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Accession Date:

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Object name: Grid-Ireland Infrastructure

Vintage: c.1999

Synopsis: The computational Grid for Ireland, participant in DataGrid, EGEE, EGI, transactionally deployed and centrally managed by Dept.Computer Science, TCD.

Description:

A pilot computational grid for Ireland, *Grid-Ireland*, was established (with funding from Enterprise Ireland) in Oct-1999 on foot of experiments over 1998-9 by Dr.Brian Coghlan (TCD) with the Globus middleware. It was the first such national grid infrastructure in Europe. The initial collaboration with Dr.John Morrison (UCC) was quickly joined by Dr.Andy Shearer (NUIG). The focus on national grid connectivity was then extended to Europe when Brian Coghlan joined the EU DataGrid consortium (unfunded) in Aug-2000, and then the EU CrossGrid consortium.



Figure 1: Initial Grid-Ireland infrastructure

Initially the middleware was manually deployed, but this was soon automated by extending scripts developed by DataGrid colleagues in the Italian INFN organisation. This allowed V1.0 of the Grid-Ireland middleware to be released in Jun-2001 as a layer above HEAnet. In Jun-2002 this was replaced with V2.0, a customisation of the University of Edinburgh's LCFG automated deployment tools used by DataGrid.

The initial three sites grew to six by 2001 in collaboration with Prof.Luke Drury of Dublin Institute for Advanced Studies (DIAS), Prof.Adrian Ottewill of University College Dublin (UCD) and Prof.Ron Perrott of Queens University Belfast (QUB). The first virtual organisation (VO), Cosmogrid (*Grid-enabled Computational Physics of Natural Phenomena*), led by DIAS, was set up in Oct-2003, with 9 institutions and 60 individuals funded by the HEA PRTLI programme.

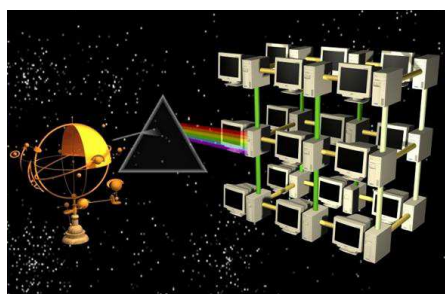


Figure 2: Cosmogrid publicity graphic

Funding also covered three Beowulf clusters and six *Grid Gateways*. The latter were points-of-presence at the six main sites virtualising all the necessary grid services, to be centrally deployed and managed by a newly established OpsCentre at TCD, see the deployment architecture papers in the associated folder of this catalog.

