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Abstract:

This deliverable provides an analysis of the results of the thematic workshops and conferences for the first year; fine tunes the dissemination strategies and proposes an updated plan for the second year.

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Table of contents

1. Introduction	4
1.1. Purpose	4
1.2. Terminology	4
1.3. Glossary	4
2. Executive summary	6
3. Objectives	7
4. Events of the first year	8
4.1. Schools	9
4.2. Brainstorming Meetings	10
4.3. Workshops	10
4.4. High level conference	15
4.5. Analysis of the outcomes	17
5. The updated planning for the second period	20
5.1. New directions and updated strategies	21
6. Conclusions	23

1. Introduction

The CHAIN project, started on the 1st of December 2010, aims to coordinate and leverage the efforts made over the past 6 years to extend the European eInfrastructure (and particularly Grid) operational and organisational principles to a number of regions in the world. CHAIN uses these results with a vision of a harmonised and optimised interaction model for eInfrastructure and specifically Grid interfaces between Europe and the rest of the world. The project developed a strategy of events (workshops, schools and conferences) to ensure coordination and interoperation of the European Grid Infrastructure with those emerging in other regions of the world (Africa, Asia, Latin America, Mediterranean and Middle East).

The events performed during the first year of activity and the outcomes of such events are the main topics discussed in this document.

1.1. Purpose

The purpose of this deliverable is to describe the activities performed in the work-package 5 of CHAIN regarding the thematic workshops and conferences.

1.2. Terminology

This subsection provides the definitions of terms, acronyms, and abbreviations required to properly interpret this document.

1.3. Glossary

AAI	Authorisation and Authentication Infrastructures
Africa & Arabia ROC	Africa & Arabia Regional Operation Centre
CAS	Chinese Academy of Science, China
CHAIN	Co-ordination and Harmonisation of Advanced eInfrastructures
C-DAC	Centre for Development of Advanced Computing, India
CLARA	Cooperación Latinoamericana de Redes Avanzadas
CNGrid	China National Grid
CNIC	Computing and Network Information Center, China
DCH	Digital Cultural Heritage
DCI	Distributed Computing Infrastructure
DoW	Description of Work – Annex I to the GA
EC	European Commission
EDGS	Equivalent Domestic Grid Structure
EGI	European Grid Infrastructure
EGI-InSPIRE	European Grid Initiative - Integrated Sustained Pan-European Infrastructure
EIRO	European International Research Organisation
EMI	European Middleware Initiative
EPIKH	Exchange Programme to advanced eInfrastructure Know-How

ERA	European Research Area
FP7	European Commission's Framework Programme Seven
GA	Grant Agreement
GOS	Grid Operating System of CNGrid, China
HPC	High Performance Computing
MoU	Memorandum of Understanding
NKN	National Knowledge Network of India
NREN	National Research and Education Network
NGI	National Grid Initiative
OSG	Open Science GRID
Portlet	Portlets are pluggable user interface software components that are managed and displayed in a web portal.
RC	Resource Centre
ROC	Regional Operation Centre
RIP	Resource Infrastructure Provider
SAGA	Simple API for Grid Applications
VRC	Virtual Research Communities
WeNMR	A Worldwide eInfrastructure for NMR and structural biology

2. Executive summary

The CHAIN project has organised a series of dissemination activities which have, as focal point, a number of workshops and conferences that addressed the virtual research communities, the eInfrastructure stakeholders and the policy makers.

The proposed themes and venues were continuously reviewed during the course of the first year of the project in order to better address the Virtual Research Communities of relevance and exploit possible synergies with other important events.

In the first twelve months (1 December 2010 – 30 November 2011) the CHAIN Project has either organised or co-organised 8 Workshops, 1 High Level Conference, 2 Brainstorming Meetings and 9 Schools in all the regions/continents of reference, from Latin America, to north and sub-Saharan Africa, and to Asia.

The results of these events have always been excellent in terms of attendance and they have contributed a lot to several advancements in the project work plan with a better comprehension of the state of the art of the regions involved, the technologies used, and the most active scientific groups.

Specifically:

- Schools in cooperation with EPIKH, EU-IndiaGrid2, EUMEDGRID-Support and GISELA have seen good feedbacks from the trainees and contributed to the deployment of new grid sites and scientific applications;
- Brainstorming Meetings, in cooperation with EGI and GISELA, have led to a better understanding of the technical and organisational issues related to interoperability and interoperations; in the specific case of EGI, a MoU has been signed by CHAIN;
- Workshops addressed several of the themes of the CHAIN project: VRCs requirements, interoperability and sustainability. The relevant participation of stakeholders of eInfrastructures and scientific communities contributed to the clarification of the necessary steps to be taken and to the agreements with two reference communities: WeNMR and WRF4G. The Nairobi event was particularly successful in raising the interest of several ICT Directors in Africa.
- The High Level Conference in Trieste was devoted to Climate Change Research and intended to support the process of creation of a VRC of worldwide span. The gathering of eInfrastructure stakeholders, Climate Change researchers, the IPCC and governmental representatives was the key of a success beyond the expectations.

After one year of activity, the CHAIN project has put in place a number of events that have been key for getting a large number of feedbacks on several topics, and which clarified a number of technical and organisational questions contributing also in defining short, medium and long term recommendations that were exposed in the Deliverable D2.2.

