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Author(s):	Rosette Vandenbroucke (SIST/DWTI)
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Project Co-ordinator

Company name : Istituto Centrale per il Catalogo Unico (ICCU)
Name of representative : Rosa Caffo
Address : Viale Castro Pretorio 105, I-00185 Roma
Phone number : +39.06.49210427
Fax number : +39.06. 06 4959302
E-mail : rcaffo@beniculturali.it
Project WEB site address : http://www.dc-net.org

Table of Contents

1   Introduction

This document presents Deliverable D2.2 of the DC-NET project.

The document consists of the following sections:

- **Background**, which reviews the need for an e-Infrastructure handbook
- **Sources for the content of the e-Infrastructures Handbook**
- **The e-Infrastructure Questionnaire**
- **The e-Infrastructure handbook**
- **Progress Update**, which will give an updated version of the handbook with modified entries for the DC-NET partner countries and new information for countries that join DC-NET.
- **Conclusion**

The current document is the first version of this deliverable.

2   Background

The e-Infrastructures landscape can be very complex seen from the perspective of a digital cultural heritage organisation. It is often not clear if existing e-Infrastructures can be used by DCH organisations, which services they deliver. It is also clear that many DCH organisations only know the NREN in their country but are unaware of other e-infrastructures. Hence the task in this project to make an e-Infrastructure Handbook that gives as good as possible an overview of the existing e-Infrastructures in the DC-NET partner countries and the modalities and cost for use of these infrastructures.

3   Sources for the content of the e-Infrastructures handbook

During the first 8 months of the project a DC-NET e-Infrastructures questionnaire has been developed and each partner has met one or more e-Infrastructures in her/his country to answer this questionnaire. The final versions of the answered questionnaires have bee used as a basis for the contents of the e-Infrastructures handbook. This information has been completed with information available on the corresponding website of the e-Infrastructures. In case a partner did not contact an existing e-Infrastructure in her/his country all information has been taken from the web sometimes completed with information asked to contact persons from that e-Infrastructure. Other sources such as the TERENA Compendium were also consulted.

4   The e-Infrastructures Questionnaire

Survey of the services offered by e-Infrastructure providers

This document is a questionnaire to gather information about services offered by national and/or international e-Infrastructures. Such e-Infrastructures include networks, computing facilities and digital repositories.

This questionnaire, which is a first step in the procedure to gather a complete view of e-Infrastructure offerings, has been prepared by WG 2 of the ERANET DC-NET project (Digital Cultural Heritage Network). A short description of the project is joined as well as information concerning the Digital Cultural Heritage requirements (storage/digital repositories, network, computing, security). Additional information on the project can be found at http://www.dc-net.org/

The questionnaire will be used by all the DC-NET partners in order to establish a first contact with e-Infrastructure providers. Based on the information received and complemented by additional information that will be obtained by direct contacts and interviews with the e-Infrastructures, a handbook will be produced and made available as part of the project deliverables "The e-infrastructure handbook".

As the recipient of this questionnaire, we kindly ask to you answer the questions and return the completed document to the email address below. If you have documents that provide the requested information or that complement that information, please provide pointers (i.e. URLs) to such documents in response to the questions.

We thank you in advance for your participation and should you have any further questions please do not hesitate to contact us at the email address below.

E-mail: wp2@dc-net.org

4.1   Section 1: Contact details

e-Infrastructure name:

e-Infrastructure provider organisation:

Name(s) contact person(s):

Contact E-mail address:

e-Infrastructure provider address:

4.2   Section 2: Network

4.2.1   Specify the access to the national network infrastructure (if national research network)

Access line possibilities

Access rules

4.2.2   Specify the possible network connections (if commercial network provider)

4.2.3   List all network bandwidth possibilities you offer

4.2.4   List all your network services including but not limited to

Basic network services (monitoring, helpdesk), VPN, CERT, Intrusion Detection, DNS, Domain names, IPv6, videoconferencing, e-collaboration, AAI federation services

4.2.5   Specify the applied network security

4.2.6   Give the cost structure for

The network connections you offer
Additional services

4.2.7   How is the connection/access to your network administratively organised:

MoU
Contract
Other, please specify

4.3   Section 3: Computing

4.3.1   Specify the type of computing you offer

Supercomputing

High Performance computing

Grid computing

Cloud computing

Other, please specify

4.3.2 Specify the access/usage rules to your computing infrastructure(s)

4.3.3 Specify the access types to your computing infrastructure
Interactive

Batch job submission
      Via your main infrastructure
      Via a dedicated user interface
      Via a web portal

4.3.4 Specify the capacity you can offer in terms of
Cores
Number of Jobs that can be submitted by a single user
Parallel processing (max. number of CPUs or cores)
Maximum duration of a single job

4.3.5 List the software that is available on your computing infrastructure

4.3.6 Are there possibilities to install specific software
Yes/No
If yes, please specify
      Conditions
      Possible installation methods

4.3.7 Describe other services you offer on your computing infrastructure including but not limited to
Helpdesk
Support for gridification of applications
Training

4.3.8 Specify the security measures that are applied to your computing infrastructure

4.3.9 Is your computing infrastructure connected to other computing infrastructures?
If yes, which ones

4.3.10 3.10   Give the cost structure of using your computing services

4.3.11 3.11How is the access to your computing services administratively organised:
MoU
Contract
Other, please specify

4.4   Section 4: Storage

4.4.1   Specify the types of storage you offer
SAN
NAS
Other

4.4.2   Specify the capacity that can be made available to an organisation
Now
In the future

4.4.3   Do you offer storage for
Long term
Medium term
Short term

4.4.4   Specify the types of storage access in terms of
Hardware
Software

4.4.5   List the applications you support to access storage/data

4.4.6   Specify the possibilities of hosting applications

4.4.7   List any storage services you might offer:
Backup
Archive
Data format change
Other, please specify

4.4.8 4 Which security measures have you taken for data protection

4.4.9   Specify the cost structure for the use of the storage and associated services

4.4.10 How is the use of your storage facility administratively organised

MoU
Contract
Other, please specify

In particular, do you have specific arrangements for the use of your storage that describe the legal aspects of data handling and the responsibilities of all involved parties ?

4.5 Section 5 Customer references

4.5.1 List the Digital Cultural Heritage (DCH) organisations/memory institutions that make already use of your e-Infrastructure services

4.5.2 What kind of services do they use

4.5.3 Specify best practices you have for the use of your e-infrastructure by DCH organisations

4.5.4 Do DCH organisations benefit of specific access rules/conditions

4.6 Section 6: Suggestions, comments, additional information

4.6.1 Specify any additional information you have concerning your e-Infrastructure (website, wiki, documents, …)

4.6.2 Note any suggestions you might have concerning the usefulness of your e-Infrastructure for the Digital Cultural Heritage

5   The e-Infrastructure handbook

5.1   Executive Summary

This e-Infrastructures Handbook includes four main chapters dealing with different aspects of e-Infrastructures. The first one gives an overview of the three types of e-Infrastructures in each DC-NET partner country. The second chapter deals with the ways user organisations or users can physically connect to a certain type of e-Infrastructure in their country. A third chapter looks at the rules and possible hindrances to make use of a particular e-Infrastructure. Finally, a fourth chapter describes the cost associated with the connection and use of an e-Infrastructure and the corresponding services.

