Access to Knowledge Through the Grid in a Mobile World –

Competitive Call for Testbed Provider

Call Announcement

ANNOUNCEMENT OF A COMPETITIVE CALL FOR AN ADDITIONAL PROJECT PARTNER

The following project, active in the EU Sixth Framework Programme for research, technological development and demonstration activities *contributing to the creation of the European research area and to innovation (2002-2006),* requires the participation of a new partner to carry out certain project tasks.

Project information	
Project contract number	*004293*
Project acronym	Akogrimo
Project full name	Access to Knowledge Through the Grid in a Mobile World
Instrument type	Integrated Project

SIXTH FRAMEWORK PROGRAMME

PRIORITY IST-2002-2.3.1.18

Grid for complex problem solving

Summary of tasks requested

The Akogrimo Integrated Project is aiming at the integration of possibilities of modern mobile networks with advanced properties of so called 'Business Grids'. It is funded under the IST Strategic Objective "Grid for Complex Problem Solving" and is one of the major contributors to the definition of Next Generation Grids. The Akogrimo project will extend and adapt capabilities of beyond 3G networks for complex distributed applications based on Grid middleware and in the same way will extend existing Grid architectures solutions beyond current reference models such as the Open Grid Service Architecture (OGSA).

This Call concerns workpackages in the field of testbed definition, realisation, validation and also contribution to exploitation activities of the Akogrimo Integrated Project. The role of the existing two testbeds in the eHealth and eLearning domain is to drive through their requirements several activities within the project including business modelling and architecture definition. The realised testbeds will be a key element for the validation of the architecture and the developed middleware components. As the validation scenarios are expected to be one of the exploitable elements of the overall projects they will also contribute to the exploitation activities.

Specific attention will be given on how the proposed testbed will contribute to the elements mentioned above. Furthermore each proposal should clearly indicate the challenges addressed with respect to Knowledge Services, Mobility, Grids and should indicate the business relevance of the proposed scenario.

The Akogrimo consortium has already analysed potential application fields in the public available deliverable "Testbed description" which is available on the public web page of the project at http://www.mobilegrids.org. As part of this work the application domain of Disaster Handling and Crisis Management has been identified as a very promising area for Mobile Grids and proposal in this domain are especially encouraged to submit a proposal. Disaster Handling and Crisis Management is seen as particular interesting as these kind of applications are very complex, there is typical the problem of lack of control and information management as many actors are involved in the process. Such application can be characterized as follows:

- Large amount of information from a variety of sources is available which is incomplete, inconsistent or even wrong.
- There is a high time pressure
- Multiple several actors acting simultaneously that need collaboration in space and time to coordinate their actions and resources
- Often the regular processes for making decisions are insufficient or broken so a high level of adaptation is needed.
- Each actor will focus on solving short-term problems as observed from different standpoints.
- There is a high interest from external actors such as mass media (newspapers, TV, radio, etc)
- State of lawlessness hindering the overall operational work may occur

However there is no limitation to this domain and proposals from other application domains imposing similar requirements are welcome.

The following elements need to be addressed in order to meet the objectives of this call

1. The proposed scenario must clearly impose challenges on Knowledge Services, must benefit from Mobility aware networks and must show the relevance for Grids

2. There must be a visible benefit of the proposed scenario for the requirements definition and validation activity compared to the existing scenarios in the eHealth and eLearning domain

3. The business relevance of the scenario and potential contribution to the exploitation activities must be shown

4. The Akogrimo project is aiming at the provision of the middleware solution under open source. The implications of the proposed scenario with respect to IPR should be indicated and a list of existing applications to be used for the realisation of the testbed must contain the used licenses either in the Annex or in case of open source licenses the location in the Internet.

The contractor(s) to be selected under the present Call therefore will be joining an existing team in jointly executing the work. Assessment will be based on S&T excellence, quality of the proposer and mobilisation of resources. The consortia should be kept small and could be proposed by a single partner. However we expect beside application providers also real end users of the proposed application.