The precious experience made in these events has also suggested some possible modifications to the original planning and generated an updated strategy.

3. Objectives

The CHAIN project has several objectives, with different activities aiming at gathering the experience made in the previous Regional eInfrastructure projects and elaborate, on the basis of the past and present knowledge, a model and a road-map for the interconnectivity of European eInfrastructures with other similar regional infrastructures worldwide. A few Virtual Research Communities have also been selected to validate the proposed model.

The dissemination Work-Package (WP5) aims to support the other activities in the project by means of a number of workshops and conferences scheduled during the whole project lifetime. The CHAIN project has thus organised a series of dissemination activities which have, as focal point, a number of workshops and conferences that addressed, respectively, the virtual research communities and the policy makers. A preliminary list of events (thematic workshops and high-level conferences) was already proposed in the Description of Work (Annex I to the Grant Agreement).

The proposed themes and venues were subject to be reviewed during the course of the project in order to better address the Virtual Research Communities of relevance and exploit possible synergies with other important events. On the other hand, a minimum number of 4 workshops and 2 conferences have been foreseen for the entire lifetime of the project.

A brainstorming meeting with EGI and EMI projects was also foreseen in the DoW in the first months of the CHAIN project. This event was considered a fundamental step towards the coordination of the activities of CHAIN with EGI-InSPIRE and EMI and the definition of possible common strategies.

In the following chapter the actual execution of WP5 activity in the first 12 months is described and an analysis of the outcomes of the events is also performed.

4. Events of the first year

The first twelve months of the CHAIN project have seen a very intense program of events. The complete list is shown in the following table and it is dynamically available on the project website¹. The events are divided in three categories: Workshops, Schools and Conferences. The website also reports about other external events where the CHAIN project and its results have been disseminated.

Year-Month	Type	Name	Location
2011-11	Workshop	CHAIN Workshop on Research Applications and eInfrastructures	Nairobi, Kenya
2011-10	Workshop	Developing Lebanese National Research and Education Network	Beirut, Lebanon
2011-09	Workshop	CHAIN Workshop	Lyon Conference Centre
2011-08	Workshop	CHAIN - EU-IndiaGrid2 Workshop on Research Applications of High Speed Connectivity Across Europe, India and the Asia-Pacific Area	New Delhi, India
2011-06	School	Africa 6 2011 - Joint CHAIN/EUMEDGRID-Support/EPIKH School for Application Porting	Rabat (Morocco)
2011-05	School	Africa 6 2011 - Joint CHAIN/EUMEDGRID-Support/EPIKH School for Grid Site Administrators	Rabat (Morocco)
2011-05	School	Africa 5 2011 - Joint CHAIN/EUMEDGRID-Support/EPIKH School for Application Porting	Stellenbosch (South Africa)
2011-05	Conference	The Role of eInfrastructures for Climate Change Research	Trieste (Italy)
2011-05	School	Africa 5 2011 - Joint CHAIN/EUMEDGRID-Support/EPIKH School for Grid Site Administrators	Stellenbosch (South Africa)
2011-05	School	Asia 3 2011 - Joint CHAIN/EPIKH School for Application Porting	Beijing (China)

¹ www.chain-project.eu/events

Year-Month	Type	Name	Location
2011-05	School	Asia 3 2011 - Joint CHAIN/EPIKH School for Grid Site Administrators	Beijing (China)
2011-04	Workshop	GISELA & CHAIN Workshop	Vilnius (Lithuania)
2011-03	Workshop	Thematic Workshop on Interoperability across Europe and Asia	Taipei (Taiwan)
2011-02	Workshop	Asia 2 2011 - Joint CHAIN/EU-IndiaGrid2/EPIKH Workshop	Kolkata (India)
2011-02	School	Asia 2 2011 - Joint CHAIN/EUMEDGRID-Support/EPIKH School for Application Porting	Kolkata (India)
2011-02	School	Asia 2 2011 - Joint CHAIN/EU-IndiaGrid2/EPIKH School for Grid Site Administrators	Kolkata (India)
2011-01	Workshop	GISELA & CHAIN Meeting	Amsterdam (Netherlands)
2010-12	Workshop	CHAIN Launch Event	Roma (Italy)
2010-12	Workshop	Brainstorming Meeting	Rome (Italy)
2010-12	Workshop	Latin America 3 2010 - Joint CHAIN/GISELA/EPIKH Workshop	Valparaiso (Chile)
2010-12	School	Latin America 3 2010 - Joint CHAIN/GISELA/EPIKH School for Application Porting	Valparaiso (Chile)

4.1. Schools

The schools have all been organised in cooperation with the EPIKH project² and, sometimes, together with other projects or initiatives that are relevant in the target region. The contribution of CHAIN to these schools has included the dissemination of the event on the web site,

² <http://www.epikh.eu/>

presentations at the final workshop and support for the participation of some students or tutors from project partners.

The attendance to these schools has been between 9 and 25 persons with different skills (i.e. system administrators or users) and the mean evaluation has been around 5 in a scale from 1 to 6. More information is available on the EPIKH web site.