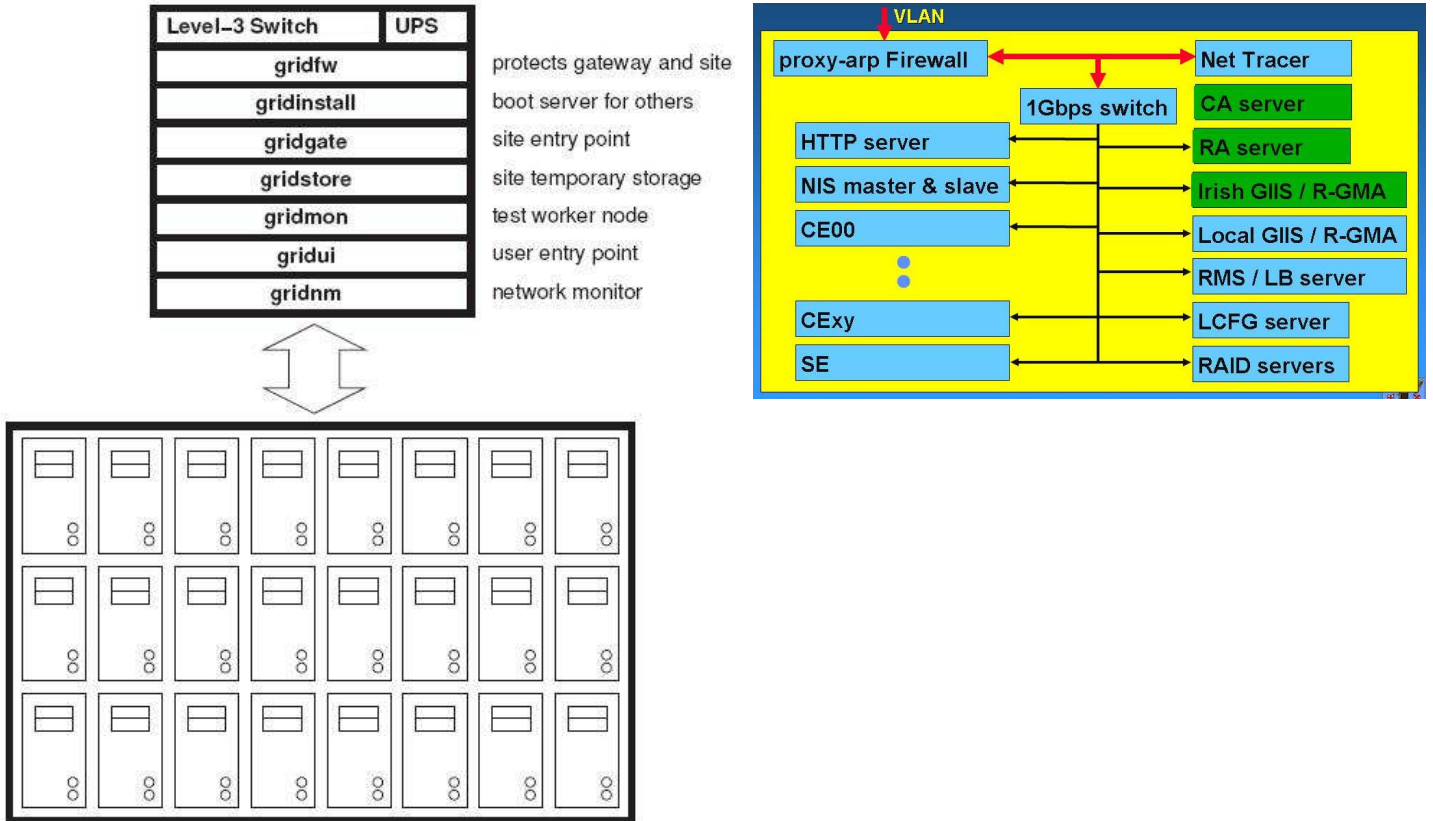


Figure 3: Architectures of (a) Grid-Ireland site, and (b) Grid-Ireland grid gateway

In 2004 Dell generously donated eleven Dell 1650 servers to Grid-Ireland to enable expansion of the grid gateway infrastructure, eventually to 18 sites, North and South, in collaboration with the national research and education network provider, HEAnet.

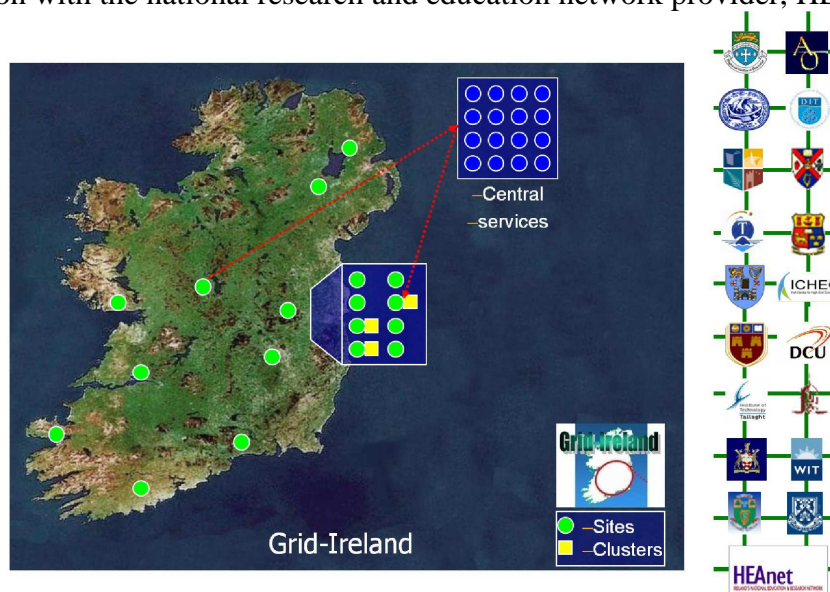


Figure 4: Grid-Ireland infrastructure showing all 18 grid sites

To support this larger infrastructure, the OpsCentre developed a transactional way to deploy middleware, again see the papers in the associated folder of this catalog.

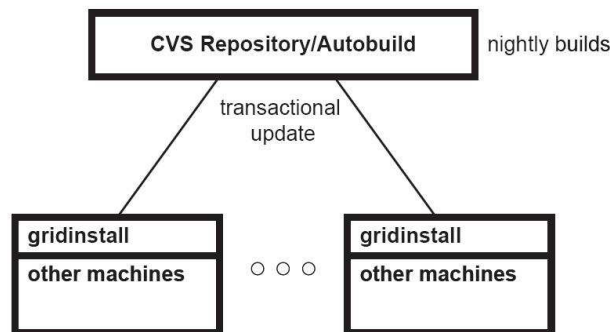


Figure 5: Transactional deployment process

This allowed push-button deployment of grid middleware, an unusual facility that greatly eased the task of maintaining the infrastructure in a consistent state.

