Material for Section A

Proposal Acronym: EGI-InSPIRE

Proposal Title: European Grid Initiative: Integrated Sustainable Pan-European Infrastructure for Researchers in Europe

Free Keywords (100 chars)
e-Infrastructure, Grid, Europe, Supporting Researchers, HTC, HPC

Abstract (2000 chars)
Scientific research is no longer conducted within national boundaries and is becoming increasing dependent on the large scale analysis of data generated from instruments or computer simulations housed in trans-national facilities through the use of e-Infrastructure (distributed computing and storage resources linked by high-performance networks). The EDG, EGEE, NDGF and other projects have over the last decade pioneered the prototyping and operation of a European production quality e-infrastructure which now supports over 13,000 researchers spanning over a dozen scientific disciplines. Providing a sustainable model for the e-infrastructure supporting these communities has been the focus of the European Grid Initiative Design Study that has over the last two years been developing community consensus on how such a European Grid Infrastructure can be federated from National Grid Initiatives.

The EGI-InSPIRE project will over the next 4 years continue the transition to a sustainable pan-European Grid Infrastructure started in the final year of the EGEE-III project that will sustain support to Grids while seeking to integrate new DCIs (Clouds, SuperComputing, Desktops) as they are required by the user community. It will support a central coordinating organisation, EGI.eu, and staff throughout Europe necessary to provide an integrated and interoperable e-Infrastructure composed of national grid infrastructures. It will provide a user-support function that works with the different user communities to further develop the e-infrastructure to meet their needs. Support for the current heavy users of the e-infrastructure to transition their critical services and tools from a central support model to ones driven by their own individual communities and to reach out to new communities such as the ESFRI projects. To define, verify and to integrate within the Unified Middleware Distribution, the middleware needed to support the e-Infrastructure from providers outside the project.

European Grid Initiative: Integrated Sustainable Pan-European Infrastructure for Researchers in Europe

(EGI-InSPIRE)

Type of funding scheme:
Combination of Collaborative Project and Coordination and Support Action: Integrated Infrastructure Initiative (I3)

Work programme topic addressed:
FP7-INFRA-2010-1.2.1.1 and 1.2.1.2

Name of the coordinating person:
TBC

1 **List of participants:**

Participant no.	Participant organisation name	Part. short name	Country
1 (coordinator)	EGI.eu		Netherlands

2
3

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Executive Summary Mk II – 1 page maximum

Distributed Computing Infrastructures (DCIs), encompassing both high performance and high capability computing resources have become a vital Research Infrastructure that underpins collaborative research activities within Europe and beyond. The integration by software of distributed storage and computing resources, brought together by high performance research networks, to provide secure controlled access to these research assets (i.e. grids) has never been as vital as researchers deal with the data deluge coming from today's research instruments (e.g. LHC, telescopes, computer simulations, micro-array analysis, etc).

Europe has over the last decade led the world in developing production quality research infrastructures to underpin the European Research Area achieved through the EDG and EGEE series of projects for capacity computing, GEANT for networking, DEISA for capability computing, and supported by the work of many other projects. The next decade will see the establishment of high-volume data-driven science as a routine research methodology through the commissioning of the ESFRI projects, the LHC and other similar international research facilities. With this adoption of data-driven science there is an urgent need to move the research infrastructures supporting these projects to be sustainable (as many of the research projects they support will last for years, if not decades) and to support the different computing models and technologies needed by these different research communities.

Central to this proposal and key to coordinating an **In**tegrated **S**ustainable **P**an-European **I**nfrastructure for **R**esearchers in **E**urope (InSPIRE) is a new legal organisation EGI.eu. Currently, being established in Amsterdam, EGI.eu's focus is coordinating the *continued* operation and *expansion* of today's production grid infrastructure that supports over 13,000 researchers, many of them already heavy users of the infrastructure, across diverse disciplines such as Earth Science, Fusion, Computational Chemistry and Materials Science Technology, Life Sciences and High Energy Physics. EGI.eu's primary stakeholders are the providers of the distributed computing research infrastructures for these research communities either within their own national borders (the NGIs – National Grid Initiatives) or across their own research communities (the EIROForum – European Intergovernmental Research Organisations facilities) and it is only natural that they drive the inclusion of other distributed computing technologies into tomorrow's production infrastructure.

It is against this current state of the art that this community is being faced with three additional opportunities:

- Integrated access to all resources: Except for the most high-end or exotic resources researchers are no longer willing to tolerate disjointed access to the resources they need within their daily research activity. This applies to the same class of resource (e.g. capability computing, high performance computing) be it accessed locally, nationally or internationally or to different resources (e.g. storage, compute, data, instruments).
- Expanding access to new communities: The pioneering work over the last decade has shown the value that can be offered by DCIs by a number of early-adopting communities. The successes from these experiences need to be consolidated and an active engagement with new projects (e.g. ESFRI) needs to be started to grow the user communities.
- Integration of new technologies: Grids of capability computing (DEISA) and capacity computing (EGEE) will continue to underpin European DCIs for the foreseeable future. However, new technologies will need to be integrated to expand this existing offering. Virtualisation offers many advantages to the researcher in how their application environment is provisioned, which will have to be integrated into the current operational models. Within some communities, the desktop grid is the primary provider of computing resources and can be effectively exploited by some applications. Cloud computing offers new approaches to providing resources within DCIs that brings commercial providers into the provision of research infrastructures.

The EGI-InSPIRE collaboration is ideally placed to expand and consolidate its proven operational framework to encompass these new technologies and new communities in order to deliver a research infrastructure that benefits all communities within Europe, and to continue to be recognised worldwide for doing so. In doing so it is acting as a 'hub' within the community working in partnership with other EC funded projects to bring their innovations through into the operational infrastructure and to deliver these innovations to a Europe wide audience. This project will provide operation and development of a pan-European DCI by consolidating the supporting teams around Europe that deliver the operational infrastructure, and provide the coordination necessary to integrate access to resources, for expanding DCIs to new user communities and bringing new technologies into the production infrastructure.

1.1 Concept and objectives

Explain the concept of your project. What are the main ideas that led you to propose this work? Describe in detail the S&T objectives. Show how they relate to the topics addressed by the call, which you should explicitly identify. The objectives should be those achievable within the project, not through subsequent development. They should be stated in a measurable and verifiable form, including through the milestones that will be indicated under section 1.4, 1.5 and 1.6 below.

Explain the concept of your project. What are the main ideas that led you to propose this work?

Following a decade of successful research in using Grid technologies to provide Distributed Computing Infrastructures (DCIs), the EGI-InSPIRE collaboration are ready to consolidate their experiences and deliver a sustainable high-quality infrastructure for the European Research Area (ERA) along with consistent support services necessary for its exploitation by the European research and scientific community. Indeed, such an e-Infrastructure, which goes beyond DCIs to encompass other resources such as remote instruments and data stores, has become an essential foundation to conducting world leading research where the deluge of scientific data from computing simulations and instruments has changed the way science is conducted today, leading to a shift towards the so-called electronic-Science or e-Science.

In a recently published EC communication on "ICT infrastructures for e-Science"[1] this paradigm shift is embraced, "highlighting the strategic role of ICT infrastructures as a crucial asset underpinning European research and innovation policies" and "calls for a reinforced and coordinated effort to foster world-class ICT infrastructures" (e-Infrastructures), "paving the way for the scientific discoveries of the 21st century". e-Science enables both intra- and inter-scientific collaborations among researchers, in some cases without any sophisticated means. E-Infrastructure can also support researchers' access from less developed countries, providing remote access to facilities not available within their own countries and supporting international collaborations.

Indeed, e-Infrastructures are now integral parts of our daily lives. They are not only an essential tool for scientific research but now also central to the business models of companies such as Google and Amazon and increasingly even SMEs. It is clear and has been recognised in the planning of EU research infrastructures (e.g. ESFRI, e-IRG) that provision of effective e-Infrastructures is fundamental to supporting competitive research activities in the future. The current proposal provides a mechanism by which the acknowledged lead the EU has built up in this field can be expanded and sustained in the coming decades, to present an integrated view of European e-Infrastructure, focussing initially on DCIs, in a way analogous to the successful mechanisms which achieved the same for GEANT and research networking.

Key to providing a persistent integrated European DCI is to have a sustainable operating model for the coordination of the infrastructure as a whole and the delivery of the trans-national services. The European DCI will be built by integrating computing and storage resources provided and managed from individual **National Grid Initiatives (NGIs)**, acting as single points of contact at the national level (similar to the NREN model). Bringing these individual components together to offer an integrated high-quality service to European researchers and their international collaborators can only be achieved with a high-level of coordination at the national and the European level and this one of the primary outcome of this proposal. This broad collaboration of resource providers and user communities represented by their national infrastructures or by international research institutions is the **European Grid Initiative (EGI).**

[1] COM(2009) 108 final: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0108:FIN:EN:PDF

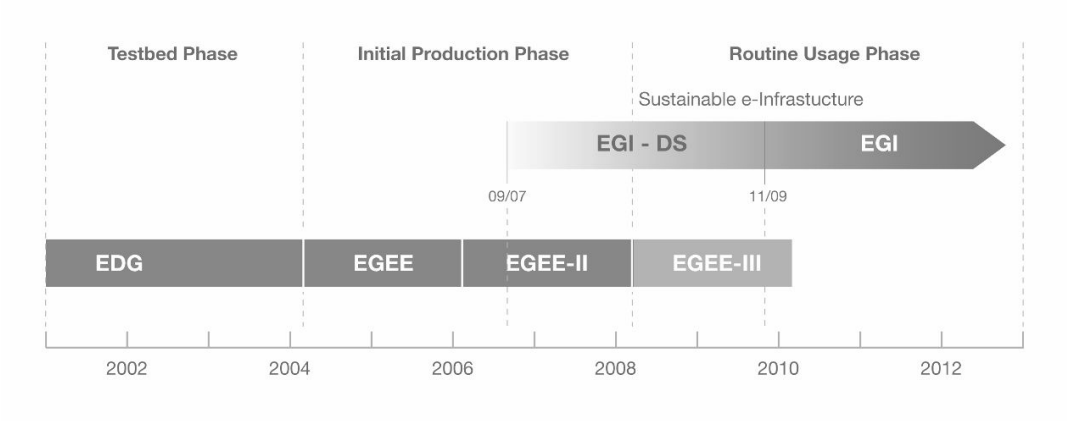


Figure 1 – Sequence of European projects for migrating into EGI
(Editor's comment: Maybe other important projects could be included in an updated figure)

The European Grid Initiative has emerged from a succession of FP5, 6 and 7 projects .... LINK TO DIAGRAM

A model for a sustainable Grid infrastructure has emerged from the EGI Design Study project through its primary outputs the EGI Blueprint document[2] and EGI functions definition document[3], which are now being implemented, in collaboration with the EGEE-III project, and which we propose to continue in EGI-InSPIRE. At the core of EGI is establishment of sustainable e-Infrastructures (from within NGIs, EIROForum labs, or other resource providers) able to support their own operations and deliver resources and support to their own collaborating research communities. These organisational resources need to be made available to collaborators outside of the organisation in a secure, controlled, manner as part of a seamless and transparent pan-European distributed computing environment. The coordination effort necessary to integrate and harmonise this infrastructure, balancing the individual constraints and requirements of the different NGIs and user communities, will be undertaken by a new dedicated organisation, **EGI.eu**. This coordination activity will encompass operation of the core infrastructure and its interface into national services; user support coordination working with national, generic and domain specific support teams; and the specification and integration of middleware from external software providers to support the user communities.

This new organisation is the lead partner in the EGI-InSPIRE project which will support the establishment of this organisation and the transition of the EGI collaboration, represented by the EGI Council, which has many partners in common with the EGI-InSPIRE project but they are not identical.

Describe in detail the S&T objectives. Show how they relate to the topics addressed by the call, which you should explicitly identify

Recognising that a distributed computing and software infrastructure is a key enabler of eScience, this action aims at the development and sustainable provision of services, underlying middleware and access to Distributed Computing Infrastructures (DCI), including actions in support of the European Grid Initiative (EGI). More specifically:
1.2.1.1– European Grid Initiative (EGI)
The main objective is to set up an organisation that will enable the sustainable provision of grid services to the European scientific community. The proposal should cover all strategic, policy, technical, financial and governance aspects. The EGI should also provide appropriate user support, certify as well as maintain and operate repositories of middleware/software components – developed by the EGI or others, facilitate the launch of cooperative grids development projects and should plan and prepare the future evolution of grids by innovating in services, technological approaches and business models to stay abreast of user needs.

The stakeholders of the EGI should be the National Grid Initiatives (NGIs) as well as other entities that are willing to significantly contribute to the aims of the EGI. The majority of the stakeholders should be NGIs; the latter must be legal entities with a public service mission

[2]EGI Blueprint: http://web.eu-egi.eu/blueprint.pdf
[3]EGI Functions Definition: http://web.eu-egi.eu/fileadmin/public/Deliverables/d3.2-postrev-v3.2.pdf

aiming at integrating resources on a national level for "one-stop-shop" efficient provision of grid-based services to the research community. The EGI should be inclusive in membership. Its services should be extended, where possible and appropriate, also to countries not participating yet in the EGI through an NGI.

The EGI should ensure a seamless and progressive transition in service provision from the current arrangements to a new scheme that is more sustainable organisationally and financially, demonstrating economies of scale with respect to the current situation as well as progressively increasing financial commitment from its stakeholders.
The EGI should promote close collaboration and interoperability with similar infrastructures in other parts of the world. It should follow a clear policy for open source software, adherence to open standards and for licensing.

1.2.1.2 – Service deployment

The aim is to deploy services for user communities that are heavy users of DCIs and have a multi-national dimension. Software components should be integrated in platforms as needed for service provision. Where appropriate, new service provision models should be explored and harmonised interfaces to DCI resources should be ensured. This activity should ideally be articulated with the EGI (sub-topic1.2.1.1).

The focus of the EGI-InSPIRE project is an **In**tegrated **S**ustainable **P**an-European **I**nfrastructure for **R**esearchers in **E**urope. This will be achieved through:

- The continued operation and expansion of today's production infrastructure by transitioning to a governance model and operational infrastructure that can be sustained outside of specific project funding.
- The continued support of researchers within Europe and their international collaborators that are using the current production infrastructure.
- The support for current heavy users of the infrastructure in Earth Science, Fusion, Computational Chemistry and Materials Science Technology, Life Sciences and High Energy Physics as they move to sustainable support models for their own communities.
- Interfaces that expand access to new user communities including new potential heavy users of the infrastructure from the ESFRI projects.
- Mechanisms to integrate existing infrastructure providers in Europe and around the world into the production infrastructure so as to provide transparent access to all authorised users.
- Establishing processes and procedures to allow the inclusion of new DCI technologies and resources into the production infrastructure as they mature and demonstrate value to the EGI community.

The consortium of 37 partners, which includes 35 NGIs and 2 EIROForum members, the European Organisation for Nuclear Research (CERN) and the European Molecular Biology (EMBL), are in a unique position to deliver this new sustainable model of service provision as they have built up a globally unique experience in the field of delivering such services to their national or discipline specific research communities. Through the partners the consortium brings unparalleled experience in operating production quality distributed computing resources, in depth knowledge of the current middleware and operational software needed with production infrastructures, and nearly a decade of experience in working together in different collaborations.

EGI will also establish relationships with other EU projects and international infrastructures that will be relevant to the project. These include:

- Virtual Research Community (VRC) projects such as ROSCOE, SAFE, SIMBIOME, WeNMR, DRIHM, DECIDE, ICE-INFRA and GISELA which seek to bring research communities together and support their use of DCI production infrastructures.
- Technology projects such as EMI, StratusLab, IGE and SGI which wish to enhance existing technologies for accessing distributed computing and storage resources, or to establish new paradigms capable of being integrated into the EGI production infrastructure.
- Projects that provide cross-discipline Specialised Support Centres (SSCs) that such as TAPAS and CUE.
- Projects that support the continued establishment and expansion of DCIs within Europe and beyond such as the OGF-Europe-II, GridTalk-II, CHAIN, GrACE and DEGISCO projects.

- Projects that establish production infrastructures such as DISC, DEISA[4], the US Open Science Grid-OSG[5], and the US TeraGrid[6] that need to be integrated with the resources presently provided through EGEE to ensure an integrated resource fabric for the European user community.

National and regional users of EGIs integrated services will benefit from.

The following text expands on these objectives and draws attention to text from the call (*in italics*) to show how EGI-InSPIRE's activities respond to objectives 1.2.1.1 and 1.21.2 of the call INFRA-2010-1.2.1: Distributed computing infrastructure (DCI).

Objective 1 (O1): The continued operation and expansion of today's production infrastructure by transitioning to a governance model and operational infrastructure that can be sustained outside of specific project funding.

The main focus of the EGI-InSPIRE project is to consolidate national, regional, and international initiatives into an integrated European Grid e-Infrastructure composed of sustainable grid activities (i.e. NGIs or EIROForum facilities) sustained by their own funding, and a coordinating body EGI.eu sustained by its stakeholders. Through this infrastructure we expect to serve an extended and increasing user base and user communities, ranging from large organised international user communities to small ad-hoc user groups and individuals.

The NA1 and NA2 activities within EGI-InSPIRE will support the establishment of the EGI.eu organisation responsible within the collaboration for coordinating the European distributed computing and storage resources. This will include the development of the processes and procedures necessary to supporting its financial, technical and administrative governance, and establishing the strategies and policies necessary to further develop the collaboration and establish cooperative agreements with other EC and nationally funded projects. The NA3 activity provides the coordination of the user support functions that will be delivered through the NGI support teams and those in collaborating projects that provide discipline specific or generic support functions. The middleware necessary to operate the production infrastructure will be specified and verified, and issues found when deployed in production, investigated through SA2. SA2 will also collect components from external software providers into a repository of open-source and freely reusable components that are moving to adhere to open standards. These will be made available for deployment onto the production infrastructure through SA1. Collaboration with projects such as OGF-Europe-II will be essential to promote standardisation activity by EGI's software providers in order to promote common open interfaces, operating models and licensing schemes. The evolution of the operational tools necessary to support new service charging models will be defined by the EGI Collaboration and then implemented within EGI-InSPIRE through the JRA1 activity. These work packages together address:

The main objective is to set up an organisation that will enable the sustainable provision of grid services to the European scientific community. The proposal should cover all strategic, policy, technical, financial and governance aspects. The EGI should also provide appropriate user support, certify as well as maintain and operate repositories of middleware/software components – developed by the EGI or others, facilitate the launch of cooperative grids development projects and should plan and prepare the future evolution of grids by innovating in services, technological approaches and business models to stay abreast of user needs. .... It should follow a clear policy for open source software, adherence to open standards and for licensing. (From sub-topic 1.2.1.1)

The governance model of EGI is described in the EGI Blueprint (See Figure 1) and is described in more detail in the statues of EGI.eu (see Annex XX) which is the coordinating body that is being established in Amsterdam, Netherlands following an open completion for the host location in March 2009. The statutes establish that at least 75% of the votes in EGI Council, the governing body of the EGI collaboration and EGI.eu, will be held by NGIs. Other NGIs and organisation that subscribe to the EGI statutes may join EGI following application and acceptance by the EGI Council. Currently there are 35 NGIs (XX votes) and 2 EIROForum facilities (XX vote) establishing that:

The stakeholders of the EGI should be the National Grid Initiatives (NGIs) as well as other entities that are willing to significantly contribute to the aims of the EGI. The majority of the stakeholders should be NGIs; the latter must be legal entities with a public service mission aiming at integrating resources on a national level for "one-stop-

[4] The Distributed European Infrastructure for Supercomputing Applications http://www.deisa.eu
[5] The Open Science Grid project http://www.opensciencegrid.org/
[6] http://www.teragrid.org

shop" efficient provision of grid-based services to the research community. The EGI should be inclusive in membership. Its services should be extended, where possible and appropriate, also to countries not participating yet in the EGI through an NGI. (From sub-topic 1.2.1.1)

The transition towards the new operational structure has already started, and is being undertaken mainly as part of the EGEE-III and EGI_DS projects. Within EGEE-III the operational structure has started to move towards decentralised operations, initially at a regional level, before completing the move to national operations within this project. The gLite middleware team has restructured itself as product teams, each responsible for the development, testing, integration and certification of their software outputs in preparation for the move in EGI to there being no centralised team tasked with these activities and the continued support of gLite within the EMI project. The EGI Council has been established through the EGI_DS project with XX representatives of NGIs or EIROForum facilities having agreed and signed a memorandum of understanding (MoU) and having paid €XXX towards the establishment of EGI.eu in advance of the end of the EGEE-III project. This preparatory work to the establishment of EGI.eu during the EGI-InSPIRE and the commitment by the EGI Council for the membership revenue to increase over the next 4 years ensures that:

The EGI should ensure a seamless and progressive transition in service provision from the current arrangements to a new scheme that is more sustainable organisationally and financially, demonstrating economies of scale with respect to the current situation as well as progressively increasing financial commitment from its stakeholders. (From sub-topic 1.2.1.1)

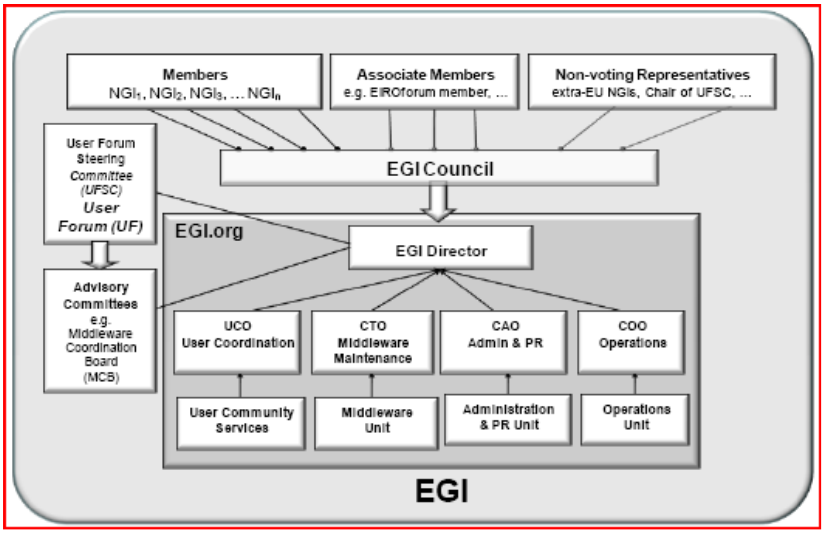


Figure 2 – EGI Governance Structure according to the EGI blueprint (Editor's comment: Update figure and change EGI.org to EGI.eu)

Objective 2 (O2): The continued support of researchers within Europe and their international collaborators that are using the current production infrastructure.

Through the user support coordination provided within NA3 and the operational support teams provide in SA1 the use of the infrastructure by a diverse end-user community will continue to be supported. Domain specific support will be provided outside of the project through Virtual Research Communities (VRCs) designed to bring together research communities to provide mutual support, networking, dissemination and training. These resources will be incorporated into the EGI support function to enable end-users see a unified support structure. By recognising community driven structures within the VRC for governance and representational, EGI.eu will be in a better position to understand and prioritise their requirements, thus addressing:

The EGI should also provide appropriate user support ... and should plan and prepare the future evolution of grids by ... stay abreast of user needs. (From sub-topic 1.2.1.1)

Objective 3 (O3): The support for current heavy users of the infrastructure in Earth Science, Fusion, Computational Chemistry and Materials Science Technology, Life Sciences and High Energy Physics as they move to sustainable support models for their own communities.

As part of the EGI-InSPIRE proposal, the SA3 activity provides dedicated support to the applications, services and tools current being used by the heavy users of the infrastructure in integrating their domain specific use of the generic production infrastructure. This may include software services, support, or effort to ensure that the infrastructure delivers the capability they need. This activity builds on synergies between these communities where it exists, and aims to transition these capabilities either into the production infrastructure for the benefit of new heavy user communities and the general national or local user, or to sustainably support the work within the domain community. Thereby addressing:

The aim is to deploy services for user communities that are heavy users of DCIs and have a multi-national dimension. Software components should be integrated in platforms as needed for service provision. This activity should ideally be articulated with the EGI - sub-topic1.2.1.1 (From sub-topic 1.2.1.2)

Objective 4 (O4): Interfaces that expand access to new user communities including new potential heavy users of the infrastructure from the ESFRI projects.

The benefits of a generic infrastructure that can be enabler for collaboration within and between science communities and their related virtual organisations have been shown repeatedly in the EGEE and DEISA projects. As the ESFRI projects move from the planning to the commissioning phases the need for a generic research infrastructure to support their data analysis needs becomes clearer. As many of these projects will have a life-span (operation and data-analysis phases) measured in decades, the use of a sustainable DCI to support this work is essential. The experiences gained by the heavy user communities in SA3 in shaping the generic production infrastructure in EGI will be exposed to the ESFRI project communities to demonstrate the potential benefits that their adoption of the infrastructure can provide. The coordination of this activity will take place at a strategic level within NA2 and directly supported by NA3. Indeed, several ESFRI projects are already becoming engaged in EGI through their participation in the closely aligned VRC projects, thereby:

Recognising that a distributed computing and software infrastructure is a key enabler of eScience, ... (Introduction to 1.2.1)

Objective 5 (O5): Mechanisms to integrate existing infrastructure providers in Europe and around the world into the production infrastructure so as to provide transparent access to all authorised users.

EGI will continue the interoperability and interoperation efforts achieved within the EGEE-III project with other regional or continental efforts around the world needed to support the collaborations required by EGI's user community. Firstly, this will bring all the European countries together to provide a coherent and seamless integration of national e-Infrastructures. This integration will continue outside of Europe with the Open Science Grid and TeraGrid in the US, projects such as EuMEDGrid, SEEGrid, BalticGrid to expand support to countries around Europe, and EU-India2 and EELA-2 to other regions. Some of these regional activities will continue alongside EGI-InSPIRE in proposed projects such as CHAIN and GISELA. Closer collaborations with other European e-Infrastructure providers (namely GEANT, DEISA/PRACE and collaborations such as EDGES/DICE) will be pursued in order to provide an integrated view of networking, supercomputing and desktop resources with those offered within EGI to present these different resources to users as a unified e-Infrastructure ecosystem. The coordination activity will be provided within NA2 and the technical support for this activity within the SA1 activity which will allow:

The EGI should promote close collaboration and interoperability with similar infrastructures in other parts of the world. (From sub-topic 1.2.1.1)

Objective 6 (O6): Establish processes and procedures to allow the inclusion of new DCI technologies and resources into the production infrastructure as they mature and demonstrate value to the EGI community.