4.2. Brainstorming Meetings

Two workshops were structured as brainstorming meetings. The first one, organised in Rome on the 13th of December 2011 after the kick-off meeting of the CHAIN Project, saw the participation of representatives from GISELA, EGI, DECIDE, DC-NET/INDICATE and WeNMR and it was dedicated to a first discussion on the issues related to supporting VRCs across several Grid infrastructures in different continents.

The presentations made the point regarding the state of the art of several scientific communities that are currently addressed by specific projects co-funded by the EC.

Another topic was the interoperations with EGI and the relationships with EGI-InSPIRE. There were presentations by EGI regarding the different options of agreements with external resource providers that were currently in preparation. These documents address the Service Level Agreements and the Operation Level Agreements in the bilateral mode between EGI and resource providers, and specify how they can participate in the Operation Management Board.

All these documents are available on the EGI web site.

The discussion went on in analysing the case of a Grid infrastructure willing to interoperate with EGI, but not available to be absorbed by the EGI infrastructure. As clear example of specific cases were cited:

- The Grid infrastructures in China and India, with their own middleware deployed;
- The Arab and African countries' initiatives organised by non-legal entities or initiatives that could not sign such documents.

The Africa & Arabia ROC initiative was proposed as a pilot activity to reproduce an EGI-compatible infrastructure duplicating tools and best practices, but allowing a more relaxed set of requirements that could fit with the practical issues in the African continent.

The second Workshop/Meeting in Amsterdam was among EGI, GISELA and CHAIN and it was more concentrated on the activities and details of the MoUs to be signed between EGI-InSPIRE and GISELA. CHAIN representatives did also discuss the articles of the MoU in view of creating a separate one between CHAIN and EGI that was reviewed during the CHAIN Meeting in Trieste (May 2011) and actually signed during the summer of 2011.

The brainstorming meetings were attended by all the relevant actors and technical personnel.

4.3. Workshops

Workshops are intended to be opportunities of discussion among the various regional projects and the VRCs with the aim of aligning regularly the common understanding of the issues to be addressed and the milestones to be reached. Some topics needed to be addressed first: the requirements of the VRCs and the interoperability options. Thus, in the first year the workshops organised are mainly addressing these two topics.



The following table is restricted to the workshops organised by CHAIN, in many cases in cooperation with other regional projects (e.g., EUMEDGRID-Support, EU-IndiaGrid2, GISELA), showing the exact dates and themes of the workshops.

Event N.	Venue/Region	Theme	Date	Number of participants
1	Rome/Europe	Launch Event	14/12/2010	50
2	Taipei/Asia Pacific	Interoperations & Interoperability	23/03/2011	22
3	Vilnius/Europe	VRC Meet Resource Infrastructure Providers	13/04/2011	30
4	New Delhi/India	Research Applications of High Speed Connectivity Across Europe, India and the Asia-Pacific Area ³	24/08/2011	50
5	Lyon/Europe	Resource Providers meet VRCs – II	21/09/2011	35
6	Beirut/Mediterranean	Developing Lebanese National Research and Education Network	21/10/2011	50
7	Nairobi/Africa	eInfrastructures for Africa	23/11/2011	133

The workshop in Rome (Launch Event) was vastly disseminated to a long list of projects, initiatives, research organisations, stakeholders and single researchers.

The Scientific Officer Jarkko Siren from EC made a presentation introducing the strategies of the European Commission regarding the Research Infrastructures and the eInfrastructures in particular.

The workshop was organised in two sessions or groups of presentations:

- Virtual Research Communities: this was a first exploration of possible VRC candidates to be involved in the CHAIN WP3 activity. The session showed a landscape of very different situations ranging from a mature community, grid-aware, and with clear requirements (WeNMR) to the Digital Cultural Heritage community (DC-NET/INDICATE) with clear awareness of their objectives, but still exploring the path towards eInfrastructures to clarify how their requirements could be satisfied by the Grids. The Health community exploiting dedicated infrastructures for research and willing to translate their models into clinical practices showed significant requirements related to the storage and the sharing of digital images compatible with IPR and privacy issues.
- Grid infrastructure providers and managers: presentations showed the large investments made so far not only by Europe, but also in China and India, to build state of the art eInfrastructures that are empowering the Research and Education communities offering new levels of broadband transmission of data (10-100 Gb/s) and computing power (PFlop HPC machines). Most of the communities in the different continents share similar requirements and applications and thus could also share eInfrastructures if this is available in a transparent manner. It was, however, evident that DCI environments are the most advanced, while HPC infrastructures are still limited to the country (China, India) or continental level (PRACE in EU).

The topics of interoperability and interoperations were followed up during the **workshop in Taipei**, co-located with the ISGC 2011 and OGF31 conferences in **March 2011** with a very good attendance and a press-release prepared and published on the GridTalk portal.

³ www.apan.net/meetings/India2011/Session/EU-IndiaGrid.php

The Workshop reviewed the status and discussed the perspectives and future actions for eInfrastructure cooperation in the Asia-Pacific area with respect to the European and worldwide context. It covered aspects spanning from communication networks to middleware and applications aspects addressing the relevant issues for concrete interoperation between the regional eInfrastructures and the European ones.



