



GISELA

ACTIVITY EXECUTION PLAN

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Abstract: Grid infrastructures are highly dependent on the reliability and good performance of the network(s) that connect its computing and storage resources. The Execution Plan aims to establish a coherent set of activities and collaboration between the different entities involved in GISELA to support their networking needs. An operational interface will be the single point of contact for Virtual Research Communities (VCRs) and other GISELA users for the support of troubleshooting, monitoring, reporting, infrastructure supervision, and service provisioning needs. Operational procedures will be enhanced to interact with network providers composing the project network overlay infrastructure.



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1. INTRODUCTION

1.1. PURPOSE OF THE DOCUMENT

This document describes the activity execution plan for WP5 – Network Resource Provision and Support, for the duration of the project. This plan is subject to revisions during its execution, as it adapts to the CLARA’s Sustainability Model and as new project requirements or conditions emerge. The formal update and amendment procedure is provided in Section 1.4.

CLARA, as the leading entity of WP5, will explain in this document how the GISELA Networking Provisioning and Support activity will adapt from the procedures developed in EELA and EELA-2, to become part of its Business Plan for the introduction of new networking services, taking into account the Life Cycle Product Management (LCPM) process, which will turn into the implementation of CLARA’s Sustainability Model. WP5 will maintain a central role on engineering and operations support, management of the relationships between GISELA and other entities involved¹ in network resource provision and support throughout Latin America and Europe, strengthening the link between the Virtual Research Communities (VRCs) needs and their partner in the Network/NREN communities, and, to the extent possible, automating the processes for network service provisioning and support.

For a comprehensive view of the Project and of the GISELA Consortium, the Description of Work² (DoW) and the Consortium Agreement (CoA)³ should be consulted.

1.2. DOCUMENT ORGANISATION

Section 1 describes the purpose of the document, its organisation and application area as well as the document amendment procedure. It also includes a set of terminologies used in the document and a glossary of acronyms used in grids and networks, the entities involved in GISELA and other related projects.

Section 2 depicts, in few comprehensive paragraphs, the intended Execution Plan for WP5 in order for the reader to understand how the networking provisioning and support for VRCs will be accomplished by GISELA.

Section 3 summarises how the original process was conceived by EELA and EELA2 as a cyclic and incremental process including four actions related to the Network Service Centre (NSC), namely, surveys and requirements revision, solution proposal, deployment and operation of the NSC. Then, this section explains and illustrates how relevant elements of the original process will evolve and adapt to conform to CLARA’s Business Plan and its Life Cycle Product Management process.

Section 4 reveals how the GISELA’s Network Resource Provision service can transcend its scope for the long-term sustainability of the e-Infrastructure in Latin America through the implementation of the CLARA Sustainability Model in M18. It is important to note that the Grid Regional Operation Centre (GOC) and its related activities are not part of this document.

¹ CIEMAT will play a leading role in the coordination with the European NREs and GEÁNT2

² Description of Work (DoW) available upon request to the GISELA Project Office (hlp-gisela@hlpdeveloppement.fr)

³ Consortium Agreement (CoA) available upon request to the GISELA Project Office (hlp-gisela@hlpdeveloppement.fr)

1.3. APPLICATION AREA

The document will be used as a reference for the GISELA current partners and potential new users of the e-Infrastructure network between Europe and Latin America. The WP5 Execution Plan will also serve for all other GISELA Work Packages where network provisioning and support services are needed. Partners will understand how the process of network engineering and operation, as well as provisioning and support for VRCs using the GISELA grid environment, will be accomplished by CLARA. The resulting model can serve as a best practice for other grid related projects.

1.4. DOCUMENT AMENDMENT PROCEDURE

Amendments to this document can be requested by any Project Member to the Project Coordinator, via the Project Office (hlp-gisela@hlpdeveloppement.fr).