Production quality DCI resources within Europe funded by the EC currently fall into two categories: high throughput computing resources (encompassing primarily the EGEE infrastructure) and high performance computing resources (encompassing primarily the DEISA infrastructure). These types of resources are also replicated at the national and broader international level. Presently, users are presented with different software, operational models and procedures for their use which presents European e-Infrastructure as fragmented and dis-jointed. Work proposed within the EMI project will work to harmonise the different software solutions used on HTC and HPC resources. Over the course of the projects other technologies will mature and become suitable for

inclusion into the production quality resources coordinated by EGI. These may include desktop grids (such as those developed within the EDGES and the proposed DICE projects) and cloud infrastructures (that may be explored through the StratusLab and DICE projects). The principles established in EGEE, and carried forward into EGI, of including resources where their availability and reliability can be monitored as part of the production infrastructure and presented through integrated interfaces to end-users will be applied to infrastructures built on all new or existing technologies. This activity coordinated by NA2, using enhanced operational interfaces defined by JRA1, will be integrated through the operational interfaces provided by SA1, will address how EGI-InSPIRE will:

Where appropriate, new service provision models should be explored and harmonised interfaces to DCI resources should be ensured. (From sub-topic 1.2.1.2)

Show how they relate to the topics addressed by the call, which you should explicitly identify.

The activity within EGI-InSPIRE or the EGI collaboration that is directed to meet the objectives from the INFRA-2010-1.2.1 call is shown below:

Relevant objectives from INFRA-2010-1.2.1: Distributed computing infrastructure (DCI)	**Activity within EGI-InSPIRE**
1.2.1.1– European Grid Initiative (EGI)	
The main objective is to set up an organisation that will enable the sustainable provision of grid services to the European scientific community.	EGI.eu is the coordinating organisation within the EGI collaboration. It is charged with defining, in consultation with its stakeholders represented through the EGI Council, the policies and procedures necessary to deliver an integrated seamless infrastructure to the European Research Area. The establishment of this organisation and the development of its governance model will be supported through this project as described in NA2.
The proposal should cover all strategic, policy, technical, financial and governance aspects.	The proposal will support the various bodies within EGI charged with its all aspects of its organisational structure (see NA2).
The EGI should also provide appropriate user support, certify as well as maintain and operate repositories of middleware/software components – developed by the EGI or others, facilitate the launch of cooperative grids development projects and should plan and prepare the future evolution of grids by innovating in services, technological approaches and business models to stay abreast of user needs	User support will be coordinated through the NA3 activity and delivered within the project by activity within SA1. Support functions from teams outside of the project (e.g. VRCs or SSCs) can be integrated into the EGI Helpdesk. SA2 will operate a repository of software components (including middleware) that will be available to the EGI community, notably SA1 for deployment onto the production infrastructure. These components will be provided by external software providers working to meet defined criteria on quality and defined interfaces which will by the end of the project will have to be based around open standards. SA1 will define an open process by which other resources can be monitored from the production infrastructure. NA2 will establish collaborative links with other technology projects to foster the integration of their work into the EGI production infrastructure when they are shown to be sufficiently mature and provide benefit to our user community. Activity within JRA1 will adapt the current generation of operational tools to integrate with different types of resources which may have different charging/accounting mechanisms. A study within NA2 will explore how EGI wishes to adapt its current revenue stream (i.e. the membership fee) to incorporate service charging.
The stakeholders of the EGI should be the National Grid Initiatives (NGIs) as well as other entities that are willing to significantly contribute to the aims of the EGI.	The statutes of EGI.eu allow the inclusion of any entity that is aligned to the objectives of the organisation. This currently includes NGIs and EIROForum members, but could in the future include ESFRI projects.
The majority of the stakeholders should be NGIs; the latter must be legal entities	The statutes define the maximum participation of entities that are not NGIs as 25% - ensuring a majority.

with a public service mission aiming at integrating resources on a national level for "one-stop-shop" efficient provision of grid-based services to the research community.	
The EGI should be inclusive in membership.	Any entity willing to work towards the EGI.eu objectives that is accepted by the EGI Council may join the collaboration.
Its services should be extended, where possible and appropriate, also to countries not participating yet in the EGI through an NGI.	EGI will accept counties into the collaboration that meet the qualifying criteria. The EGI-InSPIRE project will bring together partners from all around the world to provide an integrated set of services to meet the needs of the project's user community.
The EGI should ensure a seamless and progressive transition in service provision from the current arrangements to a new scheme that is more sustainable organisationally and financially, demonstrating economies of scale with respect to the current situation as well as progressively increasing financial commitment from its stakeholders.	The transition to the new nationally based operational model has already started within the final year of EGEE-III and will be continued within EGI-InSPIRE. The technical development work around the continued automation of the operational tools and adoption of a nationally based operational model will take place within JRA1 and deployed by SA1. The stakeholders within the EGI Council have committed to increasing the membership fee from its current level (€1M a year), contributing 67% of the staff effort necessary to interface national activities to the European infrastructure and to explore the adoption of service charging models to supplement the membership fee. In addition the stakeholders will be committing their own funds (estimated at XXX per annum) to purchasing supporting computing and storage hardware.
The EGI should promote close collaboration and interoperability with similar infrastructures in other parts of the world.	EGI will collaborate with a variety of projects within Europe and worldwide supported through the NA2 activity. Many of these projects will be with other infrastructure providers that our user community will wish to be seamlessly integrated with EGI's production infrastructure. This technical work will be undertaken through SA1.
It should follow a clear policy for open source software, adherence to open standards and for licensing.	The external software providers will be required to meet clear acceptance criteria around software quality and defined public interfaces as defined and verified by SA2. These public interfaces should be defined around open standards where they are available. When not defined EGI will work with related projects (e.g. EMI and OGF-Europe II) to establish these open standards. It is expected that these components will be open source and have permissive licenses.
1.2.1.2 – Service deployment	
The aim is to deploy services for user communities that are heavy users of DCIs and have a multi-national dimension.	The SA3 activity will support the current heavy user communities, all of which are based on multi-national collaborations, in their continued use of the generic production infrastructure. These activities will over the course of the project migrate into the generic infrastructure or be sustainably supported by their user communities.
Software components should be integrated in platforms as needed for service provision.	As the services being supported by the heavy user communities in SA3 mature, or are shown to have benefit to the wider user community, they will be integrated into the general service platform offered by EGI.
Where appropriate, new service provision models should be explored and harmonised interfaces to DCI resources should be ensured.	The JRA1 activity will explore different charging models that are of interest to the EGI collaboration. SA1 will define processes by which other DCI resources (e.g. clouds, HPC, desktop grids, etc.) can be integrated into the EGI production infrastructure when they have reached sufficient maturity.
This activity should ideally be articulated with the EGI (sub-topic1.2.1.1).	The support for the heavy user communities is fully integrated into the EGI-InSPIRE proposal.

EGI-InSPIRE will employ a series of measurable indicators as part of a metrics programme to track the evolution of the infrastructure and its use in a measurable and verifiable form. These will be defined in detail early in the project across all activities, but a preliminary list, grouped around the earlier objectives, is defined below:

Objective	Metrics, Deliverables or Milestones
O1: The continued operation and expansion of today's production infrastructure by transitioning to a governance model and operational infrastructure that can be sustained outside of specific project funding.	Resources (Number of sites, Number of cores, Storage, ...) Number of countries Usage (Number of jobs, Data Movement, ...)
O2: The continued support of researchers within Europe and their international collaborators that are using the current production infrastructure.	Number of users Number of jobs moving between infrastructures
O3: The support for current heavy users of the infrastructure in Earth Science, Fusion, Computational Chemistry and Materials Science Technology, Life Sciences and High Energy Physics as they move to sustainable support models for their own communities.	
O4: Interfaces that expand access to new user communities including new potential heavy users of the infrastructure from the ESFRI projects.	Number of users Number of virtual organisations Number of ESFRI projects using the infrastructure
O5: Mechanisms to integrate existing infrastructure providers in Europe and around the world into the production infrastructure so as to provide transparent access to all authorised users.	Number of integrated independent infrastructures
O6: Establishing processes and procedures to allow the inclusion of new DCI technologies and resources into the production infrastructure as they mature and demonstrate value to the EGI community.	

1.2 Progress beyond the state-of-the-art

Describe the state-of-the-art in the area concerned, and the advance that the proposed project would bring about. If applicable, refer to the results of any patent search you might have carried out.

Capacity computing, often referred to as grid computing has been steadily used for more than a decade. Starting with the experimental services of the EU DataGrid (EDG)[7] and CrossGrid projects, as well as other related efforts under the fifth Framework Programme, Europe played a leading role in the development of the Grid computing technologies, infrastructures and their related services. The pioneering EGEE project series is based on the results of these early projects and offers, together with a chain of other national, regional and international projects and initiatives, production-quality services for multiple user communities. Strong collaboration with the underlying pan-European research network provided by GÉANT and the NRENs was key to the success of the EGEE series.

Alongside capacity computing, capability computing has also been developing as an infrastructure within Europe. The DEISA series of projects has built a grid of supercomputing projects with a common resource allocation procedure, shared wide-area file system and an integrated job submission system across all of the resources. MORE. A dialogue with the supercomputing stakeholders of the e-Infrastructure ecosystem has been also initiated ultimately aiming for complementary, integrated, services for the research users.

The capability and capacity production computing infrastructures, each with their own associated storage resources, represent the state of the art of in European e-Infrastructure. The EGI-InSPIRE will move beyond this state of the art by pursing the stated objectives within the project described below. Achievement of these objectives will reconfirm Europe's leading position in e-Infrastructure provision to support world-class research.

O1: The continued operation and expansion of today's production infrastructure by transitioning to a governance model and operational infrastructure that can be sustained outside of specific project funding.

This project will bring about a full transition into a new sustainable coordination and governance scheme, mostly based on national grid initiatives in each country—the NGIs—and a coordinating body—the EGI.eu. EGI.eu is an application-neutral entity that has been created in the city of Amsterdam for the coordination of the European Grid Infrastructure and its services, and thus the promotion of e-Science and the adoption of Grid technologies by

[7] European Data Grid FP5 project: http://eu-datagrid.web.cern.ch

multiple user communities in Europe. As NGIs are the basic building blocks of the EGI, the sustainability of the latter will heavily depend on the sustainability of the NGIs in having-long term national funding commitments and organisational setups different from purely project oriented organisations. It is the NGIs that will contribute the majority of the computational and storage resources to the production infrastructure and provide the staff that will interface their national resources into the European infrastructure.

O2: The continued support of researchers within Europe and their international collaborators that are using the current production infrastructure.

As the research communities using the European e-Infrastructures continue to grow scalable support models need to be developed that can support both large and small communities. Within EGI, the focus of this scalable user support model will be through the Virtual Research Community (VRC) which provides a focus for large communities to interact with EGI – both in obtaining support and for expressing their requirements. Direct support for user communities relating to their use of the infrastructure will be provided through the NGI support teams within EGI-InSPIRE. Domain specific support is one of the services that can be provided through the VRC alongside training, dissemination and general coordination activities. It is envisaged that VRCs will be initially funded through EC projects but will migrate to self-sustaining entities supported by their own communities over the next few years. Smaller collaborations can continue to make direct use of EGI's support mechanisms.

O3: The support for current heavy users of the infrastructure in Earth Science, Fusion, Computational Chemistry and Materials Science Technology, Life Sciences and High Energy Physics as they move to sustainable support models for their own communities.

The current heavy users of the infrastructure have received significant support from the infrastructure providers during their adoption of their resources into their research activities to support large-scale data processing. For long-term sustainability this support needs to become part of the generic infrastructure offered to all communities or supported explicitly by the community that needs it. Many of the services that have in the past only been used exclusively by these heavy user communities are now part of the generic service infrastructure. Continued engagement with these communities will accelerate the evolution of the services offered to all communities from what it is now – both in terms of quality and scope.

O4: Interfaces that expand access to new user communities including new potential heavy users of the infrastructure from the ESFRI projects.

The e-Infrastructures currently provided by DEISA and EGEE do not

O5: Mechanisms to integrate existing infrastructure providers in Europe and around the world into the production infrastructure so as to provide transparent access to all authorised users.

The European E-Infrastructures Forum has been established to foster tighter coordination and cooperation between the current and future providers of DCI in Europe – EGEE/EGI, DEISA/PRACE, GEANT and TERENA. Initial steps such as integrated support mechanisms and events are already being discussed. Providing single sign on, accounting, resource allocation and community management tools across these infrastructures offers potential benefits to user communities that require the coordinated use of more than one infrastructure. Reducing these barriers will simplify access to DCI resources for future user communities.

O6: Establishing processes and procedures to allow the inclusion of new DCI technologies and resources into the production infrastructure as they mature and demonstrate value to the EGI community.

The production infrastructure provided by EGI will be based initially on the high throughput computing resources inherited from the EGEE-III project. The integration of other resources into a unified production quality infrastructure that will move the EGI infrastructure beyond the current state of the art requires the alignment of policy, operations and the interfaces accessed by the user. Many of the policy issues are already being explored through the Infrastructure Policy Group that meets regularly at the Open Grid Forum meetings. Harmonisation of the user interfaces is expected to take place within the proposed EMI project – which will see common interfaces defined and implemented over the gLite, UNICORE and ARC middlewares. The integration of resources at an operational level will be defined by EGI in collaboration with the relevant resource providers.

Providing an integrated set of resources for high capability and high performance computing will already provide an offering to the European research community that is already beyond the state of the art. As new technologies and their associated infrastructures mature other resources can be integrated into EGI. An initial focus will be to build upon the desktop resources provided by projects such as EDGES and its proposed follow on DICE. The collaboration established during the EGEE-III project will form the basis of this work. Future technologies could include the provision of cloud resources (from either commercial or academic providers) to the European research community, potentially provided though commercial in

An enhanced EGI operational model based on NGIs and related SLAs

1.3 Methodology to achieve the objectives of the project, in particular the provision of integrated services

Describe the methodology to achieve the objectives of the project, especially the way integrated services will be provided.

Editors note: Incomplete draft. Activity table is provisional and will be updated when the structure is finalized.

The methodology to achieve the objectives of the project is in-line with the usual project management principles. Each of the objectives is translated into one or more activities (i.e. work packages) and tasks. According to the CCPCSA scheme the activities span three main categories being networking, service and joint research ones. A workplan for each category of activities has been prepared (and is presented in sections 1.4-1.6), as well as individual plans for each of the activities. Proper coordination and interaction among the different activities will guarantee the provision of integrated and coherent services and will be undertaken by the project management activities in NA1.

EG-InSPIRE activities, as identified below, will provide enhanced services to an expanding geographical coverage and user base and migrate to the sustainable EGI structures. The following main actions will be performed:

Networking Activities

- **Management**: Establishment of the EGI-InSPIRE Project Office to support the administration of the project and the technical management of the project. Establishing a Quality Assurance process to monitor the formal output from the project (i.e. deliverables and milestones) and the metrics from each activity. Interaction with the EC project officer.
- **External Relations**: Dissemination of results within the project, to other projects and the wider community. Support of the governance and technical bodies within EGI.eu. Management of two large events each year to promote collaboration within the European DCI community.
- **User Community Coordination**: Providing a 'front desk' within the EGI Helpdesk to support the user community. Collection of requirements for new features or functionality. Technical services to support interaction with the user community through an applications and a training database. Technical coordination of NGIs providing application porting and the support of virtual organisations.

Service Activities

- **Operations**: Coordination of staff within the NGIs undertaking the NGI International Tasks within their own NGIs to interface into the European wide production infrastructure. Provision of the EGI Global Tasks needed to integrate the individual NGIs into a coherent integrated European e-Infrastructure.
- **Provisioning the Software Infrastructure**: Definition and validation of the criteria applied to external software components. Providing a software repository to store components from the external software providers. Support tools and processes track the work of this activity. Establishing a deployed middleware support unit to identify issues and propose solutions for the software in production use.
- **Support for the Heavy User Communities**: Provision of high-quality services to the user communities and additional specific services to the international heavy user communities

Joint Research Activities

- **Operational Tools**: Maintenance of the currently deployed operation tools. Development of the operational toolset for further automation and national deployment scenarios. Support of new service charging models once defined.

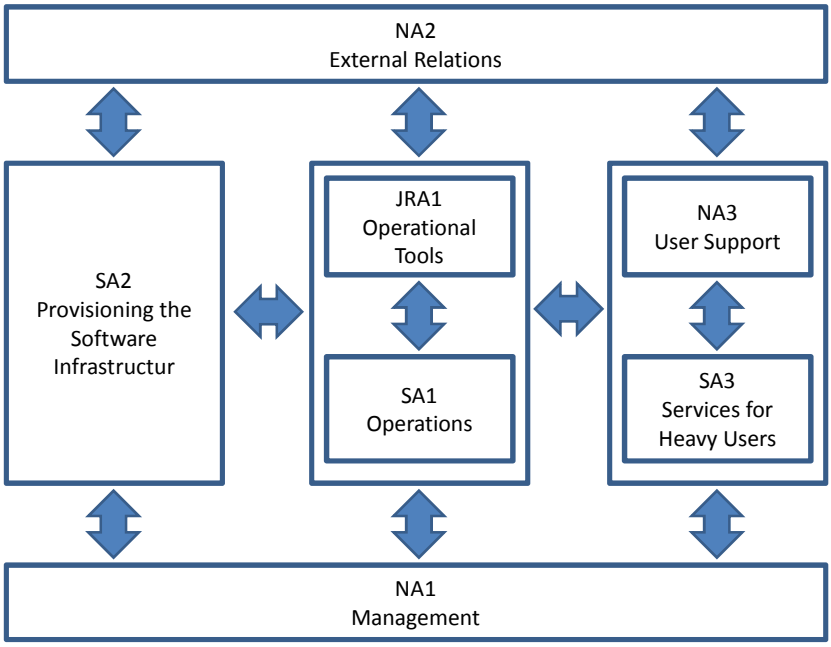
The identified objectives can be thus mapped into activities that can be found in the table below:

Objective	EGI-InSPIRE Work Packages
O1: The continued operation and expansion of today's production infrastructure by transitioning to a governance model and operational infrastructure that can be sustained outside of specific project funding.	SA1 – Coordination of a European wide production infrastructure. NA2 – Establishment of a sustainable governance model.
O2: The continued support of researchers within Europe and their international collaborators that are using the current production infrastructure.	NA3 – User Support and Community coordination. SA1 – Provision of the EGI Helpdesk and support teams. NA2 – Coordination with other e-infrastructure providers.
O3: The support for current heavy users of the infrastructure in Earth Science, Fusion, Computational Chemistry and Materials Science Technology, Life Sciences and High Energy Physics as they move to	SA3 – Support for heavy user communities. SA1 – Coordination of a European wide production infrastructure.

sustainable support models for their own communities.	
O4: Interfaces that expand access to new user communities including new potential heavy users of the infrastructure from the ESFRI projects.	SA3 – Dissemination of heavy user community activity to new users. NA3 – User support mechanisms for VRCs (expected to be established within ESFRI projects).
O5: Mechanisms to integrate existing infrastructure providers in Europe and around the world into the production infrastructure so as to provide transparent access to all authorised users.	NA2 – Support for the coordination activity needed with other infrastructures. SA1 – Technical coordination for interoperability and integration activities.
O6: Establishing processes and procedures to allow the inclusion of new DCI technologies and resources into the production infrastructure as they mature and demonstrate value to the EGI community.	SA1 – Definition of integration criteria and processes.

Table 1: Mapping of objectives into activities

These activities will be led by the EGI.eu Director and the senior managers in the main EGI.eu functions: administration, operations, software technology and user community support. Further details of the management structure can be found in Section 2.1. Together they form EGI.eu's Senior Management Team (SMT) and also lead many of the work packages within the EGI-InSPIRE project. The execution of the EGI-InSPIRE project is managed through the Activity Management Board (AMB), which reports regularly to the Project Management Board (PMB), which is in turn answerable to the project's Collaboration Board (CB). Strategic direction of EGI.eu's activities is delegated by the EGI-Council to a number of technical advisory groups which are supported logistically through the EGI-InSPIRE project office (NA1) and through a technical secretariat (NA2). EGI.eu is engaged in a number of external bodies which guide the development of policy with other infrastructures or collaborating projects. A high-level workflow that can act as the basis for further detailed inter-activity workflows and ensure the integrated services can be found below:



One of the main objectives of EGI-InSPIRE project is the establishment of a sustainable infrastructure that exists outside of a single project or community, for the management of research based DCIs for the ERA. This coordinating body, EGI.eu, of the EGI Collaboration will have its own management and technical structures which will be supported by EGI-InSPIRE during the course of the project. Therefore, EGI-InSPIRE does not have any technical structure of its own, delegating these decisions to the structures within EGI.eu which it is funded to support. Instead, EGI-InSPIRE focuses on the project's successful execution by coordinating the work of the collaboration. Likewise, EGI.eu's focus is on the successful execution of the EGI Global Tasks that it delivers to the community – these tasks include both services and coordination functions. It does not have managerial control over the staff in the NGI's performing the NGI International Tasks – although it can report issues to the relevant

NGI through the EGI Council. However, as the NGI staff performing these tasks will be partly funded through the EGI-InSPIRE project the project management structure would be able to address these issues.

To assure coherence between the work of EGI.eu in coordinating the European e-Infrastructure provision and the work of EGI-InSPIRE in supporting a pan-European production infrastructure, key positions in the project are assigned to staff within EGI.eu. Notably, the NA1, NA2, NA3, SA1, and SA2 work package leaders are all senior staff in EGI.eu. Their co-location will enable efficient execution of these work packages and the integration of their delivery.

1
2
3

The EGI generic workflow for provision of integrated services

1 **Glossary**

Acronym	Definition
PD	Project Director
CAO	Chief Administrative Officer
CTO	Chief Technical Officer
COO	Chief Operations Officer
PPT	Project Progress Tracking
EC	European Commission
UCO	User Community Officer
PO	Project Office
AMB	Activity Management Board
UMD	Unified Middleware Distribution
EGI	European Grid Initiative
NGI	National Grid Initiative
EGEE	Enabling Grid for E-sciencE
OMB	Operations Management Board
MCB	Middleware Coordination Board
IPG	Infrastructure Policy Group
QAO	Quality Assurance Officer
GAP	Gender Action Plan
CB	Collaboration Board
PMB	Project Management Board
UFSC	User Forum Steering Committee.
PAC	Partner Administrative Committee
EDG	European Data Grid
ERIC	European Research Infrastructure Consortium
VO	Virtual Organisation
VOMS	Virtual Organisation Membership Service
VRC	Virtual Research Centres (previously domain specific SSCs)
SSC	Specialised Support Centre

2

1.4 Networking Activities and associated work plan

Describe the extent to which the proposed co-ordination mechanisms will foster a culture of cooperation between the participants, and enhance the services to the users.
A detailed work plan should be presented, broken down into work packages (WPs) which should follow the logical phases of the implementation of the project's Networking Activities, and include consortium management and assessment of progress and results. (Please note that your overall approach to management will be described later, in section 2).

1.4.1 Overall Strategy

The networking activities presented in the following sections are designed to:

- Ensure the management of the project and its consortium.
- Coordinate the development of policies and standards for a sustainable European e-Infrastructure both, internally within EGI and externally, with collaborating projects and initiatives.
- Liaise with EGI's user communities, including both, those organized within SSCs and those without, to collect feedback on the EGI services and the community's future infrastructure requirements.

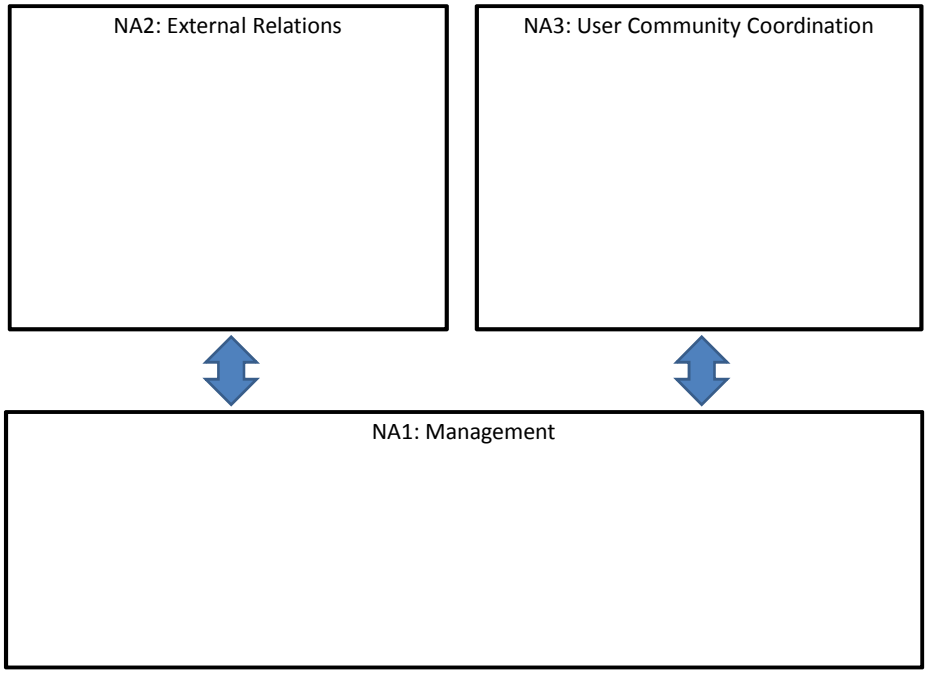
These networking activities will allow the EGI project to sustainably coordinate a pan-European Distributed Computing Infrastructure (DCI) for the European Research Area (ERA). The EGI e-infrastructure will be composed from the resources within individual NGIs and made available to the virtual communities with which their countries researchers collaborate. In some cases, these virtual communities will be supported by discipline specific SSCs funded outside of this project). Other virtual communities will obtain support directly by using relevant community and NGI resources accessed through the EGI support mechanisms. The requirements of all EGI e-Infrastructure users will be collected through an interactive two-way user community activity within EGI. It is expected that the SSCs will work with EGI to collect and prioritise requirements from within the communities they represent.

The overall management of the project is undertaken by staff within EGI.eu, an organisation formed under Dutch law, which provides support for the governance and management of the European-level e-Infrastructure. Specifically, EGI.eu coordinates the use of the infrastructure by supporting the development of policies and standards, internally through the inclusion of all the relevant stakeholders of the e-Infrastructure, and externally through collaboration with relevant other bodies within Europe and abroad to ensure that the European policy environment is compatible to that being developed globally.