Expected duration of participation in project	
From	To
09/2005[1]	06/2007
Estimated costs and planned funding for the tasks	
Research costs:	€ 381.000 (FC, FCF), € 190.500 (AC)
Demonstration costs:	€ 170.000 (FC,FCF), € 59.500 (AC)
Training costs:	€0
Consortium management costs	€0
Total Cost (FC / FCF)	€ 551.000
Total Cost (AC)	€ 250.000
Total Commission funding available	€ 250.000
Important Submission Information	
Call Identifier	FP6-2005-IST-AKO
Language in which proposal should be submitted	English
Date of close of call	3rd August 2005
Time of close of call	17h00 Brussels Time

[1] Depends on the final date of call closure

Detailed description of the requested contribution

This section will start with a short outline of the overall project structure and the rough dependencies between them. The requested contribution is expected to be in the workpackages WP2.3 Testbed Definition, WP5.2 Testbed Realisation (major part), WP5.3 Architecture Evaluation and Assessment and WP7.1 Demonstrator. Whereas WP2.3, WP5.2 and WP5.3 are Research Activities and WP7.1 belongs to demonstration activities where different funding policy might apply depending on your cost model.

The second part provide a more detailed description of the relevant workpackages and there planned start and end dates. As a general policy for defining deliverables you should foresee at least one Internal Deliverable (or Project Output) for project internal consumption and contractual deliverables at least at the end of the Workpackage. Proposer should indicate the relationship and dependencies between the deliverables and the outputs if applicable.

Activities and Workpackage Breakdown

The implementation plan is organised in *activities*. Each activity contains one or more *work packages (WPs)*. The numbering reflects this structure. An overview of the programme break-down in Activities and Work Packages is provided in Table 1. Activities may run in parallel throughout, or for substantial fractions of the lifetime of the project.

ID	Name	Expected result
Activity 1	Integrated Project Management	IP Management
WP1.1	General Co-ordination	Financial & Overall Coordination
WP1.2	Programme Management	Day-to-day Programme Management
Activity 2	Environment & Requirements definition	Context for the project
WP2.1	Market & Regulations	Project outcomes fit into the market
WP2.2	Environment & Project Context	Economic and Technological environment is identified
WP2.3	Testbed Definition	Testbeds are defined and their requirements are identified
Activity 3	Architectural framework	Overall Akogrimo Architecture
WP3.1	Overall Architecture Definition and Layer Integration	Complete Picture how the different layer work together and which responsibilities are assigned to each of the layers
WP3.2	Business Modelling Framework	Indicative Business Cases
Activity 4	Detailed Architecture, Design & Implementation	Prototypes and Infrastructure

	WP4.1	Mobile Network Architecture, Design & Implementation	Network Design and Infrastructure
	WP4.2	Network Middleware Architecture, Design & Implementation	Prototype
	WP4.3	Grid Infrastructure Services Layer	Prototype Services
	WP4.4	Grid Application Support Services Layer	Prototype Services
Activity 5		Integration and Application Case Studies	Application Case Studies
	WP5.1	System Integration	Integrated Prototypes and Interoperation assessment
	WP5.2	Testbed Realisation	Working prototype
	WP5.3	Architecture Evaluation and Assessment	Metrics and Assessment of the architecture and prototypes. This includes the assessment of the quality of the interoperation
	WP5.4	Application Adaptation, Methods & Tools	A Set of Methods & Tools for Akogrimo that allows others to integrate their application into the Akogrimo framework
Activity 6		Dissemination, Liaison, Leadership & Standards	Exploitation by-products
	WP6.1	Dissemination	Collaboration with others projects, Technology Fairs, Conferences, Scientific Publications
	WP6.2	Standardisation	Input to selected standards bodies
	WP6.3	Exploitation	Patents and New products
	WP6.4	Collaboration	Ensure collaboration with other efforts in FP6 relevant to Akogrimo and ensure contribution towards joint efforts within the European Grid community
	WP6.5	Impact Assessment	Methods for measuring the impact and the assessment of the impact achieved
Activity 7		Demonstration Trials	Demos
	WP7.1	Demonstrator	Working demonstrator
Activity 8		Training	Ensure take up of the results through early adopters
	WP8.1	Technological Training	State-of-the art evaluation

Table 1 Summary of the project structure in activities and work packages

Implementation Plan

The basic approach is to have in the first months of the project a preparatory phase where the context and environment for the project is identified. This includes analysis of the state-of-the art but also the market and the socio-economic environment.

The Implementation Plan uses an iterative and incremental approach. The work packages are grouped to Activities for a better description of how the implementation plan will allow us to reach the project objectives and related results. The Activities contains work packages belonging to only one of the four activities types requested by the Commission (i.e. RTD, Management, Demonstration and Training). Furthermore, each of these work packages could be further organised to one or more tasks that will be detailed in below.