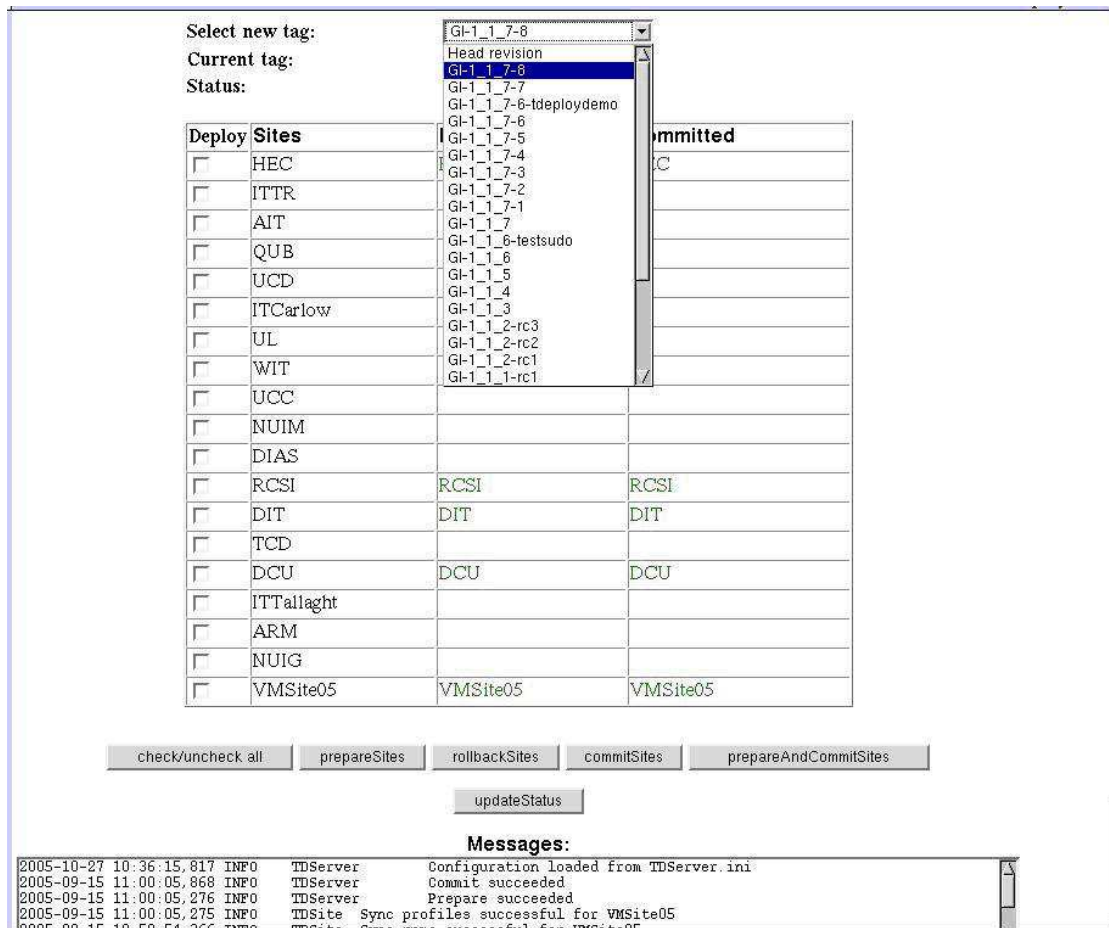


Figure 6: Transactional deployment GUI

Cosmogrid was succeeded in 2007 by e-INIS, again led by DIAS and funded by HEA PRTL. Further national VOs were established, for example, Marinegrid to support marine science, WebCom-G to support a specific computer science project, and SoloVO to support independent grid users, but also further international VOs, particularly HELIO to support the EU heliophysics community.

This grid infrastructure was embedded in an international context. In 2004 the successor to the DataGrid project, EGEE, kicked off with its first conference in UCC. Grid-Ireland was a participant in all the major European grid developments: DataGrid, CrossGrid, EGEE, EGEE-2, EGEE-3, Int.EU.Grid, EGI-InSPIRE and eventually the pan-EU *European Grid Infrastructure* (EGI). A non-profit company with charitable status, GINGI Ltd, was founded in 2009 to enable national commitments to EGI.