The Workshop “VRCs meet eInfrastructure providers”, organised during the EGI User Forum in **Vilnius on the 13th of April 2011**, in cooperation with GISELA, addressed the theme of the Virtual Research Communities requirements on the Grid Infrastructures with specific attention to those outside Europe. Representatives of VRCs (WeNMR, HealthGrid, GeoSciences, Digital Cultural Heritage) were invited to make presentations on their current understanding of the strengths and weaknesses of the present Distributed Computing Infrastructures. In a second session, the Resource Infrastructure Providers (CHAIN, DEGISCO, EGI-InSPIRE and GISELA) presented their approaches to support VRCs and the possible synergies were discussed.

As part of cooperation activity between CHAIN and EU-IndiaGrid2, a **workshop: “CHAIN - EU-IndiaGrid2 Workshop on Research Applications of High Speed Connectivity Across Europe, India and the Asia-Pacific Area”** was run at the Asia Pacific Advanced Network Conference (APAN32) in August in Delhi. The APAN Conference is a major showcase for advanced technologies and application in the Asia Pacific area and the workshop approval and its inclusion within the Conference program represented an important recognition of CHAIN and EU-IndiaGrid2 project activities.

Major eInfrastructures in Europe, as GEANT and EGI, and in India, as the National Knowledge Network (NKN) and the GARUDA National Grid Initiative, are interconnected by TEIN3 while EU-IndiaGrid2 and CHAIN support their interoperation and exploitation by high-level applications.

The workshop objective was to review the status of eInfrastructure high-speed connectivity across India with Europe and with the Asia-Pacific area presenting the best showcases for the network exploitation by research applications.

The program included in the first part presentations of the India National Knowledge Network, European eInfrastructures initiatives and the TEIN3 project that bridges European and Indian eInfrastructures. In the second part, research applications in the area of High Energy Physics, Climate Change and Material Sciences, exploiting this connectivity, as well as the EU-IndiaGrid2 and the CHAIN projects, which support these activities, were reviewed.

The key idea was to show that eInfrastructures and research applications are closely coupled. Nowadays, advanced research applications cannot progress without relying on eInfrastructure services. At the same time, there is no use of eInfrastructures without research applications exploiting them and motivating the investment with benefits for the international research cooperation. In this respect, the workshop enhanced the role of projects like TEIN3, EU-IndiaGrid2 and CHAIN which cooperate in providing the connectivity services and the support for exploiting them efficiently.

Participants and contributors included relevant representatives from the European Commission, TEIN3 and its successor TEIN4, NKN, GARUDA - India NGI, the Office of the Principal Scientific Adviser to Indian Government, major research Institutions in India and in Asia-Pacific. Therefore, the workshop was not only a good showcase to review the status of eInfrastructures and their applications across Europe, India and the Asia-Pacific area but also an excellent opportunity to discuss strategic aspects in the cooperation between the most relevant actors.

The Workshop in Lyon on the 21th of September 2011 was co-located with the EGI Technical Forum. It was organised in cooperation with EU-IndiaGrid2, EUMEDGRID-Support and GISELA and it was meant as a follow-up of the workshops organised at ISGC 2011 in Taipei and at the EGI UF in Vilnius. The former focused on interoperability and interoperability between EU and Asia, while the latter mainly concentrated on the matching of the VRC requirements with the services offered by the eInfrastructure providers. This workshop proposed to make a step forward investigating the needs of VRC regarding interoperations and interoperability, possibly demonstrating the existing solutions developed until now and discussing the standards that are ready to be adopted. At the date of the EGI TF, CHAIN had signed MoUs with some VRCs. At the same time, new emerging VRCs (Climate Change, Agriculture) were invited to present their programs. The interoperations among regional infrastructures, both at the operational and organizational levels, is one of the CHAIN's major goals and thus part of the session was dedicated to middleware (EMI) and a possible interoperability plan.

The Lebanon Workshop in Beirut was at the premises of the Ministry of Education and Higher Education on the 21st of October 2011.

Together with the Ministry of Education and Higher Education in Lebanon, Lebanese Universities, and the National Council for Scientific Research, the CHAIN project, in cooperation with EUMEDGRID-Support and ASREN, launched the development of the Lebanese National Research and Education Network. The goal was to establish an electronic infrastructure to connect all Lebanese Universities through a dedicated network at the national level, and then link them to the Arab and European research and education networks. The eInfrastructure will help supporting advancing research, improving education, accelerating progress, providing hope and enabling better opportunities for the Lebanese young scientists.

The Lebanese research and education network will allow researchers, faculty, staff, and students around the country to communicate with each other and access a broad range of research tools and information resources. In addition to physical connectivity, the network will provide applications, such as videoconferencing, media streaming, IP telephony, identity federations, and wireless roaming. The network may also facilitate distributed computing resources (grids) and operating experimental test-beds for data-intensive applications through

connectivity to the regional research networks, providing opportunities for joint research collaboration and online education initiatives.



From left to right: HE Dr. Talal Abu-Ghazaleh, HE Professor Hassan Diab, Lebanese Minister of Education and Higher Education and Dr. Mouin Hamza, Secretary General of National Council for Scientific Research during the launching ceremony of the National Lebanese Network for Scientific Research and Education

The Nairobi Workshop on Research Applications and eInfrastructures, held on the 23rd of November 2011, took place in the context of the UbuntuNet Connect 2011 Conference in Kenya and saw a very good participation of European and African researchers and stakeholders. The Agenda is available on the web at http://www.ubuntunet.net/uc2011_programme.