The plan is structured in two overlapping cycles:

The **first cycle** has duration of 18 months. The main objectives of this cycle are to assess the state of the art of Grid and Mobile Internet (IPv6) technologies investigating implication in creating Grid services that utilizes the functionality of the feature enhanced network layer compared to the currently used IPv4 networks. This cycle will clearly demonstrate the potentialities with respect to the project challenging vision investigating the feature interaction of the so far orthogonal worlds.

This will help us in managing and mitigating the technology risk. Re-using existing Grid aware applications and the approach to replace and modify existing Grid Services utilising mobility enabled IPv6 functionality will allow the early provision of some basic results for technical evaluation as well as for assessing the Akogrimo infrastructure requirements. This is possible due to the already available expertise and pre-existing knowledge and software solutions within the Consortium. In this cycle particular emphasis will be given to the investigation and monitoring of the continuous developments in the Grid and Mobility domain in order to re-use the results of the various initiatives running in EU (especially in Research Networking Infrastructure call) and in other countries.

The **second cycle** will be mainly devoted to the construction of a first instance of the Mobile aware Grid infrastructure, test-bed's design and implementation. It will have duration of 22 months (4 months simultaneously with first cycle). The Grid based software architecture will be developed taking into account innovative aspects related to semantic grid, trust and security for service provision and for facilitating the creation of virtual organisations, and their dynamic mapping to one or in case of a roaming scenario multiple administrative network domains. It is expected the mechanisms available at the network layer and the network middleware layer will support the overall service provisioning process of the Grid applications considering the economic value added chain in a mobile environment. This cycle ends with two iterations within a transition phase that will be focused test-bed's experimentation and project results evaluation.

It is worth to underline the role of the testbeds in the two project cycles. In the first cycle, they will simply provide their needs in order to allow a first validation of the partially merged infrastructure. In the second cycle the users stimulated by the results of the first cycle will review the testbeds specifications providing new inputs for the whole Akogrimo infrastructure design and implementation. In this cycle the testbeds will be designed and implemented. Finally in at the end of the second cycle the testbeds will be executed for validating the Akogrimo infrastructure and the project results in general. The testbeds execution will imply some maintenance activities concerning the software architecture.

The following table shows in greater detail the timeline for the chosen iterative approach:

Phase	No. of Iterations	Start	End	Duration in month	Remarks
1st Cycle				**18**	
Inception Phase	1	Month 1	Month 3	3	
Elaboration Phase	2	Month 4	Month 11	8	
Construction Phase	1	Month 12	Month 18	7	
Transition Phase[2]	-			-	Not executed for the first cycle
2nd Cycle				**22[3]**	
Inception Phase	-	-	-	-	Not executed in the second cycle
Elaboration Phase	1	Month 14	Month 19	5	This phase runs for 4 months in parallel to construction phase of the 1st cycle
Construction Phase	3	Month 20	Month 29	9	
Transition Phase	2	Month 30	Month 36	6	
Overall Duration				**36**	

Workpackage details

As mentioned above the contribution is expected in the workpackages described below.

WP2.3 Testbed Definition

Start Date: PM 14[4]

End Date: PM 20

Based on the experiences in the first cycle the scenarios from cycle one will be further refined and

Task 2.3.1: Scenario Definition

Visionary scenarios from the domain of the new 3rd testbed outlining the need for and the benefit of using Grid technology, the capabilities of Mobility, the business opportunity and for each scenario the stakeholders will be identified. These testbeds will support an extended vision that will not be possible to be implemented in all aspects in the lifetime of the project but will represent a clear roadmap for further development starting from the project results and will also build vital input for the work packages of Activity 6. In the second cycle this activity is limited to the 3rd testbed and minor updates for the scenarios from cycle one if needed.

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[2] Even if the RUP identifies 4 phases it is not necessary to have all phases to be executed in every cycle. For Akogrimo the first cycle does not include a Transition Phase and ends with the Construction Phase.