1.4.2 Relationship between Networking Activities

Work package No	Work package title	Type of activity	Lead partic no.	Lead partic. short name	Person-months	Start month	End month
NA1	Management	MGT		EGI.eu		1	48
NA2	External Relations	COORD		EGI.eu		1	48
NA3	User Community Coordination	COORD		EGI.eu		1	48
	TOTAL						

TO ADD: Reference to the virtuous circle
TO COMPLETE DIAGRAM BELOW



1 ### 1.4.3 Work Package NA1: Management

2 #### 1.4.3.1 Summary

Work package number	NA1	**Start date or starting event:**		1/5/2010			
Work package title	Management						
Activity type	MGT						
Participant number							
Participant short name							
Person-months per participant							

3

Objectives

- Overall project management and reporting to the European Commission (EC)
- Administrative support necessary to coordinate a project of this size through establishment of a Project Office (PO)
- Technical management of the project
- Quality assurance efforts to monitor the progress of the project against its defined metrics and management of the corresponding review process

4

Description of work

TNA1.1: Management of the NA1 activity and the work of the Project Office
This task will cover the management of the NA1 activity and the PO by the lead partner, EGI.eu. This activity will be led by the CAO who reports to the PD and includes the provision of tools and the establishment of procedures to be used in the successful execution of the project.
Requested Effort: XXX + PPT Costs

TNA1.2: Project and Consortium Management and Managerial Liaison
This task covers all reporting for the project – both financial and administrative – and the liaison with partners in the EGI-InSPIRE project and the EC. It includes cost statement collection and analysis, preparation of budgets for EGI.eu (and the NGI partners delivering the EGI Global Tasks), interim payment coordination and transfer, and budget monitoring and reporting (e.g. GAP). The task provides the managerial liaison with collaborating projects, engagement with the business community, and other European and International infrastructures. The main internal management function is the chairing of the AMB by the PD, and the support of the PMB and CB. The CAO will coordinate administrative representatives of each NGI through the PAC.
Requested Effort: XXX

TNA1.3 Technical Management
Detailed technical management of the project's activities is split across the project's main technical objectives: user support, operations, and software provisioning. Coordination of these activities and issues relating to their day-to-day management are discussed and resolved at the AMB. Detailed technical issues are resolved at the relevant management board for each area: MCB, UFSC & OMB. The senior management of each of the main functions within EGI.eu (the CTO, UCO & COO) contribute to these management boards and are responsible for the day-to-day execution of EGI.eu's activities within their respective areas.
Requested Effort: XXX

TNA1.4: Quality Assurance
A Quality Assurance Officer (QAO) will be a key member of the NA1 team and will be responsible for ensuring the high quality of the output of the project – the services, deliverables and processes. The QAO will also be involved in defining; implementing and collecting the metrics through the various EGI functions – the operations, software and user support – and the project as a whole. These metrics will be established, reviewed annually for their relevance, and used to monitor progress within these areas of the project.
Requested Effort: XXX

5

Deliverables (brief description) and month of delivery

1.4.3.2 Overview

The overall management structure is defined in Section 2.1 which describes the relevant entities and their relations within the project. The lead partner, EGI.eu, is an organisation established to coordinate the activities of national grids across Europe in order to provide an integrated e-infrastructure to support activity within the ERA. The EGI-InSPIRE project will support EGI.eu during its transition to a model where it is partially supported by EC funds and from funds collected from its members. The organisational structure of EGI.eu and the EGI collaboration is a result of a two year long design study, EGI_DS, funded by the EC. The proposed structure was endorsed by the EGI Policy Board (PB), consisting of representatives from the National Grid Initiatives (NGIs) within Europe, as a sustainable model of future e-Infrastructure operation in Europe. As such this proposal builds upon and extends the work and experience of the EGEE series of projects funded by the EC between 2004-2010, and the work of the EDG project before that, along with other infrastructure projects with the EU Seventh Framework Programme (FP7) to deliver the EGI operational model.

1.4.3.3 Project Consortium & Technical Management

The NA1 activity will support EGI.eu, the lead partner in the effective technical and project management of the project, and the administrative and financial support related to the collection and analysis of reports from within the project consortium and their delivery to the EC. ADD IN DETAILS OF THE PROJECT DIRECTOR. The PD will chair the AMB that is charged with the daily execution of the project's objectives.

The Senior Management Team (SMT) within EGI.eu (the Director, CAO, COO, CTO, UCO and QAO) will be based at EGI.eu physically located at the Science Park in Amsterdam. Each will be experts in their respective areas and provide technical direction and leadership to the staff within EGI.eu and in the supporting NGIs in these areas. They also have a reactive managerial role (dealing with the daily technical decisions needed to run a complex distributed project) and a proactive managerial role (in identifying issues that need to be brought before the relevant management bodies).

The EGI Council has delegated technical and operational supervision of the main activities within EGI to the Director of EGI.eu and management groups covering governance, operations, technology, user support, collaboration, etc. to bodies described in more detail in NA2. The role of the CTO, CTO and UCO is to execute the policy set by these groups, to manage their local and remote staff, identify areas needing policy development, and to work with the relevant stakeholders to develop and propose policy for the approval of the relevant management body. These bodies are established outside of the EGI-InSPIRE project as part of EGI,eu, but are supported by the project during the establishment of EGI.eu.

The PO in EGI.eu will be established in Spring 2010 before the planned start of the project through funds provided by the Dutch NGI. This will include the selection and appointment of the senior staff so that they can provide continuity from the current EC projects. As part of the transition strategy from EGEE, EGI.eu will be able to draw temporarily on the experienced personnel already available at NIKHEF and on the relevant staff from the NGIs.

1.4.3.4 Quality Assurance

The QAO will develop and maintain a Quality Assurance process relating to the formal output of the project and for monitoring its progress. Metrics for each activity and the project as a whole will be established and reviewed monthly by the AMB and incorporated into the quarterly and periodic reports. The QAO will also establish a review process for the project's milestones and deliverables that will ensure they are of a consistent high quality.

Monthly reporting within the project will be undertaken for internal management purposes. Quarterly and Periodic reports will be prepared for the consortium and the EC. Both funded and matched NGI staff time will be recorded for each member of the collaboration using the PPT tool developed and supported by CERN. This will allow the time devoted by each project member to the various tasks within each activity to report monthly on their work. This

tool provides an excellent mechanism to collect timesheets that allows effort to be tracked and monitored to produce effort reports for the periodic management reports and information for the GAP.

1.4.3.5 Deliverables

Del. No.	Deliverable Name	WP	Nature	Dissemination	Delivery Date
DNA1.1.1 DNA1.1.2 DNA1.1.3 DNA1.1.4	Periodic Report	NA1	R	PU	PM11, PM23, PM35, PM47
DNA1.2	Gender Action Plan	NA1	R	PU	PM3
DNA1.2.1 DNA1.2.2	Report on Gender Action Plan	NA1	R	PU	PM23, PM47
DNA1.3	Quality Plan and Project Metrics	NA1	R	PU	PM3

1.4.3.6 Milestones

Milestone number	Milestone name	Work Package(s) involved	Expected Date	Means of Verification
MNA1.1	QA Website with Document Templates and Processes	NA1	PM1	The main EGI.eu website will have a QA section with document templates and processes
MNA1.2	Execution Plan	NA1	PM2	Will provide details of the staff assigned by each partner to each task and the reporting lines.
MNA1.3.1-4	Quarterly Report Template (revised annually)	NA1	PM2, PM14, PM26, PM38	Document template describing the information required from each activity as part of its quarterly report.
MNA1.4.1-12	Quarterly Report	NA1	PM3, PM6, PM9, PM15, PM18, PM21, PM27, PM30, PM33, PM39, PM42, PM45	Quarterly report describing the status of each activity within the project.
MNA1.5.1-4	NGI International Task Review	NA1	PM11, PM23, PM35, PM47	Review of the users and resources supported within the NGIs by the NGI International Tasks within each NGI.

1.4.3.7 Risk Assessment and Mitigation

Risks	Impact	Probability of Occurrence	Mitigation
Partners do no complete the tasks assigned to them.	This might cause part of the work programme not to be delivered.	High	A strong and clear consortium agreement will identify the roles of each partner and the management structure for resolving conflicts and the associated escalation procedure.procedures. Project progress will be monitored through the regular AMB meetings. Partner

			performance will be monitored each year and work reassigned if needed.
EGI.eu cannot be established as a legal entity.	The consortium cannot be formed with EGI.eu as the coordinating partner.	Medium	If the formation is EGI.eu is delayed NIKHEF will assume the role as the coordinating partner.
As EGI.eu is a new organisation, key roles within the organisation cannot be recruited in a timely manner for the project' start date.	With no leadership or supporting staff EGI.eu will not be able to undertake its role as lead partner and the initial execution of the project will be delayed.	Medium	At his point in time (date), EGI.eu has already collected €250,000 in membership fees and startup costs (of up to €XXX,000) have been underwritten by the Dutch NGI. It will be able to start recruiting staff from Spring 2010 so that critical staff will be in place before the projected start date.
The Collaboration will not be able to agree on a Consortium Agreement.	Without a consortium agreement the project will not be able to start.	Medium	Many of the partners have worked together on previous EC projects, notably EGEE-III, and will be able to use this agreement as a starting point for discussions.
The statutes necessary to form EGI.eu as Dutch federation are not agreed upon by the EGI collaboration.	EGI.eu cannot be established under Dutch law.	Medium	A draft of the proposed statutes is included in Annex XXX. This has gained considerable consensus within the consortium and is now undergoing final legal review...

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1 ### 1.4.4 Work Package NA2: External Relations

2 #### 1.4.4.1 Summary

Work package number	NA2	**Start date or starting event:**		1/5/2010			
Work package title	External Relations						
Activity type	COORD						
Participant number							
Participant short name							
Person-months per participant							

3

Objectives

- Disseminating the work of the EGI and its user community both within the project and worldwide.
- Supporting the development of policy within and external to EGI.eu in conjunction with EGI's stakeholders relating to governance, standardisation and integration with other infrastructures.
- Running two large (~500 people) events each year to promote interaction between European infrastructure providers and their user communities.

4

Description of work

TNA2.1 Activity Management
This activity will be managed by the PD. The agenda of the policy groups will be determined by their respective Chairs in consultation with the PD, and supported technically by the staff in this activity and administratively by the PO established in NA1. The dissemination manager employed in TNA2.2, will have sufficient experience to coordinate the other member of the dissemination team and the resources located out in the NGIs and related projects. The policy development manager employed on TNA2.3 will coordinate the work of the local staff and those in the NGIs involved in policy matters.
Requested Effort: XXX

TNA2.2 Dissemination
This task will disseminate EGI's activity within the project and worldwide through dissemination contacts located within the NGIs and related EC projects (e.g. VRCs, GridTalk2, BEINGrid, OGF-Europe II, etc.). This task will maintain and develop content for the project website, the monthly PD letter, a quarterly news letter, and the development of case studies and 'success' stories around the applications and communities within the applications database. A budget is requested for the design and printing of additional dissemination material, and EGI's participation at European and International distributed computing meetings through stands and promotional material.
Requested Effort: XXX PM funds for dissemination material & design. Website hosting. Stands. Promotional material

TNA2.3: Policy Development
Policies are needed to govern the provision of high-quality distributed computing infrastructure. EGI.eu, the coordinating body for this community, provides management and policy groups for developing and approving policies relating to operations, software quality, security, user communities and general governance. Development of these policies is supported by the project and may have relevance and impact with other European (e.g. DEISA & PRACE) and International e-infrastructure providers (e.g. OSG, TeraGrid) who will be involved in these policy bodies. A policy development manager will coordinate the work of this task and will report to the work package leader, the PD.
Requested Effort: XXX PM

TNA2.4: Event Management
This task provides the support and management of two large community driven events a year a European e-Infrastructure Conference (carrying on the EGEE series of conferences) and a European Distributed Computing User Forum (carrying on the User Forum series of conferences). The location of each meeting will be selected by the EGI Council following an open bidding process from the NGIs. For each meeting a dedicated programme committee (under a programme chair) drawn from the community and a local

organising committee (under a chair from the bidding organisation) with members drawn from the EGI project office and the local organisers will be formed.
Requested Effort: XXX FTE

Deliverables (brief description) and month of delivery

1.4.4.2 Overview

This activity supports the development of policy, the coordination of standards, and the dissemination and community building activity appropriate for the role EGI.eu will play in coordinating European e-Infrastructure and its interactions worldwide.

For a collaboration as large and as distributed such as EGI-InSPIRE's, communication and community building is vital project wide function that goes beyond just the individual project tasks. The EGI community not only includes those directly involved in the EGI-InSPIRE project, but also those involved in tightly affiliated projects such as the middleware providers and the distributed user community that use resources coordinated through EGI.

1.4.4.3 TNA2.2: Dissemination

In the modern world communication between these groups will be primarily electronic - enabled within EGI-InSPIRE through the project's website. Building on the experience of the websites provided for EGEE, EGI_DS and other projects it will feature web pages maintained by the NA2 dissemination team and wiki pages maintained by registered and authorised members of the project. The project website will be developed for it to become ***the*** place to go for EGI related information and support. RSS feeds will be provided for new news items and general content updates. We will also aggregate RSS feeds from other projects onto our website. A budget of XXX is requested for the professional design of the website graphics, and for the hosting and development of the website.

Dissemination material will be sourced from staff within the NGIs and through contacts in the VRCs and related projects. The coordination of these contacts will yield information that will be used as the basis of articles relating directly to activities within the community, and as a means of disseminating material generated within EGI. This material will also be used for EGI's own promotional material and website, and as the basis for the monthly Director's letter and quarterly newsletter. The applications ported by the NGIs and related projects will be registered in the applications database (run by NA3) and can provide indications of new end-user activity. Such work may be suitable for further dissemination through news articles and in-depth case studies – especially when new applications have been ported to the infrastructure for new user communities.

Our dissemination and community building activity will not be limited to the immediate European distributed computing community. A budget of XXXX is requested to support stands at major conferences and exhibitions in areas aligned with EGI. These will include international conferences such as SuperComputing, and European events such as EC Research meetings [LIST THEM]. These funds will cover the exhibition space, exhibition stand, staff subsistence and travel costs. Additional funds XXXX are requested for the printing of dissemination materials (e.g. leaflets, posters, brochures, etc) and the work of professional designers to ensure that the work is visually appealing and of a high quality.

1.4.4.4 Internal and External Policy Bodies

One of EGI-InSPIRE's objectives is to support through EGI.eu a sustainable DCI potentially encompassing other infrastructures and new technologies within Europe . Key to this coordination role are the policies that EGI.eu develops to govern the use and operation of the infrastructure and its interaction with its stakeholders and user communities. The strategic direction of EGI.eu, and the EGI Collaboration is determined through the EGI Council. Meeting at least twice a year, many of the policy decisions are delegated by the EGI Council to the EGI Council Executive Board, while specific technical decisions are delegated to the relevant technical bodies:

- Middleware Coordination Board (MCB) for defining the policies relating to software acceptance criteria, prioritisation of middleware requirements, and the UMD Roadmap.
- Operations Management Board (OMB) for the policies needed to provide a reliable transparent infrastructure composed of multiple national infrastructure providers.

- Security Policy Group (SPG) to provide policies that define the expected behaviour of sites and users to ensure a secure distributed computing infrastructure.
- Software Security Group (SSG) has representatives from the software providers contributing software to EGI.eu in order to ensure a common coherent approach is taken to the security frameworks.
- User Forum Steering Committee (UFSC) provides a forum for defining policies and prioritising requirements and issues relating to the use of the infrastructure by end-users.
- User Services Advisory Group (USAG) has representatives from the user communities to feedback to the EGI.eu on the user facing operations tools and support processes.
- Operational Tools Advisory Group (OTAG) has representatives from the NGI Operations Centres and provides feedback on the operational tools and how they need to be adapted in response to EGI's requirements.
- EGI Council & Executive Committee will initially have representatives from the NGIs within Europe and the EIROForum organisations, with additional large international research communities and ESFRI projects joining over time. A detailed governance and structure discussion is provided in Section 2.1.2.
- EGI Organisational Task Force will continue to review and propose improvements in the structure (e.g. ERIC), governance and business models (e.g. inclusion of service charging) relating to EGI.eu.

EGI.eu also contributes to external, independent policy activities:

- Infrastructure Policy Group (IPG) has meetings currently co-located with the Open Grid Forum and provides a forum for the providers of production e-Infrastructure to align their activities with a goal of eliminating operational differences between different infrastructures.
- IGTF and EUGridPMA provides processes around common authentication trust domains which are required to persistently identify all EGI participants.
- E-IRG
- European e-Infrastructures Forum (EEF) provides a framework for the current and future providers of European e-Infrastructures to meet. Currently, this meeting has representatives from EGEE, EGI, DEISA, PRACE, GEANT and TERENA.
- Open Grid Forum is the standards development organisation (SDO) that is the focus of much of the standardisation activity within the EGI community, and the high-level coordination and reporting of activity in this body is required.

The EGI-InSPIRE project will support the work of these groups through the provision of administrative support (i.e. meeting logistics, paper preparation, and technical secretariat) and the support of these expert elected/appointed chairs of these groups through travel and subsistence if not already supported by the project.

The transition of the EGI community to the sustainability proposed within EGI_DS has started during the final year of EGEE-III and will continue throughout EGI-InSPIRE – both in terms of evolving the identity of the NGIs, the policies within EGI.eu and the sustainability model for EGI.eu itself. It is expected that significant new stakeholders will emerge within the user base through international research projects, such as those in ESFRI. Therefore it will be necessary to evolve EGI.eu's sustainability model both organisationally and financially. We will examine the new European legal entity – the European Research Infrastructure Consortium (ERIC) – early in the project and assess the benefits and define a roadmap to its possible adoption. The move from a revenue stream in EGI.eu based solely on a membership fee to a mixed model supplemented from other income sources such as service charges will also be assessed.

User Forum Steering Committee (UFSC)
The extended body, the User Forum, is established directly by the user communities, and includes high-level representatives from VRCs, SSCs, NGIs and collaborating projects. The UFSC is tasked with advising the EGI.eu Director on strategic and managerial issues concerning the evolution of EGI.eu's user facing services and the broader support offered by EGI.

Middleware Coordination Board (MCB)
This is an advisory body which provides recommendations to the Director on the strategy and technical priorities concerning the maintenance, support, evolution, deployment and operation of the middleware services adopted in the EGI e-Infrastructure. The MCB is composed of representatives of the following areas:

- the technical and managerial representatives from EGI.eu
- the main software providers engaged with EGI.eu;
- the operational requirements of EGI.eu through representation of the NGIs and Resource providers;

- the user communities affiliated with EGI.eu represented through their VRCs.

The MCB provides strategic advice to the Director on the middleware used in the EGI ecosystem. The role of MCB is to collect and prioritise the high-level requirements following the requests from users and operational staff, and to endorse (or to eventually reject) updates to the UMD roadmap. It has no involvement in the day to day activities of the middleware unit (SA2).

Operations Management Board (OMB)

1. Consolidate all requirements taking into consideration the needs and operational procedures of ROCs and sites.
2. Examine requirements from all relevant parties - VOs, ROCs and Sites, identify common points and differences and see how they influence the Grid Support processes and tools.
3. Define the expectations from all Support Units (SUs) via Operational Level Agreements (OLAs), get acceptance by the SUs and leave OLA enforcement to the management partners involved.

European E-Infrastructure Forum (EEF)

The European E-Infrastructure Forum is a forum that meets quarterly for the discussion of principles and practices necessary to create synergies for seamless interoperation of the leading e-Infrastructure serving the ERA. The focus of the forum is the needs of the user communities that require services which can only achieved by collaborating infrastructures. Its current membership is EGEE, EGI, DEISA, PRACE, Terena & GEANT.

Infrastructure Policy Group (IPG)

The Infrastructure Policy Group has representation from major production e-Infrastructures from around the world – currently EGEE, OSG, DEISA, Naregi and TeraGrid. Meeting at OGF, its purpose is to ensure that the policies sued within each of these production infrastructures is aligned. This activity has emerged in recent years to complement the interoperability activity taking place elsewhere in OGF between these organisations.

Operational Tools Advisory Group (OTAG)

The Operational Tools Advisory Group mandate is to manage the development and evolution of the operational tools in response to new scenarios or feedback from its users – primarily the NGI Operation Centres and the EGI.eu Operations Unit. New requirements are collected and prioritised, and ongoing development, testing and release activities are reported upon. It provides a forum to discuss the future evolution of the operations tools and to agree tool roadmaps that meets the expressed needs of the EGI community.

User Services Advisory Group (USAG)

The USAG mandate is to provide feedback on the user facing tools and services provided to the EGI user community. The main focus will be on the evolution of the EGI Helpdesk but it will also collect requirements and feedback relating to the services offered through NA3 (i.e. documentation, training database, application database, etc.) and the processes provided for user support in EGI. It will have representation from the User Forum (including both small and large user communities) and the operational staff responsible for managing the EGI Helpdesk.

Security Policy Group (SPG)

The SPG is responsible for the development and maintenance of security policies and for providing advice on any security policy issue to the Director. This will be led and coordinated by EGI.eu. SPG's primary stake-holders will be internal to EGI, i.e. the NGIs, the sites and the application communities. Building on the earlier work within the Joint (EGEE/WLCG) Security Policy Group (JSPG), SPG will continue to aim for common simple policies for interoperation across the world. Participation in SPG by policy experts from other e-Infrastructures will therefore still be encouraged. The membership of SPG must contain not just representatives from the NGIs, but also some Site managers, VO managers, middleware experts, operations experts, operational security experts etc. As SPG will not just prepare and maintain formal policy documents. Security policy input will be required in many other bodies. The Security Policy coordinator or other SPG members will represent EGI.eu's security policy interests on EUGridPMA, TERENA and NREN federation activities and other groups, such as the Software Security Group.

Software Security Group (SSG)

The SSG draws its membership from the relevant security experts located in the development teams of its external software providers. The leadership of the activity will rotate between representatives of the main middleware distributions, expected to initially be ARC, gLite and UNICORE, that are deployed within EMI. As other software distributions become part of UMD and deployed within EMI, additional experts will be invited to join this group.

The goal within EGI is that all middleware stacks use the same security components wherever feasible. Relationships will be established with similar experts in other e-Infrastructures and projects. Members of the will contribute their expertise to the relevant OGF working groups as required. The SSG will meet each year – generally at the EGI Conference and at a suitable OGF meeting.

IGTF and EUGridPMA

A common authentication trust domain is required to persistently identify all EGI participants. To ensure interoperability, both at the European as well as the global scale, the project will support the International Grid Trust Federation (IGTF), and the EUGridPMA in particular, in line with the relevant e-IRG recommendations. The accreditation by the IGTF of identity providers can then be a guiding statement for the providers and users of EGI and the NGI infrastructures with respect to compliance and quality of the identity providers.

This representation will bring operational and policy needs of EGI to the attention of the PMA and bring issues raised by the PMA to the attention of the appropriate groups within EGI, and keep the EGI Council informed of progress and policies of the EUGridPMA. It will also coordinate the provision of EGI versions of the IGTF Certification Authority distributions as required by the EGI Council. NGIs may also want to add more CAs, or even remove specific CAs that are incompatible with national policy. In these cases, such an NGI will need to build its own distribution locally.

Open Grid Forum (OGF)

The OGF is the focus of much of the standardisation activity taking place within the EGI community. Reporting on the activity undertaken by the EGI community is essential to plan future policy actions within the MCB and the interoperation activity (O-E-11). The technical work will take place outside of EGI.eu – either within the NGIs or by EGI.eu's software providers (e.g. EMI), is undertaken by EGI.eu on behalf of the community. EGI.eu will expect to liaise closely with the OGF-Europe II project if funded.

1.4.4.5 TNA2.4: Event Management

Bringing all of the EGI stakeholders together into regular meetings is vital in enabling collaboration and exploring research opportunities. EGI will organise two meetings a year each with a distinct (but not exclusive focus) – one meeting focusing on the user community and another on the infrastructure providers. We will work in collaboration with other European e-infrastructure providers and their user communities to make these meetings infrastructure neutral in order to promote the harmonisation between European e-Infrastructures. The initial meeting of this series will be held in Amsterdam in Autumn 2010. Future meetings will be selected through an open bidding process.

1.4.4.6 Deliverables

Del. No.	Deliverable Name	WP	Nature	Dissemination	Delivery Date
DNA2.1	Project Presentation	NA2	R	PU	PM1, PM13, PM25, PM37
DNA2.2	Project Paper	NA2	R	PU	PM3, PM25
DNA2.3.1-4	Annual Report on Dissemination, Standards and Policy	NA2	R	PU	PM11, PM23, PM35, PM47
DNA2.4	Transition plan of EGI.eu to ERIC	NA2	R	PU	PM12
DNA2.5	EGI.eu Financial Model	NA2	R	PU	PM24

1.4.4.7 Milestones

Milestone number	Milestone name	Work Package(s) involved	Expected Date	Means of Verification
MNA2.1	Basic website with key collaborative tools	NA2	PM1	EGI.eu website with static webpages, wiki, links to relevant email lists and document archive.
MNA2.2	Project Presentation Template	NA2	PM1	Presentation template for MS PowerPoint and OpenOffice.

MNA2.3	Dissemination Handbook	NA2	PM2	Establishing the dissemination contacts within the NGIs and projects related to EGI (e.g.. the SSCs) and the basic procedures for events, press-releases and publicity.
MNA2.x	The EGI Consortium will have membership of the EUGridPMA (and through it become part of the IGTF).	NA2	PM3	The EGI Consortium will have membership of the EUGridPMA (and through it become part of the IGTF).
MNA2.4	Review of website content	NA2	PM3, PM15, PM27, PM39	Comprehensive review of website and update of content where required.
MNA2.4.1-4	EGI Conference	NA2	PM6, PM18, PM30, PM42	Project wide conference organised in conjunction with other European e-Infrastructure providers.
MNA2.5.1-4	EGI User Forum	NA2	PM12, PM24, PM36, PM48	Conference organised in conjunction with the user communities associated with EGI and other
MNA2.6	EGI Newsletter	NA2	PM3, PM6, PM9, PM12, PM15, PM18, PM21, PM24, PM27, PM30, PM33, PM36, PM39, PM42, PM 45, PM48	Quarterly newsletter distributed electronically to all project members, external contacts and placed on the website.
MNA2.7	Alignment of EGI.eu with ERIC	NA2	PM7	Report analysing the opportunities provided by ERIC and changes needed for EGI.eu
MNA2.8	Establishing a standards website	NA2	PM3	Identify the Standards Development Organisations (SDOs) and the activities within them relevant to EGI and its partners.
MNA2.9	Review of the standards website	NA2	PM9, PM21, PM33, PM45	Review and update the website with current information.
MNA2.10	The opportunities for Service Charges in EGI	NA2	PM20	Service charges could be used as an income stream within EGI.eu. Any changes in the software and operating model will be assessed in this report to guide future discussions.
MNA2.x	Agreed framework for Security Policies.	NA2	PM12	
MNA2.11.1-4	Report of EUGridPMA progress. Provision of the informational document on membership and policy	NA2	PM11, PM23, PM35, PM47	

	changes of the EUGridPMA to the EGI Council.			
MNA2.14	Revised EGI security policies according to framework agreed earlier.	NA2	PM36	
		NA2	PM39	

1 **1.4.4.8 Risk Assessment and Mitigation**

Risks	Impact	Probability of Occurrence	Mitigation
The dissemination activity accidentally communicates incorrect information.	Depending on the information this could be very damaging to the EGI-InSPIRE project or European DCI activity in general.	Medium	The information used by the dissemination team will be sourced from within the project partners and the dissemination contacts within the NGIs. Press releases, newsletters and major announcements will be reviewed by the AMB for technical matters and the PMB for broader political issues.
Bodies setting technical policy within EGI.eu (MCB, OMB, UFSC) are unable to agree on an inssue.	Getting a coherent and agreed policy across many actors in a complex policy is essential. Failure would impact the governance of the organisation, operations, software provision, interoperability with other infrastructures, etc.	Medium	Many of these policy forum have been in existance for many years and consensus has been reached on many issues. Escalation mechanisms exist through the Director and then the EGI Council for decisions to made if they relate to the infrastructure, or the PMB and the CB if they relate to the project.
One of the large (500-600 people) events makes a loss.	The EGI-InSPIRE budget does not have funding to subsidise events therefore is not able to sustain a loss.	Medium	EGI-InSPIRE will not directly run events. It will partner with a local organiser who will bear the full financial risk, but the project will work with the local organiser to adjust the programme and the event to maximise revenue and minimise cost. Experience from other projects and the use of professional conference organisers have proven to be a successful combination.