2001	January	European Data Grid project is launched
2004	April	EGEE begins
2006	May	EGEE-II takes over from EGEE
2007	September	EGI_DS begins
2008	May	EGEE-III begins
	December	EGI_DS releases 'Blueprint for a European Grid Infrastructure'
2009	March	EGI_DS policy board decide Amsterdam will host EGI.eu
	July	EGI council is created based around a Memorandum of Understanding
2010	8 February	EGI.eu is founded
	1 May	EGI.eu assumes coordination of European Grid Infrastructure, supported financially by NGIs, EIROs and the EC through the EGI-InSPIRE project
2014		EGI-InSPIRE ends, EGI.eu continues to coordinate EGI

Figure 7: The European context for the Grid-Ireland infrastructure

A parallel international context existed for security. Computational grids are secured with a PKI infrastructure. For the very earliest experiments, PKI certificates were acquired from the Globus Certificate Authority (CA) in America. But even before Grid-Ireland was established it was clear that an independent CA was needed, with its own policies and procedures.

Initially a *Simple CA* (from SSL) was set up, but quickly replaced with customised *OpenCA* software. When DataGrid began it was found the UK grid CA had also taken this approach (both were members of the original six in the DataGrid CA Group), and they then collaborated in solving problems in OpenCA. Until 2006 the primary CA was Dr. Brian Coghlan and the backup was David O'Callaghan, then they swapped roles. The Grid-Ireland CA was deeply involved in the evolution of the CA Group and its successor the EUGridPMA (European grid policy management authority), now one of the three PMAs of the International Grid Trust Federation (IGTF).

The CA hardware consisted of a front-end online RA (registration authority) server and an isolated back-end CA server, both within a half-height rack (actually the disk chassis of the Sequent Symmetry in this collection), along with a small safe for backups, with multiple locks securing all the panels from entry (the UK grid CA hardware actually resided inside a 6ft-high safe). Certificate requests approved on the RA server were transferred to the CA server using floppy disks and vice versa.

Grid-Ireland was also a participant in significant international research such as the EU EMI, StratusLab, Mantychore and SCI-BUS projects, as well as the EU/USA HELIO project and the global CERN LHC computing for the ATLAS and LHCb detectors.

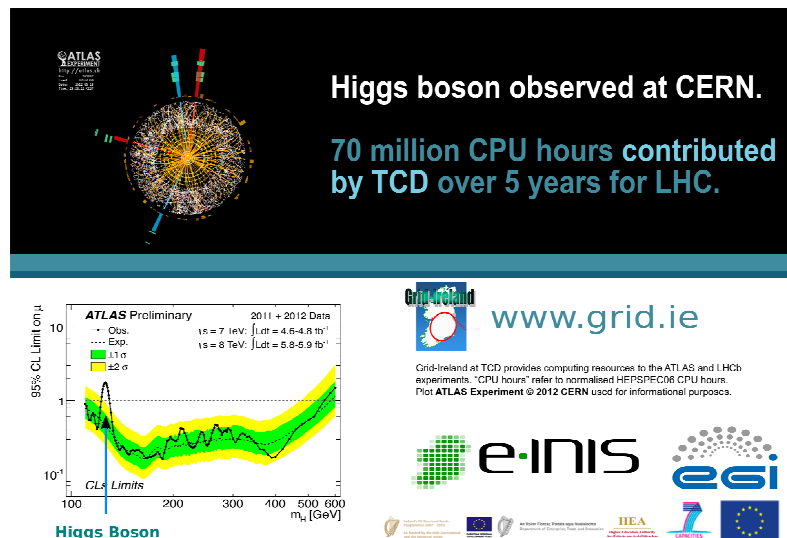


Figure 8: Grid-Ireland *csTCDie* site contribution to CERN LHC computing

Ultimately, however, it became a casualty of the economic crash of 2008 (aka Global Financial Crisis, or GFC), and was gracefully closed down on 31-Dec-2012.

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design by www.reddog.ie

www.CosmoGrid.ie

Further information on the CosmoGrid Project is available at www.CosmoGrid.ie or by contacting the CosmoGrid Office, 5 Merrion Square, Dublin 2.

Email: admin@Cosmogrid.ie
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Funded by the HEA under the National Development Plan with assistance from the European Regional Development Fund

+ the CosmoGrid project

Grid-enabled
Computational
Physics
of Natural
Phenomena

+ the CosmoGrid project

The Grid-enabled Computational Physics of Natural Phenomena is a research and technology development project funded as part of the Programme for Research in Third Level Institutions (PRTLII) supported by the National Development Plan with assistance from the European Regional Development Fund.

The aim of the Project is to study natural phenomena occurring in the cosmos using a powerful computer Grid - hence, the Project's abbreviated title 'CosmoGrid'. These natural phenomena range from earthquakes to climate change to supernova explosions and are often so complex that traditional analytic approaches are difficult to apply. Computational simulations, however, offer the possibility of increasing our understanding of these phenomena by bridging the gap between experiment and theory. Until recently, computational scientists have been limited by the amount of available computing power. The introduction of new Grid technology will facilitate large-scale, data-intensive computation and analysis and enable the scientists to research and model more effectively the complex systems that make up our universe.

