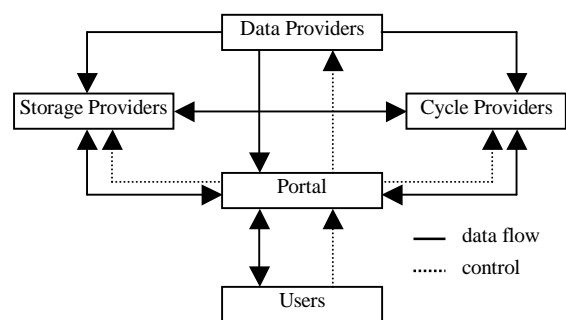


Figure 1. The roles of entities in (our) VO and the flow of data and control

A creation of virtual organization requires setting up certain basic services on resources designated for sharing to make them Grid enabled. These services include information and monitoring service for reporting resource

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