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1 ### 1.4.5 Work Package NA3: User Community Coordination

2 #### 1.4.5.1 Summary

Work package number	NA3	**Start date or starting event:**			1/5/2010		
Work package title	User Community Coordination						
Activity type	COORD						
Participant number							
Participant short name							
Person-months per participant							

3

Objectives

- Coordination of effective, responsive support for the EGI user communities (both individual VOs and those represented by SSCs) through the efforts from the national and specialist support units.
- Coordination of training, documentation and technical requirements from the user communities to improve the EGI user experiences and services.
- Coordination of technical services to support the establishment and management of virtual organisations.

4

Description of work

TNA3.1: Activity Management

This activity is managed by the User Community Officer who reports to the Director for the effective running of these services and implements many of the functions relating to the User Community Services described in the EGI Blueprint. Extensive use will be made of the EGI Helpdesk provided by the EGI.eu Operations team to route and allocate issues to the various support units through the use of tickets. Many of the requests coming from the user communities will enter into the help desk and this provides an ideal mechanism for monitoring the service (i.e. examining the time to resolution, etc.)
Requested Effort: XXX PM

TNA3.2: Coordinating Support for the User Communities

EGI's e-Infrastructure will need to support different sized user communities – ranging from the small international research collaborations, to large internationally funded research labs and research projects. The support provided will be reactive (i.e. dealing with issues referred to it through the helpdesk system and referred to it through other sources) and proactive (i.e. by engaging with the user communities through SSC and other community meetings). Through the EGI Helpdesk we will provide a 'front desk' for new users, new communities and non-operational issues that the user community requires assistance with. This may include requests for changes to the operational tools or deployed middleware, support for setting up new VOs or porting applications to the infrastructure. These requests will be passed to the relevant NGI support teams or to teams within EGI.eu or its partner projects as required.
Requested Effort: XXX PM

TNA3.3: Technical Coordination for User Communities

Trainers and training resources will be provided through NGIs (generic grid training) or by external projects. The coordination of this activity across the different projects and national teams will be supported by EGI.eu through a database of registered trainers (across all middleware types) and the advertising of planned training events. EGI.eu will contribute to the established Winter and Summer Schools on Grid Computing as part of a broader community resourced effort. The availability and accessibility of documentation relating to the use of the infrastructure will be continually reviewed. This will include an analysis of issues reported to the EGI helpdesk to see if the documentation can be improved, identifying where there are gaps in the training material coming from the software providers, and the material EGI.eu provides to guide access to its services. These documentation issues will be reported to the relevant teams in EUI.eu, the NGIs and other projects for correction.
Requested Effort: XXX PM

TNA3.4: Technical Support for User Communities

EGI.eu will maintain an application database to support new and existing user communities. The application database will provide a registry of all applications that are currently being, or have been ported, to the infrastructure by teams in the NGIs or related projects. Such a resource enables user communities to see if the tools that they require are already available. The basic technical services needed by VOs within the infrastructure (e.g. VOMS, VO database, VO registration, VO portals, VO Dashboards, etc.) are provided within EGI.eu through the operations teams and through the NGIs. The coordination of these technical services with the requirements from the user communities through the VO Managers are provided through this task.
Requested Effort: XXX PM

Deliverables (brief description) and month of delivery

1.4.5.2 Overview

The user communities are effectively EGI's customers. Delivering an excellent user experience will be the goal of all activities within EGI but it is this activity that will provide the 'front office' through which many new users will have their first experience of EGI and that many established users will see as their interface to EGI. In common with many activities within EGI.eu, the people undertaking these central user support tasks coordinate the distributed expertise in the EGI community to those that need it. Much of this work will be facilitated trough the EGI help desk provided within the EGI.eu Operations functions with the staff organised as support units, virtual teams that issues (tickets) can be assigned to.

Providing assistance to new users and new communities in their initial use of the EGI infrastructure is essential if we are to expand the user community. Effort is provided to ensure that the documentation being presented to new users is complete and matches their experiences when they start using the infrastructure. New users and communities can be directed to the training opportunities (grid schools, online training, national training sessions, domain specific, etc.) coordinated by EGI through its NGIs and partner projects to smooth their use of DCIs. Some communities may also need to access the application porting capabilities provide within the NGIs, VRCs or by partner projects which can be facilitated by EGI.eu.

Experienced users and user communities (frequently represented by VRCs) will inevitably make complex demands of the infrastructure. Dedicated staff will be able to build relationships with the relevant SSC contacts by attending their meetings and to better understand their evolving needs, enabling these representatives to provide a 'voice' for the community within EGI.eu. Any technical changes required by the users in the EGI infrastructure will be coordinated by a dedicated representative within the relevant EGI.eu management bodies – which is in addition to the dedicated representation that heavy user communities may have.

The technical instantiation of a user community within the infrastructure is a VO. VO Managers need technical services (e.g. VOMS and the VO Database) to support their user communities. To simplify access to the infrastructure and to promote collaboration within the VO, EGI.eu will provide a basic portal infrastructure and access to a 'dashboard' where the status of the resource fabric being used by a particular VO can be reported upon. Both the portal and dashboard offered up by this activity will be basic, but it will provide a core framework around which the particular community can, through their own work, customise their web presence and VO specific monitoring of the infrastructure.

The support mechanisms that EGI provides will be tuned to the different structures within these user communities. For instance, for many large user communities, the SSC, or similar community based coordinating body, model will provide the focal point for EGI.eu to engage strategically with their utilisation of the infrastructure and for the communities own support infrastructures to be integrated with EGI.eu. Smaller communities, which rely much more on ad hoc support mechanisms within their own community for solving their community specific issues, will still be able to access the support mechanisms within EGI.

Broad feedback from the user community within EGI is obtained through an inclusive User Forum with representation from the VRCs, ESFRI projects, support activities in the NGIs, and other major activities. The User

Forum is supported by TNA3.2. The development and direction of the User Forum is driven by the UFSC (see NA2). Detailed feedback on the tools and processes used by EGI.eu to interact with the user community is undertaken in the USAG (see NA2).

NA3 will also coordinate Front Desk activities where appropriate. This activity involves Consulting for New Communities, where EGI.eu central personnel may provide initial consultations and redirect new users to the appropriate SSC or NGI consulting services (collaboration with U-N-18 - Consulting for new communities); in general, the U-N-18 tasks will then take up the more specialised activities in U-N-19 (Assistance for Application Porting).

On the UCS end, the VRCs and NGIs will have personnel dedicated to Grid Planning (U-N-7) who are the prototypical user representatives for MCB purposes. It is also possible that some MCB meetings include the participation of personnel working on the development of Scientific Gateways (U-N-15) and other high-level services (U-N-6).

1.4.5.3 Deliverables

Del. No.	Deliverable Name	WP	Nature	Dissemination	Delivery Date
DNA3.1	Project Presentation	NA2	R	PU	PM1, PM13, PM25, PM37
DNA3.2	User Community Support Process	NA3	R	PU	PM3
DNA3.2	Annual Report on EGI.eu's User Community Services	NA3	R	PU	PM11, PM23, PM35, PM47

1.4.5.4 Milestones

Milestone number	Milestone name	Work Package(s) involved	Expected Date	Means of Verification
MNA3.1	User Support Contacts	NA3	PM2, PM13, PM25, PM37	Establish contact points with the NGI support teams for user facing support – application porting, etc.
MNA3.2	Training Website	NA3	PM3	Integration of the registered trainers website and training event calendar into EGI.eu website.
MNA3.3	Ported Applications Website	NA3	PM3	Integration of the applications database website into the EGI.eu website.
MNA3.4	Documentation Review	NA3	PM6, PM18, PM30, PM42	Review of provided documentation.
MNA3.5	User Support Metrics	NA3	PM3	Define the helpdesk metrics that will be used to optimise the user support process and monitor the performance of the support teams.

1.4.5.5 Risk Assessment and Mitigations

Risks	Impact	Probability of Occurrence	Mitigation
The VRC proposals are not funded or severely reduced in scope	The user communities are still transitioning towards sustainability for their adoption of DCIs.	High	This proposal is aligned with the VRC proposals and strong collaborative links will be carried forward from the EGEE-III project into EGI-InSPIRE.

	Removing the community building and support funding in the VRC proposals (e.g. ROSCOE and SAFE) would inhibit continual adoption research infrastructures in Europe.		The EGI model relies on independently funded VRCs that can collaborate with EGI.
The production infrastructure delivered through EGI-InSPIRE does not meet the needs of the current user community.	The user communities move to some other infrastructure provider.	Medium	Through the VRC EGI will build up strong links with the user communities. The UFSC and the MCB exist to collect feedback from the user community and to prioritise the requirements and identify software providers capable of meeting these needs. EGI is not tied to any particular middleware provider and will therefore be able to move quickly to source software to meet any new needs.
The support teams within EGI.eu and the EGI-InSPIRE proposal fail to promptly respond to support issues.	Users will no longer have faith in the infrastructure and start exploring other means. If the research infrastructure (EGI) does not support research then investing in future projects will be harder to justify.	Medium	The EGI Helpdesk (the model used in previous projects) has been shown to be an effective approach of bringing together different support teams. Automatic reporting will track and escalate issues that have not been updated or resolved after defined intervals. General issues can be escalated through the UFSC to the Director.

1

1.5 Service Activities and associated work plan

Describe the extent to which the activities will offer access to state-of-the-art infrastructures, high quality services, and will enable users to conduct high quality research.
A detailed work plan should be presented, broken down into work packages (WPs) which should follow the logical phases of the implementation and provision of the project's Service Activities, and include assessment of progress and results.

1.5.1 Overall Strategy

The service activities in EGI-InSPIRE are aimed at ensuring that the Grid infrastructure supports the different Science communities in a way that is both efficient and sustainable.
This aim will be achieved:

- operating the production Grid infrastructure (SA1),
- providing a software infrastructure through the coordination of external software providers, appropriate middleware component repositories, support tools and procedures, and a support unit for investigating software issues found in production (SA2),
- providing specific higher level services for the needs of the communities that are presently heavy users of the Grid (SA3)

The main actors for SA1 activities will be the NGIs, coordinated by EGI.eu, and the infrastructure will be truly Pan-European, building on the Grid established by the EGEE projects but covering also the geographical areas served by Baltic-Grid and SEE-Grid, as well as many East-European countries and Israel. Full interoperability will be pursued within this large European area and increasing interoperation will continue to be ensured with US and Japan.

The SA2 activity will establish formal agreements with external software providers to supply software components that will form the basis of the UMD release. It is expected that the majority of these components will be sourced initially from the proposed EMI project.

The SA3 activity is fully integrated in EGI-InSPIRE. The heavy user communities will both continue to use and contribute to the evolution of the production infrastructure, which they have been doing in their role as early adopters for many years. The SA3 services will complement the ones deployed as general EGI infrastructure and some of them may in future become part of such general infrastructure.

1.5.2 Relationship between Service Activities

Work package No	Work package title	Type of activity	Lead partic no.	Lead partic. short name	Person-months	Start month	End month
SA1	Operations	SVC	1	EGI.eu		1	48
SA2	Provisioning the Software Infrastructure	SVC	1	EGI.eu		1	48
SA3	Services for the Heavy User Communities	SVC		CERN		1	48
	TOTAL						

1 ### 1.5.3 Work Package SA1: Operations

2 #### 1.5.3.1 Summary

Work package number	SA1		**Start date or starting event:**		1/5/2010		
Work package title	Operations						
Activity type	SVC						
Participant number							
Participant short name							
Person-months per participant							

3

Objectives

- Coordinate a European wide production grid infrastructure federated from national grid initiatives that is integrated and interoperates with other grids worldwide
- Maintain a secure infrastructure through the establishment of the necessary operational security teams
- Validating new releases of the middleware and operational tools through a coordinated staged roll-out to sites
- Establish the monitoring services needed to manage the production grid infrastructure
- Provide a central accounting database and portal where aggregated use of the infrastructure is recorded
- Provide the EGI Helpdesk infrastructure, which can be integrated into national instances, to coordinate activity between the different support teams.
- Establish the necessary support teams within the infrastructure that once integrated will the EGI Helpdesk will respond to user and site support issues
- Providing a reliable and consistent production grid infrastructure through the establishment and monitoring of SLAs, documentation and the provision of core grid services.

4

Description of work

TSA1.1: Activity Management
The overall management of the activity is led by the Chief Operations Officer, reporting to the EGI.eu Director, who coordinates the work of the NGI/EIRO Operations Centres. The Operations Coordination Centre (OCC) consists of the COO and the SA1 Task coordinators. They manage the effective delivery of the (i) the EGI.eu Global Tasks (either running services or coordinating the work of the NGIs and related activities), and (ii) the International Tasks carried out by the NGIs in order to provide an integrated European e-Infrastructure to support the international VOs.
Requested Effort: XXX PM

TSA1.2: A Secure Infrastructure
The aim of this task is to address the various operational security-related risks and to maintain the availability of EGI services. This task covers all aspects of operational security including Security Incident Coordination and Security Vulnerability Handling. It relies on the GOCDB Security contact information and the security related policy work done under NA2.
Requested Effort: XXX PM

TSA1.3: Service Deployment Validation
This task will ensure that new software releases (for operational tools, and global and site services) can be deployed safely and reliably without any degradation of service to the production grid infrastructure, and while maintaining interoperability with other grids infrastructures. There will be achieved through a managed staged roll-out of middleware and operational tools. In collaboration with NGIs and end-user communities new software releases may be deployed to build operational and user experience.
Requested Effort: XXX PM

TSA1.4: Infrastructure for Grid Management
The purpose of this task is the deployment of the infrastructure for Grid management consisting of a set of

services and tools needed by the NGI/EIRO Operations Centres for the running of the Grid software services, for Grid monitoring (including SLA and security monitoring), and ongoing Grid management. At the core of this infrastructure is a set of monitoring tools to be deployed in all NGIs to monitor their sites. Above this will sit higher-level monitoring of global services and automated measurement of various service and site reliability metrics.
Requested Effort: XXX PM

TSA1.5: Accounting
This task will provide a reliable record of the usage of the infrastructure for users, VOs, NGI and EGI management. Access to data will be restricted according to agreed policies and NGI/EIRO privacy laws. This task will provide: securely and reliably run accounting repositories for EGI, and if desired at the NGI-level; a portal to provide on-demand visualisation and/or data download.
Requested Effort: XXX PM

TSA1.6: Helpdesk Infrastructure
This task will provide a central EGI Helpdesk available to all NGIs and related support projects. Optionally, an NGI can integrate their own national helpdesk into EGIs through an agreed interface. Standard procedures for handling tickets, passing them between helpdesks, escalating them will be established based on the experiences from previous projects.
Requested Effort: XXX PM

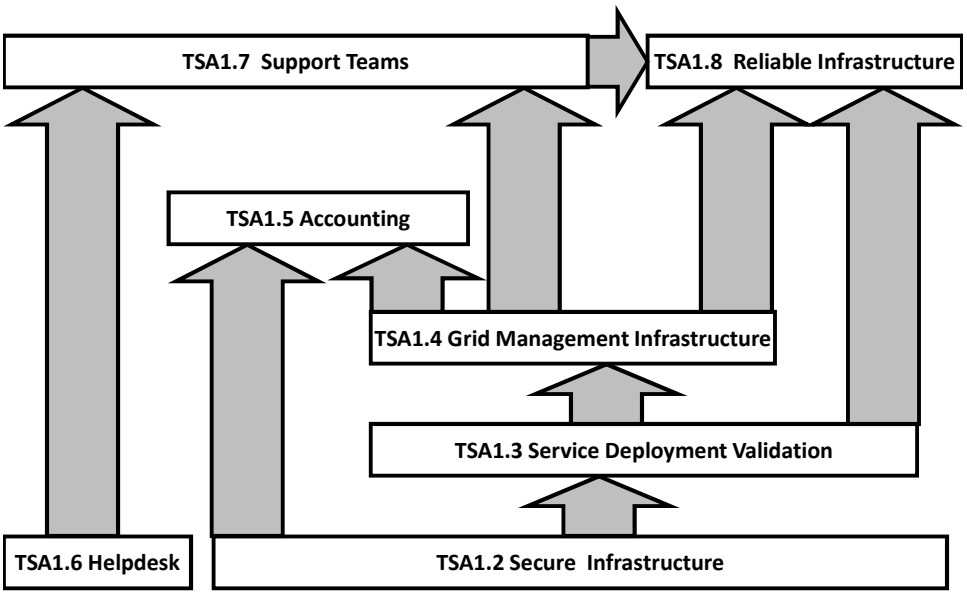
TSA1.7: Support Teams
This task will bring together the various teams of people handling support issues for users, sites and the network within the production infrastructure. It will not merge them into a common team as the skills required differ, but it will make sure the infrastructure is in place and the teams are trained and resourced and all the required documentation is in place.
Requested Effort: XXX PM

TSA1.8: Providing a Reliable Grid Infrastructure
This task is to ensure that sites and operational and middleware services are functional, reliable, and responsive. It will achieve this through subtasks on: production grid services, interoperability, best practices and service level agreements. It also has dependencies on other subtasks which manage the human support teams, security, helpdesks, and the monitoring and management infrastructure.
Requested Effort: XXX PM

Deliverables (brief description) and month of delivery

In this version EGI-DS Blueprint reference numbers are still used for the benefit of reviewers and other internal people. They should be removed in a later version.(JCG)

The SA1 activity is composed by a number of mutually dependent tasks. The interconnection and dependency between them are illustrated by the diagram in Figure below:



Relationship between SA1 tasks

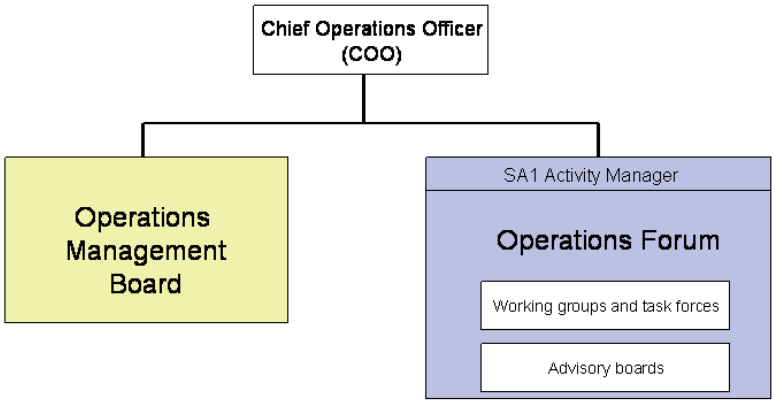
1.5.3.2 TSA1.1: Activity Management

The EGI operations management is mostly built upon the inherited experience of the EGEE project series. Two new structures, namely the Operations Forum and the Operations Management Board are proposed in order to ensure the technical cooperation and the governance in the more complex scenario of new NGIs and the evolution of EGEE ROCs into a set of independent NGIs/EIROs.

The SA1 activity is managed by the **Chief Operations Officer (COO)** who also leads the EGI.eu Operations Unit. They lead the SA1 activity and oversee the JRA1 activity (Operational Tool Development). They direct the work of the **SA1 Task Coordinators** and work with the **NGI/EIRO Operations Centre Managers** to achieve the activity's objectives.

The COO and the SA1 Task coordinators constitute the **Operations Coordination Centre (OCC)** that is responsible for the overall management of the activity. The OCC will oversee the execution of the overall SA1 activity, checking the consistency between the different activities, and their relationship with the agreed roadmaps. Policy and future roadmaps will be established through the Operations Management Board (part of NA2).

The **EGI Operations Forum** is a technical body lead by the COO, where technical issues of general interest concerning all operational activities are discussed. It is an incubator of ideas of new developments, and it provides a means to share experience and know-how between partners. The Operations Forum facilitates the cooperation between the NGIs/EIROs, and between NGIs/EIROs and the SA1 task coordinators. Its activity is structured into two types of groups working under defined charters: working groups and task forces for long-term and short-term technical activities respectively. These technical activities could include stakeholder consultations to review the performance of services and tasks over an extended period and propose changes to requirements, service levels or procedures, etc. Existing advisory groups (e.g. GOCDB Advisory Board, the User Support Advisory Board, etc.) will be maintained during the transition from EGEE-III to NGI. New boards may be defined as needed during the project, and boards dealing with different types of tools may be combined into a single one.



Organization of operational activities and related management structure.

The EGI Operations Forum is an inclusive body run by the OCC on behalf of the EGI operations community and participation in the Forum, and its working groups, task forces and advisory groups is open to all, with representation from:

- NGI/EIRO Operations Centre Managers
- technical staff from the NGIs/EIROs
- resource providers
- operations development teams (see JRA1 for details)
- representatives from other Grid projects and infrastructures if/when required;
- representatives from the users and middleware Product Teams if/when required.

The EGI Operations Forum provides advice and is the body where NGIs, EIROs and resource providers can be technically consulted. It is the body for the discussion and definition of best practices, procedures, and operational interoperability issues concerning the EGI NGIs/EIROs, as well as EGI and other Grid projects and infrastructures.

The Management Tasks includes the following sub-tasks:

1. TSA1.1.1: coordination of the overall EGI operations activities (COO);
2. TSA1.1.2: coordination of the SA1 tasks (OCC);
3. TSA1.1.3: coordination of NGI/EIRO Operations centre (NGI/EIRO responsibility);
4. TSA1.1.4: participation to EGI Operations Forum and operations meetings (all);
5. TSA1.1.5: quality assurance, including the definition of operational service SLAs (between NGIs and EGI for the NGI international tasks, and between EGI and global service providers for the EGI.eu tasks), their periodic review, and the monitoring of the defined SLAs in collaboration with the VOs (OCC). The scope of this sub-task only includes operational services. It is carried out in collaboration with NA2 ("EGI setup and sustainability plan") to meet Object O1 ("Migrate the European Grid e-infrastructure and its services into a new sustainable governance model and plan for the future sustainability of the whole EGI construct").
6. TSA1.1.6: the definition of operational services and their model for the implementation of the EGI business model towards an increasing long-term sustainability; definition of an implementation roadmap (OCC);
7. TSA1.1.7: liaison of "operations" with other EGI activities (OCC);

1.5.3.3 TSA1.2: A Secure Infrastructure

This task covers all aspects of operational security aimed at achieving 'a secure infrastructure' within EGI and relies on site and NGI security contact information maintained in the GOCDB by each NGI.

The **EGI Computer Security and Incident Response Team** (EGI CSIRT) is an activity aimed at coordinating the operational security activities in the infrastructure, in particular the response to security incidents. As security incidents may affect any resource providers, inside or outside EGI, the appropriate procedures, information flow and a collaboration based on trust have to be implemented to ensure security incidents are dealt with appropriately by the resource providers and the involved CSIRTs. The EGI CSIRT ensures both the coordination with peer grids (via its GRID-SEC membership), and with the NGIs and NREN CSIRTs. In addition, the EGI CSIRT acts as a forum to mutualise efforts and resources from the NGIs in different areas, including Grid security monitoring, Security training and dissemination, as well as Incident response improvement (e.g. security drills).

Each NGI appoints a "NGI Security Officer" (post O-N-9a) in order to provide the NGI CSIRT function. A number of NGIs are already implementing this functionality via their local NREN CSIRT. Where this is not the case, a close collaboration with the local NREN CSIRT is highly encouraged. The resulting group of NGI Security Officers collaborate as part of the EGI CSIRT. The EGI CSIRT is led and coordinated by the EGI Security Officer (post O-E-16), whose role and mission are defined by security policies approved by EGI and the NGIs.

CA Support (O-E-15) This sub-task will coordinate the provision of EGI versions of the IGTF Certification Authority distributions for as long as it is needed since EGI to have the ability to add or remove authorities as specified by the project and the EGI Council. NGIs may also want to add more CAs, or even remove specific CAs that are incompatible with national policy. In these cases, such an NGI will need to build its own distribution locally.

The main purpose of the **Software Vulnerabilities Group** (SVG) is to eliminate existing vulnerabilities from the deployed infrastructure, primarily from the grid middleware, and prevent the introduction of new ones. The aim is to prevent Grid security incidents. The SVG will need to interact strongly with the operational development teams in JRA1 and the middleware teams in Software Security Group. SVG will be situated in the Operational Security area in order that it should be recognised as a means of ensuring security of the deployed infrastructure and enforcing the responsible disclosure strategy. As well as handling specific vulnerabilities found, it is important to actively check that the deployed middleware is secure so the SVG will look for strategies for doing this. There is also an educational role for SVG within the developer community to improve the quality of any newly developed software that also needs to be fulfilled.

Coordination between the operational security groups, the software security groups, the security policy activities both inside EGI and in other infrastructures and projects will be undertaken by the **EGI Security Coordination Group** which will have monthly phone calls. An annual face-to-face meeting of all security groups will be held, for example at the EGI Conference. Coordination will also take place in OGF. Information mail lists will also be used for all interested parties to receive quarterly reports from each group and for discussion of general issues.

1.5.3.4 TSA1.3: Service Deployment Validation

Processes will be put in place to ensure that new middleware releases can be deployed safely and reliably without any degradation of service to the production grid infrastructure. The task includes operational tools, not just site services.

Coordination of middleware roll-out and deployment (O-E-9, O-N-9b)
It is important to ensure that middleware updates move from certification and into production as quickly as possible, while also assuring that the updates are suitable for deployment in the production Grid. EGI.eu coordination will be needed for strategy decision, for example to decide significant changes to processes, and to ensure that resource sites are encouraged to upgrade whenever new critical updates of supported middleware stacks are released. Being still in a phase where middleware is subject to frequent bug fixing cycles, prompt alignment of the Grid services and components to the latest releases, contributes to better functionality and availability of the overall infrastructure.

Operational tools (O-E-17) This global task is about the validation and staged rollout of new software releases of operational tools. This task includes the coordination of the process (O-E-17) to ensure convergence and interoperation between NGIs) and the operation of a testbed for early testing and gradual deployment of new releases by the interested NGIs. This subtask is carried out in collaboration with SA1.8, which is responsible for the running of the production instances of the tools.