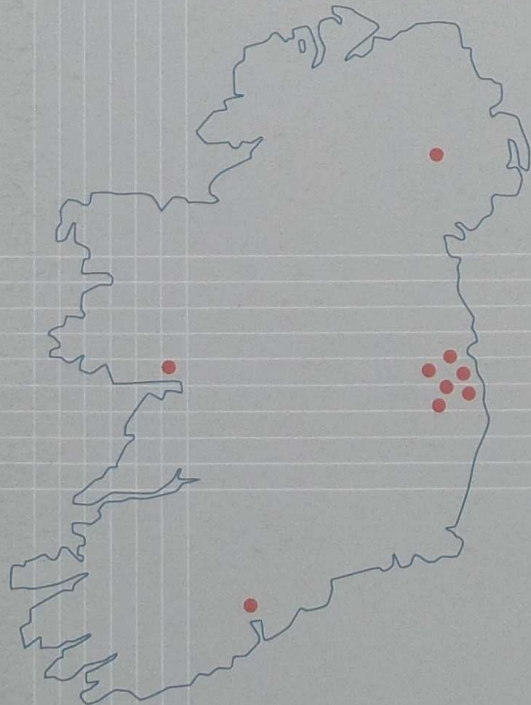
The main objectives of the CosmoGrid Project are to:

- * develop a world-class Grid system and a culture of Grid use in Irish research;
- * undertake leading-edge research in the field of the physics of natural phenomena;
- * instigate and promote collaboration between a wide range of institutions and organisations involved in the study of natural phenomena;
- * provide an innovative training programme in Grid-enabled research and advanced scientific computing.

The CosmoGrid Consortium

The Project draws together a large team of scientists and researchers from numerous disciplines including astronomy, astrophysics, atmospheric physics, computer science, geophysics, mathematical physics and meteorology. As well as being interdisciplinary, the project is inter-institutional in nature involving eight institutions and organisations throughout Ireland, including Northern Ireland. These include:

- The Dublin Institute for Advanced Studies
- National University of Ireland, Galway
- University College Dublin
- Dublin City University
- Grid-Ireland (a collaboration of computer scientists in TCD, UCC & NUIG)
- Met Éireann
- Armagh Observatory
- HEAnet



Scientific Projects Using Grid Technology

As part of the Cosmogrid Project a wide range of leading-edge science research projects will be undertaken. Each research project will utilise the high performance computing capabilities of the Grid to replicate a specific natural phenomena. The research projects include the:

- * development of a regional climate model to generate information on recent and future climate change in Ireland;
- * construction of digital virtual rocks leading to greater understanding of geophysical processes;
- * creation of rheological and thermal models of lithospheric structures with particular application to the North Atlantic;
- * computation of seismic waves in models of geological and geophysical structures;
- * simulation of astrophysical shocks such as those that occur when a star dies (supernova event);
- * simulation of astrophysical jets which are seen when a star is born and during its demise, and associated phenomena;
- * intensive study of atmospheric gravity waves;
- * reproduction and modelling of radiative processes in neutron star astrophysics;
- * calculation of optical scattering properties of atmospheric dust particles;
- * construction of computation models to advance the use of adaptive optics in ground-based telescopes;
- * development of a model of the solar transition region i.e the region between the cool chromosphere and hot corona;
- * analysis of data resulting from gravitational waves passing through the Laser Interferometer Gravitational Wave Observatory (LIGO) in the US.

The Grid in Operation

The construction of the Grid involves the large-scale aggregation of high-capacity computers to create three large clusters (each a 128 processor system) which will be linked together. These clusters will act as the major suppliers of computing power to the Grid and will be based at the Dublin Institute for Advanced Studies, UCD and NUIG. The clusters will be connected through Grid-Ireland by using dedicated gateway machines located at each of the remaining Cosmogrid consortium members. This will allow the three clusters to operate as a single virtual system, transparently distributing jobs across the Grid and, in the case of really large jobs, sharing the load across all 384 processors.

