

Mobile Service Management in Service Orientated Grids

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Akogrimo is an EU Framework 6 project developing an infrastructure to support the use of mobile services within Grid computing applications. This investigation focuses on the presentation of mobile services as valid resources for Grid applications to use. The project is nearing completion and has developed an architecture supporting eHealth, eLearning and Disaster and Crisis management testbeds.

What sets Akogrimo apart from many other service-oriented architectures (SOA) and mobile Grid applications is that Akogrimo focuses on the provision of applications that use resources sourced from mobile Grid services. This is in contrast to common methods of mobile Grid usage where the client is mobile and the services static: a one-to-many relationship. In the case of Akogrimo, both clients and services can be mobile.

The key advantage of SOA in Grid environments is that applications can be composed from multiple separate services that are executed to a specified workflow. This enables the SOA applications that run on Grid computing platforms to become more business-oriented and adaptive to user needs. Users also have increased flexibility in their choice of service provider, with service selection taking place close to execution time. Mobile Grid services add an extra dimension to this, as the workflow must adapt to service behaviour introduced with the addition of mobility.

In order to enhance this service composition and workflow management, Akogrimo has developed an infrastructure to support the selection and execution of

mobile services. This is based on both context management and service composition. The Akogrimo approach is to present service and network context monitoring to aid service composition based around four main architectural layers: the network, service providers, Operative Virtual Organization (OpVO) and Base Virtual Organization (BVO).

The Base VO is the head of the infrastructure and controls the behaviour of the services that pass information down to the bottom two layers. The Operative VO layer allows the BVO control to be abstracted and applied to specific applications, the design being an Operative VO per application instance. This allows specific services to be grouped together in environments that are focused on a specific application delivery. The service providers are mobile and linked to the network, and data related to mobility is monitored by services in the OpVO within specific context management services.

There are three testbeds. One (eLearning) is mainly used as a case study for developing individual services using the Akogrimo infrastructure. The eHealth testbed uses a service-oriented workflow that invokes application serv-

ices based on the infrastructure. This twelve-partner testbed was demonstrated forty times at a major European conference (IST2006). The DHCM (Disaster Handling and Crisis Management) testbed is being developed at present and the infrastructure and partnership are being extended for this.

The key innovations in these testbeds have been in the services that enable the Akogrimo applications to traverse the levels of the mobile Grid infrastructure. This has been achieved by services that represent network and Grid middleware services. These services work by processing subscriptions and monitoring changes in mobility of the services at the network level that may affect the larger workflow of the application at middleware level.

As Akogrimo goes into the future the focus is on increasing the level of communication between these layers using approaches that are increasingly available in similar fields such as the Semantic Grid. In addition, it is intended that a wider range of mobile positioning devices be used, introducing the concept of mappings of space to the applications. A bid is being developed to explore this in more detail.

Link:
<http://www.mobilegrids.org>

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