Interoperability (O-E-11, O-N-9d) This sub-task is only part of the wider Interoperability task described in detail in 0 **Error! Reference source not found.**. The relevance to this task is that change management of the production infrastructure must also include interoperability issues. It is not sufficient that middleware releases are rolled out without disruption to the EGI production Grid; interoperability with other grids must also be maintained.

1.5.3.5 TSA1.4: Infrastructure for Grid Management

Purpose of this task is the deployment of the infrastructure for Grid management consisting of a set of services and tools needed by the NGI/EIRO Operations Centres for the running of the Grid software services, for Grid monitoring (including SLA and security monitoring), and Grid management[8]. The running of such services requires

[8] Note that this task does not include the activities relying on such a Grid management infrastructure.

a combination of EGI.eu global activities and NGI/EIRO international activities. An initial list of services and tools is provided below. More services are expected to be defined and implemented during the project.

Monitoring infrastructure, including Nagios, SAM, and other tools (e.g. GridMap, Gridview, ...) (O-E-3, O-N-3) Monitoring information is gathered to support the assessment of the quality of the services delivered by resource providers, NGIs and global task service providers. Operation of this service includes the maintenance of the repositories, the supervision of the processes to populate them, the maintenance of the schema used for publishing the site and service status information, and the contribution to the preparation of reports, which will be automated in collaboration with the JRA1 activity.
It is assumed that all EGEE Regions and some NGIs will already be running their own national monitoring infrastructure, and metric store. The data will also be published to a central metric store from which EGI-wide reporting will be possible. The task also includes the rollout of monitoring to new NGIs.
EGI.eu (O-E-3) is responsible for coordination of this sub-task, gathering of statistics, maintenance of the schema for central publication of site and service status information, the deployment of the central instances of monitoring-related tools such as the dashboard and the alarm system, and the preparation of performance reports.
NGI/EIRO (O-N-3) responsibilities are to monitor their sites, to run the regional monitoring infrastructure, to monitor the central Grid service instances (FTS, WMS, VOMS etc.), to validate the information, to make it available and publish information to a central metric store, and to run failover instances of central services as applicable.

End-to-end network performance monitoring infrastructure and its support (part of O-E-12) The troubleshooting of network connectivity issues, such as end-to-end network performance affecting Grid data transfers, requires the availability of light-weight network monitoring tools. EGI.eu (O-E-12) coordinates support for its configuration and usage but deployment of end-to-end monitoring tools is a responsibility of the Grid site managers coordinated by their respective NGIs/EIROs.

GOCDB knowledge of topology and configuration, downtime schedule (O-E-1, O-N-1) Many aspects of operations rely on the availability of information (as applicable) from NGIs about service nodes, contact details, security contacts, certification status, sites in scheduled downtime, etc. The Grid repository provides all such information. By the end of EGEE III, a new version of the current repository GOCDB will have been deployed to fill this role. It will run a central database containing a sub-database per EGEE region (these will be managed by the regions). Effort will be devoted to the regionalization of the tool, i.e. to deploy the capability for the database to be run by an NGI/EIRO and to synchronise with the central instance.
EGI.eu (O-E-1) is responsible of the coordination of the tool deployment, and of the running the central service. This may be the master copy for an NGI/EIRO, or a cached copy if the NGI/EIRO runs its own service.
The NGIs/EIROs (O-N-1) are responsible for maintaining data about itself and its sites, for running the NGI service instance (where applicable) and in this case also for publishing the agreed schema to the central database. The NGIs are also responsible of running failover instances of central services as applicable.

CIC Portal and NGI dashboard. (O-E-4, O-N-4) The Grid operations portals provide an entry point for various actors to support their operational needs. Different “views” are possible according to the role of the customer (Grid operators, VOs, Grid site managers, Region Operations Managers, etc.). The portal also provides a bundle of services including the VO registration tool, the broadcast and downtime tool, the periodic operations report submission system, and the regional dashboard. By the end of EGEE III a version of the CIC portal will be maintained centrally with the management distributed to regions and VOs. The operations portal will be distributed to regions willing to deploy a national instance for customization to the local needs and the local helpdesk system.
EGI responsibility is to run the central portal and automate gathering of the required information, while NGI responsibility is be to maintain relevant information about their infrastructure and VOs, and to run the service locally as required. EGI.eu (O-E-4) is responsible of coordinating this activity, and of the daily running and supervision of the central service instance. The NGIs/EIROs (O-N-4) are responsible for maintaining data, for running the NGI service instance (as applicable) and for running failover instances of central services as applicable.

Security Monitoring (currently a development task JRA1) The primary goal of the security tests is to achieve and keep a high level of overall security at the NGI/EIRO level. Security monitoring will provide the NGI/EIRO with an overview of the situation at sites. The NGI/EIRO-level monitoring tools will run security-oriented tests utilizing the public interface of sites and make the results available to responsible people.

SLA portal (currently a development task JRA1) An SLA portal and related tools are necessary to control the performance achieved by the EGI services provided as EGI.eu global services as well as NGI international services, and to automate the generation of monthly/yearly reports.

1.5.3.6 TSA1.5: Accounting

A reliable record of the usage of the infrastructure with access restricted according to agreed policies and NGI/EIRO privacy laws.

Accounting Repositories (O-E-2, O-N-2) Grid accounting repositories (central and regional) are required by EGI stakeholders such as Virtual Organization managers and VO members, resource providers, NGI/EIRO Operations Centres, SSCs etc. for an overview of the resource usage across the different domains of the EGI Grid e-Infrastructure. Accounting repositories require gathering and making publicly available the accounting information (as applicable and according to local laws) for each NGI/EIRO. A deployment plan will be defined for the regionalization of the accounting repository. The central repository can act as the default repository for international VOs.
EGI.eu (O-E-2) EGI is responsible for coordinating this sub-task;
EGI.eu (O-E-2) runs the central service where VOs can interrogate their usage, and for maintaining the schema of the centrally-held information. It is responsible for supervising the status of the central repository, for ensuring that the required level of availability is provided and for monitoring the publication of usage records from NGIs/EIROs into the central repository instance.
The NGI (O-N-2) is responsible for running the local accounting repository, for maintaining and validating data about all usage made of its sites and for publishing data on international VOs to the appropriate repository.
Accounting Portal (O-E-2) The central accounting portal provides a way to collect all the accounting data produced at the NGI/EIRO-level by different accounting sensors (e.g. APEL, DGAS, SGAS, Gratia) in just one place for an aggregated view. The set of information about usage is selectively displayed depending on the client's role. Running the central accounting portal is a responsibility of EGI.eu (O-E-2).
GOCDB topology information (O-E-1, O-N-1)

1.5.3.7 TSA1.6: Helpdesk Infrastructure

Physical infrastructures of helpdesks
Helpdesk (O-E-6, O-N-6) The EGI Helpdesk is a distributed infrastructure consisting of a central helpdesk interconnected to a collection of NGI/EIRO local helpdesks. This implements a regional support system with central coordination. The central instance gives access to user documentation and support, and to a ticketing system, and allows the bi-directional exchange of tickets with the remote NGI helpdesks to ensure that tickets opened centrally are handled by the appropriate support team (for example, those opened locally can be passed to the central instance or other areas, while user and operational problem tickets can be open centrally and subsequently routed to the NGI local support infrastructures).
We expect only a fraction of the NGIs to be ready, at the beginning of the project, to fully run their national support infrastructure and integrate it with the central EGI tools. Therefore the effort used to enable NGIs interconnecting their support infrastructure with the central one will be spread over the whole project, especially as some partners will enter the project later. This task includes the following activities:

- coordination of deployment (O-E-6);
- the hardware procurement and the ownership of the hardware infrastructure at the central and local level (O-E-6, O-N-6);
- the installation and timely update of the software tools at the central and local level (O-E-6, O-N-6);
- the daily monitoring/supervision of the tools in order to meet an agreed SLA;
- the operation of the failover service instances, as applicable (O-N-6);
- the support to new NGIs about the interconnection of their local helpdesk to the central one (O-E-6).

Service requirements capture (O-E-8) This consists of chairing a user support advisory group (working in the framework of the Operations Forum) that should be manned by all stakeholders and customers of user support. The management of this group, is located in operations, but the scope and membership of the group should cover the whole project. EGI.eu is responsible for the coordination of this process (O-E-8).

1.5.3.8 TSA1.7: Support Teams

A number of teams of people handling support issues for users and sites.

Helpdesk Triage Teams (O-E-7), National User Support Teams (O-N-7), This task is the human teams carrying out the user support work.

In the EGI.eu domain the task is the triage of tickets entering the central user support system (also known as ticket processing management in EGEE). It consists of the monitoring and routing of all active tickets in the Grid user support system by Grid and VO experts, who are responsible for addressing the problems to the appropriate second-line specialized support units. These support units may be in the operational tasks, in other activities, or other projects like the SSCs. In the NGIs, the teams support their local users of international VOs

COD Support Teams, central and national (cCOD, rCOD), (O-E-5, O-N-5)
At the core of this task is the monitoring and support of the sites through a ticketing system which will contain issues raised as a result of SLA checking (i.e. SAM monitoring tickets or equivalent), VOs, users and system administrators. This ensures that the International VO's get the services agreed through EGI. The practical work needed includes:

- Monitoring and help desk shifts
- Triage of incoming problems, assignment of tickets to the 2nd line support units, ticket escalation to EGI.eu, ticket follow-up, suspension of sites if needed, etc.
- Certification of the sites entering the NGI Grid and thus in the EGI Grid, with the rules agreed with EGI, according to the site category and SLA.
- The interface with the NREN is specifically required for troubleshooting of connectivity problems, test for advancement in technologies etc.
- Maintenance of web pages for FAQ, best practices etc.
- Operation of a ticketing system integrated with the global EGI.eu ticketing system

The bulk of the work is done by NGIs using their own monitoring infrastructure for their own sites and users but there is a central role in coordination so that the international VOs receive the same level of service and cross-border issues are resolved.

Resource Allocation (O-E-10, O-N-9c) Coordination of resource allocation and brokering support for VOs from NGIs VOs can specify requirements in terms of resources to be guaranteed by the overall pan-European Grid infrastructure used. In this case, coordination – as required by VOs – contributes to ensure that a suitable production infrastructure (Grid core services and resources offered) is in place, to meet such requirements. Development is still needed to provide tools for the automation of the management and the negotiation of SLAs.
EGI.eu is responsible for support and coordination of this process (O-E-10) while the NGIs find specific sites to support the VOs at levels subject to negotiation (O-N-9c).

Network Support (O-E-12) Network operation design, handling of troubles affecting international VOs, and network assessment allow EGI to keep the state of the network under control, and to establish link between Grid operations and network operations. A centralized approach is proposed here in order to keep this task is close relationship with the other External Liaison tasks run by EGI.eu

1.5.3.9 TSA1.8: Providing A Reliable Grid Infrastructure

This task has the duty of ensuring that sites, operational and middleware services are functional, reliable, and responsive. This task has dependencies on others as shown in Figure ?? and contains the following constituent parts:
Production Core Grid Services (O-E-14, O-N-8) Core Software Services are those necessary components of which a VO requires one (or a small number) in order to operate. For example a single or shared central instance of a service is core. One that is replicated once per NGI is core. One that is required at every site supporting the VO is not. Catch-all instances can be required to support small user communities. It is a responsibility of EGI.eu to ensure that user communities are properly supported by the NGIs of reference. Examples of gLite Core Software Services are: the VO management service (e.g. VOMS), the File catalogue and transfer services (e.g. LFC and FTS), Job management services (e.g. WMS), Information services (e.g. BDII), Security services, etc.
The EGI.eu task is to coordinate the provision of services as required by VOs. The NGI task is to run the services as requested/agreed. Most VOs will have a 'home' NGI primarily responsible for these services.
Interoperability (O-E-11, O-N-9d) Interoperation covers a **number** of aspects, such as the availability of common tests for monitoring of site status, the interconnection between helpdesks/ticketing systems, etc. "Other Grids" includes Asia-Pacific regional Grids, OSG, Naregi, and related infrastructure projects.
This role owns the definition of the operational tools interfaces, the procedures and the operational activities allowing the NGIs to interoperate. EGI aims at continuing the collaboration established with operations centres outside Europe in order to preserve the current integration of non-European sites into the production infrastructure. EGI.eu is responsible for support and coordination. NGIs may work on interoperation of grids of relevance to them

but only with EGI.eu approval. Interoperation with grids within a country is considered an internal national matter.

Definition of best practices, operations procedures, operations requirements (O-E-13, O-N-9d) This task is a combination of:

a) the definition of mandatory operational procedures and requirements necessary for the NGIs to work together in a seamless and functional EGI.
b) Documenting best practices to gather the knowledge of how an efficient and effective grid infrastructure operates. While obeying this best practice is not mandatory, it will be particularly useful for the nascent NGIs who did not work independently prior to EGI and will become independent during the project.

The operations during the first year of the project will be mainly based on existing EGEE procedures and practices. These will be redefined to adapt them to the needs of new NGIs joining the infrastructure, and to the new operations architecture that will be defined by the EGI project.

Supervision of SLAs etc (as part of O-E-3, O-N-3) This task is part of the BP task O-E-3, of which the main part is described in **Error! Reference source not found.**. Although in EGI SLAs will be an agreement between NGIs and their sites, there will need to be central oversight of the performance of sites so that international VOs can be assured of the quality of the sites on which they run. This task will use the outputs of various monitoring tools to evaluate metrics of the quality of sites. The feasibility of the tool developments needed to automatically monitor the SLAs will be assessed. It will use the SLA Metric Portal as defined in **Error! Reference source not found.**.

1.5.3.10 Deliverables

Del. no.	Deliverable name	WP no.	Nature	Dissemi-nation level	Delivery date (project month)
DSA1.1	Definition of the network support service and the related service providers	SA1	R	PU	PM 3
DSA1.2	EGI Operations Architecture *Description: a technical description of all the operational services needed both at the global level (EGI.eu) and at the national level (NGI/EIRO int. tasks). It also defines the operational interfaces needed.*	SA1	R	PU	PM 6
DSA1.3	Assessment of status of operational service regionalization	SA1	R	PU	PM 11
DSA1.4	Review of status and performance of EGI.eu global operational tasks and NGI international services against SLAs where appropriate. *(Is this NA?*?	SA1	R	PU	PM 11
DSA1.5	Report on NGIs interoperation status	SA1	R	PU	PM 12
DSA1.6	Definition of future EGI operations services and related business model for long-term EGI sustainability	SA1	R	PU	PM 18
DSA1.7	Interim assessment of EGI infrastructure	SA1	R	PU	PM 18
DSA1.8	Mid-term assessment of status of user support	SA1	R	PU	PM 24
DSA1.9	Satisfaction level with Operations Infrastructure for User Support *Description: input is gathered by polling the SSCs*	SA1	R	PU	PM 21
DSA1.10	Integration of Operations Infrastructure Services at World Level	SA1	R	PU	PM 30

DSA1.11	Final assessment of EGI operational services	SA1	R	PU	PM 36
DSA1.12	Final assessment of EGI infrastructure	SA1	R	PU	PM 42
DSA1.13	Final definition of future EGI operations services and related business model for long-term EGI sustainability	SA1	R	PU	PM 40
DSA1.14	Security Risk Assessment of the EGI infrastructure.	SA1	R	PU	PM 18
DSA1.15	Evaluation of the handling of security vulnerabilities.	SA1	R	PU	PM 33

1 **1.5.3.11 Milestones**

Milestone number	Milestone name	Work package(s) involved	Expected date	Means of verification
MSA1.1	Definition of EGI Service Level Agreements .	SA1	PM 1	
MSA1.2	Assessment of status of regionalization of all operational tools	SA1	PM 1	
MSA1.3	Deployment plan to complete the distribution of operational tools to the NGIs/EIROs *Description: the full integration of all NGIs into the EGI operations infrastructure, and the complete devolution of services to NGIs should be completed by M24*.	SA1	PM 1	
MSA1.4	Tool requirements for SLA monitoring and resource allocation. *Description: this milestone provides information on new requirements to JRA1*	SA1	PM 6	
MSA1.5	EGI operational procedures covering all operational activities	SA1	PM 12	
MSA1.6	Roadmap towards the implementation of EGI operations service business model and their provisioning to the customers	SA1	PM 18	
MSA1.8	Definition of the strategy for handling security vulnerabilities.	SA1	PM 6	
MSA1.9	Definition of the interactions between grid CSIRTs and the academic community.	SA1	PM 12	
MSA1.12	Operation of a full international distributed CSIRT in a heterogeneous environment.	SA1	PM 30	

MSA1.16	Complete devolution of all operational services to NGIs	SA1	PM 24	

1 **1.5.3.12 Risk Assessment and Mitigation**

Risks	Impact	Probability of Occurrence	Mitigation
NGIs will deploy their own middleware solutions that will not be interoperable with others.	Non-interoperable middleware stacks will shatter the transparent infrastructure being offered to users. Users will have to customise their client and application for particular sites, rather than for the infrastructure as a whole.	High	The EGI model accepts that NGIs might deploy their own middleware solutions. The MCB, through the UMD criteria, will define the interfaces that the public site services must support to provide an interoperable solution. Software that has been shown to meet these criteria will be endorsed by EGI even if it is not distributed as part of the UMD solution.
A security vulnerability could be discovered in software deployed within the production infrastructure.	An exploitable vulnerability could allow a malicious user to use the grid for denial of service attacks on high profile websites that could bring bad press to European DCIs.	High	The infrastructure as a whole, each NGI, and each site in the infrastructure must provide a security officer and backup. These will be used to communicate and act on issues and promptly implement any mandated changes. This protocol will be tested with regular security challenges. The Software Vulnerability Group will proactively assess the impact of reported issues on the infrastructure, and the Software Security Group will work to improve the quality and coherence of security related grid specific code.
Software within UMD is found to fail when used in production.	The functionality offered within EGI stagnates as no new software can be deployed, forcing users to explore other solutions and for the operations staff to waste their time in fixing these problems.	High	New software releases will be rolled out to sites in stages restricting the sites exposed to any new software. Operations staff will also be involved in setting the performance and deployment environment for new components. Failures will be reviewed to see if improvements are needed in the assessment criteria, the work of the software provider or the overall process.

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1 ### 1.5.4 Work Package SA2: Provisioning the Software Infrastructure

2 #### 1.5.4.1 Summary

Work package number	SA2	**Start date or starting event:**	1/5/2010				
Work package title	Provisioning the Software Infrastructure						
Activity type	SVC						
Participant number							
Participant short name							
Person-months per participant							

3

Objectives

- Establish agreements with key software providers
- Maintain the UMD roadmap
- Define general and component specific quality criteria to be applied to software components
- Verify the software components against the criteria
- Provide a repository for the software components within UMD and the related support tools
- Provided a distributed 'support unit' within the EGI helpdesk infrastructure with expertise on the deployed middleware in production use

4

Description of work

TSA2.1: Activity Management
This task focuses on the management of the activity and the relationship with EGI's software providers. Prioritised requirements from elsewhere in EGI are collated and distributed to the current software providers and published for the whole community. The functional roadmaps and release dates from individual software providers are assembled into an integrated UMD Roadmap. The projected UMD Roadmap is monitored and the effectiveness of software providers to deliver component to the required schedule and quality will be reported to the MCB. This work will be managed by the CTO who reports to the PD and will hold regular meetings of the team to ensure effective coordination of its activities.
Requested Effort: XXX PM

TSA2.2: Definition of the UMD quality criteria
The generic component acceptance criteria will be provided and updated according to evolving needs. Specific criteria will be developed for components on the UMD roadmap.
Requested Effort: XXX PM

TSA2.3: Verification of conformance criteria
The components contributed into the repository will be validated against the generic and component specific conformance criteria. SA2 will be involved in pre-release component testing. Verification of each component will be summarized into acceptance report, available with the component in the repository.
Requested Effort: XXX PM

TSA2.4: Provision of a software repository and support tools
Necessary services to deliver the functionality of the repository and its surrounding process (FTP server, web server, issue tracker, version control system, etc.) will be provided and maintained.
Requested Effort: XXX PM + Hardware

TSA2.5: Support Unit for Middleware Deployed and Used in Production
Expertise is needed in the production infrastructure to debug problems and then to propose workarounds or solutions with the software used in production. This group will be deployed as a support unit (**second line support**) as part of the EGI helpdesk and it will work closely with other EGI operations and the software.
Requested Effort: XXX PM

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Deliverables (brief description) and month of delivery

1.5.4.2 TSA2.1: Provisioning Software within EGI

The main focus of SA2 is the software that will be deployed by many of the NGIs within EGI to build the production infrastructure. EGI will define functional requirements, interfaces, and other associated quality criteria (e.g. scalability, performance, stability, etc) that any deployed software will have to implement. Components meeting these criteria will be included in the EGI Repository. A selection of the software components within the repository will be integrated within the *Unified Middleware Distribution* (UMD) recommended for use on the production infrastructure in order to enable interoperation among NGIs.

1.5.4.2.1 Relationships with software providers

Formal relationships will be established with the providers of the key software components within the UMD Release. The relationship, defined in a Service Level Description, will include the agreed release schedule and expected support and maintenance of the software components. During the project this SLD model is expected to evolve to a sustainability model which may include SLAs negotiated with commercial software providers, as well as open source contributions etc. Maturity of the process will be assessed in the activity deliverables. It is expected that a very strong collaboration will be established with the EMI project as it will provide many of these key software components.

1.5.4.2.2 UMD Roadmap

UMD Roadmap will be the principal detailed specification of the UMD showing which of contributed components releases will appear in UMD releases. The specification will evolve continuously, reflecting new infrastructure and users' requirements. Entries in the UMD Roadmap will contain, for each major and minor release of a software component:

- functionality description, including links to the requirements addressed by this release
- expected release date
- expected level of maintenance and its duration
- component-specific acceptance criteria
- dependencies with other components
- any associated risks (security, privacy, etc.)

Possible conflicts in the UMD Roadmap will be detected and resolved through discussion with the relevant software providers and refinement of the UMD Roadmap. In general, the UMD Roadmap must ensure that components used in production are supported at an appropriate level. If a component is planned for replacement or phase out, a transition plan must be included. Complementarily, use of components will be monitored, and sparsely used or unused components downgraded in support or removed from the distribution entirely. SA2 will be responsible for continuous maintenance of the UMD Roadmap. Updated roadmaps will be regularly submitted to MCB for approval and the approved version published. Interim unapproved versions of the roadmap will be available for community comment and feedback.

Publication of the roadmap is a source of important information for both operations & users to be aware of upcoming new functionality and the phasing out of existing functionality, as well as for software providers to know about requirements for new functionality. Initial version and major updates of the roadmap are included in milestones MSA2.1 and MSA2.4. Also the generic component acceptance criteria are expected to evolve according to experience - they should generally become stricter. Their change may cause a component not to pass anymore (e.g. new security requirement). Therefore planning of a new conforming release and corresponding update of the roadmap is triggered in this case. A special case of this situation is the beginning of UMD, when the criteria will be defined at the first time but not all included components will satisfy the criteria. An appropriate transition plan will be included in MSA2.1. Progress of the plan given by the roadmap will be followed, and emerging issues (delayed delivery of planned functionality may have consequences on other components) resolved.

1.5.4.2.3 Component and UMD versioning

Providers are required to deliver components versioned according to the conventional "major.minor.revision" scheme, where increment of revision number means fixing bug(s) only and adding no new functionality, increment of minor number brings new functionality while preserving backward compatibility of interface and functionality, and increment of major number means large revision, possibly breaking the backward compatibility.

Baseline releases of UMD as a whole are defined by specific versions of all UMD components. In a given baseline backward compatibility of interfaces of all components (i.e. major version number) is fixed strictly. New UMD Releases (baselines) will occur at time and frequency determined by the MCB in consultation with the community (timeframe of 6-12 months is foreseen).

The baselines are complemented with updates, consisting mostly of fixes for individual critical bugs and/or cumulative bug fixes within specific components. Minor, backward compatible functionality additions can occur with these updates if the functionality is urgently needed, however the addition of new functionality will normally be postponed until the next baseline release.

1.5.4.3 TSA2.2: Defining Component Acceptance Criteria

SA2 will process incoming requirements (formally via the MCB or informally from the community) on software from:

- *Users and operations*. Besides receiving requirements passively operations and user communities will be approached (e.g. during user conferences, SA1 operations meetings etc.) to discuss existing issues and suggest solutions.
- *Software providers* are expected to suggest design changes, replacement components etc. to address known issues, e.g. outcome of EMI harmonization effort etc.

SA2 will coordinate discussion among these parties and formalise the requirements so that they can be addressed coherently by all the relevant software providers either by refining existing components or developing new components. The requirements will be specified as either *generic acceptance criteria* which should hold for any component in UMD (e.g. interoperability, extensibility, availability on a specified minimal set of platforms, availability of SDK, security, requirements on documentation, etc.), or *specific criteria* valid for a concrete components only (e.g. requirements on throughput or stability).

1.5.4.4 TSA2.3: Verification of a software release

Accepting New Components

Complete testing, ensuring that released software meets all specified criteria, will be done by the software provider in environments representative of those found in production. The software provider may cooperate with users and operations in providing these environments and test cases. SA2 will be involved, mostly as an observer, in the testing process. Therefore the final (after the component is released by the provider) independent verification of the component will be a lightweight process, based on results of these tests. The verification will be summarized into a publicly available acceptance report.

Upon component acceptance, terms of SLD for the component, as well as duration of the support are negotiated between EGI and the provider. For long-term sustainability of EGI and its community, an open environment is essential in order to promote competition and innovation to achieve high quality software. Thus EGI will always reserve the right to choose the best available implementation that meets the specified criteria which is acceptable to the EGI community.

Component Release Process

Basic workflow for a component release is shown in Figure 3. A *major* or *minor* release (one that contains new functionality or an interface change) after being uploaded the component is verified by SA2 to conform with criteria specified in the UMD Roadmap, taking into account results of pre-release testing. For a *revision* releases the software provider uploads a new version and it is marked as certified by software provider (meaning that the agreed criteria are not broken and bugs declared to be fixed are really fixed). There are no further checks done by SA2 as the full responsibility for the new release is with the provider and its own quality assurance mechanisms.