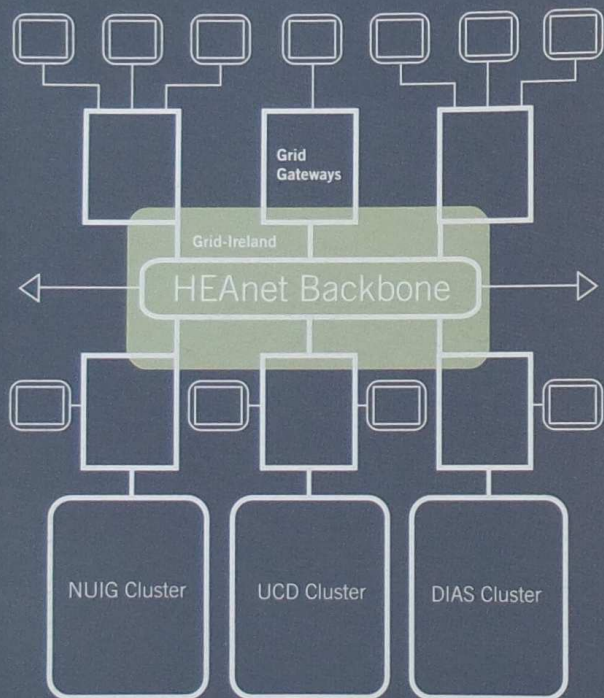
Effectively then, the Grid will provide a shared computational resource, with flexible access and a common interface for the user. The principle of the Grid computing system can be equated with that of an electricity supply Grid. A peak in demand in one area can be supplied from excess capacity elsewhere in the system to deliver a uniform, consistent and reliable service. A user can plug into the Grid and use the resources required to address a science problem. Ideally, the end user should consider the machine running the software as irrelevant as the power station providing the electricity to switch on a light!

Grid Technology Worldwide

The arrival of Grid computing heralds an era of 'e-science' to match that of 'e-commerce'. The existence of a wide variety of physical phenomena that require large scale computation and the rapid growth in available computing power provides a major opportunity for scientific advances. Across Europe and the US numerous computational and data grid projects are being implemented. The CosmoGrid will provide Irish scientists with the opportunity to be at the cutting-edge of scientific discovery. Before the end of the Project, it is envisaged that the CosmoGrid will form part of a distributed, Grid-based, European or even global, virtual supercomputer resource.

Training and Development

Investment in the development of a Grid System will make a very important contribution to the development of Irish research capabilities. However, equally important is the investment in education and training. To maintain a high quality research environment, researchers, postdoctoral fellows, postgraduate and undergraduate students will have to acquire the specific skills and experience needed to use and develop Grid tools in the Irish research system. As part of the CosmoGrid Project, training workshops and regular seminars will be undertaken with students of all levels. The Grid will also be used as a specialist training resource in a number of specific undergraduate courses identified in the University sector.





Investing in your future



Ireland's EU Structural Funds Programmes 2007 - 2013
Co-funded by the Irish Government and the European Union



An Roinn Fiontar, Trádála agus Nuálaíochta
Department of Enterprise, Trade and Innovation

HEA

Higher Education Authority
An tÚdarás um Ard-Oideachas



What is Grid-Ireland?

Grid-Ireland is the **National Grid Initiative** (NGI) for Ireland. Each European Union member state has a National Grid Initiative. NGIs are entities with a public mission aiming to mobilise funding resources at national level for the provision of grid services. The Irish NGI, Grid-Ireland, was established in 1999 to develop and coordinate the provision of national grid services for the academic research community in Ireland. It is a founder member of the European Grid Infrastructure (EGI). It supports Irish academics who wish to participate in EU projects and would benefit by bringing grid resources to the table.



What is EGI ?

EGI is a collaboration of NGIs and EIROs to coordinate a sustainable computing grid infrastructure for Europe that will seamlessly enable users access to a diverse range of widely dispersed computing resources in the most efficient and suitable manner possible. EGI headquarters are at EGI.eu in Amsterdam.

EGI's mission is aligned with the European Commission's goal to remove barriers to the free movement of knowledge across Europe. This ambition, outlined in the Lisbon Treaty, is now hailed as the fifth freedom to be enjoyed by the EU, after the free movement of goods, capital, services and people.

Grid is one of the key distributed computing infrastructure technologies underpinning the fast-evolving sectors of e-Science, e-Health and e-Government, and is expected to play a key role in the development of the European Research Area (ERA).

What are grid services?

Grid Computing is a generic term used to describe a distributed ensemble of computing services that enable user communities to form *Virtual Organisations (VOs)* and share widely distributed resources in a co-ordinated, structured, secure and trusted manner, and meanwhile guarantee that resource providers still control who may access their resources.

What is a grid infrastructure?

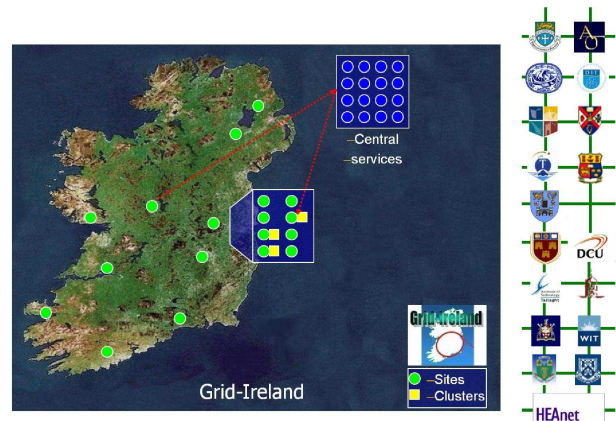
e-Science computing grids are infrastructures assembled using grid services on which groups of scientists (e.g. bioinformatics, high-energy physics) can share and aggregate computers, storage and scientific instruments. Some grid infrastructures are specific to a discipline (e.g. *Cancergrid*), whilst others serve many.