5.2   Introduction

The DC-NET project aims to make a better use of existing e-Infrastructures in order to be able to introduce more and better services for the customers of the digital cultural heritage organisations. These customers can vary from the general public to very specialised researchers and each should obtain the information he or she wants or needs. Digital cultural heritage organisations are not always aware of existing national and international e-Infrastructures and the services they provide. To make a start for a better knowledge of the e-Infrastructures the DC-NET project has drafted a questionnaire that has been presented to the national and international e-Infrastructures. The answers will be used not only to define new services in the DCH area but also to provide information for this e-Infrastructures handbook which will be a guide to the e-Infrastructures and their services.

Each chapter deals with a different aspect of e-Infrastructures and each chapter looks at the three different type of e-Infrastructures. It must be said that the notion of "data infrastructures" is not yet well defined. A data infrastructure could be seen as a (distributed) quantity of storage where users can put their data respecting the provision of well-defined metadata. Such data infrastructures are non-existent. On the other hand many thematic data infrastructures do exist, also in the digital cultural heritage sector, but are very often not compatible with each other and hence prohibit data exchange between them.

5.3   Existing e-infrastructures in the partner countries

e-Infrastructures do exist in all the partner countries. While in each country the network infrastructure is mostly well defined this cannot be said for the computing infrastructure and even less for the data infrastructure. Below the contacted e-Infrastructures in all partner countries will be described.

5.3.1 Network infrastructures

5.3.1.1 Italy

The main network e-Infrastructure in Italy is **GARR**. GARR (Gruppo per l'Armonizzazione delle Reti della Ricerca) is the Italian Research & Education Network (NREN). It plans and operates the national high-speed telecommunication network for University and Scientific Research. Its shareholders are four major Research and Academic organizations in Italy, CNR, ENEA, INFN and Fondazione CRUI, representing the Conference of Italian University Rectors. The widespread GARR network infrastructure covers the whole national territory and its backbone is based on leading-edge optical circuits and technologies. It is interconnected to GÉANT, the pan-European R&E backbone and trough it to all European and worldwide Research Networks. The GARR network and its services are dedicated to the Italian Academic, Research and Education community. Currently, about 450 user sites, are connected including Research Organizations, Universities, Observatories, Laboratories, Institutes for Research in Health Care (IRCCS), Music Conservatories and Academies of Art, Libraries, Schools, Museums and other Scientific and Educational Facilities of national and international relevance, representing more than 2 Millions end users. GARR is connected to GÉANT.

5.3.1.2 France

Today more than 1000 sites involved in research, technology and education are connected to **RENATER** the French NREN. This network is a national backbone and is connected to other networks through high speed links. It is also connecting French overseas territories. RENATER has a 10 Gbps connection to other research and education networks in the world (including Abilene/Internet2) via the paneuropean backbone GÉANT. Interconnection with the Internet is done through the Internet eXchange SFINX managed by RENATER where more then 80 ISPs exchange traffic. RENATER also has 10 Gbps connections to 2 transit providers, Cable&Wireless and Level3, to get access to the rest of the Internet.

5.3.1.3 Estonia

The Estonian Educational and Research Network **EENet** is a governmental non-profit organization that was established in August 1993 by the Ministry of Education with the task of managing, coordinating and developing the computer network of science, education and culture. Since 1997 EENet has been operating as a state agency administered by the Estonian Ministry of Education and Research. The mission of EENet is to provide a high-quality national network infrastructure for Estonia's research, educational and cultural communities. The current international connection of EENet is a 2.4 Gbps channel to the GÉANT network.

5.3.1.4 Slovenia

The Academic and Research Network of Slovenia **ARNES** is a public institute that provides network services to research, educational and cultural organizations, and enables them to establish connections and cooperation with each other and with related organizations abroad. Arnes builds, maintains and manages infrastructure linking universities, institutes, research laboratories, museums, schools, databases and digital libraries. It offers users the same services

as national academic networks in other countries; it cooperates with these networks in European Commission projects to test, develop and introduce new Internet protocols and services. It also provides services that are not offered by commercial organizations but which are essential to the operation of the Internet in Slovenia. The ARNES network links over 1000 Slovenian organizations and makes Arnes' services available to nearly 200,000 people. International connections with educational and research networks in other countries are provided through the multi-gigabit GÉANT network. Next to the basic network services (monitoring, helpdesk) the following services are also provided: VPN, CERT, Intrusion Detection (to some extent), DNS, Domain names, IPv6, videoconferencing, e-collaboration, AAI federation services, virtual server hosting, email (anti-spam, anti/virus) and hosted personal space. The complete list of services can be found at http://www.arnes.si/en/services.html .

5.3.1.5 Greece

In Greece two network infrastructures can be of use to digital cultural heritage organisations: GRNET and Syzefxis.

GRNET SA runs the Greek Research & Technology Network, according to the operating   model of corresponding EU Research and Education Networks. It operates both at a   national   and international level and constitutes the setting for the development of innovative services for the members of the Greek research and education communities. GRNET SA connects more than 90 institutions, including all universities, technical and   research institutes, as well as the public Greek School Network, supporting more than 500.000 users all over the country. Moreover, it provides local interconnection services to the main Greek Internet providers, through the Greek Internet Exchange/GR-IX   www.gr-ix.gr/). GR-IX started operating in 2008 and provides interconnection at Nx10 Gbps, enhancing the quality of internet service and infrastructure nationwide.

The Greek National Public Administration Network ("**SYZEFXIS**") has developed a common technological ground for the Public Sector where participating agencies are able to interact with each other, communicate with Greek citizens and also cooperate with agencies of   other EU member states. In other words it is the technological framework that glues together various distinctive actors and numerous e-government services in a versatile collaboration environment.

5.3.2 Sweden

SUNET (Swedish University Computer Network) is dedicated to support the needs of the research and education communities within Sweden. The Swedish Research Council is administratively responsible for SUNET. The Swedish Research Council is an authority   under the Department of Education and Culture, and is the largest Swedish funding agency   for basic research at Swedish universities, colleges and institutes. The services of SUNET   are partially funded by the government, but connected organisations are also partially charged for services.

5.3.2.1 Hungary

The **National Information Infrastructure Development (NIIF) Program** serves as a framework for the development and operation of the research network in Hungary. The Program covers the entire Hungarian academic, research and public collection community by providing them with an integrated computer networking infrastructure and, on the   basis of that, a wide range of communication, information, and co-operation services. The program is based on funding by the central state budget. The development and operation of the network and the services are executed by the NIIF Institute (NIIFI), under the supervision of the Program Committee , and by the contribution of the Technical Committee. The Program is closely co-operating with Hungarnet , the association of the user community. The network-based up to date communication and co-operation facilities, especially those for joint research and education activities with domestic and foreign partners, as well as for accessing the relevant information both in the areas of academic, scientific, and library activities, are available for about 500 institutions (some 700 access points) throughout the country. Next to the basic network infrastructure services the following additional services are offered: L2 and L3 VPN, IPv4/IPv6 unicast and multicast, CERT, DNS, domain names, videoconferencing, VoIP, AAI federation services, server hosting, webhosting and e-mail.