The presentations introduced first the general concept of eInfrastructure, the need for such infrastructures and the benefits for the Research and Education community and the society at large. Then, “Setting up National Grid Initiatives, based on SEE-GRID model” was presented to give some guidelines on the path to be followed to create NGIs in Africa based on the experience of South East Europe, and enhanced by CHAIN recommendations on sustainability.

The experience made in South Africa with their National Grid Initiative was then presented to show an on-going successful experience in an African country.

Prof. Luis Nuñez then illustrated the “Latin American CLARA experience, CHAIN advances and their implementation in Africa” making a useful comparison of LA and African situations. Then, a presentation on eb@leGrid and the need for introduction of Grid technologies in the Democratic Republic of Congo was given by Prof. Dibungi Kalenda of the University of Kinshasa.

The last presentation on “e-Applications Tutorial and Round-up” by Prof. Roberto Barbera addressed the panorama of the many possible applications already available on the Grid Infrastructures and the possibilities to port new ones.

The number of participants (133 in total of which 108 from Africa) was largely the highest number reached so far by a CHAIN Workshop, showing the benefit of co-locating such events with other largely attended conferences related to eInfrastructures.

The event saw, indeed, a large participation of ICT directors (50) of the African Organisations/Institutions and their interest in the topics of the workshop and the various presentations was expressed by a large number of questions on the details of how Distributed Computing Infrastructures can be deployed in Africa and which role should the NRENs have in this process. In particular, questions were directed to the setup of NGIs and help with such a process, to the cost estimates of the grid infrastructure and its management. Also, access to the commercial software as well as the actual experience with provision of generic infrastructure was discussed during the workshop. The scientific domains of interest were very broad, ranging from Agriculture to Health (e.g., telemedicine and African Pharmacopeia), from eLearning to Computational Chemistry and to Climate Change.



4.4. High level conference

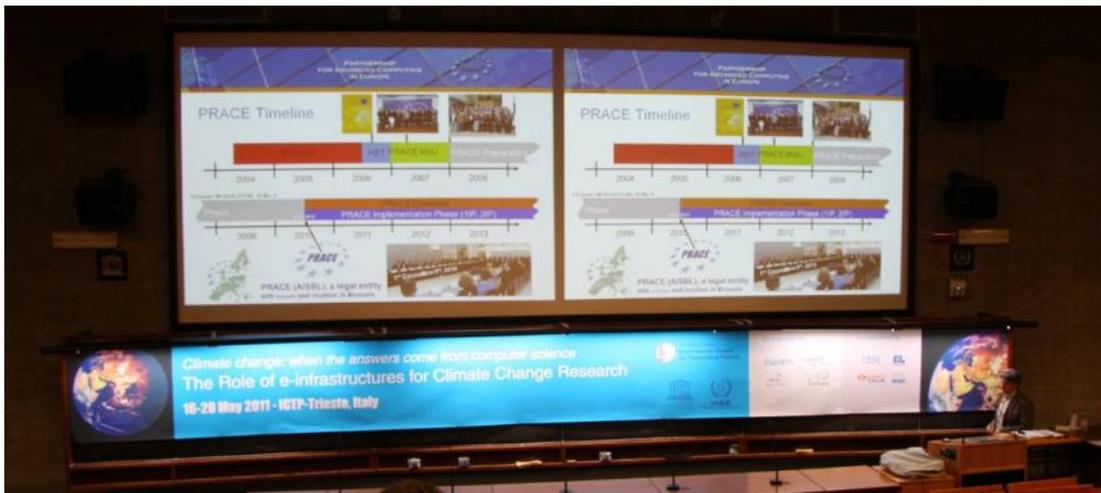
With Climate Change high on the political agenda, the “Conference on the role of eInfrastructures for Climate Change Research”, held in Trieste at the Abdus Salam International Centre for Theoretical Physics (ICTP) 16-20 May 2011, brought together scientists, policy makers and international actors addressing climate change from scientific, economic and political perspectives. The event was co-organised by 3 EC-funded projects: CHAIN EU-IndiaGrid2 and EUMEDGRID-Support which are driving forward collaboration among regional eInfrastructures; and the Italian Institute of Nuclear Physics (INFN).

The conference was mainly intended to gather Climate Change scientists, eInfrastructure providers and stakeholders to exchange



information and views regarding the present and the future needs for resources of computing and data storage.

The conference program saw the contributions of leading eInfrastructure initiatives for climate change in Africa, Asia-Pacific, China, Europe, India, Mediterranean Area, Latin America, USA, together with presentations of outstanding scientists in climate research, including the Intergovernmental Panel on Climate Change (IPCC) vice-chair, Prof Van Ypersele. The need for a worldwide strategy for a worldwide problem was clearly identified and the role of eInfrastructures and international cooperation as key instruments for achieving progress in the understanding of climate change impact and possible mitigation strategies was acknowledged.