The generic European Grid

TCD/Grid-Ireland is a partner in the EU FP7 **EGI-InSPIRE** project, led by EGI.eu. Currently, this grid infrastructure is composed of some 310 sites from 57 countries, providing over 240,000 CPU cores and over 100 petabytes of data storage to many research disciplines, and will unify several previously diverse large EU grids to form a persistent generic EU Grid.

The Irish Grid

Grid-Ireland has sites and central services:





Ireland's EU Structural Funds Programmes 2007 - 2013
Co-funded by the Irish Government and the European Union



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Investing in your future

Sites that share resources (clusters/storage) do so via *gateways* that run the grid services (a layer above HEAnet). Currently over 1000 CPU cores and over 100 terabytes of storage are shared. Central services provide necessary coordination.

Grid-Ireland users

Grid-Ireland currently supports usage in the following research domains: bioinformatics, high-energy physics (incl.CERN), geophysics and earth sciences, astronomy & astrophysics, computational chemistry, network simulation, mathematical research, grid middleware and marine sciences. Support staff can advise on the best way for users to get their applications grid-enabled as quickly as possible, and a helpdesk tracks all user requests and issues.

Grid applications are typically *loosely-coupled*, where the workload can be easily broken down into smaller sets of individual tasks that have little or no interaction with one another. In this way, a large job may be grid-enabled in an efficient manner. In addition, Grid-Ireland staff are joint leaders with CSIC in Spain in expanding the support for *tightly-coupled* (MPI) parallel workloads on the EU Grid.

Grid-Ireland policy activities

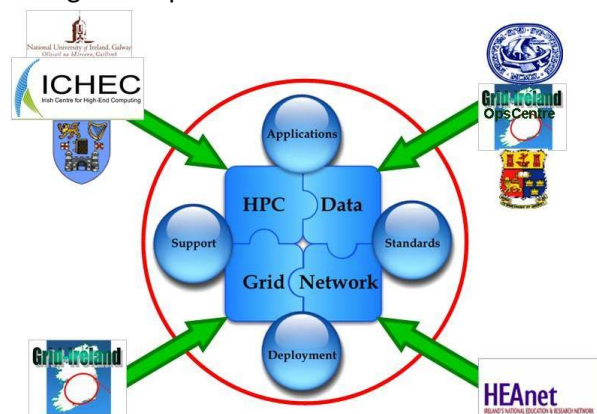
Grid-Ireland is primarily a policy body that engages with its EU peers, the Irish Government and other interested parties. It establishes the policies, practices and standards for grid operations in Ireland. It interacts with its peers within EGI, which is a member of the European e-Infrastructure Forum along with PRACE and Geant. User requirements influence policy inputs to the relevant funding agencies.

Grid-Ireland operational activities

Grid-Ireland delegates its operations to the OpsCentre, based in Trinity College Dublin, which is recognised internationally as the operations centre coordinating Irish grid activities, e.g. it is the body that issues grid certificates accepted by most major grid infrastructures. It also underpins Irish grid activities in major EU projects. It interacts with EU Grids, especially EGI-InSPIRE, which interfaces with EU ESFRI projects. It is funded by the EU FP7, and by the HEA as part of the e-INIS collaboration under PRTL cycle 4.

e-INIS integrated e-Infrastructure

The e-INIS initiative aims to coordinate and enhance activities to create a sustainable national e-infrastructure. Since 2007 it has made significant input into the Irish Centre for High Performance Computing on HPC, into HEAnet for federated identity management and lambda switched 10Gbps networking, into the Grid-Ireland OpsCentre as funding, and into the OpsCentre, DIAS and UCC for a large scale pilot national datastore.



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Grid-Ireland OpsCentre

Department of Computer Science Trinity College Dublin

What is Grid-Ireland ?



In Ireland, the universities and other institutions of advanced education and research are represented by the Higher Education Authority (HEA), and computing systems at these institutions are interconnected by the HEAnet.

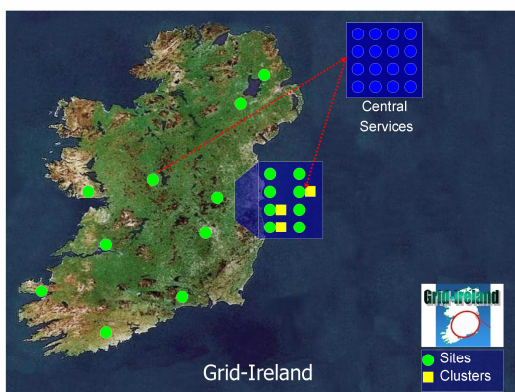
Grid-Ireland is a managed layer above HEAnet that provides grid services.