5.3.2.2 Belgium

BELNET is the Belgian national research network that provides high-bandwidth internet connection and services to Belgian universities, colleges, schools, research centers, and government departments. The network is mainly open to researchers, academics and students at nearly 200 Research & Education institutions, government/public services and research centres. All three user groups are entitled to network connectivity and research bandwidth at more than fair rates (subsidized). BELNET connectivity even includes access to the pan-European research network Géant and the American Internet2. For internet service and content providers and large private companies, BELNET also operates a central infrastructure for exchanging internet traffic, called the Belgian National Internet Exchange or BNIX.

5.3.3 Compute infrastructures

Compute infrastructures are less widespread and certainly less known by Digital cultural heritage organisations. Below the compute infrastructures are described per partner country.

5.3.3.1 Italy

IGI is the Italian NGI (National Grid Initiative) and is part of the European Grid Infrastructure named EGI. It is currently an EU Joint Research Unit (JRU), based on a Memorandum of Understanding signed between the members in December 2007, and formally supported by the Italian Ministry for University and Research (MIUR) and the European Commission. The IGI infrastructure has more than 22.000 cores. There is in general not a limit to the number of jobs that a single user can submit but a fairshare algorithm is normally applied. Parallel processing is only supported in specific sites and its configuration is site dependent. The maximum job

duration is maximal 48 hours but longer durations may be possible at some sites, according to specific arrangements among the VOs and the resource owners. COMETA, the Sicilian grid is part of IGI.

5.3.3.2 France

The French Grid Institute is a structure of the NATIONAL CENTRE FOR SCIENTIFIC RESEARCH in charge of the coordination and animation of all the CNRS work in the field of the grid production and research. It serves as contact point towards the partners, in particular European ones, for all the grid projects in these domains. It has vocation to federate, in agreement with the other participating organizations and the departments concerned, the national contribution to international projects. For the production grid the institute will be responsible for the scientific animation around the users communities, and for the induction of new users. It takes at his expense all the efforts of the NATIONAL CENTRE FOR SCIENTIFIC RESEARCH in the EGI grid production. It is thus responsible for operational aspects and application software of this grid, developments software, communication aspects, spreading and training. It will be responsible for the material financed on the credits of the Institute. It will interact with the LCG-France project for specific questions related to the LHC project. The institute will be in charge of a forum rallying the various communities using the grid and of the development of new users.

5.3.3.3 Estonia

The Estonian grid is run by EEnet. EEnet is also representing the Estonian grid in EGI. The Estonian grid includes now 200 CPUs and 32 GPUs, each with 2400 cores. Maximum number of cores that can be used for parallel processing depends on the amount of free resources at the time of the request. The maximum duration of a single job can be a maximum of seven workdays. The available applications software is CMS and GAMESS.

5.3.3.4 Slovenia

The Slovenian national grid initiative provides resources to EGI and is represented in the EGI Council by ARNES. ARNES runs a cluster for testing the technology where users can also submit jobs. The cluster consists of 300 cores and is growing. The number of jobs one user can submit is currently unlimited. Up to 12 cores can be used for parallel processing.

5.3.3.5 Greece

HellasGRID provides high performance computing services (High Performance Computing, High Throughput Computing) in the Greek academic and research community. By the installation, operation and support of 6 computing and storage nodes in Greece– (HellasGrid Athens (3), Thessalonica, Patras, Heraklio), the operation of the Certification Authority HellasGrid for the signing of user certificates, the support of the users for the transfer of their applications to the grid infrastructure, the support of applications and provision of libraries and support software. HellasGRID is the biggest grid infrastructure in the South-Eastern Europe, and one of the most stable infrastructures at European level. Resources of the infrastructure are used by Greek researchers and those active in European programmes. During the last years a significant and increased number of users from various scientific fields (physics, biotechnology, computing

chemistry, information technology, meteorology etc.) uses the HellasGrid infrastructure for their computing needs. The infrastructure of HellasGrid is continuously adapted and corresponds to the demands of its users, while the expansion of its offered resources has been planned so that the extra computing needs arising within the following years will be able to be covered. This HellasGRID infrastructure has a capacity of 1.615 cores and is also connected to EGI. The number of Jobs that can be submitted by a single user depends on the load of the infrastructure + the Virtual Organisation the user belongs to. Parallel processing (max. number of CPUs or cores) depends on the size of the site. The largest site offers 615 CPUs. Any user may request to reserve 10 % of that for any given job. The maximum duration of a single job is 1 week.

5.3.3.6   Sweden

The **Swedish National Infrastructure for Computing** (SNIC) is a national metacentre for high-performance computing under the Swedish Research Council dedicated to researchers and their compute requirements. Computing facilities with state of the art compute resources are of strategic relevance for research at the international forefront. National coordination of Sweden's six HPC-centres ensures that these resources are used and developed optimally and SNIC is making these HPC resources available to the Swedish academic research community. SNIC's mandate includes the provision of unified access to the leading supercomputers in Sweden while SNIC is also responsible for the strategic and scientific development and funding of all infrastructure for efficient computing, i.e. networks, compute servers, data storage, visualization and Grid technologies. There are six major high-performance computing centers affiliated with SNIC : **Lunarc** Lund University http://www.lunarc.lu.se ,**C3SE** Chalmers University of Technology http://www.c3se.chalmers.se,   **NSC** Linköping University http://www.nsc.liu.se, **PDC** Royal Institute of Technology http://www.pdc.kth.se, **UPPMAX** Uppsala University http://www.uppmax.uu.se, **HPC2N** Umeå University http://www.hpc2n.umu.se.

SweGrid - The Swedish GRID initiative
Swegrid is a Swedish national computational resource, consisting of over 3000 cores spread out over 6 clusters at 6 different sites across Sweden. The sites are connected through the high-performance GigaSunet network. Together the computers form what is known as a *computational grid*, where submitted computation jobs are automatically and transparently started at the most suitable resource, irrespective of where it is located geographically and organizationally. The hardware in the Swegrid project is financed by a donation from the Knut and Alice Wallenberg foundation. Operational costs and personnel for support and maintenance are funded by the Swedish research council (VR) via SNIC. VR is also funding research targeted toward grid within the framework of Swegrid. SNIC is coordinator of Swegrid operation. One third of the Swegrid capacity is reserved for high energy physics computation, with the remaining capacity to be granted on a peer-review basis to researchers in different disciplines by the Swedish National Allocations Committee (SNAC).

High Performance Computing equipment is available at the six SNIC centres. Note that SweGrid and the HPC computing is only meant for universities. Other organisations cannot make use of this service.

5.3.3.7 Hungary

NIIF offers supercomputing and grid computing services.

The NIIF Institute operates the most powerful supercomputer of Hungary that is entirely dedicated to research. The supercomputing service is available to the users of the NIIF member institutes and includes digital cultural heritage institutions.

The Hungarian Grid Competence Center (MGKK) was established in 2003 by the five most active Grid centres of Hungary in order to intensively promote and coordinate high-quality research and development activities in the field of Grid computing. The main aim of MGKK is to create a knowledge centre in Grid technology where the available critical mass enables the intensive support of establishing and operating nation-wide Grid infrastructures for the benefit of the whole Hungarian academic community. MGKK will provide consultancy in Grid computing also for the business technology in companies and governmental institutions. Members of MGKK are BME, ELTE, KFKI–RMKI, MTA–SZTAKI, NIIFI and 4D SOFT KFT ; The Hungarian grid is member of EGI via NIFF.