1.5. GLOSSARY

CEDIA	Consortio Ecuatoriano para el Desarrollo de Internet Avanzado (Ecuador)
CLARA	Cooperación Latino Americana de Redes Avanzadas
CUDI	Corporación Universitaria para el Desarrollo de Internet, A.C.(México)
DoW	Description of Work
EC	European Commission
EELA	E-Infrastructure shared between Europe and Latin America
EELA-2	E-science grid facility for Europe and Latin America
EGEE	Enabling Grids for E-science in Europe
ENSC	EELA-2 Network Support Centre
EOC	EELA-2 Operation Centre (now GOC)
EU	European Union
GÉANT2	Pan-European backbone network
GOC	NGI - Grid Operation Centre (previously EOC)
GridLGI	Latin American Grid Infrastructure
GridNGI	National Grid Infrastructure
INNOVA-T	(Argentina)
JRU	Joint Research Unit
LA	Latin America

LGI	Latin American Grid Infrastructure
NGI	National Grid Initiative
NOC	NREN - Network Operations Centre
NREN	National Research & Education Network
NSC	CLARA - Network Support Centre (previously ENSC)
PC	Project Coordinator
PM	Person Month
PO	Project Office
PQI	Production Quality Infrastructure
QoS	Quality of Service
RAAP	Red Avanzada Académica Peruana
RC	Resource Centre (<i>sometimes called Site</i>)
RedCLARA	CLARA Network
REUNA	Red Universitaria Nacional (Chile)
RNP	Rede Nacional de Ensino e Pesquisa (Brazil)
TB	Technical Board
TC	Technical Coordinator
TL	Task Leader
ULA	Universidad de Los Andes, Venezuela

2. EXECUTIVE SUMMARY

This deliverable presents the Activity Execution Plan of the GISELA Work Package 5 (WP5) led by CLARA. The WP5 objectives play a central role in network related issues of the project. Its main goal is to build a coherent collaboration between the different entities involved in GISELA with the aim to support their networking needs by means of an operational interface and operational procedures and, to interact with the network providers composing the project network overlay infrastructure.

CLARA will rely on its ability to provide the network resources used to connect providers of computing, storage, instrumentation and applications resources with users in Virtual Research Communities (VRCs), through the coordination with high-speed pan-European and Latin American research and education backbones and the related National Research and Education Networks (NRENs), with the support of operational procedures.

For these purposes CLARA will also maintain the Network Service Centre (NSC) originally created by EELA-2 to continue to be the operational interface responsible for all interactions between GISELA grid infrastructure and the network infrastructure (NREN's and continental backbones). The NSC aims to be a central point of contact of the GISELA user community, supporting information exchanges about incidents and maintenance, network performance monitoring and reporting, problem troubleshooting, infrastructure supervision and service provisioning.

In order to fulfill the aforementioned objectives, WP5 has been divided in three tasks named TWP5.1 - Overall Networking Coordination, TWP5.2 - Network Engineering and Operations and TWP5.3 - Liaison with Network Providers. CLARA in Latin America and CIEMAT in Europe will coordinate TWP5.1. The remaining tasks, TWP5.2 and TWP5.3, will start with the original process developed by EELA and EELA-2, conceived as a cyclic and incremental process including four actions related to the Network Service Centre (NSC), namely surveys and requirements revision, solution proposal, deployment, and operation of the NSC. The relevant elements of the original process will evolve and adapt to conform to CLARA's Business Plan and its Life Cycle Product Management process, to finally assess in M18, as established by Milestone 4 (MS4) defined in the DoW, the implementation of the CLARA Sustainability Model.

3. EXECUTION PLAN

3.1. OVERVIEW

WP5, as its SA2 predecessors in EELA and EELA-2, will depend on the network infrastructure of a set of campus and access networks, connected to the National Research and Education Networks (NRENs), which are interconnected via the high-speed Latin American and pan-European backbones, the RedCLARA and GÉANT2 networks, respectively. One of the most relevant issues on network resource provisioning for grid infrastructures, as discussed in the two previous projects, has been the ability to grant a seamless network service independent of the number of parties involved in the connection. In order to continue its collaboration activities, CLARA has setup, as one of its main GISELA WP5 objectives, the improvement of the operational interface and its associated procedures for the benefit of the users, learning from what has been done in the past.

Previously, the EELA and EELA-2 projects developed the concept of operational interface (Network Support Centre or ENSC) with its related engineering, operational, provisioning and support procedures that included information exchanges about network incidents, network performance monitoring, problem troubleshooting and service provisioning.