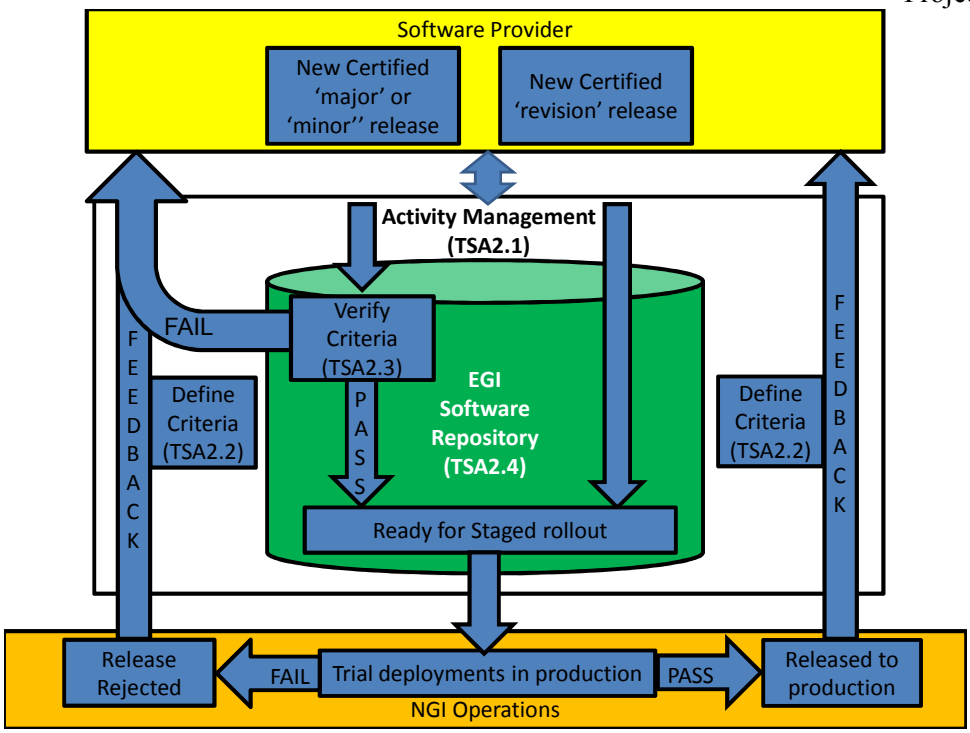

Figure 3 High level workflow of software release

The former case will typically include new criteria relating to any new functionality in the release. Therefore the verification process is based around manual testing and automated test suites involving SA2 and other stakeholders (i.e. operations & users community) as required.
The latter case assumes the provider is trusted and test suites are available, so that the interaction between EGI and the provider is more streamlined, eliminating the verification effort and reducing the delay around new revision releases. On the other hand, the case of a provider, who would deliver faulty components repeatedly, will be escalated and solved at the level of UMD composition.
In both cases the released components enter staged rollout phase, available for trial deployment in production. Unless negative feedback is received within a short timeframe (1-2 weeks) the released components become available for wide deployment.

1.5.4.5 TSA2.4: EGI Software Repository

The *EGI Software Repository* will be a highly-available source of software components available for inclusion in the UMD Release or for direct use by NGIs. The repository will have 'real' components (with source and binary releases physically located on the servers) or 'virtual' components (with source and binary releases located on the software provider's servers).

Components (and their specific releases eventually) in the repository are expected to fall into categories:

- *UMD Components*, included in UMD distribution; they are further classified as:
  - *fully supported* – terms of support (SLD) were negotiated with the component provider, and they are documented and published with the component
  - *community supported* – there is no explicit support agreement, however, the component is of general importance, it is actively used by the community and supported by its provider
- *associated components*: software that is generally recognized to work well with UMD, however, it is not its intrinsic part, and EGI provides no explicit support to it, leaving it to the interested community (similar to RESPECT program in EGEE)

The repository will contain versioned binary (for multiple supported platforms, in a format native for the platform, e.g. RPM, deb etc.) components as uploaded by software providers. Access to the source code must be provided unless an exemption has been specifically negotiated with the provider. This can be achieved by explicitly uploading the source or by using an established repository (e.g. SourceForge).
Versioned components will appear in one of the states of their life cycle (contributed, under evaluation, in staged rollout, in production, rejected, and deprecated) according to their state w.r.t. the software release process described above.

Components will be arranged into installation repositories for automatic download through existing platform-specific repository formats (e.g. yum, apt, etc.). Multiple such repositories per platform will be available, depending on state of the component (pre-release, released, in-production). Only components in the in-production state are exposed in repositories used for automatic updates.

1.5.4.6 TSA2.5: Deployed Middleware Support Unit

Second line support ensures availability of more specialist skills than what offered by the first line support (the helpdesk) in the resolution of incidents and investigation of problems. Normally, if the helpdesk desk is unable to resolve the incident it is escalated for further support to a second line support unit; if even more technical knowledge is required for the incident that the second line support is unable to solve the incident within the agreed timeframe, it must be escalated to the third line support, which is supplied by the provider of the affected component. This industry standard model provides the most effective use of resources – escalating trivial issues to the ultimate technical experts in the third line support is disruptive, but the first line support units may not have the experience to resolve the most complex issues.

The experience from other infrastructure projects has shown the second line support capability to be vital – especially for middleware related issues. Within EGI the first line support activity is enabled through the helpdesk function and ticket processing teams provided by SA1. The second line support unit provides a buffer of middleware-related expertise within the infrastructure to resolve the source of complex issues that cannot be fixed by 'reading the manual'.

The 'Deployed Middleware' support unit (DMSU) provides a dedicated second line support function for the middleware used in production, receiving issues from the EGI helpdesk (the first line) and working with the external software providers to resolve the issues (the third line). The relationship of DMSU with these other groups and the workflow of incident resolution is shown in the diagram below.

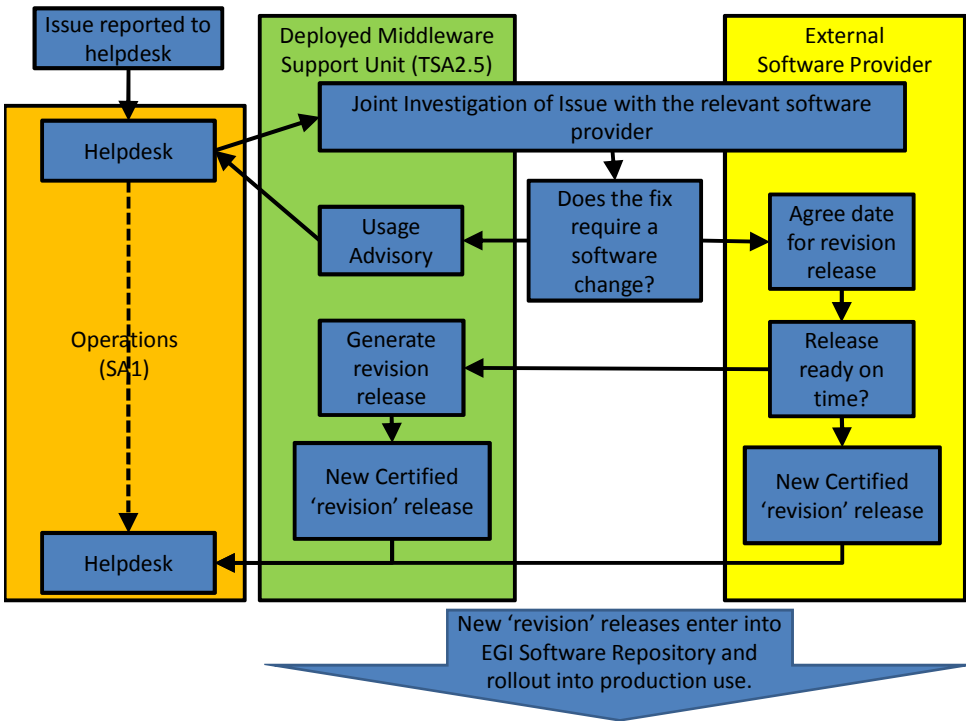

Figure 4 Workflow of incident resolution

The DMSU is a distributed, but tightly integrated team of experts working responsively to the issues assigned to it – there can be no planned roadmap of activity – and focuses on a rapid resolution of the most critical (i.e. high impact to operations) or complex (i.e. hard to reproduce) issues. Expertise of the team members should cover all middleware areas (job management, data, information, security). Similarly, contacts sites of various sizes should be established in order to cover knowledge of different deployment scenarios, architectures, storage and network setups etc.

The work is managed by designated leader responding to SA2 manager. Within the team, it is important to conduct frequent meetings, firstly to get the team to work closely together, but also to be able to setup sub-groups dedicated for addressing urgent issues. In some aspects work of the team is similar to pre-release verification of components done within TSA2.3. Therefore close collaboration, and even overlap in physical people involved is foreseen.

Integration with Operations

DMSU will work tightly with EGI operations (SA1). A strong interaction between the support unit staff and their local operation teams can help in pinpointing problems or designing tests scenarios for debugging an issue. On the other hand, from the operations viewpoint the DMSU team members are trustworthy experts within the project, who can be granted access to operations resources when needed, in order to investigate issues on the spot.
DMSU will become a unit in the helpdesk ticketing system, handling escalated tickets directly.
The team members are also expected to take part in regular operations meetings to become aware of emerging issues immediately.

Integration with the Middleware Providers

DMSU will establish close relationships with the software providers in order to be able to investigate issues jointly. Issues identified as software defects will be assigned to the support units within software providers. Depending on priority they will be resolved during their normal release cycle or as a critical bug-fix release. Close integration with the external software providers is therefore vital and this will be captured through a written Service Level Description.

Emergency interim releases

If, for whatever reasons, the external provider fails to deliver a revision release to address a specific issue in the requested timeframe, DMSU will generate an interim release of the affected component(s). Further on the release will follow standard release path described above.
The process of such emergency releases must remain at the level of exceptional risk mitigation mechanism only. The expected effort assigned to DMSU is not sufficient to work in this way normally, and it would turn into bottleneck of the software release process. If a software providers starts failing to deliver revisions continuously, it must be escalated and solved in other way at the level of UMD composition (replacement of the component etc.).

Feedback to quality criteria

The analysis of issues and the knowledge accumulated during this support activity will provide a source of future functional and operational requirements and contribute to the feedback on the quality of the delivered middleware components. Therefore experience of DMSU will be projected to the definition of UMD roadmap and generic criteria definitions.

1.5.4.7 Deliverables

Del. no.	Deliverable name	WP no.	Nature	Dissemi-nation level	Delivery date (project month)
DSA2.1	Report on setting up UMD repository, initial UMD releases and progress of transition to UMD, and work of DMSU.	SA2	R	PU	PM10
DSA2.2	Report on subsequent UMD releases, assessment of the achieved processes, support and quality statistics	SA2	R	PU	PM 22
DSA2.3	Second report on subsequent UMD releases, assessment of the achieved processes, support and quality statistics	SA2	R	PU	PM 34
DSA2.4	Final report on UMD releases, support and quality statistics, and achieved sustainable processes	SA2	R	PU	PM 46

1.5.4.8 Milestones

Milestone	Milestone name	Work	Expected	Means of verification

number		package(s) involved	date	
MSA2.1.1-8	UMD Roadmap (detailed for Y1, outlook in future), initial definition of generic component acceptance criteria, transition plan	SA2	PM 3, PM 9, PM 15, PM 21, PM 27, PM 33, PM 39, PM 45	
MSA2.2	Setup of component repository, support tools, and definition of the release process	SA2	PM 1	
MSA2.3	Support plan (definition of functions of Deployed Middleware Support Unit)	SA2	PM 3	

1 **1.5.4.9 Risk Assessment and Mitigation`**

Risks	Impact	Probability of Occurrence	Mitigation
A release from a software provider fails to meet its acceptance criteria.	The release will be delayed from entering into staged rollout until the issue is resolved.	High	The acceptance criteria will be defined in conjunction between the software provider, the user and the operations teams. They will be regularly reviewed to make sure they are relevant and measurable. Software providers who regularly fail to meet these criteria will not be supported in their future funding applications.
EMI project is not funded by the EC due to the quality of the proposal or the competition in the call.	EMI will provide the main maintenance and development effort for the software deployed by EGI. Without its funding the continued evolution of Grids in Europe, and the success of EGI-InSPIRE will be severely compromised.	Medium	The many of the partners within the EMI middleware consortia are committed to providing some level of middleware support. The provision of the deployed middleware support unit within EGI will provide some resources to undertake **critical** or **security** related fixes but nothing more. This should provide time for EMI to restructure itself and bid successfully.
Software provider delivers update software release of poor quality,	Low-quality software releases can severely impact the quality of the production infrastructure and result in degradation of service and significant effort to correct.	Medium	SA2 plans to only perform lightweight verification on update releases so that they move rapidly into production following staged rollout. If individual software providers incorporate new functionality into these releases rather than just fixing bugs, then the trust with these providers is broken. EGI will have to reconsider the use of the software provider and/or devote extra effort to validating their releases slowing down their release into production.
Software providers do not deliver their components to the time, quality and functionality they agreed to.	The EGI community will base its work around the functionality that will be offered by the infrastructure through its software. Not having the	Medium	The UMD roadmap will be formally reviewed every 6 months and updated with any changes from the software provider. Dependencies between releases from different providers will be identified and tracked so that

	functionality there on time will disrupt their work.		dependent providers and user communities can be informed of delays. Critical changes will be communicated as required between these updates.
A critical/security issue is identified in a component deployed in use on the production infrastructure.	If not resolved such an issue may degrade the capability of the production infrastructure or expose it to malicious users.	Medium	The Deployed Middleware Support Unit will have experts associated with the infrastructure able to investigate these issues. Solutions to issues such as these will be developed in conjunction with the relevant software providers. Fixes to these issues will by default be implemented by the software provider unless they are unable to undertake the work in which case the DMSU will provide a new release.
Software provider deliver major/minor software releases of poor quality.	Low-quality software releases can severely impact the quality of the production infrastructure and result in degradation of service and significant effort to correct.	Low	SA2 will verify that the releases from the software providers meet the defined criteria. Major/minor releases will have significant external testing and inspection. Any issues found during the SA1 staged rollout or in production will be recorded and the acceptance criteria changed if required. Software providers that consistently provide poor-quality code will no longer be used.

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1 ### 1.5.5 Work Package SA3: Services for Heavy User Communities

2 #### 1.5.5.1 Summary

Work package number	SA3	**Start date or starting event:**	1/5/2010				
Work package title	Services for Heavy User Communities						
Activity type	SVC						
Participant number							
Participant short name							
Person-months per participant							

3

Objectives

- To support the tools, services and capabilities required by different heavy user communities (HUCs)
- To identify the tools, services and capabilities currently used by the HUCs that can benefit all user communities and to promote their adoption
- To migrate the tools, services and capabilities that can benefit all user communities into a sustainable support model as part of the core EGI infrastructure
- To develop a sustainable support model for the tools, services and capabilities that will remain relevant to single HUCs

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Description of work

TSA3.1: Activity Management
The SA3 management is responsibility of the Activity Manager, who reports to the UCO for the running of this activity. They coordinate the work across the different tasks within the activity to meet the stated objectives. Not all of the tasks will contribute to all of these objectives. The task leaders will be part of HOW SUPERVISED - USAG or a new body? The activity manager will pay particular attention to the provision of the shared services and tools task (TSA3.3) to ensure that all requests from all communities are correctly evaluated and prioritised into the workplan even if the work is being undertaken by a single community. All tasks will establish outreach and sustainability plans, and mechanisms for monitoring and gathering feedback on the delivery of their services.
Requested Effort: XXX PM

TSA3.2: Outreach to potential heavy user communities..
Many of the activities supported within this activity have potential benefits to other heavy user communities (e.g. EIROForums and ESFRI) and more broadly the general DCI community. Some of the potential results from this activity include: dashboards customised to specific VOs, workflows and schedulers bridging different DCIs (e.g. DEISA, PRACE, EGI), support of MPI, frameworks for managing collections of jobs on DCIs, services for accessing relational data resources, secure data storage, visualisations tools, etc. The technical outreach necessary for these activities to be picked up by these other communities will be the focus of this task.
Requested Effort: XXX FTE

TSA3.3: Shared services and tools
Evolutionary development, deployment, operation and maintenance of the services and tools that are of interest to multiple communities. It is expected that by the end of the project many of these services and tools will have been migrated into UMD (i.e. be supported independently of the EGI project by an external software provider) and deployed within EGI. This migration will be justified by the continued adoption and use of these tools and services by HUCs and the broader EGI user community.
Subtasks:

- **TSA3.3.1 Dashboards**: Dashboards provide a generic framework to monitor sites and their services within a VO using tests specific to that community. Dashboards have emerged from within the HEP community, and are now being adopted by the LS community, to monitor their resources. Requested Effort: XX CERN, YY LS
- **TSA3.3.2 Applications**: The GANGA and DIANE tools are both part of the EGEE RESPECT programme which recognises software that builds on top of the gLite platform. Although initially

developed for the HEP community these tools have now gained traction in other communities, as they provide simple environments to manage large collections of tasks, and their requirements will be integrated into the workplan. Requested Effort: XXX PM

- **TSA3.3.3 Services:** The HYDRA and GReIC are services that have emerged from a single community that show potential adoption in others. HYRDA allows an encryption key to be securely stored on distributed servers in order that storage elements can be used to securely store confidential data which is critical for the medical community. The GReIC service provides uniform relational and non-relational access to heterogeneous data sources and is currently being used to support bioinformatics and Earth Observation Systems. Requested Effort XXX PM
- **TSA3.3.4 Workflow and Schedulers**: These tools are critical in integrating complex processes, generally involving multiple data sources and different computational resources, needed within many disciplines. SOMA2 is a web based workflow tool used for computational drug design and general molecular modelling. TAVERNA is used extensively the bioinformatics community. The combination of the Kepler workflow engine and the Migrating Desktop platform are used by the Fusion community to run workflows requiring visualisation and interactive access on gLite and UNICORE enabled resources. For simpler workflows and metascheduling scenarios the GridWay system is used. Effort is provided to maintain the integration of these tools with the different systems. Requested Effort: XXX PM
- **TSA3.3.5 MPI:** Support for parallel computing (MPI) applications are critical for many user communities but the integration of this capability into the general infrastructure has been difficult. This task will focus on the improvement of the core services and software needed to support MPI, while engaging with two representative user communities (CCMST & Fusion) to ensure that the offered support meets their requirements. Requested Effort: XXX PM

TSA3.4: Services for High Energy Physics (HEP)
The HEP VO specific services are devoted to the support of the Grid interfaces of the 4 LHC experiments and are of particular importance now as we enter the exploitation phase of the world's largest scientific machine – the Large Hadron Collider at CERN. They are aimed to ensure the LHC experiment can rely on the Grid for their data handling, as planned in their Computing Models.

All LHC VOs require optimizations and improvements in a number of common areas: workload management, data management, monitoring, service deployment and operation. These optimizations – of which specific details are provided in the task description below –are an essential part of the move to sustainable operations, as well as handling additional load and complexity expecting from LHC data taking, (re-)processing and analysis. The work programme will be defined reactively as the performance and behaviour of the LHC machine and the experiments' detectors are understood, and the Grid deployment model is optimized to handle the associated needs.
Requested Effort: XX PM at CERN.

TSA3.5: Services for Life Sciences (LS)
This task will provide services and service deployment for the Life Sciences community. The Medical Data Manager (MDM) can be used to store image data on services attached to the Grid. The resources available to the biomolecular community at the EBI will be integrated into EGI. A RSCA secured for framework for public health informatics (PANDORA) that can be used to design disease surveillance systems will be integrated with EGI's resources.
Requested Effort: XXX PM

TSA3.6: Services for Astronomy and Astrophysics (A&A)
Many disciplines use e-Infrastructure for data analysis. Visual representations of these data sets provide an effective approach for many disciplines to gain knowledge from this data. The A&A community will Grid enable visualisation and associated data interpretation tools (e.g. VisIVO) to show the collected data. The integration of HPC (e.g. DEISA/PRACE) resources with HTC resources for the A&A with will be undertaken in this task.
Requested Effort: XXX PM

TSA3.7: Services Earth Sciences (ES)
Implement, deploy and maintain the EGDR service to provide access from the grid to resources within GENESI-DR.

Requested Effort: XXXPM

Deliverables (brief description) and month of delivery

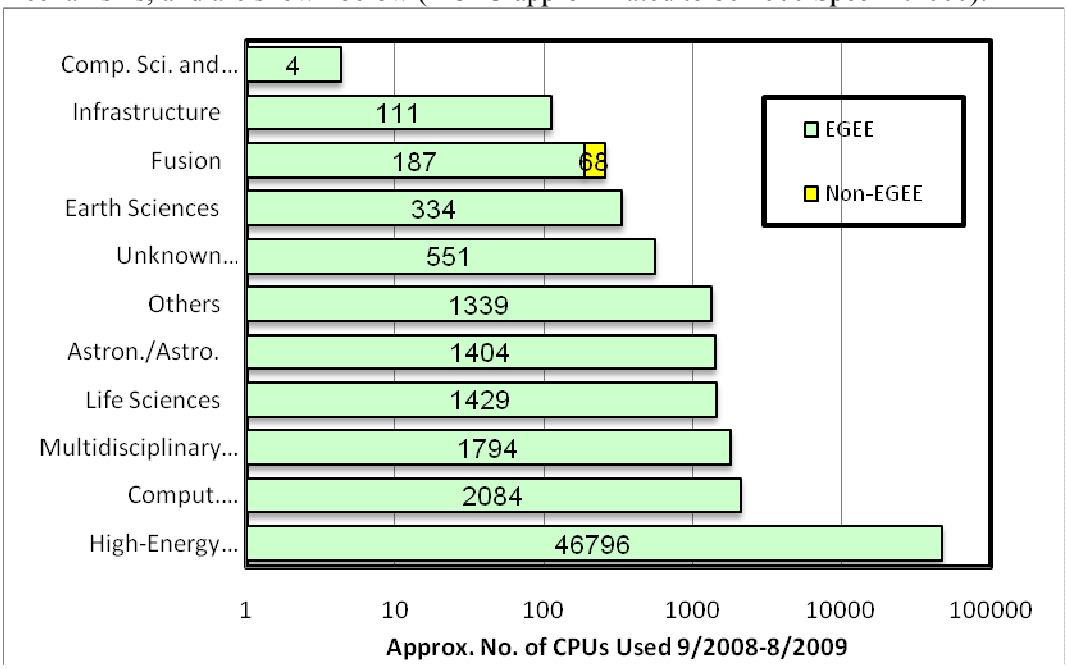
1.5.5.2 Overview

This activity responds to the 1.2.1.2 sub-call, whose objective is "to deploy services for user communities that are heavy users of DCIs and have a multi-national dimension. Software components should be integrated in platforms as needed for service provision. Where appropriate, new service provision models should be explored and harmonised interfaces to DCI resources should be ensured."

This activity has three main motivations:

- To provide a transition to a sustainable environment of services and tools for those scientific communities that have already adopted DCIs, to where their services are part of the general service infrastructure provided through EGI or they are sustained by other means – either through their own community or through external software providers (middleware projects such as EMI).
- To continue the pioneering activity of these communities in the way they exploit the e-infrastructure by integrating new data sources, tools and services so that their successful activities can continue to be disseminated to other communities.
- All the user communities that will be supported by EGI should experience no disruption as they move from their current e-infrastructure provider. This is especially critical for communities that are already actively exploiting the infrastructure.

These communities have been identified through their current usage of the EGEE and related infrastructures (e.g. EUFORIA, EDGES, national infrastructures) by collecting the usage statistics through the relevant accounting mechanisms, and are shown below (1 CPU approximated to be 1000 SpeciInt2000):



The communities identified as Heavy Users Communities (HUCs) within this proposal are:

- High Energy Physics (HEP)
- Life Sciences (LS)
- Astronomy and Astrophysics (A&A)
- Computational Chemistry and Materials Sciences and Technologies (CCMST)
- Earth Sciences (ES)

- Fusion (F)

Besides their extensive usage of the grid infrastructure, these communities, and especially HEP and LS, have played a vital role in EGEE in actively working to bring the grid to production quality. Their continual feedback on the deployed infrastructure (the effectiveness of the services, and their functionality, stress tests, operational procedures, etc.) needs to be captured within EGI, and from all the HUCs in order to develop EGI's service offering for all user communities.

These HUCs will be supported through a number of mechanisms:

- Maintenance, operation and development of specific software services, tools and applications.
- Deployment and integration of domain specific applications and tools with the infrastructure
- Integration of data resources onto the e-infrastructure
- Expansion of the user base beyond the initial user community

Some of these tasks are targeted at specific user communities, while others are driven by a subset of the HUCs for all users of the infrastructure.

The services provided by the generic production infrastructure will be supplemented by the services needed by the HUCs. Not all NGIs are expected, or need to deploy these services.

Table SA3.1

Service Description/Name	Main User Community	Current Software Providers
Work Load and Workflow Management servicess	All	gLite, ARC, UNICORE, GridWay, Taverna, SOMA2
LFC	HEP, LS, CCMST, ES, FUSION	gLite
FTS	HEP, LS, CCMST	gLite
AMGA	LS, CCMST, A&A, ES	gLite
Hydra	LS	gLite

1.5.5.3 TSA3.1 Activity Management

The SA3 activity will be managed by CERN. The SA3 manager will report to the UCO and be a member of the OMB to ensure the link with the SA1 activities.

1.5.5.4 TSA3.2:

1.5.5.5 TSA3.3 Shared Services & Tools

Each tool or service is normally led by a single HUC funded within this activity, while the development of community specific plug-ins and any associated prototyping are outside scope of this activity and may be carried out within the SSCs or the broader user community.

The Shared Services & Tools supported in this task is detailed below – along with the current and future user community within the HUC.

Tool or Service	Current HUC Adopters	Future HUC Adopters
Dashboard for monitoring	HEP, LS, CCMST, ES	A&A
GANGA Task Manager	HEP, CCMST, A&A, ES	F, LS
GRelC Database Access Service	ES, A&A, CCMST	
TAVERNA Workflow Manager	LS, A&A, CCMST	
DIANE Task Manager	A&A, ES	

A brief description of the sub-tasks is provided.

1.5.5.5.1 TSA3.3.1 Dashboards

In order to perform production and analysis tasks across a highly distributed system crossing multiple management domains powerful and flexible monitoring systems are clearly needed. To respond to the LHC experiments' requirements in this area, the experiment Dashboard monitoring system was originally developed in the context of the EGEE NA4/HEP activity. This framework, not only supports multiple grids / middleware stacks, including gLite (EGEE), VDT (OSG) and ARC (NDGF), but is also sufficiently generic as to address the needs of multiple

other communities including but not limited to HUCs. Furthermore, it covers the full range of the experiments' computing activities: job monitoring, data transfer (see FTS and VO services above) as well as site commissioning. It also addresses the needs of different categories of users, including:

- Computing teams of the LHC VOs;
- VO and WLCG management;
- Site administrators and VO support at the sites;
- Users running their computational tasks on the grid infrastructure.

Future work will concentrate effort on common applications which are shared by multiple LHC VOs but can also be used outside the LHC and HEP scope. Examples of such applications are: generic job monitoring application and user task monitoring, FTS monitoring, site status board, VO-specific site availability based on the results of tests submitted via Site Availability Monitor (SAM).