5.3.3.8 Belgium

Belgium offers grid computing with BEgrid at the federal level. HPC and supercomputing will be provided at the regional level. Currently HPC is provided by the Flemish Supercomputer Centre (Vlaams Supercomputer Centrum – VSC).

BEgrid is the Belgian national grid infrastructure and is connected to EGI. It has about 1.000 cores available. It is coordinated by BELNET and its partners are mostly Belgian universities and research organisations. BEgrid uses the gLite middleware. All members of the partner organisations can get access provided they obtain a personal grid certificate and obtain a VO membership. Other researchers can also ask for access which is normally granted but could depend on the availability of resources. The number of jobs that can be submitted by a single user depends on the site and on the VO but often up to 1.000 submissions are accepted. For parallel processing the maximum number of cores is limited (128 cores) and depends also on the site. The maximum duration is also defined site per site. Typical maximum duration is 96 hours but some sites offer longer execution times.

VSC offers currently HPC computing in a grid scheme between four Flemish universities. Supercomputing will be provided at the end of 2011. The VSC is also responsible for the Flemish contribution to the compute and storage nodes of BEgrid. Currently 5.000 cores spread over six clusters are available. The number of jobs that can be submitted by a single user is negotiable and depends on the type of the job and the concerned cluster. For parallel processing the maximum number of cores is currently about 300-400 for a single job. The policy for the maximum duration of a single job depends on the cluster but a maximum of 24-48 hours is preferred.

5.3.4 Data infrastructures

5.3.4.1 Italy

IGI offers SAN storage on the grid. For the moment several Tbytes can be made available to an organisation. In the future this will depend on the arrangements stated in the MoU between the organisation and IGI. The storage offered can be for short, medium or long term preservation. The software that is available to access data includes the glibrary framework for creation and operation of digital archives. There are no specific arrangements for the use of your storage that describe the legal aspects of data handling and the responsibilities of all involved parties. Special cases have to be defined in the MoUs. IGI can support DCH organisations to design, create and deploy their digital repositories and applications. specific access rules/conditions are possible if agreed and explicitly mentioned in the MoUs. if agreed and explicitly mentioned in the MoUs.

5.3.4.2 France

No information available

5.3.4.3 Estonia

No storage services are currently offered by EEnet.

5.3.4.4 Slovenia

For the moment Slovenia does not offer storage for long term preservation or large amounts of storage for temporary use. There is the possibility to have a limited space of 20 to 40 Gb available as part of virtual server hosting.

5.3.4.5 Greece

HellasGRID offers grid storage services. There is a capacity of 30 Tbytes SAN and 30 Tbytes on tape. The capacity offered is dealt with on a case by case scenario according to the available resources on the moment of request. A new system of 240 Tbytes is planned. Currently only short term storage is possible but in the near future other services could be added.

5.3.4.6 Sweden

SweStore - The Swedish Storage Initiative

SNIC is building up a storage infrastructure to complement the computational resources. Many forms of automated measurements can produce large amounts of data. In scientific areas such as high energy physics (the Large Hadron Collider at CERN), climate modelling, bioinformatics, bioimaging etc., the demands for storage are increasing dramatically. To serve these and other user communities, SNIC has appointed a working group to design a storage strategy, taking into account the needs on many levels and creating a unified storage infrastructure, which is now being implemented.

They provide two types of storage: centre storage and national storage.

Centre Storage

Centre storage is a storage solution that lives independently of the computational resources and can be accessed from all such resources at a centre. Different centres should also have a common method for accessing the local centre storage, using common names for environment variables. Hardware for centre storage is in the process of being procured and installed at the SNIC centres.

National Storage
The aim of the nationally accessible storage is to build a robust, flexible and expandable system that can be used in most cases where access to large scale storage is needed. To the user it should appear as a single large system, while it is desirable that some parts of the system are distributed across all SNIC centres to benefit from the advantages of, among other things, locality and cache effects. The system is intended as a versatile long-term storage system.

Note that SweStore is only meant for universities. Other organisations cannot make use of this service.

5.3.4.7 Hungary

NIIF offesr a total capacity of 50 Tbyte for medium an short term preservation. The storage solutions range from high end, mostly SCSI and FC technology based solutions to the low end but high-capacity storage systems. The former is represented by an EMC CX3-40 incorporating both FC and SATA disks, while the latter is represented by mostly Coraid based storage chassis including SATA and PATA disks. While the EMC is connected to the servers by FC network via local SAN, Coraid storages allow us to connect the individual nodes by using standard Ethernet based network. Current applications are as follows: central services, such as web, e-mail, FTP, news, video archives, grid, netflow processing, backup services and virtual machine services. Data protection security is manifold: Storage services are located in separated network segments (either in separate physical network, or VLAN), Appropriate volume configuration and RAID level offer enough protection against disk failures, Storage nodes are continuously monitored and any suspicious behaviour is immediately taken care of, Physical protection of consoles is applied, built in security is used, like mutual authentication in case of iSCSI.

5.3.4.8 Belgium

BEgrid offers about 50 Tbytes of storage for its grid users for medium term storage.

VSC is not really a storage provider. However, some storage is provided as part of the computing services for short and medium term use. The VSC does not yet provide storage-as-a-service to the user.

5.4 Physical access to e-infrastructures

5.4.1 Network infrastructures

5.4.1.1 Italy

Most of the access to the GARR Network is done via Ethernet access. For GARR-X most users will use this type of access line.

5.4.1.2 France

RENATER has +30 Points of Presence in mainland and overseas territories. Access is possible reaching any of these PoPs, directly or through a local or regional backhaul. Access capacities start from 10 Mbps and go up to 10 Gbps

5.4.1.3 Estonia

Access to EEnet can be realised via rented lines to the nearest EEnet PoP. Possible connection speeds lay between 256 Kbps and 1 Gbps.

5.4.1.4 Slovenia

The access line possibilities include dark fibre, DSL, VPN (wireless). Connection speeds go up to 10 Gbps.

5.4.1.5 Greece

Not specified for GRnet.

Small public sector agencies connect to SYZEFSXIS by SDSL 2 Mbps, medium agencies connect by SDSL 4 Mbps/4 Mbps – 8 Mbps/8 Mbps and large can connect with a 34 Mbps/34 Mbps SDSL. Very small agencies can connect via ADSL.

5.4.1.6 Sweden

Universities can connect to the OptoSunet backbone by means of access networks at speeds between 10Mbps and 10 Gbps. Every university city has access networks between the backbone network and their own university. There are a total of 94 fibre connections in OptoSunet that function as access networks.

5.4.1.7 Hungary

Users can connect to the Hungarian research network by means of DSL, MetroEthernet, microwave (protected band), managed leased line, dark fiber, FastEthernet, GigabitEthernet and TengigabitEthernet.

5.4.1.8 Belgium

Users can connect to BELNET with a leased line with a bandwidth of 100 Mbps, 1 Gbps or 10 Gbps Ethernet.

5.4.2 Compute infrastructures

5.4.2.1 Italy

Batch job submission and interactive access are both possible on IGI. Job submission can be done via a dedicated user interface or via a web portal.

5.4.2.2 France

No information available.

5.4.2.3 Estonia

Access to the grid computing infrastructure can be done via a dedicated user interface.

5.4.2.4 Slovenia

Batch submission on the grid can be done via the main infrastructure.