As has been stated in an EELA-2 Deliverable, *“the e-Infrastructure to be used by grid projects is highly dependent on the performance of its network infrastructure, which is rather complex”*⁴. It is a three level hierarchy, the local infrastructure, generally located within a university or research campus, the domestic or national infrastructure, in most cases represented by the National Research and Education Networks (NRENs), and the regional infrastructure which is the configuration of a set of interregional routes to connect the NRENs of the different countries pertaining to that region and the intercontinental routes to connect RedCLARA and GEÁNT2. *“The multi-structure is composed of various autonomous systems and with a high level of heterogeneity regarding resources and services”*⁵. EELA and EELA-2 have setup pilot test-beds for the network monitoring system for the ENSC, finding that its environment evolved from a single-domain to a multi-domain monitoring architecture of at least six domains involved. To monitor the network infrastructure and to assist troubleshooting network problems, the team of the EELA-2 Network Resource Provision (SA2), led by RNP on behalf of CLARA, adopted a perfSONAR multi-domain performance monitoring solution based on MonIPÊ⁶ and MonEELA⁷. This initiative started on a pilot test-bed deployed during the EELA project. MonEELA consists of a perfSONAR-based solution with a central Lookup Service (LS) and Measurement Points (MPs) based on CL-MP. PerfSONAR⁸ has also been deployed on EGEE, GÉANT2, and EU- and LA-NRENs. MonEELA was used to serve specific monitoring objectives such as traffic characterisation via flow measurements, high accuracy network performance measurements (one way delay, jitter, losses and available bandwidth), regular connectivity tests, last/first mile performance measurements, network performance verification and observation environment.

The RNP experience appears to be extremely valuable to start the GISELA WP5 Execution Plan using what has already been developed and tested by EELA-2. As RNP is not a Partner of GISELA, WP5 will interact with RNP through CLARA.

⁴ DSA2.1-v1.5 - Activity Execution Plan for SA2 - EELA-2 Project

⁵ *ibid*

⁶ <http://wiki.monipe.rnp.br/monipe/index.php/Descricao>

⁷ <http://wiki.monipe.rnp.br/monipe/index.php/Descricao>

⁸ <http://wiki.rnp.br/display/MonEELA2/PerfSONAR+overview>

3.2. GOAL

CLARA aims to meet all WP5 objectives to the extent possible. GISELA will continue to have a single point of contact for Network Resource Provision and will organise its operation in order to maintain and operate the network service centre-like activity in an ongoing basis in support of the e-Infrastructure for quality grid operations. CLARA will improve existing collaboration procedures between GISELA and the network entities involved. To support this, WP5 takes advantage of the inherited Network Service Centre, its monitoring system and the operational procedures of a comprehensive set of networking incident report actions for GISELA users and resource providers.

Past the midterm of the project, other objectives need to be met. Before M18, CLARA will have to evolve from the NSC organisation to adapt it to the CLARA proposed sustainability model. CLARA will have to analyse the costs and impact of the current NSC structure as it has been configured by EELA-2 in the long-term estimations of the operation of the Latin American part of the GISELA Network. Depending on the results obtained, CLARA will have to decide whether to maintain the same structure as it is or propose a new solution.

On M12, CLARA needs to report on the Network Resource Provision Assessment of the first year. This deliverable will assess the WP5 activity, providing information about the work performed, featuring all relevant events, quality metrics and performance measurements. On M24, after the assessment of the implementation of the CLARA sustainability model (Metrics MS4) on M18, CLARA will deploy the proposed solution and operation of the new structure.

3.3. DESCRIPTION OF ACTIONS

The WP5 execution plan is composed of the following actions:

- Action 1 - TPW5.1 - Overall networking coordination. CLARA will propose a single point of contact architecture involving all LA NREN's NOC managers for the Network Resource Provision of GISELA;
- Action 2 - TPW5.2 - Network Engineering and Operations. CLARA will review with RNP the current status of NSC and MonEELA to assess its upgrade concerning the state of the art of multi-domain network requirements and related networking services;
- Action 3 - TWP5.3 - Liaison with Network providers. CLARA through its business plan, will implement and operate a sustainable operational interface and its associated procedures to support adequate collaboration between GISELA VRCs and network providers.

After the termination of GISELA the process could be cyclic and incremental as was proposed before by SA2 in EELA-2, to maintain it up-to-date revising and including new requirements as needed. Assessments from year 1 and year 2 will serve as inputs to this process.

3.3.1. Action 1 – TPW5.1 - Overall Networking Coordination

This action will start in M04 and will continue till the end of GISELA. The NSC and its operational procedures will be coordinated by CLARA's Regional Network Operation Centre that will be located in CUDI from 2011 to 2013. The WP5 manager will include in his team 1 FTE (24 PMs) to engage in network resource provision activities. WP5 aims on supporting adequate collaboration procedures between GISELA and the VRCs that participate in its infrastructure. WP5 will analyse procedures and tools developed in the EGEE context that may suit the inter-domain operation in Latin America. The solution proposed must be designed to compose a sustainable e-Infrastructure for quality Grid operation.