[3] Please note that the two cycles do overlap for 4 months so that the overall duration of the projects is 36 months

[4] All dates are relative to the start date of the Akogrimo project

Task 2.3.2: Validation Scenario Definition

This task will define the scenarios that are expected to be implemented in WP5.2. The scenarios will be defined using UML technology and concepts such as Use Cases, Deployment diagrams and Sequence Diagrams. In particular it is expected to see here what is expected to be realised later one as Application Service and which services and functionality is expected from the Akogrimo platform.

Task 2.3.3: Demonstrator Definition

In the second phase of the project in this task the functionality expected for the demonstrator at the end of the project are identified. It is expected that all testbed providers contribute to this demonstration and join their forces here to provide a clear showcase for mobile grids.

WP5.2 Testbed Realisation

Start Date: PM 20

End Date: PM 36

Within this work package the components of the Akogrimo platform coming out of the Activity 4 work packages will be used in order to realise the Validation Scenarios of the 2nd cycle as defined in WP2.3 Testbed Definition. The second cycle validation scenarios (the testbeds) will show that the visionary scenarios outlined in the testbed definition phase are feasible and will build the basis for the final demonstrator of Akogrimo.

The testbed realisation will require work to be done within the following categories:

- **Task 5.2.1 Scenario Configuration Definition:** The general description of the scenario must be mapped down to a concrete definition where the involved hardware and software components in the scenario must be defined. This includes a listing of hosting environments for services, network infrastructure and also guidelines for administrative personnel to make proper configurations.

- **Task 5.2.2 Testbed Planning and Environment:** This task covers all the actions needed for setting up the configuration as defined in the previous task and also the definition of a process outlining intermediate versions to be released. It is expected to have an iteration plan showing the specific goals of each intermediate versions and the time and resource planning for this.

- **Task 5.2.3 Testbed Design and Implementation**: This part of the work package is the most important and covers the actual realisation of the testbed specific functionality. This includes the design of the application specific software components and also their implementation.

- **Task 5.2.4 Testbed Operation:** In support of the validation and assessment activities and also to assist in dissemination, training and exploitation activities it is planned to have the intermediate testbeds to be in operation and available for a limited number of users.

WP5.3: Akogrimo Architecture and Scenario Evaluation

Start Date: PM 30

End Date: PM 36

Test purposes are identified based on the requirements put forward by the system model. Test cases - the implementation of a test purpose for a particular test architecture, i.e., a complete specification of the actions required to achieve a specific test purpose - will be developed. Several hardware and software architectures will be chosen for the purpose of generalization of results gathered for test cases and the testbed will be built as a composition of their hardware and software systems.

The Conformance Specifications for Service Environment will be developed with state of the art tools; i.e., UML UTP. This would hopefully integrate notation (languages) across parts of middleware. Best practices of methodology developed for general software testing (component) will be adopted for the purpose of the project.

- **Task 5.3.1: Definition of Testing Criteria**

In order to allow validation and verification of the overall Akogrimo implementation in both qualitative and quantitative manners a set of metrics and test cases must be defined. These test cases must clearly describe the goal of the test and which metrics should be applied.

- **Task 5.3.2: Validation of the Architecture, Prototype and Validation scenarios**

Following the guidelines, test cases and metrics defined in the previous tasks the test cases will be performed. This includes the deployment of the prototype on the IPv6 infrastructure and the execution of a sufficient number of tests.

WP7.1: Demonstrator

Start Date: PM 30

End Date: PM 36

Within this work package the components of the Akogrimo platform coming out of the Activity 4 work packages and the Testbed realisation workpackage 5.3 will be used in order to realise the Demonstrator as defined in WP2.3 Testbed Definition. The major focus of this activity will be on integration and operation activities. The major difference to the Testbed Realisation will be to focus on an European wide deployment at different partner sites.

The Demonstrator will require work to be done within the following categories:

- **Task 7.1.1 Scenario Configuration Definition:** The general description of the scenario must be mapped down to a concrete definition where the involved hardware and software components in the scenario must be defined. This includes a listing of hosting environments for services, network infrastructure and also guidelines for administrative personnel to make proper configurations.

- **Task 7.1.2 Planning and Environment:** This task covers all the actions needed for setting up the configuration as defined in the previous task and also the definition of a process outlining intermediate versions to be released. It is expected to have an iteration plan showing the specific goals of each intermediate versions and the time and resource planning for this.

- **Task 7.1.3 Demonstrator realisation**: Based on the available components a deployment of the realised infrastructure in form of a demonstrator will be performed.