5.4.2.5 Greece

Access to the grid happens via batch job processing submitted on a dedicated user interface that runs the adequate grid middleware.

5.4.2.6 Sweden

No explicit information about the user interfaces for the different types of computing is currently available.

5.4.2.7 Hungary

Interactive access is possible to the compute infrastructure. Batch job submission is only possible via the main NIIF infrastructure.

5.4.2.8 Belgium

On BEgrid essentially batch job submission is possible via a dedicated user interface or via a web portal. There is a very limited access to the compute nodes.

On VSC the users have interactive access to the head nodes and limited access to the compute nodes. The batch job submission is realised via the main infrastructure (headnode).

5.4.3 Data infrastructures

5.4.3.1 Italy

All storage access happens via the grid.

5.4.3.2 France

Not applicable

5.4.3.3 Estonia

Not applicable.

5.4.3.4 Slovenia

Access to the obtained space can be done via a hosted virtual server.

5.4.3.5 Greece

The storage is available via the grid.

5.4.3.6 Sweden

No explicit information on the data access on the two types of storage is currently available.

5.4.3.7 *Hungary*

Most of the storage is accessible via the virtual server service where the storage can then be accessed via both ATA-over-Ethernet and iSCSI protocols.

5.4.3.8 *Belgium*

No direct physical access to storage on BEgrid or VSC exists. All access goes via the compute services.

5.5 Access use Policies and constraints for the use of e-infrastructures

5.5.1 Network infrastructures

5.5.1.1 *Italy*

All academic and major Scientific and Cultural Research organisations can get access. All the GARR users have to comply with the Acceptable Use Policy regulations.

5.5.1.2 *France*

The primary criterion to use RENATER is the compliance to the RENATER Acceptable Use Policy (AUP), available from http://www.renater.fr/IMG/pdf/charte_fr.pdf . The second criterion is financing. For those depending of one of the GIP RENATER Members, the cost of connectivity is supported by the Member (which must agree for it). For others, the cost is chargeable according to a cost list publically available on RENATER website.

5.5.1.3 *Estonia*

Users of EEnet have to respect the AUP.

Organisations that want to use EEnet have to rent the line to the nearest EEnet PoP. The availability, cost and length of those physical line can be a limiting factor for realising the connection to EEnet. Therefore mostly only those institutes situated near the backbone can use the permanent connectivity of EEnet.

5.5.1.4 *Slovenia*

Access to the ARNES network is ruled by an AUP. All eligible organisations that comply with the AUP can connect to one of ARNES POP's. Typically all DCH (at least public) institutions satisfy the criteria.

5.5.1.5 *Greece*

All GRNET users have to agree with the AUP.

Not mentioned for SYZEFXIS.

5.5.1.6 *Sweden*

SUNET's main role is to offer Swedish universities national and international data communications. SUNET offers various types of connections, depending on customer type, in the first place to universities and university colleges. But also organisations that can demonstrate that they are useful for or cooperate with the university sector can join SUNET.

There is also a decision by the government that arts colleges in Stockholm, the National Library and central public museums should be connected to SUNET.

5.5.1.7   Hungary

Rules and regulations to get access to the Hungarian Research Network is regulated via an Acceptable Use Policy (AUP). This AUP includes access criteria, permitted activities, prohibited activities, careless and malicious usage, consequences of improper behaviour, ...

5.5.1.8   Belgium

All BELNET users have to agree with an AUP.

5.5.2   Compute infrastructures

5.5.2.1   Italy

Researchers can get access to IGI by requesting a personal grid certificate and obtain membership of a VO (Virtual Organisation). AUPs are connected to the different VOs and must be observed by all VO members.

5.5.2.2   France

No information available.

5.5.2.3   Estonia

The person interested in usage of EENet computing resources should apply for a
certficate from the Baltic Grid CA. However, EENet grid may be used only for research purposes.

5.5.2.4   Slovenia

The NGI test cluster is accessible to all eligible organisations that express interest.

5.5.2.5   Greece

The access to HellasGRIS is free for the Greek academic and research community with a simple procedure of registration.

5.5.2.6   Sweden

Access to the SNIC coordinated compute infrastructure is divided into tree categories: small, medium and high level requests. Application forms exists for the request of the first two categories. For large scale requests a call for proposals will be issued twice per year.

Small level requests (maximum 5 000 core hours/month/resource; for Mozart the upper limit is   250   core   hours/month)
Applications for small allocations are handled locally at the SNIC centres. This category is for small projects and for new groups that want to gain experience of using HPC-systems.

Medium   level   requests   (maximum   80   000   core   hours/month/resource)
Applications for medium level allocations can be submitted at any time to any of the SNIC

centres   via   a   unified   web   form.
The evaluation is performed locally and assesses the feasibility of using the requested resources.

Large level requests (minimum 80 000 core hours/month for at least one resource; minor applications for supplementary resources can be included)
Calls for applications for large level allocations are issued twice a year by SNAC, and SNAC also evaluates the applications and decides on the allocations. The evaluation is based on scientific merit, need for the resources, feasibility of efficient use of the requested resources, and impact.

Note that the SNIC managed resources can only be used by universities.

5.5.2.7 Hungary

Any user belonging to any NIIF member institution and performing scientific research activities is eligible to request for computing resources from NIIF.

5.5.2.8 Belgium

On BEgrid users of a VO have to agree the VO Access User Policy.

Access to the VSC infrastructure will be mostly granted by approval of projects that require computing time. VSC is currently starting up and the final modalities are not yet defined.

5.6 Costs connected to the use of e-infrastructures

5.6.1 Network infrastructures

5.6.1.1 Italy

The cost structure is based on access costs (Telco operator, access equipment), core infrastructure costs (fibers or leased connections, equipment, general internet bandwidth), labour costs (technicians, engineering staff, administrative staff), other equipment costs (for monitoring or to provide a service, hardware, software).

5.6.1.2 France

For those depending of one of the GIP RENATER Members, the cost of connectivity is supported by the Member (which must agree for it). For others, the cost is chargeable according to a cost list publically available on RENATER website. All additional services are part of the standard service portfolio, available to all RENATER users.

5.6.1.3 Estonia

The costs of last mile connection have to be paid by the connected institution itself; usage of EENet backbone (incl international connection) is free for all EENet customers.
Some other services have a relatively low price according to the price list, approved by the Supervisory Board of EENet (e.g. 25 EEK/month for webhosting; 25 EEK/month for up to 50 mailboxes in EENet's server). Full price list is available at: http://www.eenet.ee/EENet/hinnakiri.html .

5.6.1.4 Slovenia

The customer pays for the access lines. Network use and all ARNES services are free of charge for the eligible organisations. Public (or public funded) DHC organisations are eligible for ARNES services free of charge. We specifically encourage and support (knowledge transfer, trainings, project collaboration) all collaborative efforts with educational and research community.

5.6.1.5 Greece

GRnet services are provided for free.

The network connections through SYZEFXIS are provided to the public sector agencies for free.

5.6.1.6 Sweden

Fees from universities finance three fourths of OptoSunet and other SUNET activities. SUNET receives the remaining fourth from the state through the national budget. The universities' revenues are the starting point for the size of the SUNET fee, which usually amounts to approximately 0.25 per cent of the affiliated universities' revenues. Despite the low percentage, the Swedish universities have considerable financing responsibility. The universities' SUNET fee entitles them to the basic level of service and options – a general network with very high capacity and security.