Reliable monitoring is a necessary condition for establishing and maintaining production quality of the distributed infrastructure. Monitoring of the computing activities of the main communities using this infrastructure in addition provides the best estimation of its reliability and performance. The importance of flexible monitoring tools focusing on the applications has been demonstrated to be essential not only for "power-users" but also for single users. For the power users (such as managers of key activities like large simulation campaigns in HEP or drug searches in BioMed) a very important feature is to be able to monitor the resource behaviour to detect the origin of failures and optimise their system. They also benefit from the possibility to "measure" efficiency and evaluate the quality of service provided by the infrastructure. Single users are typically scientists using the Grid for analysis data, verifying hypotheses on data sets they could not have available on other computing platforms. In this case the monitoring / dashboard is a guide to understand the progress of their activity, identify and solve problems connected to their application.

This is essential to allow efficient user support by "empowering the users" in such a way that only non-trivial issues are escalated to support teams (for example, jobs on hold due to scheduled site maintenance can be identified as such and the user can decide to wait or to resubmit).

1.5.5.5.2 TSA3.3.2 Applications

GANGA is an easy-to-use frontend for job definition and management, implemented in Python. It has been developed to meet the needs of ATLAS and LHCb for a Grid user interface, and includes built-in support for configuring and running applications based on the Gaudi / Athena framework common to the two experiments. GANGA allows trivial switching between testing on a local batch system and large-scale processing on Grid resources.

A job in GANGA is constructed from a set of building blocks. All jobs must specify the software to be run (application) and the processing system (backend) to be used. Many jobs will specify an input dataset to be read and/or an output dataset to be produced. Optionally, a job may also define functions (splitters and mergers) for dividing a job into sub-jobs that can be processed in parallel, and for combining the resultant outputs. GANGA provides a framework for handling different types of application, backend, dataset, splitter and merger, implemented as plugin classes. Each of these has its own schema, which places in evidence the configurable properties.

As it is based on a plugin system, GANGA is readily extended and customised to meet the needs of different user communities. Activities outside of ATLAS and LHCb where GANGA is successfully used include GEANT4 regression tests and image classification for web-based searches. GANDA is included in the EGEE RESPECT Program (Recommended External Software Packages for EGEE Communities).

The number of GANGA users has steadily increased and today there are several hundred grid users using the tool in their daily work, some 25% of whom are not from HEP VOs. Whilst these other VOs and the successful "gridification" of numerous associated applications in a wide range of fields including Fusion, Material Sciences, Accelerator Studies and Biomedical applications, the effort requested here would focus on production service deployment to the WLCG VOs ATLAS and LHCb in the critical early years of the LHC's operation..

DIANE is a lightweight distributed framework for parallel scientific applications in master-worker model. It assumes that a job may be split into a number of independent tasks which is a typical case in many scientific applications. The DIANE framework takes care of all synchronization, communication and workflow management details on behalf of the application. DIANE is included in the EGEE RESPECT Program.

1.5.5.5.3 TSA3.3.3 Services

GRelC (Grid Relational Catalogue) is a Grid database access and integration service. The GRelC service allows users to interact with different Database management systems, both relational (PostgreSQL, MySQL, Oracle, DB2, SQLite, etc) and non-relational (eXist, XIndice, XML flat files). It provides a uniform access interface to heterogeneous data sources in a grid environment. The GRelC middleware has been included in the EGEE RESPECT Program since it works well with the EGEE software by expanding the functionality of the grid infrastructure (with regards to database management in the grid). The GRelC middleware is currently used within several grid research projects to support bioinformatics experiments on distributed and huge databases as well as the metadata management related to Earth Observation System applications (i.e. Climate-G).

During the project the **GRelC system** (the P2P network of GRelC services deployed within EGI) will be enhanced to support the EGI communities with a new set of functionalities. These will be accessed by end users through the **GRelC Portal**, a seamless, ubiquitous and web-based environment for the management of geographically spread and heterogeneous grid data sources.

An important task will be related to the monitoring and control functionalities connected with the underlying P2P infrastructure of the GRelC system. Such a management framework will be managed through the GRelC Portal by means of a new set of web pages exploiting the dashboard approach (charts, reports, table, diagrams able to provide a global and local views about the status of the system). Users will be able to configure, manage and query their own GRelC services exploiting a wide set of management functionalities embedded into the GRelC Portal. A key point will be related to make easier (few steps in a web-based wizard) the *gridification process* (bringing into the grid) of a **database resource**.

A key task will be the creation of the **EGI Database of Databases**, a registry service accessible through a specific GRelC Portal web page that will contain all of the information about the grid-databases available in the **GRelC System**. Users will be able to:

- *query the registry* (exploiting a keyword-based approach) asking for specific databases, filtering by VO, keywords, domain, etc. This will help people working in a specific domain to quickly identify available and related resources, identify key people working on specific subjects, easily contact them to establish collaborations, etc.
- *join a specific grid-database*, submitting via web a request to the grid-database administrator, know more about the supported VOs, etc.;
- *add comments* on the available data and the related data sources being part of a community exploiting a collaborative and Web2.0 oriented approach. All of this data will be available for future users, creating a knowledge base centered around community-oriented topics.

The **EGI Database of Databases** will complement the functionalities provided by the **EGI Application Database** and will represent a distributed and multi-VO system.

During the project a set of specific use cases oriented to the EGI VOs working with the GRelC service will be defined starting from user needs and requirements. Support will be provided to these VOs to 'gridify' their data sources and to use these experiences to drive the design and implementation of new functionalities provided through the GRelC Portal. Success stories relating to the GRelC Portal will be disseminated through NA2 to the entire community.

HYDRA will be maintained, tested and deployed by NGI France (CNRS partner). The Hydra service, is a critical component for the MDM service in particular and medical image manipulation on the grid in general. Preserving compatibility of the MDM with the evolution of Hydra and guaranteeing proper operation of the service is critical for the medical imaging user community. This work will cover (1) functionality testing and stress testing of the Hydra service; (2) transparent interface and update of the Hydra encryption / decryption functionality inside the MDM client; (3) deployment and maintenance of a multi-servers Hydra services to serve the community.

1.5.5.5.4 TSA3.3.4 Workflows and Schedulers

SOMA2 is a web browser based workflow environment for computational drug design and general molecular modelling (http://www.csc.fi/soma). The purpose of the SOMA2 environment is to provide users an easy access to computational tools. SOMA2 hides all technicalities related to execution of scientific applications in complex computing facilities allowing users to focus on their actual scientific tasks. The SOMA2 server platform will be set up and cofniured with suitable authentication and user management systems needed for integrating SOMA2 with EGI infrastructure. Grid job submission features will be integrated and deployed into SOMA2 including procedures

for handling personal grid certificates for authentication. These features will be tested to ensure quality and same jobs run and documented. The SOMA2 scientific gateway will be maintained in operation during the project including the necessary user management and system administration, and the necessary maintenance of the existing scientific applications integrated into the gateway and the new tools and applications requested by the use community.

TAVERNA is a workflow engine initially developed within the MyGrid project by University of Manchester. Because of its wide adoption by the bioinformatics community, TAVERNA has been ported to EGEE by EGEE-III Life Sciences cluster. TAVERNA is maintained and keeps being developed by a consortium involving most notably University of Manchester and EBI. This work will ensure its continual interoperability with the security models used by the production infrastructure and the middleware deployed within EGI (e.g. gLite, ARC, UNICORE).

MD / RAS / Kepler platform consists of two major components: server (Roaming Access Server - RAS) and client (Migrating Desktop - MD). Users authenticate and login in the Java based graphical portal Migrating Desktop. The RAS does the job submission and data handling on the Grid on behalf of the user. Several deployments of the web service RAS will be maintained by the partners involved in the task. In particular the RAS is able to use the workflow manager Kepler, which is the workflow tool selected by the Fusion modelling community, to submit workflow jobs.

Furthermore the RAS currently contains plugins allowing the access to gLite and UNICORE based resources, which makes the combination of RAS + Kepler + (gLite / UNICORE plugin) a very useful tool for generic applications. The effort will be dedicated to maintain the RAS servers and to the upgrade of plugins according to the evolution of underlying middleware. One backup instance of RAS will be installed at the central services of the National Network provider, in Spain to increase reliability.

GRIDWAY is a metascheduler to launch jobs to Grid infrastructures, it also allows workflows. It has fewer capabilities than RAS because visualisation and interactivity are not provided, but it is used in many Fusion workflows because of its ease to use. Several instances of the metascheduler Gridway will but in service, one of them in the central services of the National Network provider in Spain, RedIRIS to increase reliability.

1.5.5.5.5 TSA3.3.5 MPI

The need for focused MPI support within the infrastructure for non-HEP communities, notably Astronomy and Astrophysics, Computational Chemistry & Materials Science, Earth Sciences, Fusion, Life Sciences and Solid State Physics communities was established during the EGEE-III project... Such an activity needs dedicated effort on the operations side to improve the quality of the infrastructure and effort amongst some of the critical user communities to actively provide feedback on the ongoing operational support for MPI.

CSIC maintains the *mpi-start* middleware component originally developed and deployed extensively during the Int.EU.Grid FP7 project. This product was crucial in enabling MPI on the EGEE infrastructure. TCD led the first MPI Working Group (MPI-WG) in EGEE-II and delivered middleware components which allowed Resource Centres to easily deploy MPI including an initial SAM based test suite. Both CSIC and TCD have a well-established relationship in working together on the MPI-enabled middleware deployment issues.

CCMST will engage in testing of MPI with CCMST specific applications to ensure that the MPI service is fully functioning for the CCMST Community. CCMST already offers support on MPI usage to its community on a smaller scale through the COMCHEM Virtual Organization. Priority will be given for identifying applications currently running on dedicated supercomputers that could be ported to the grid, porting them, and registering them in the Applications database. Fusion applications will be tested with special emphasis on assessing its scalability on Grid. The high number of legacy codes that exist in Fusion and plasma physics will in general pose a particular challenge to these tasks due to the architectural and software constraints that need to be taken into account. Fusion currently provides support to MPI in the context of EGEE through the Fusion VO and also in the EUFORIA project. The question of providing a proper accounting of MPI jobs remains open, and work is needed together with the developers of accounting repositories and portals in order to test their solutions. The Fusion community will work hand in hand with the developers in this respect in order to provide a solution for this, providing testing applications and feedback from the users side.

The Fusion community are reliant in the advanced predictive modelling capabilities provided by MPI applications in the area of magnetically confined fusion plasmas which are needed to understand and design the next-generation

Fusion devices such as ITER (the International Thermonuclear Experimental Reactor). Computer science efforts have also been directed towards developing tools to facilitate the integrated plasma-edge model within the framework of an integrated Fusion framework (see EUFORIA project description in http://www.eu-euforia.eu) The wide range of physical scales that needs to be approached, from the core to the edge, makes it necessary to apply the techniques of parallel computing to integrate the full reactor geometry in the simulation, providing an excellent driver for MPI support in Grids.

The partners involved in this task will:

a) Assume responsibility for the integration of MPI into the infrastructure by maintaining, testing and certifying the integration of MPI related software components coming from the external software providers into the infrastructure;
b) Maintaining a suite of monitoring tests (i.e. SAM tests) to validate that the deployed MPI components are working correctly at a site;
c) Establish an 'MPI Support Unit' in the EGI Helpdesk to ensure that support issues from users and sites will be effectively handled and any issues relating to the software are recorded for resolution by the relevant software provider and any raised monitoring tickets are dealt with;
d) Disseminate the successes of this MPI support activity to the EGI community, in particular the relevant SSCs, and arrange provide updated training material for national or SSC oriented training events.

General MPI support for all communities will be delivered through an operational activity (CSIC+TCD) and through engagement from the application communities (CCMST + FUSION).

1.5.5.6 TSA3.4: Services for HEP

Building on the powerful generic infrastructure of the underlying grids that they use, the LHC experiments have developed important complementary services particularly in the areas of data and workload management, as well as in support for analysis services. Such services, which extend the capabilities of the infrastructure by exploiting knowledge of the experiment's computing model, data placement policies and/or information in metadata repositories, allow these massive international communities to maximise the benefit of the grids that they use.
This task will focus on essential optimisations of the existing solutions as well as improvements that are mandated by the experience of first long-term production data taking. As in the past, such "innovations" are expected to be of benefit to many communities and understanding how the advances made can move to the mainstream will be an important element of the work undertaken.

It is foreseen that the effort in this task be integrated into the Grid Support group at CERN, focussing on workload management, data management, monitoring, service deployment and operation issues driven by the production needs of the supported VOs. Specific examples include the provision, deployment and operation of scalable solutions to the experiments' needs for data distribution, detector conditions data distribution and access – such as the deployment of distributed services to provide the caching of database information for the reconstruction and analysis of physics data , automation of the management of experiment specific services at the various sites and the development and deployment of efficient monitoring tools that are essential to ease the tasks of shift operators.

This activity is of particular importance now as we enter the exploitation phase of the world's largest scientific machine – the Large Hadron Collider at CERN – and will allow us to capitalize on the investment made by the European Commission through its funding of three phases of the EGEE project. This has resulted in large scale production use of world-class Grid-based solutions by many key communities and has established Europe's leadership in this area. In the short to medium term it is expected that this will lead to significant advances in our basic understanding of the Universe around us, whereas in the longer term major spin-offs, both related to the advances in science as well as in Information Technology, can be expected.

1.5.5.7 TSA3.5: Services for LS

Distributed Medical Data Management

The large availability of tools for data management has widely opened a portfolio of scientific applications on grid infrastructures. A new generation of grid applications in the field of medical imaging and public health informatics is now under deployment with the potential for high scientific impact and visibility. The support to the high level services allowing the management of distributed data is of utmost importance to the growing adoption of e-infrastructures in life sciences.

CNRS will ensure sustainability and distribution of the Medical Images Management (MDM) tool. This work includes MDM software update (in particular DPM-DICOM plugin update to preserve compatibility with the evolutions of the MDM), software packaging and distribution (in particular, packages updates to preserve

compatibility with the future version of the gLite middleware), and MDM user support. Additionally, the MDM client will be enriched with the functionality required by further community use cases.

Integration of molecular biology core resources on the biomed VO

For the users of the Life Sciences Virtual Organization, access to the core molecular biology databases (UNIPROT, PDB, GenBank) is absolutely critical. Building upon the recommendations and developments of the EMBRACE network of excellence (DG-RESEARCH, FP6), the adoption of web services enables the interoperability but specific efforts must be dedicated to allow life sciences grid users to query the core biomolecular data bases at EBI in an easy and mostly transparent way. A service will be set up to regularly install updated versions of the data bases on storage elements of the Biomed VO. This work will contribute to the collaboration between EGI and ELIXIR, the distributed research infrastructure for molecular biology.

Secured framework for public health informatics

Disease surveillance has become a major concern for public health authorities worldwide. High-level services for cancer and Influenza A surveillance are now under deployment. This task is about further developing a secured framework (PANDORA) to serve the growing user community in the field of public health informatics, including secure access through smart cards for healthcare professionals. The PANDORA gateway developed by MAAT will be distributed freely to academic EGI users with an open source license.

1.5.5.8 TSA3.6: Services for A&A

Work in this task will focus on developing operational capabilities that will have a direct impact on the A&A and potentially on other communities. This includes Grid-enabled data interpretation and visualization tools to extract as much information as possible from A&A archived data and to easily show the results of data processing to final users (e.g. VisIVO). This will include the integration and interoperation with the data stored in HPC data centres (e.g. through DEISA/PRACE) with other EGI resources.

1.5.5.9 TSA3.7: Services for ES

Data are key part of any ES application. Currently, the ES community are using several interfaces to access Data and Metadata outside of the EGEE infrastructure using grid enabled database interfaces such as OGSA-DAI, Spitfire and AMGA. The data centers have also developed service tools for basic research activities like searching, browsing and downloading of these datasets, but these are not accessible from applications executed on Grid. This task will also enable these tools to be accessed from the Grid. In collaboration with GENESI-DR (Ground European Network for Earth Science Interoperations - Digital Repositories) this task will maintain and evolve an interface in response to new requirements that will allow data in the GENESI-DR infrastructure to be accessed from EGI resources to enable future research activities by this HUC**.** The GENESI-DR provides one approach to scientists accessing satellite and earth observation data located in different data centers for data processing on the Grid.

The GENESI-DR work is aligned with an international initiative GMES (Global Monitoring for the Environment and Security) that is supported jointly by the EC, the European Space Agency and their respective member states.

These data access interface are critical for the VOs in ES, A&A climate modelling. meteorology as well as projects from other domains (e.g. biodiversity projects like LifeWatch,, cyclops**,** civil protection, health and agriculture.

1.5.5.10 Deliverables

Del. No.	Deliverable Name	Task	Nature	Dissemination	Delivery Date
DSA3.1	Deployment and support Model	SA3.1	R	PU	PM4
DSA3.2	Assessment and Plan for the Tools and Services to become integral EGI part	SA3.2	R	PU	PM9, PM21, PM33, PM43
DSA3.3	Assessment and Plan for the Tools and Services to be included in their specific SSCs. Achievements in term of advantages for HUC	SA3.3,4,5,6	R	PU	PM9, PM21, PM33, PM42

	research				
DSA3.4	Annual Report on SA3 Tools and Services	SA3.1	R	PU	PM11, PM23, PM35, PM47

1 **1.5.5.11 Milestones**

Mil. No.	Milestone Name	Task	Verification	Expected Date
MSA3.1	HUC contacts and requirements	SA3.1	Establish HUC contact points and collect requirements	PM2
MSA3.2	Deployment and Support model first implementation; implementation of the revised models	SA3.2,3,4,5,6	DSA3.2, DSA3.3	PM6, PM12, PM24, PM36
MSA3.3	Yearly training and dissemination event for shared services, including MPI	SA3.2	Event advertising	PM9, PM21, PM33, PM45
MSA3.4	Tools and Services ready for becoming integral EGI part	SA3.2	Last annual report deliverable	PM45
MSA3.5	Tools and Services ready to be included in their specific SSCs.	SA3.3,4,5,6	Last annual report deliverable	PM45
MSA3.x	Hydra service deployment on a multi-servers configuration	SA3.2.3	Service availability	PM12
MSA3.x	Medical Data Manager release	SA3.4	Release publication	PM12, PM24, PM36, PM48

2 **1.5.5.12 Risk Assessment and Mitigation**

Risks	Impact	Probability of Occurrence	Mitigation
Services provided by one community on behalf of another are not responsive to other communities needs.	The other communities go off and develop their own solutions.	High	Each shared service/tool will define a process by which new requests are recorded, assessed and prioritised. This will apply to both their own and other communities. Transparency in the decision making process will be assured by inviting members of the other user communities to be involved in these decision making processes.
The production grid infrastructure (represented by UMD) that the user community is building upon does not provide a coherent model or interface, or services that the HUCs need.	Retaining the current users and attracting new users will be difficult if UMD is seen to have no coherence or integration.	High	The HUCs are represented on the MCB which will define the UMD roadmap and assessment criteria. They will be able to also define their requirements as to the functionality that should be incorporated into the production infrastructure in the future, and select the software providers to deliver that software.
Communities develop and adopt different services that have similar functionality.	In the worse case the production infrastructure has to deploy different services with the same functionality, thereby multiplying the cost of supporting different user communities.	Medium	Within EGI-InSPIRE any duplication is understood. Within the broader community this may still happen. However, the open process within EGI provides more opportunity for communities to collaborate on services, and for EGI to make it clear the functionality that will need to be supported in new software for it to be

			deployed.
The production grid infrastructure does not meet the needs of the current HUCs and new potential HUCs (i.e. ESFRI projects).	The user base reduces as existing users go away and no new users are attracted to the infrastructure.	Medium	The HUCs will be represented in the management bodies guiding the development of the current production grid infrastructure. Technical outreach within SA3, and engagement within NA2 and NA3 will continue to show the benefits of the infrastructure for new communities.

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1.6 Joint Research Activities and associated work plan

1.6.1 Overall Strategy

Operation of the EGI Grid e-Infrastructure involves several groups at different levels: the Grid site managers, the national/regional operations centres, the users, the middleware consortia, and the EGI.eu Operations Unit. The Operations Unit is responsible for the management of the central operational tools and activities. The operational tools, examples of which include the central EGI Helpdesk, the regional dashboard, and monitoring, are critical in allowing the groups involved in the day-to-day technical operations activities to work efficiently together. An Operations Product Team will be responsible of the maintenance and development work of an operations tool. A Product Team can be a distributed entity when different NGI contribute to it. Technical collaboration between the operations Product Teams and the NGIs will be ensured by the Operations Forum.

1.6.2 Relationship between Joint Research Activities

Work package No	Work package title	Type of activity	Lead partic no.	Lead partic. short name	Person - months	Start month	End month
JRA1	Operational Tools	RTD				1	48
	TOTAL						

A new version of JRA1 is currently under development. This space to be filled later!

2 Implementation

2.1 Management structure and procedures

Describe the organisational structure and decision-making mechanisms of the project. Show how they are matched to the complexity and scale of the project.
(Recommended length for Section 2.1 - five pages)

The EGI represents an organisational model for distributed computing infrastructures in Europe composed of independent National Grid Infrastructures. This model is the culmination of a two year design study project, EGI_DS, funded by the EC, to develop a sustainable operating model to support e-infrastructures and their user communities within Europe. The model is described in detail in the EGI Blueprint (endorsed in January 2009 by XX national grid representatives) and the EGI Functions documents. Together, they detail the role of a central coordinating body (EGI.eu) that brings together independent National Grid Infrastructures (NGIs) within Europe. The transition from the current operating models (e.g. EGEE) to the sustainable model presented in the EGI Blueprint is one of the main objectives of this proposal, and the support given by EGI-InSPIRE to the coordinating body within EGI, EGI.eu, is one of the project's primary activities. The support provided by the EC to EGI.eu's running costs is profiled during the 4 year EGI-InSPIRE project (reducing to 25%) demonstrating EGI.eu's movement to a self-sufficient operating model that leverages effort from within the broader EGI community.

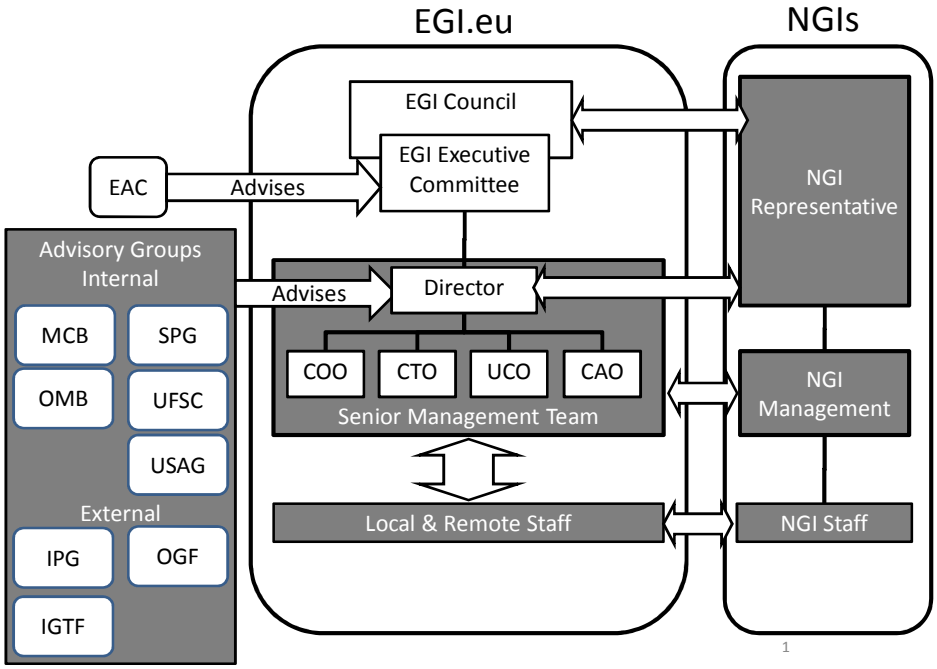
Separate management structures are presented for the operation and governance of EGI.eu and of the management of the EGI-InSPIRE project. This distinction is essential as the stakeholders in the two organisations are different (although there is a common core) and while their goals are aligned they are distinct.

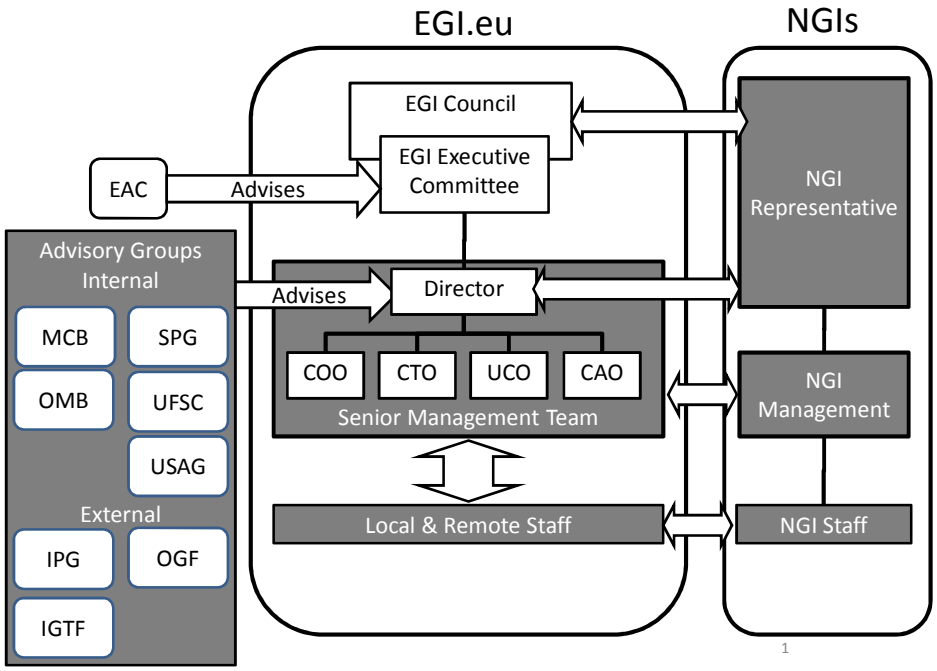
2.1.1 EGI.eu

EGI.eu is the coordinating body within the EGI collaboration that provides the day-to-day management and coordination of the European Grid Infrastructure. It is an independent legal entity that will be formed as a Foundation ('stichting') under Dutch Law (See Annex A for a draft of the current statutes).

The foundation (EGI.eu) is there to bring together the EGI Community (the NGIs and EIROFourm labs are represented in the EGI Council) to support research communities within the ERA engaged in trans-national computing. As the EGI Council is large (~40) and will meet around twice a year to consider strategic issues, most of the duties are delegated to the EGI Council Executive Board (EEB). Meeting monthly, the main focus of the EEB is the tactical direction of EGI.eu with the day-to-day running of the foundation left to the Director and the Senior Management Team (SMT) – the CAO, COO, CTO & UCO. The primary interaction of the SMT is with the EGI.eu staff employed locally and those located remotely in the NGIs collaborating on delivering the EGI Global Tasks. The primary focus of the Global Tasks is the coordination and support of services located and functions provided with each NGI.