“Climate change has become a political issue in many national and international debates, but despite the inception of many international programs there is the tendency to use national models and centres” explained Filippo Giorgi of the Abdus Salam ICTP. In order to support the global drive to address climate change issues, VRCs require robust and reliable eInfrastructures. This concern has a special impact in developing countries which are the most vulnerable countries. At times, such countries are actors in the climate change debate participating to climate research, while at other times they are simply spectators. According to Professor Philander, Director of African Centre for Climate and Earth System Science, Princeton University, (USA), “Global Warming is elitist and should be democratized in a way that boosts self-esteem”.

The conclusions outlined the importance of the interconnection and interoperability between Europe and other continents for new VRCs, such as Climatologists that need to collaborate at an international level to address new large scale top-level scientific challenges such as Climate Change. The models developed by several centres produce large amounts of data (in the order of several PBytes = 10^{15} Bytes) and these need to be shared with other centres which sometimes are interested to downscale the simulations at the level of a region or of a country.

Indian representatives reported as Climate change is one of the flagship applications of the Indian National Knowledge Network, recently launched by the Indian Government, with a massive €1 billion infrastructure program which will run till 2020.

A large interest on Grid Infrastructures was shown by several participants from Africa for their potential to help developing countries in closing the ICT gap and empowering a large number of their researchers to actively participate in leading edge scientific challenges such as Climate Change.

4.5. Analysis of the outcomes

The general outcome of the events of the first year can be considered, in many respects, adequately and efficiently addressing the project objectives.

The schools have been a key to widen the number of grid aware users and, as one of the important outcomes, there were several new applications ported to the grid and deployed. Moreover, in many cases the schools contributed to the deployment of new Grid sites.

The CHAIN website has an application registry that allows the presentation of information about the applications ported in the context of several other regional projects and the gateway or portal that allows to execute them. CHAIN had a good visibility with some presentations made in the workshops at the end of the schools. This very successful activity has also generated many positive feedbacks from the participants. The contents of these schools are currently under internal revision and a new approach has been proposed and discussed in the following sub-chapter 5.1.

The Brainstorming meetings were organised very early in the lifetime of the project because it was fundamental to collect VRC requirements and compare visions regarding interoperations, interoperability and the steps needed to reach them. The first outcomes were related to the definition of the MoU to be signed between CHAIN and EGI-InSPIRE which was actually signed during the summer. It is however important to note that some of the topics related to interoperations were also discussed during the meetings and were key to clarify some of the issues related to the deployment of Africa & Arabia and China ROC services (e.g., GOCDDB, Nagios, etc.).

CHAIN workshops were dedicated to three aspects: VRCs, interoperability and sustainability (although not apparently interrelated), because it was felt very important for VRCs of intercontinental span to show their requirements and ways of operating face to face with infrastructure providers and middleware developers. The iterative process went on through the different workshops narrowing the number of candidate VRCs for validating the CHAIN model and suggesting possible intermediate approaches to the long term solutions of interoperability issues. This led to the MoUs with WeNMR and WRF4G initiatives that will be involved in the process. An initial investigation was also done in the Agricultural Research Domain, Digital Cultural Heritage and Health, inviting agINFRA, DC-NET/INDICATE and DECIDE projects to present their requirements at the workshops.

Regarding interoperability, the options shown in Figure 1 were presented and discussed during the last workshop in Lyon in September 2011. Although there was not a consensus on the proposed options, this triggered the necessity of a much deeper discussion with middleware developers and maintainers and thus led to defining intermediate pragmatic steps based on solutions not requiring large software coding investments (also presented in the CHAIN Deliverable D2.2).

- A first step based on Science Gateways in order to facilitate the access of existing and emerging communities to applications using grid resources;
- An intermediate step based on the choice of applications that could run on multiple infrastructures based on gLite;
- A long-term vision expressed in an initial schema of interoperability of grid middleware based on a limited set of standards.