So that Universities that consume less bandwidth will not need to finance the large consumers' needs, SUNET has introduced a finance model where those with special needs have to finance their own additional costs.

The national museums and the National Library of Sweden are also connected to SUNET. The museums and the library connect to OptoSunet free-of-charge in accordance with a governmental decision.

5.6.1.7 Hungary

Cost elements for network connections and additional services are: fiber lease or transport service fee, equipment procurement costs, equipment support costs, IP transit service costs, operating staff costs and administrative costs. The service is free of charge for NIIF member organisations.

5.6.1.8 Belgium

For a connection to BELNET the user (organisation in this case) has to pay the access circuit (leased line) to the BELNET network, the connectivity to global/commercial internet + a standard service package and a cost per used interface on the network.

IP traffic over the BELNET network and the international research networks is free of charge and there are no limitations on bandwidth or volume.

The additional services that are currently charged are: Point-to-point / multipoint connections over the BELNET backbone, domain name registration and the vulnerability scanner services.

5.6.2 Compute infrastructures

5.6.2.1 Italy

The cost of using the IGI infrastructure depends on the service level required and on the correlated activities (gridification, user support, etc.) so evaluations are performed on a case-by-case basis and conditions are cast in the MoUs.

5.6.2.2 France

No information available.

5.6.2.3 Estonia

Currently there is no fee for usage of EENet grid computers, all costs are paid by EENet.

5.6.2.4 Slovenia

Access to the grid is free of charge for eligible organisations.

5.6.2.5 Greece

The access is free for the Greek academic and research community with a simple procedure of registration.

5.6.2.6 Sweden

No explicit cost model is available for use of the computing infrastructure.

5.6.2.7 Hungary

Any user belonging to any NIIF member institution and performing scientific research activities is eligible to request for computing resources from NIIF.

5.6.2.8 Belgium

For BEgrid there are currently no costs to use the infrastructure. This can change in the future.

VSC is working on the cost structure. The cost of using the services will depend on the type of research project and the user. A 5% contribution of the full cost will be asked to users funded by projects of the two Flemish research foundations or by the internal research competitions in the universities. In other cases a large fraction of the full cost or even the full cost will be charged.

5.6.3 Data infrastructures

5.6.3.1 Italy

The cost depends on the service level required and on the data model (number of replicas, number of transfers, etc.) so evaluations are performed on a case-by-case basis and conditions are cast in the MoUs.

5.6.3.2 France

No information available.

5.6.3.3 Estonia

Not applicable

5.6.3.4 Slovenia

The available storage services are free of charge.

5.6.3.5 Greece

The access is free for the Greek academic and research community with a simple procedure of registration.

5.6.3.6 Sweden

No explicit cost model is available for the use of Swestor.

5.6.3.7 Hungary

For the moment there are only measures on the low-end storage. The building cost here is about 277EUR/Tbyte, while the maintenance cost is about 10W/Tbyte, equivalent to about 0.02 EUR/Tbyte/day by applying current Hungarian electricity prices.

5.6.3.8 Belgium

For BEgrid there is currently no charge. This could change in the future.

For VSC the storage requested with compute time in projects with cost contribution from the user is similar to the cost for computer time. Very large quantities as required for long term preservation and for some larger medium term , storage applications will only be available at full cost.

5.7 International e-infrastructures

International e-infrastructures have been approached via the EEF (European e-Infrastructures Forum). EEF includes Dante, TERENA, EGI, DEISA and Prace. The questionnaire has not been directly answered by EEF but they confirmed their interest in the DC-NET project.

Use, access and cost have to be looked at case per case for those international e-Infrastructures.

Dante, the provider of the international network connections, is directly in contact with DC-NET and ready to answer questions and requests.

5.8 Partner organisations already using e-infrastructure services

5.8.1.1 Italy

Using GARR: Archivio di Stato, Firenze
Biblioteca Nazionale Sagarriga Visconti Volpi, Bari

Biblioteca Nazionale Braidense, Milano
Biblioteca Nazionale Centrale, Firenze,
Biblioteca Nazionale Centrale V. Emanuele II, Roma
Biblioteca Nazionale Marciana, Venezia
Biblioteca Provinciale Sanat Teresa dei Maschi, Bari
Biblioteca Angelica, Roma
Biblioteca Statale Antonio Baldini, Roma
Biblioteca Casanatense, Roma
Biblioteca Estense e Universitaria, Modena
Biblioteca Marucelliana, Firenze
Biblioteca Medica Statale, Roma
Biblioteca Medicea Laurenziana, Firenze
Biblioteca Palatina, Parma
Biblioteca Riccardiana, Firenze
Biblioteca Universitaria di Bologna, Bologna
Biblioteca Universitaria – Genova, Genova
Biblioteca Universitaria – Napoli, Napoli
Biblioteca Universitaria – Padova, Padova
Biblioteca Universitaria – Pavia, Pavia
Biblioteca Universitaria di Pisa, Pisa
Biblioteca Universitaria Alessandrina, Roma
Discoteca di Stato, Roma
ICCU, Roma

Using IGI :   ArchaeoGrid

5.8.1.2   France

Using Renater: BNF (Bibliothèque Nationale de France)

INA (Institut National de l'Audiovisuel)

IRCAM/Beaubourg

CSI (Cité des Sciences et de l'Industrie)

CINES

5.8.1.3   Estonia

Using EENET :   Ajalookirjanduse Sihtasutus Kleio
Äksi Raamatukogu
Eesti Animatsiooni Liit
Eesti Keele Instituut
Eesti Kirjanduse Selts
Eesti Kirjandusmuuseum
Eesti Kodu-uurimise Selts
Eesti Kunstiakadeemia
Eesti Looduskaitse Selts
Eesti Muusika- ja Teatriakadeemia
Eesti Pimedate Raamatukogu

Eesti Raamatukoguvõrgu Konsortsium
Eesti Rahva Muuseum
Eesti Rahvuslik Folkloorinõukogu MTÜ
Eesti Rahvusraamatukogu
Eesti Spordimuuseum
Elistvere Raamatukogu
Evald Okase Muuseum
Harjumaa Muuseum
Hellenurme Külaraamatukogu
Ilmatsalu Raamatukogu
Järvamaa Keskraamatukogu ja AIP
Jõgeva Linnaraamatukogu
Jõgeva Maakonna Keskraamatukogu
Kambja Raamatukogu
Kärdla Kultuurikeskus
Kärdla Linnaraamatukogu
Kavastu Raamatukogu
Kiviõli Linnaraamatukogu
Kolkja Raamatukogu
Külitse Raamatukogu
Kureküla Raamatukogu
Läänemaa Muuseum
Lähte Raamatukogu
Liivi Muuseum
Lohkva Raamatukogu
Luke Raamatukogu
Luunja Raamatukogu
Maarja Raamatukogu
Meeksi Raamatukogu
Melliste Raamatukogu
Muhu Muuseum
Narva Keskraamatukogu
Narva Muuseum
Nõgiaru Raamatukogu
Nõo Raamatukogu
Nõuni Külaraamatukogu
Pimedate Infoühing Helikiri
Projekt Nikolai Roerichi virtuaalne muuseum
Rannu Raamatukogu
Raudteemuuseum
Roiu Raamatukogu
SA Ugala Teater
Sangla Raamatukogu
Sihtasutus Kultuurileht
Sihtasutus Rannarahva Muuseum
Siimusti Raamatukogu
Sillaotsa Talumuuseum
Tallinna Keskraamatukogu