The SMT will hold regular weekly meetings to resolve managerial issues relating to EGI.eu and its operations. Escalation of issues relating to the performance of activities outside of EGI.eu's direct management structure (i.e. NGIs and the support of the Heavy User Communities) will be escalated to the AMB within the EGI-InSPIRE project that does have managerial control of these activities.





2.1.1.1 EGI Council (See EGI.eu Statutes)

Composition

The EGI Council has voting representation from the NGIs and the EIROForum organisations that have signed the MoU. NGIs that have not signed the MoU and other organisations can be present, but only has observers and they have no voting rights. Voting will be proportional to the paid membership fee. The MoU describes the current voting distribution which will be carried forward into an EGI.eu resolution once EGI.eu is established. A chair is elected by the EGI Council from its members according to the agreed procedure. The EGI Council Chair is also the chair of the EGI Council Executive Board.

Meetings

The EGI Council will meet physically twice a year. Any urgent issues that arise between meetings will be passed to the Chair who may decide to call an extraordinary meeting (either in person or by phone) or deal with the matter electronically. A chair is elected by the collaboration as described in the collaboration agreement.

Responsibilities

The EGI Council is the body that represents all of the stakeholders involved in the EGI collaboration and provides long-term strategic direction to the activities of EGI.eu that coordinates activity within Europe on its behalf. It appoints the EGI Council Chair and elects the EGI Council Executive Board of EGI.eu that coordinates the operation of the European e-Infrastructure.

Interactions

The EGI Council Chair will define the agenda for the meetings in response to issues raised by the the EGI.eu Director, the EGI Executive Board and the EGI Council members. For the EGI Council to work effectively, most issues will be developed by the EGI Executive Board in advance of the meetings. The EGI Council Chair will be the 'voice' of the collaboration in external interactions consulting with the EGI Executive Board and Council as they see fit. Logistical support to the EGI Council will be provided by NA1. Administratively the EGI Council is support by NA2.

2.1.1.2 EGI Executive Board (EEB) (See EGI.eu Statutes)

Composition

The EEB is elected by the EGI Council and will consist of between 5-9 members. The EEB Chair will be the EGI Council Chair. The membership has to be named and recorded with the Dutch authorities as part of the 'Stichting' regulations.

Meetings

The EEB is expected to meet at least monthly. During the startup phase of the project it may meet more frequently making use of electronic communication and phone calls to facilitate meetings when required.

Responsibilities

EGI.eu is a distinct legal entity (a foundation) formed under Dutch law. The governance of the foundation is undertaken by a named board (the EEB) that represents the interests of the represented community (the EGI Council). The EEB has formal duties under Dutch law as the board of a foundation which it will carry out – see the Statutes. Its primary role is to steer the activity of EGI.eu and the EGI.eu Director as required on immediate issues. It develops policy for presentation to the EGI Council.

Interactions

The EEB will be able to seek external advice on the strategic direction of the project from the EGI Advisory Committee (EAC). The EEB will interact with the Director for EGI.eu business and propose policy to the EGI Council. The work of the EEB will be supported logistically by NA1 and th PO and by NA2 to develop draft policy documents for review and discussion.

2.1.1.3 Senior Management Team

Composition

The Senior Management Team (SMT) is a group internal to EGI.eu that is charged with the daily management of EGI.eu and its activities and is composed of the Director, the CAO, the COO, the CTO and the UCO.

Meetings

It will meet as required (generally weekly) to coordinate the daily activities of EGI.eu and will be chaired by the Director.

Responsibilities

Its primary responsibility is the internal management of the EGI.eu organisation. This will include the staff physically based in Amsterdam and those based in the NGIs. Matters relating to staff or activities outside of EGI.eu that are part of the EGI-InSPIRE project will be referred to the project management structure – the AMB. Issues unresolved in the AMB will be escalated with the EGI-InSPIRE management structure – the PMB and ultimately the CB.

Interaction

The each member of the SMT will interact with the staff that report to them within their respective areas. All staff report to the Director, who will report on the issues discussed within the SMT to the EEB.

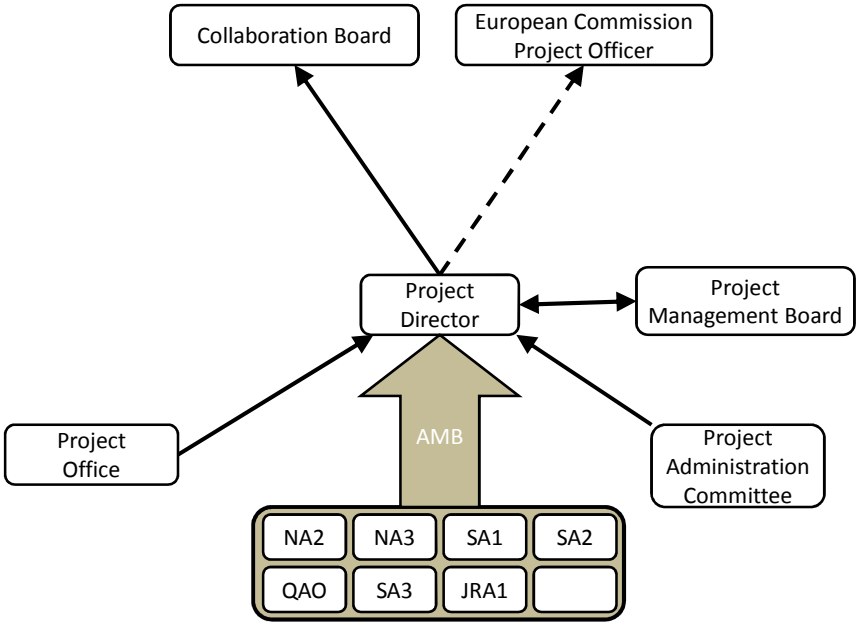
2.1.1.4 Advisory Groups

EGI.eu has a number of internal advisory/management groups to provide strategic guidance to its different functions, e.g. Security Policy Group (SPG), User Forum Steering Committee (UFSC), Operations Management Board (OMB), External Advisory Committee (EAC) and Middleware Coordination Board (MCB) provide advice to the EGI.eu Director and the Senior Management Team (the COO, CAO, CTO and UCO) on technical matters within their respective areas. These groups are detailed in TNA2.3 in this proposal where there is dedicated resource to support their activity. EGI.eu also supports interactions with a number of external groups and organisations that it uses to guide activity within the community. This includes organisations such as the IGTF, EUGridPMA, OGF, etc.

NOTE: How to integrate international partners. IPG handles the policy issues. Needs an operational and probably a management counterpart.

2.1.2 EGI-InSPIRE

The EGI-InSPIRE project is a 4 year EC funded project to support the transition of European distributed computing infrastructures to the sustainable model described in the EGI Blueprint where independent national grid initiatives are coordinated by a central body – EGI.eu. As a transitional project it contains activities and partners that would not normally be part of EGI.eu. This includes partners that would not be eligible for inclusion in EGI.eu and activities such as the explicit support for Heavy User Communities (SA3).



Technical and policy issues relating to the operation of the infrastructure are resolved through the structures available within EGI.eu (i.e. the Advisory Groups).

2.1.2.1 Collaboration Board (CB)

Composition

The CB has representation from **all** the partners involved in the project, if they are members of an NGI or JRU or equivalent structure, their representation is via the NGI, JRU, or equivalent structure. Its members will be formally defined through the EGI-InSPIRE project Collaboration Agreement.

Meetings

It is envisaged the CB will meet twice a year – generally co-located with major community events organised by EGI-InSPIRE – where the meeting will be chaired by the local host.

Responsibilities

Provides the general direction of the project.

Interactions

The main interaction is through the PD, the CAO and the PO. The PD will provide a general report on the project's activity through the quarterly and periodic reports. Additional matters will be raised with the CB as required. The CAO will also report on the project's finances and other administrative matters. Many of these detailed issues will be resolved through the PAC,

2.1.2.2 Project Management Board (PMB)

Composition

The composition of the PMB will be based on regional federations. The chair of the PMB will be selected from its members and will be changed annually.

Meetings

The PMB will meet at least quarterly.

Responsibilities

The PMB steers the project on behalf of the CB, dealing with project management issues referred to it by the PD and any other matters requiring a timely response.

Interactions

The main interaction of the PMB is with the PD.

2.1.2.3 Project Administration Committee (PAC)

Composition

The composition of the PAC will be drawn from the administrative contacts from each partner.

Meetings

The PAC will meet as required – generally twice a year – with most of its communication taking place electronically.

Responsibilities

The PAC will establish and maintain the necessary administrative processes necessary for the good running of the project, i.e. budgetary control.

Interactions

2.1.2.4 Activity Management Board (AMB)

Composition

The AMB is chaired by the PD and has representation from all the activity leaders (which in many cases are the senior managers within EGI.eu - COO, CTO, CAO & UCO). Managerially these staff all report to the PD.

Meetings

The AMB will meet on a regular basis, generally by phone, meeting more frequently during the early stages of the project (i.e. weekly). There will be regular longer face-to-face meetings for more detailed planning.

Responsibilities

AMB will be responsible for regularly monitoring the progress of the project. Day-to-day management of the individual activities will be undertaken by EGI.eu and the STM where technical issues within an area (administration, middleware, operations & user support) will be resolved by the relevant EGI.eu managers (the CAO, CTO, COO & UCO) who report to the EGI.eu Director.

Activity	Activity Leader	EGI.eu Manager
NA1	CAO (EGI.eu)	CAO
NA2	Director (EGI.eu)	Director
NA3	UCO (EGI.eu)	UCO
SA1	COO (EGI.eu)	COO
SA2	CTO (EGI.eu)	CTO
SA3	TBD (CERN)	UCO
JRA1	TBD (IGI)	COO

Interactions

As part of the AMB the activity leaders report to the PD on the progress of the tasks within their respective activities. Issues can be escalated to the PMB through the PD as required.

2.1.3 Interactions between EGI.eu and EGI-InSPIRE

The portioning of responsibilities between the two structures is derived from EGI.eu being the coordinating partner in the EGI-InSPIRE project. As such matters relating to the organisation and management of EGI.eu and its local staff and those directly affiliated to it through the undertaking of EGI Global Tasks are dealt with internally by EGI.eu. In addition, EGI.eu provides the structures for the technical management of the infrastructure with active participation and representation from the NGIs. This includes the policy governing its access and operation, defining the quality of service expected from the various functions within the infrastructure. As EGI.eu grows as an organisation it will become involved in projects other than EGI-InSPIRE and therefore needs to recognise the difference between internal organisational activities and the managerial actions that take place within a specific project.

The role of the EGI-InSPIRE is primarily to support activity within EGI.eu as it transitions to a sustainable model, to support the activities of the NGIs as the conduct their NGI International Tasks in order to interface their national infrastructures into the European infrastructure, and to support the Heavy User Communities as they transition activity into their own communities or the generic infrastructure. These activities span staff and activities outside of EGI.eu and are managed through the EGI collaboration and its project structure described previously.

2.2 Individual participants

For each participant in the proposed project, provide a brief description of the legal entity, the main tasks they have been attributed, and the previous experience relevant to those tasks. Provide also a short profile of the individuals who will be undertaking the work.

*(Maximum length for this Section**: one page per participant**. However, where two or more departments within an organisation have quite distinct roles within the proposal, one page per department is acceptable.*

The maximum length applying to a legal entity composed of several members, each of which is a separate legal entity, is one page per member, provided that the members have quite distinct roles within the proposal.)

2.3 Consortium as a whole

Describe how the participants collectively constitute a consortium capable of achieving the project objectives, and how they are suited and are committed to the tasks assigned to them. Show the complementarity between participants. Explain how the composition of the consortium is well balanced in relation to the objectives of the project.

If appropriate describe the industrial/commercial involvement to ensure exploitation of the results.

Show how the opportunity of involving SMEs has been addressed

i) Sub-contracting: If any part of the work is to be sub-contracted by the participant responsible for it, describe the work involved and explain why a sub-contract approach has been chosen for it.

ii) Other countries: If a one or more of the participants requesting EU funding is based outside of the EU Member states, Associated countries and the list of International Cooperation Partner

Countries23, explain in terms of the project's objectives why such funding would be essential.

iii) Additional partners: If there are as-yet-unidentified participants in the project, the expected competences, the role of the potential participants and their integration into the running project should be described. (These as-yet-unidentified participants will not be counted in the minimum number of participants for the eligibility of the proposal).

*(**No recommended length for Section 2.3** – depends on the size and complexity of the consortium)*

2.4 Resources to be committed

Describe how the totality of the necessary resources will be mobilised, including any resources that will complement the EC contribution. Show how the resources will be integrated in a coherent way, and show how the overall financial plan for the project is adequate.

In addition to the costs indicated on form A3 of the proposal, and the effort shown in section 1.3 above, please identify any other major costs (e.g. equipment). Ensure that the figures stated in Part B are consistent with these.

(Recommended length for this Section – two pages)

3 Impact

3.1 Expected impacts listed in the work programme

Describe how your project will contribute towards the expected impacts listed in the work programme in relation to the topic or topics in question. Mention the steps that will be needed to bring about these impacts. Explain why this contribution requires a European (rather than a national or local) approach. Indicate how account is taken of other national or international research activities. Mention any assumptions and external factors that may determine whether the impacts will be achieved.

As outlined in the objectives of the project (section 1.1) the EGI-InSPIREproject will enable the extension of both the geographical footprint, to cover the whole European continent, and the user base of the infrastructure, reaching a multitude of disciplines and application communities ranging from heavy organised international ones to small ad-hoc user groups and individuals with similar problems. . A process will be defined on how new NGIs will be integrated in the infrastructure leading to geographic expansion of the infrastructures, while new user communities will bel integrated using the workflow described in Section 1.3.. Skill sharing, resource sharing and collaboration across disciplines are key outputs from the EGI initiative. There is already a rich legacy of communities using the European Grid infrastructure that have been collaborating for a number of years. An example of inter-disciplinary collaboration platforms is the EGEE User Forum, a concept that will be kept alive in the EGI era, through the SSCs and EMI projects. Collaboration with the ESFRI communities is another area that will be given priority. Thus the EGI DCI *"will achieve broader and deeper inter-disciplinary scientific collaboration in Europe"* and beyond, one of the concrete expected impacts of the call topic.

EGI will be liaising with external software providers (Middleware Consortia and the European Middleware Initiative-EMI) to ensure a consistent supply of high-quality middleware releases that meet the needs of the user communities in terms of stability and functionality. Through the use of the developed software in the EGI multi-disciplinary infrastructure, exploitation of the above skills across multiple fields of science will be achieved. Thus EGI, through the appropriate liaison activities with the above stakeholders, *"will ensure coordinated, strengthened and focused software deployments in the context of e-Infrastructures and across the broadest range of fields in science and engineering"*.

Exploiting the experience gained during all the previous years by national, regional, European and international efforts, EGI will strive to enhance the offered Grid services in terms of availability and reliability, as well as attract a higher number of application disciplines (in collaboration with related projects and initiatives) and at the end offer its services to a higher number of users. The geographical expansion is also an integral part of the EGI-InSPIREscope. New countries and their diverse communities will now appear on the EGI map ensuring a coherent picture of seamless European integration. A new scalable user support model of international reach will be designed and deployed serving the increased requirements of the extended user base. Efficient problem reporting and user support, quick and successful bug fixing, secure, stable and robust middleware, and prompt escalation of serious issues will characterise the usability of the EGI DCI services. Thus EGI-InSPIRE is expected to provide *"improved usability of DCI platforms for a larger user base and for conducting inter-disciplinary research"*, another important expected impact of the EGI topic..

EGI PROPER will undertake the migration of the European Grid e-infrastructure and its services into a new sustainable governance model and plan for the future sustainability of the whole EGI construct. The EGI governance model besides the EGI.eu coordinating unit is primarily based on a extended set of NGIs providing the appropriate EGI PROPER project co-funding at roughly 50%. This is in addition to the national e-Infrastructure capital and operational expenditures, as well as other local site administration and support services.
EGI will, evaluate multiple sources of funding including industry and possibly new business models where services will be offered for a fee. Thus EGI will *"create a sustainable environment for the provision of grid-based computing services to a wide range of research fields, based on a stable collaborative European and National co-funding scheme"*.

EGI will set up a new organisational structure that will enable the resource provision and sharing in an optimal way, through coordination at the national level. NGIs will be acting as one-stop shops for the sustainable provision of grid services to the European scientific community coordinating strategic, policy, technical, financial and governance aspects. Efficient policies for resource sharing and allocation are essential steps already planned as part

of the policy task that will be needed to bring about the efficient resource sharing. Thus it is expected that EGI "*will enable the easy sharing of resources (computation, storage, data) across national and administrative boundaries".*

EGI will continue to play a key role in world-wide interoperability efforts so as to be able to interoperate with other regional or continental efforts. Particular focus will be laid on interoperation with other European e-Infrastructures such as DEISA and PRACE. EGI-InSPIRE will also work closely with standardization bodies and in particular with Open Grid Forum and OGF-Europe promoting common and open interfaces and models and licensing schemes. Active participation in the OGF and related policy events such as e-IRG and ESFRI ones, as well as rapid identification of potential technical incompatibilities will be the required steps to achieve interoperability, which are already planned in the related EGI-InSPIRE activities. EGI is committed to an open standards based infrastructure that will encourage both new users and new providers. Open standards will of necessity involve international agreement to be effective. In this way, EGI-InSPIRE "*will ensure the technological interoperability of global grids",* as outlined in the expected impacts of the EGI call.

It is obvious that national efforts cannot provide the computing potential and capacity, the collaboration ranges, the economies of scale and obviously the sustainability that the European integration can easily accomplish. Even regional[9] efforts cannot be compared nor survive without the active collaboration and integration with the European efforts. National approaches are therefore much poorer in the above aspects, even in the case of a rich national infrastructure since the collaboration parameter will be missing.

Yet, national, regional, other European and international research activities need to be taken into account and be brought into the EGI forefront, as they can constitute valuable and effective education and culture sources. In other words, the different national, regional or international flavours need to be kept alive in the European for a and comprise cross-fertilisation foundations.

The most important external factors for success of the EGI are the sustainability and funding of the NGIs, and the adoption of the EGI infrastructure by multiple user communities. As stated above the latter will further depend upon the flexibility and ease-of-use of the EGI services and software. These aspects are explicitly addressed in the EGI-InSPIRE work plan, there is confidence that the objectives will be achieved, and the expected impacts will be materialised. The existence of a coordinated pan European e-infrastructure such as the EGI, used by multiple research communities will have a profound enabling effect, including:

- Resource sharing across multiple large scale initiatives
- Fostering cross discipline collaborations facilitated through a common processes, procedures and languages.
- Common open interfaces to a wide range of resources, encouraging the development of higher level functionality and innovative exploitation.
- Encouraging the development of a market for services provided through open interfaces.

All the above developments *"will provide a new dimension to the realisation of the European Research Area".*

3.2 Dissemination and/or exploitation of project results, and management of intellectual property

Describe the measures you propose for the dissemination and/or exploitation of project results, and how these will increase the impact of the project. In designing these measures, you should take into account a variety of communication means and target groups as appropriate (e.g. policy-makers, interest groups, media and the public at large).

For more information on communication guidance, see http://ec.europa.eu/research/science-society/science-communication/index_en.htmhttp://ec.europa.eu/research/science-society/science-communication/index_en.htm

Describe also your plans for the management of knowledge (intellectual property) acquired in the course of the project.

Within the EGI-InSPIRE project dissemination, policy development and standards are the subject of a dedicated Networking Activity for External Relations (NA2, described in section 1).

External relations will be focused on establishment of formal relations with relevant organizations, promotion of common understanding on policies in the scope of grid interoperation, influence on policy and standards shaping

[9] Region referred to as a collection of countries

activities and networking and enlargement of the EGI sphere of influence. In particular efforts will be directed towards building relations with:

- Other e-Infrastructure organizations and projects, both inside and outside of Europe; within Europe a start has been made by forming the EEF (European e-Infrastructures Forum, currently consisting of EGI, EGEE, DEISA, PRACE, TERENA, DANTE and GEANT);
- Policy and standard shaping bodies (e-IRG, OGF)
- Large-scale international research collaborations (EIROFORUM and ESFRI organizations and WLCG).
- Private sector entities and initiatives (such as cloud service providers), that could bring extra competences and resources to EGI;

With regard to *dissemination* a dedicated manager, reporting directly to the Project Director, will lead the dissemination activities. These are designed to gather and present the project's achievements and successes throughout Europe and worldwide, demonstrating the impact, capability and use of a distributed computing infrastructure in diverse research areas. Target audiences will be:

- decision makers and government officials to promote the sustainability model as pursued in the EGI-InSPIRE project;
- scientific user communities, in close cooperation with the User Community Officer (UCO);
- development projects and standards communities; in close cooperation with the CTO;
- the general public, especially by accommodating the NGIs by relevant material;

Relevant information on the project's activities, defined in section 1, will be collected and made accessible to these diverse audiences through appropriate dissemination techniques, including brochures, information sheets and diverse dissemination material targeted at specific audiences. The collection includes the deliverables of the project, the majority of which will be made publicly available. EGI events, in particular User Forums and conferences, one of each to be organized each year, which regularly attract over 500 participants, represent leading European Grid occasions for showcasing the project's advances and the progress made towards sustainability.

Collaborating projects listed in table *xx* provide another channel of dissemination to more user communities with a wider geographical reach. Interaction with user communities is the subject of a separate Networking Activity (NA3), User Community Coordination & Support. This encompasses the coordination of training, documentation and technical requirements from the user communities to improve the EGI user experiences and services.

These measures will position EGI worldwide as major player in the e-Infrastructure arena, attracting new user communities and ensuring its experience and expertise is taken into account in policy making and strategic planning.

With respect to Intellectual Property Rights, all background owned by the participants will be clearly stated in the project's Consortium Agreement. All deliverables produced by the project that do not include financial information or security-related issues will be made public, and the project does not make claims on the IPR of the scientific results/data produced on the Grid infrastructure. Further, information about users or applications on the infrastructure will not be shared with third parties unless permission is requested and granted. Finally, the operational tools developed within the project, will be distributed under a business-friendly open source licence which facilitates technology transfer to the business sector and encourages the creation of layered products.

~~3.3~~ 3.3 Contribution to socio-economic impacts

Describe the socio-economic impacts of the project.

(Maximum length for the whole of Section 3 – ten pages)

In coordinating the operation of a seamless transparent pan-European e-infrastructure composed of individual NGIs, the EGI-InSPIRE project will ensure continued access and availability of what has become a critical infrastructure for a diversity of scientific undertakings beneficial to society at large.

Via the infrastructure, existing computing resources and scientific data are made available to a wide range of researchers, vastly increasing the interconnectivity of European research and ensuring the exploitation of these resources. This infrastructure is unique in the world, as there is no other integration of resources on this scale.

The benefits of a large scale production grid infrastructure to the European Research Area are demonstrable in the broad range of collaborative European scientific undertakings it serves and the consequent impact on society. From

Biomedical sciences to geophysical studies, humanities, fusion, astronomy and astrophysics to name but a few, user communities have now become reliant on the grid to ensure continued progress of their data-intensive scientific applications.

Its quality, accessibility and pervasiveness throughout the European Research Area and beyond contribute to the progress of current scientific projects on all scales. The project promotes the continued development of a consistent, sustainable and well-integrated fabric of research infrastructures of the highest quality and performance in Europe and beyond, and this in turn increases the mobility of individuals and ideas, both within the field of Grid computing, and in the disciplines that benefit from the established infrastructure.

In linking link existing NGIs, and actively support the setup and initiation of new NGIs, EGI InSPIRE provides a framework by which they are key components of the e-infrastructures map and fosters European and international collaborations which are vital to the sustained competitiveness of the European Research Area.

(Maximum length for the whole of Section 3 – ten pages)

3.4 ETHICAL ISSUES TABLE

	YES	PAGE
Informed Consent		
• Does the proposal involve children?		
• Does the proposal involve patients or persons not able to give consent?		
• Does the proposal involve adult healthy volunteers?		
• Does the proposal involve Human Genetic Material?		
• Does the proposal involve Human biological samples?		
• Does the proposal involve Human data collection?		
Research on Human embryo/foetus		
• Does the proposal involve Human Embryos?		
• Does the proposal involve Human Foetal Tissue / Cells?		
• Does the proposal involve Human Embryonic Stem Cells?		
Privacy		
• Does the proposal involve processing of genetic information or personal data (e.g. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)		
• Does the proposal involve tracking the location or observation of people?		
Research on Animals		
• Does the proposal involve research on animals?		
• Are those animals transgenic small laboratory animals?		
• Are those animals transgenic farm animals?		
• Are those animals cloned farm animals?		
• Are those animals non-human primates?		
Research Involving Developing Countries		
• Use of local resources (genetic, animal, plant etc)		
• Impact on local community		
Dual Use		
• Research having direct military application		
• Research having the potential for terrorist abuse		
ICT Implants		
• Does the proposal involve clinical trials of ICT implants?		
I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL		

Ethical Issues

Describe any ethical issues that may arise in their proposal. In particular, you should explain the benefit and burden of their experiments and the effects it may have on the research subject. The following special issues should be taken into account:

Informed consent: When describing issues relating to informed consent, it will be necessary to illustrate an appropriate level of ethical sensitivity, and consider issues of insurance, incidental findings and the consequences of leaving the study.

Data protection issues: Avoid the unnecessary collection and use of personal data. Identify the source of the data, describing whether it is collected as part of the research or is previously collected data being used. Consider issues of informed consent for any data being used. Describe how personal identify of the data is protected.

Use of animals: Where animals are used in research the application of the 3Rs (Replace, Reduce, Refine) must be convincingly addressed. Numbers of animals should be specified. State what happens to the animals after the research experiments.

Human embryonic stem cells: Research proposals that will involve human embryonic stem cells (hESC) will have to address all the following specific points:

- the necessity to use hESC in order to achieve the scientific objectives set forth in the proposal.
- whether the applicants have taken into account the legislation, regulations, ethical rules and/or codes of conduct in place in the country(ies) where the research using hESC is to take place, including the procedures for obtaining informed consent;
- the source of the hESC
- the measures taken to protect personal data, including genetic data, and privacy;
- the nature of financial inducements, if any.

Identify the countries where research will be undertaken and which ethical committees and regulatory organisations will need to be approached during the life of the project.

Include the Ethical issues table below. If you indicate YES to any issue, please identify the pages in the proposal where this ethical issue is described. If you are sure that none of the issues apply to your proposal, simply tick the YES box in the last row.

(No maximum length for Section 4 – depends on the number and complexity of the ethical issues involved)

Notes:
1. For further information on ethical issues relevant to ICT, see Annex 5 of this Guide
2. Only in exceptional cases will additional information be sought for clarification, which means that any ethical review will be performed solely on the basis of the information available in your proposal.