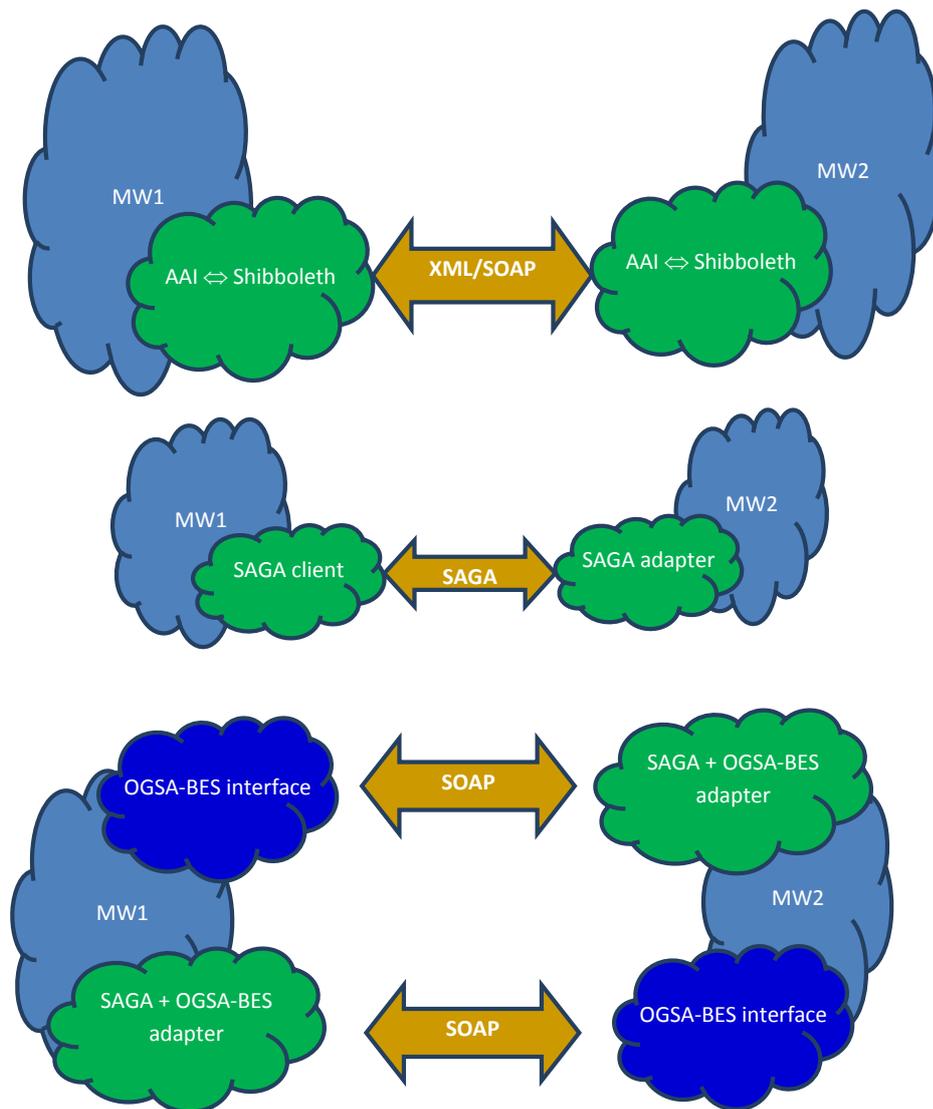


Figure 1 - Possible interoperability approaches

The next workshop at ISGC 2012 will also be focused on the definition of the path forward, including the testing related to the previous list of steps.

The workshop in Lebanon was organised by the Ministry of Education and Higher Education and was attended by a large number of stakeholders representing the public and private Universities and the main laboratories and research centres. It was thus conceived at a very high policy level with the speeches of the Minister HE Dr. Hassan Diab, and HE Dr. Talal Abu-Ghazaleh, Chairman of ASREN and the Secretary General of the National Council for Scientific Research Dr. Moeen Hamzeh.

A final Declaration was approved stating that the Lebanese community, with the support of the Ministry and CNRS, will launch the Lebanese NREN (LREN). The Lebanese Network will possibly join EUMEDCONNECT3 and ASREN.

The day before the event two representatives of the Saint Joseph University were appointed as Registration Authorities (RA) of the INFN CA in the country. This fundamental step will be followed by the deployment of a Grid site in Saint Joseph University that will eventually join the Africa and Arabia ROC.

The workshop in Nairobi needs a separate analysis due to the continent-specific topics that were raised during the event by several interventions from the floor.

The main topics addressed were:

- tools and applications that can be used on mobility were of interest for many researchers and NRENs and specifically the possibility to deploy eduROAM facilities linked with Europe;(KENET has already deployed eduROAM with support from DFN)
- DCIs deployment attracted also many interesting questions; the availability of new high bandwidth links in many countries (e.g., Kenya through KENET) removes some of the previous obstacles to the implementation of this technique of resource sharing;
- Scientific communities appear to be dispersed and frequently under-resourced and understaffed. However, specific African scientific activities deserve attention, such as African Pharmacopeia, that requires the docking applications already deployed in other projects and initiatives (e.g., WISDOM).

The human networking that followed the closure of the sessions was also very rich of information exchange. Interest in the setting up of NGIs was expressed by several representatives (e.g., Rwanda and Sudan) and some others expressed their intention to deploy a Grid site connected to Africa & Arabia ROC (e.g., DRC, Kenya, Sudan and Uganda).

5. The updated planning for the second period

The plan for the second year of the project has been formulated on the basis of the topics to be addressed and the opportunities offered by other conferences and workshops already scheduled during December 2011 and the first 11 months of 2012.

The main events already scheduled in the calendar are shown in the following table and CHAIN intends to make use of all the possible synergies with these.

Event	Place	Date	Organised by
e-AGE 2011	Amman, Jordan	12-14 December 2011	ASREN
ISGC 2012	Taipei, Taiwan	28 February-2 March 2012	ASGC
EGI CF 2012	Munich, Germany	26-30 March 2012	EGI
CLARA Conference	Lima, Peru	2-3 July 2012	CLARA
EGI TF 2012	Prague, Chzech Republic	17-21 September 2012	EGI
Grid 2012	Beijing, China	20-23 September 2012	Tsinghua University

The current planning of these events is described in the following paragraphs.

e-AGE 2011 – The conference is co-organised by CHAIN, EUMEDCONNECT3 and EUMEDGRID-Support projects and by Internet2. The conference has a very broad program ranging from scientific application to technologies, covering aspects of Distributed Computing and High Bandwidth Intercontinental Networking.