Tallinna Ülikool
Tallinna Ülikooli Ajaloo Instituut
Tallinna Ülikooli Akadeemiline Raamatukogu
Tammistu Raamatukogu
Tartu Kõrgem Kunstikool
Tartu Mänguasjamuuseum
Tartu Oskar Lutsu nimeline Linnaraamatukogu
Tartu Ülikool
Tartu Ülikooli Viljandi Kultuuriakadeemia
Teaduste Akadeemia Kirjastus
Teater Vanemuine
Tõrvandi Raamatukogu
Ülenurme Raamatukogu
Ulila Raamatukogu
Uula Raamatukogu
Vaida AIP ja Raamatukogu
Välgi Raamatukogu
Varnja Raamatukogu
Varstu Raamatukogu
VAT Teater MTÜ
Vedu Raamatukogu
Viljandi Kultuurimaja
Viljandi Linnaraamatukogu
Võnnu Raamatukogu
Võõpste Raamatukogu
Võru Kultuurimaja Kannel
Võrumaa Keskraamatukogu

5.8.1.4   Slovenia

Using Arnes :   (public) Libraries (incl. National and University Library and Slovenian Virtual Library (http://www.cobiss.si/cobiss_eng.html . The Virtual Library includes 399 librairies, museums and archives.

5.8.1.5   Greece

Using GRNET: The new Acropolis Museum
National Archaeological Museum
Byzantine Museum, Athens
Byzantine Politism Museum, Thessaloniki
Greek Parliament
Hellenic Broadcasting Corporation
Athens Concert Hall
Thessaloniki Concert Hall
Syros Concert Hall
Hellenic National Audiovisual Archive

5.8.1.6   Sweden

Using Opto SUNET: Arkitekturmuseet   (Swedish   Museum   of   Architecture)
Armémuseum   (Army   museum)

Danshögskolan (University of dance)
Dramatiska Institutet (University College of Film, Radio, Television and
        Theatre)
Etnografiska museet (Museum of Ethnography)
Flygvapenmuseum (The Swedish Air Force Museum)
Kungl. Biblioteket (National Library)
Kungl. Konsthögskolan (The Royal University College of Fine Arts)
Kungl. Musikhögskolan (Royal College of Music in Stockholm)
Konstfack (University College of Arts, Crafts and Design)

Livrustkammaren och Skoklosters slott med Stiftelsen Hallwylska museet
(Royal Armoury and Skokloster castle with Hallwyl Museum)
Marinmuseum (Naval museum)
Moderna museet (Modern Museum)
Nationalmuseum (Nationalmuseum)
Nordiska museet
Naturhistoriska riksmuseet (The Swedish Museum of Natural History)
Operahögskolan i Stockholm (University College of Opera)

Riksantikvarieämbetet (Swedish National Heritage Board)

Sjöhistoriska museet (The Maritime Museum)
Skansen

Sveriges Utbildningsradio (Swedish Educational Broadcasting Company)
Statens försvarshistoriska museer (The National Swedish Museums of
        Military History)
Statens historiska museer (National Historical Museums)
Statens maritima museer (National Maritime Museums)
Statens musiksamlingar
Statens museer för världskultur (National Museums of World Culture)

Teaterhögskolan i Stockholm (Stockholm Academy of Dramatic Arts)
Tekniska museet National Museum of Science and Technology)

5.8.1.7 Hungary

Using NIIF: about 200 Hungarian DCH organisations

5.8.1.8 Belgium

Using BELNET:
        State Archives of Belgium
        Centre for Historical Research and Documentation on War and Contemporary
        Society
        Royal Library of Belgium
        Royal Institute for Cultural Heritage
        Royal Museums for Art and History
        Musical Instruments Museum
        Royal Museums of Fine Arts of Belgium

Royal Museum for Central Africa
Royal Belgian Institute of Natural Sciences
Belgian Science Policy office (BELSPO)
Royal Theatre "La Monnaie"
Koninklijk Museum voor Schone Kunsten Antwerpen
Kunstencentrum Vooruit
Instituut voor Sociale Geschiedenis

5.9 Contact points

5.9.1 Italy

Network Infrastructure:
e-Infrastructure name: GARR Network

e-Infrastructure provider organisation: Consortium GARR

Name contact persons: Enzo Valente

Contact E-mail address: info@garr.it

e-Infrastructure provider address: Via del Tizii, 6 00185 Roma

e-Infrastructure URL: http://www.garr.it/

Computing Grid Infrastructure
e-Infrastructure name: INFN-GRID to become IGI, Italian Grid Infrastructure

e-Infrastructure provider organisation: INFN and IGI (later)

Name contact persons: Mirco Mazzucato, Federico Ruggieri

Contact E-mail address: Mirco.mazzucato@pd.infn.it, federico.ruggieri@roma3.infn.it

e-Infrastructure provider address:

e-Infrastructure URL: http://www.infn.it/

5.9.2 France

e-Infrastructure name: RENATER (Réseau National de télécommunications pour la Technologie, l'Enseignement et la Recherche)

e-Infrastructure provider organisation: GIP RENATER (Groupement d'Intérêt Public RENATER)

Name contact persons: Dany Vandromme

Contact E-mail address: dany.vandromme@renater.fr

e-Infrastructure provider address: 151 Boulevard de l'hôpital, 75013 Paris

e-Infrastructure URL: http://www.renater.fr/

5.9.3 Estonia

e-Infrastructure name: EEnet

e-Infrastructure provider organisation: Estonian Educational and Research Network EENET

Name contact persons: Anne Märdimäe (infor on the DC-NET questionnaire)
TriinuTamm (for further inquiries)

Contact E-mail address: anne@eenet.ee
triinu@eenet.ee

e-Infrastructure provider address: EENet, Raekoja plats 14, Tartu 51004, Estonia

e-Infrastructure URL: http://www.eenet.ee/

5.9.4 Slovenia

e-Infrastructure name: ARNES

e-Infrastructure provider organisation: ARNES

Name contact persons: Tomi Dolenc (partner communications)
Marko Bonač (director)

Contact E-mail address: info@arnes.si,
tomi.dolenc@arnes.si
arnes@arnes.si

Other contact information: http://www.arnes.si/en/about-arnes/contact-us.html

e-Infrastructure provider address: ARNES**,** PO Box 7, 1001 Ljubljana, Slovenia

e-Infrastructure URL: http://www.arnes.si/

5.9.5 Greece

GRnet and HellasGRID
e-Infrastructure name: GRnet, HellasGRID

e-Infrastructure provider organisation: Greek Research and technology Network (GRNET
SA)

Name contact persons: Tryfon Chiotis

Contact E-mail address: tchiotis@grnet.gr

e-Infrastructure provider address: 56 Mesogeion Ave, Ampelokipi, Athesn 115 27

e-Infrastructure URL: http://www.grnet.gr/

SYZEFXIS
e-Infrastructure name: SYZEFXIS

e-Infrastructure provider organisation: Information Society S.A. (Greek Ministry of the Interior)

Name contact persons: Christos Moschonas
Vaggelis Thomopoulos

Contact E-mail address: C.mos@ktpae.gr
vtomos@ktpae.gr

e-Infrastructure provider address: 2-4 Lioupoleos Str. Ymittos, Athes, P.C. 17237

e-Infrastructure URL: http://www.syzefxis.gov.gr/

5.9.6   Sweden

e-Infrastructure name: OptoSunet

e-Infrastructure provider organisation: Sunet (Swedish University Computer Network)

Name contact persons: Eva Stensköld

Contact E-mail address: eva.stenskold@vr.se

e-Infrastructure provider address: SUNET Vetenskapsrädet 10378 Stockholm

e-Infrastructure URL: http://www.sunet.se/

5.9.7   Hungary

e-Infrastructure name: NIIF (Hungarian NREN*)*

e-Infrastructure provider organisation: NIIF Institute (Hungary)

Name contact persons: Lajos Balint (general issues)
Gabor Ivanszky (Network)

Tamas Maray (Computing)
Peter Stefan (Storage)
Andras Kovacs (special services as VoIP, Video Conferencing, etc.)