The proposed solution must be integrated with the LA NRENs and with the current ROC IGALC to integrate it to NSC activities. However, other initiatives, such as ROC-LA, will also be integrated to

take advantage of their expertise. This integration will be achieved through the monitoring infrastructure, the incident management procedures and especially through collaboration agreements between the NSC, the NRENs and the Regional Grid Operation Centres. These collaboration agreements consist mainly of establishing information exchange procedures between the parties involved.

3.3.2. Action 2 – TWP5.2 - Network Engineering and Operation

This action consists in the revision of the NSC requirements including up-to-date surveys on the following issues:

- Existing proposals and solutions regarding the operation of Multi-domain networks infrastructures to find the state of the art;
- User application and infrastructure requirements update to include new VRCs;
- Development and evaluation of an interoperability model between the GISELA infrastructure networks;
- Monitoring issues update.

The first requirement revision action will be conducted during the next three months (M04 to M06) through the use of questionnaires, e-mail exchanges, videoconferences, telephone interviews and face-to-face interviews. Once the operational interface updated, concerted collaboration will feed the information flow for day-to-day operations on tracing, diagnosing and resolving problems and providing quality indicators.

3.3.2.1 Restrictions

During this action some restrictions could be faced by WP5. Not all the LA NRENs are part of GISELA. However, they could be involved in the multi-domain infrastructure, but their collaboration may not be as easy as that of those NRENs involved. WP5 will try to raise awareness of the importance to collaborate participating in the technical groups particularly those attended by the NOC representatives and will take advantage of the current monitoring tools redCLARA has setup for its network and will continue to strive at making NRENs aware of the benefits of sharing information about their networks, as the number of international e-Science projects increase.

Furthermore, the NSC and MonEELA monitoring system were deployed and maintained by RNP. As RNP is not a partner of GISELA it might be uneasy to get full attention from them in this project. As RNP has the historic happenings of EELA and EELA-2 SA2 activities, in order to counteract this issue, WP5 will continue to include RNP through CLARA in the upgrade of the network related services as part of the participating NOCs in Latin America.

3.3.3. Action 3 – TWP5.3 - Liaison with Network Providers

WP5 will coordinate the network providers on issues concerning the deployment of new networking infrastructure & services and the adoption of networking operational procedures defined by GISELA.

3.4. STAFFING AND RESOURCE ISSUES

To fulfill its WP5 goals, CLARA has established a coordinated structure of collaboration between the CLARA Network Manager and all the NREN NOC managers. The CLARA Network Manager will serve as a supervisor to the activities accomplished by the rest of the WP5 team. He will be responsible for the harmonisation of processes within the CLARA domain.

CLARA decided to nominate, as the WP5 Manager and CLARA Transition Team member, the manager who operates the Regional Network Operation Centre (CLARA NOC), that is the manager of the CUDI NOC.

CLARA has also nominated, as Deputy Manager of WP5, the NOC manager of the Peruvian NREN (RAAP) that is a GISELA Partner. The rest of the NRENs will participate through the representation of its NOC managers or related representatives.

The reasoning behind this criterion is to harmonise information, communication and operations among all NOC managers on how are they going to be dealing with any network resource provision required by GISELA VRCs regardless of their direct intervention.

The following NRENs have committed PMs in GISELA: CEDIA (4), CUDI (4), INNOVA-T (4), RAAP (9), REUNA (9) and ULA (4). Considering the CLARA contribution (36 PMs), the human effort in WP5 will amount in 70 PMs, i.e. almost 3 FTE. With this starting structure, CLARA will coordinate all the network resource provision activities.

4. CONCLUSIONS

The Activity Execution Plan presented in this document is composed of three actions related to overall networking coordination, network engineering and operations, and liaison with network providers.

The main objective is to upgrade the current NSC and MonEELA to provide a fully collaborative operational interface and operational procedures on network resource provision to GISELA VRCs and potential users of the e-Infrastructure.

It will also be important to assess which of the services can be provided by the current CLARA Business Model and what will be the cost, if any, to implement these networking services in the CLARA portfolio of services to allow a long-term sustainability of the infrastructure after the GISELA termination.