CHAIN is a partner in the upcoming 1st International Platform on Integrating Arab eInfrastructure in a Global Environment (e-AGE), to be held under the Patronage of His Majesty King Abdullah II bin Al Hussein of the Hashemite Kingdom of Jordan during 12-14 December 2011 in Amman, Jordan (<http://eage2011.ASRENOrg.net>). The objectives of e-AGE are to promote opportunities for cooperation between networks of research and education in the Arab countries, Europe and North America; to launch the third phase of the EUMEDCONNECT project; and to expand the framework of effective participation of e-infrastructure linking the Arab Organizations for research and education to the world.

e-AGE will host three main events:

- The fourth Event on Euro-Mediterranean eInfrastructure;
- The annual meeting of the US Internet2 Special Interest Group, Middle East;
- The first annual meeting of ASREN.

CHAIN will contribute to the organisational costs and will organise a dedicated session on eInfrastructures sustainability.

The full program is available on the event web site⁴.

ISGC 2012 in Taipei, 27th of February 2012⁵ – A CHAIN Workshop will be organised in cooperation with GISELA on the interoperability and VRCs co-located with the ISGC 2012 Conference. The preliminary agenda is the following:

- Session 1 - Status and plans of sustainability:
 - CHAIN sustainability guidelines;
 - CLARA/GISELA and LA;
 - Asia-Pacific issues on sustainability;

⁴ eage2011.asrenorg.net

⁵ event.twgrid.org/isgc2012/

- Discussion;
- Session 2 – Status and plans of interoperability:
 - Current status and plans of EGI, GARUDA, CNGrid, OSG, OurGrid;
 - Development & uptake of standards for interoperability: OGF/GIN, EMI, SAGA, etc.;
 - Science Gateways and Authentication & Authorisation Infrastructures;
 - Candidate VRCs for a world-wide demonstration:
- Discussion and outlook.

CLARA Conference in Lima, Peru – A CHAIN Workshop will be organised during the CLARA Conference on the 3rd of July 2012⁶. The event will be focused on LA sustainability issues and, possibly, on the advancements of the work on interoperability.

EGI TF2012 in Prague, 17th-20th of September 2012 – The Technical Forum of EGI is a good opportunity to gather technical people in a workshop dedicated to the VRCs. It partly overlaps with the following event in China and the plan is to try to organise the CHAIN event in the first days of the week.

Grid 2012 – 13th IEEE/ACM International Conference on Grid Computing, co-located with ChinaGrid 2012. The conference is part of a series of IEEE conferences and it is a good opportunity for disseminating the CHAIN activities and, at the same time, a workshop dedicated to the VRC's and Interoperations will be organised.

5.1. New directions and updated strategies

After one year of activity, the CHAIN project has put in place a number of events (Schools, Brainstorming Meetings, Workshops, Conferences) larger than originally foreseen but this was a key to get a large number of feedbacks on several topics, as it has been described in the previous section 4.5. The precious experience made in these events has suggested some possible modifications of the original plana and generated an updated strategy.

The Schools conducted in cooperation with EPIKH have shown that it is still very hard to catch the interest of the community of final users (scientists) and even when a success is reached in involving large scientific communities, this does not automatically produce a “domino effect” on other scientific communities. Very frequently, the best practices of large VRCs do not enter into the common practice of single researchers not involved in the VRC, even if largely disseminated. This roots back to original worries that exposing directly the users to the Technology and encouraging them to absorb and use it creates a big step in the process of Distributed Computing Infrastructures and Grids becoming a daily way of work. Moreover, even the large number of existing Grid users appears to be saturating and it imposes a reflection on which different approach can be more effective in attracting new larger number of users.

Science Gateways are emerging as a possible way of addressing these issues. In this scenario, applications can be presented in “portlets” embedded in portals. Thus, training people on how they can build such portlets and set-up Science Gateways appeared one of the most interesting topics for future training schools and indeed the next school in Amman will experimentally adopt such a new format.

⁶ http://www.redclara.net/index.php?option=com_content&view=article&id=934%3Aredclara-invita-a-ser-parte-de-tical-2012&catid=5%3Aimportantes&Itemid=353&lang=en

The deployment of two new regional operation centres (ROCs) has also raised the need for some training on ROC set-up and management and this has been chosen as a second track that could be of interest for Regional and National Grid Infrastructures.

Next workshops should thus also be focused on verifying the possible improvements generated by the steps previously described, reinforcing the aim of the CHAIN project to demonstrate that there are indeed several VRCs that could work in an intercontinental dimension, provided that they can easily and transparently access powerful and well coordinated eInfrastructures.

6. Conclusions

After one year of activity, the CHAIN project has organised a number of events that have been key for getting a large number of feedbacks on several topics and helped to clarify a number of technical and organisational questions, also contributing in defining short, medium and long term recommendations that were summarised in the Deliverable D2.2.

The events contributed to contact VRCs, exchange information on their requirements and on how they can be addressed by RIPs.

The human networking was also relevant to widen the audience and receive feedbacks: the workshop in Nairobi was a great success and the analysis of the follow-up actions is still in progress.

The precious experience made in these events has also suggested some possible modifications of the original plans and generated an updated strategy.