Contact E-mail address: Lajos Balint <Lajos.balint@niif.hu>

e-Infrastructure provider address: NIIFI, Victor Hugo 18-22, Budapest, H-1132, Hungary

e-Infrastructure URL: http://www.niif.hu

5.9.8 Belgium
BELNET
e-Infrastructure name: BELNET, the Belgian National Reserach& Education Network

e-Infrastructure provider organisation: BELNET

Name contact persons: Koen Schelkens

Contact E-mail address: Koen.schelkens@belnet.be

e-Infrastructure provider address: 237 Avenue Louise, 1050 Brussels

e-Infrastructure URL: http://www.belnet.be/

BEgrid
e-Infrastructure name: BEgrid the national computing grid for research

e-Infrastructure provider organisation: BELNET

Name contact persons: Rosette Vandenbroucke

Contact E-mail address: rosette.vandenbroucke@belnet.be

e-Infrastructure provider address: 237 Avenue Louise, 1050 Brussels

e-Infrastructure URL: http://www.begrid.be/

VSC
e-Infrastructure name: VSC – Vlaams Supercomputer Centrum

e-Infrastructure provider organisation: Consortium of 5 Flemish university Associations

Name contact persons: Kurt Lust

Contact E-mail address: Kurt Lust@vscentrum.be

e-Infrastructure provider address: KULeuven Department of Mathematics, Celestijnenlaan 200A, Bus 2400, 3001 Heverlee

e-Infrastructure URL: http://www.vscentrum.be/

5.10 Glossary

AAI: Authentication and Authorisation Infrastructure

ADSL: Asymmtreic Digital Subscriber Line

ARNES: Academic and Research Network of Slovenia

ATA: Advanced Technology Attachment

AUP: Acceptable Use Policy

BEgrid : Belgian national computing grid for research

BELNET : Belgian National research network

BME :

BNIX :   Belgian National Internet Exchange

CA : Cerification Authority

CERN : centre Européenne pour la recherche nucléaire

CERT : Computer Emergency Response Team

CMS : Compact Muon Solenoid

CNR : National Research Council – Italy

CNRS : ICentre National de la Recherche Scientifique - France

COMETA : Sicilian grid

CPU : compute processor unit

Dante : Delivery of Advanced Network Technology to Europe

DCH: Digital Cultural Heritage

DEISA: Distributed European Infrastructure for Supercomputing applications

DNS: Domain Name Service

DSL: Digital Subscriber Loop

EEF: European E-Infrastructues Forum

EENet: Estonian national network for research

EGEE: Enabling Grid in E-sciencE

EGI: Europan Grid Initiative

ELTE: EÖTVÖS Loránd University

ENEA: Agenzia nazionale per le nuove tecnologie

FC : Fiber channel

FTP :File Transfer protocol

GAMESS : Software package - chemistry

GARR : Gruppo per l'Armonizzazione delle Reti della Ricerca

GARR-X : Italian national research network

Gbps: gigabit per second

GÉANT: European research network

GIP RENATER: Groupement d'Intérêt Public RENATER

GPU: Graphical Processor Unit

GRNET: Greek national research network

HPC: High Performance computing

IGI: Italian Grid Infrastructure

INFN :   Istituto Nazionale di Fisica Nucleare

IPv4 : Internet protocol Version 4

IPv6   Internet protocol Version 6

IRCCS   Institutes for Research in Health Care

iSCSI: Internet Smaal Computer System Interface

IS: Internet Service Provider

JRU: Joint Reserach Unit

L2 VPN: Level 2 Virtual Private Network

L3 VPN: Level 3 Virtual Private Network

LCG: large Hadon Computer Grid

LHC: Large Hadron Collider

Lunarc: center for scientific and technical computing for research at Lund University

Mbps: megabit per second

MGKK: Hungarian Grid Competence Center

MIUR: Ministry of universities and research - Italy

MoU: Memorandum of understanding

MTA-SZTAKI: Hungarian research institute

NGI: National Grid Infrastructure

NIFF: National research network - Hungary

NIIF: National information Infrastructure Development - Hungary

NREN: National Research Network

OptoSuNet: Swedish national research network

PATA: Parallel Advanced Technology Attachment (hard disk interface)

PDC: Center for High performance computing - Sweden

PoP: Point of Presence

Prace: Partnership for Advanced Computing in Europe

RAID: Redundant Array of Independent Disks

RENATER: French national research network

SAN: Storage Area Network

SATA: Serial Advanced Technology Attachment

SCSI: Smaal Computer System Interface

SDSL: Symmetric Digital Subscriber Line

SFINX: French Internet Exchange

SNAC: Swedish National Allocations Committee

SNIC: Swedish National Infrastructure for Computing

SUNET: Swedish organisation that operates the national research network

SweStore: Swedish Storage Initiative

SYZEFXIS: Greek network for administration

Tbyte: Terabyte

Telco: telecommunication compnay

TERENA: Trans-European Research and Education Networking Association

VLAN: virtual local area network

VO: Virtual Organisation

VoIP: Voice over IP

VPN: Virtual Private Network

VR: Swedish research council

VSC: Flemish Supercomputer Centre

6   Progress Update

This Delivery is the first version of the e-Infrastructures Handbook. Subsequent versions will be made available when new information about the concerned e-Infrastructures is published or communicated or when other countries join DC-NET.

The e-Infrastructure Handbook will also be re-edited and made available as a separate document for the use of all Digital Cultural Heritage organisations.

7   Conclusion

e-Infrastructures do exist in all the DC-NET partner countries. The network e-infrastructure is most developed in all countries with rather clear offers and rules for connection and access and with well defined services. All these network infrastructures offer almost the same set of services, basic as well as additional ones. All Digital Cultural Heritage organisations seem to be allowed to connect to at least one of those national network infrastructures. Compute services do exist in most of the

partner countries but are not everywhere well defined. DC-NET partners did not always find the possibility to find or contact the organisation(s) responsible for the compute services in their country. Data Infrastructures are almost not available, particular storage offers are often connected to a corresponding compute service. The e-Infrastructure handbook gives a short summary of each available e-infrastructure in the DC-NET partner countries and has also listed all contacts in order to facilitate the further discussions between e-Infrastructures and DC-NET organisations. This handbook is a first version and it should be updated on a regular basis. This update will reflect all modifications to the already listed information and information about other countries will be added.