The aim is to enable communities of users, for example, astrophysicists, geneticists or linguists, to construct virtual organizations above Grid-Ireland.

The guiding principle is that there may be many virtual organizations, but there only needs to be one grid layer.

Infrastructure

All Grid-Ireland sites are interconnected with the Grid using a homogeneous set of hardware and software resources. Minor changes are required to customise to the local environment. Machine configurations are securely distributed from a central repository.



National Collaborations

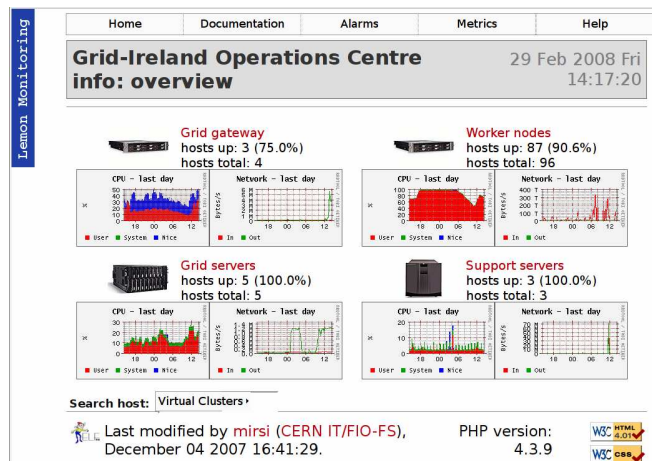
A varied range of projects are supported. These include national VOs such as CosmoGrid and WebCom-G. Grid-Ireland is also a core partner in the HEA PRTL14 project e-INIS to create a sustainable national e-infrastructure.

European Collaborations

Through the OpsCentre, Grid-Ireland also collaborates in international grid efforts such as EGEE and Int.EU.Grid, and is preparing for the European Grid Infrastructure (EGI), a federation of national Grid infrastructures (NGIs). Grid-Ireland supports Irish academics who wish to participate in EU projects and would benefit by bringing grid resources to the table.

Grid-Ireland OpsCentre

The national Grid is closely monitored by the operations team based in Trinity College Dublin. From there, they are able to view an up-to-date overview of the status of the Grid. The Grid-Ireland OpsCentre is the EGEE Regional Operations Centre (ROC) for Ireland.



A major OpsCentre goal is to support many flavours of operating systems and architectures. Currently it leads the EGEE-II porting activity, which will enable the gLite middleware to run on diverse operating systems such as MacOS X, Solaris, AIX, as well as the common variants of Linux, such as CentOS, Debian and Ubuntu.

Grid-Ireland Local ETICS Build of gLite-3_1_0

News: gLite WN 3.1.0-6 now available for SuSE 9.3 and CentOS 4.6. Installation guide and:

Builds using ETICS version: 1.3.2-1 (Debian x86_64 at PSNC)

ARCH	OS TYPE	VERSION	DISTRO	VDT	deps	Gridfile	Basic	RGMA	VOMS	DM	gfal	WN-head	WN-prod	Full	torque
CentOS	4	yum		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	110/111	0/6	343/379	0/0
SuSE	9	apt		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	107/111	0/0	313/374	0/0
CentOS	5	yum		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	87/111	85/112	234/378	0/0
ia32	Solaris	10	pkg/tarball	0/0	0/0	10/11	14/42	0/11	7/17	7/20	N/A	N/A	N/A	N/A	N/A
Debian	4	debs		0/0	7/15	0/1	1/11	3/41	0/0	0/0	0/0	N/A	N/A	N/A	N/A
CentOS	4	yum		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	19/21	99/112	66/105	0/1
x86_64	SLES	9	apt	0/0	0/0	24/41	19/15	12/18	12/21	7/6/11	N/A	N/A	N/A	239/375	0/0
Debian	4	debs		0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	59/121	N/A	N/A	N/A
powerpc	Mac OS X	10.4	fink/tarball	0/0	0/0	11/12	13/27	0/11	0/17	11/29	N/A	42/61	170/372	0/0	0/0
powerpc	Mac OS X	10.3	fink/tarball	0/0	0/0	11/12	13/27	0/11	0/17	11/29	N/A	44/62	64/368	0/0	0/0
AIX	5	rpm/tarball		0/0	0/0	0/0	0/0	0/0	0/0	0/4	7/17	7/20	N/A	N/A	N/A

Legend: Colour: ■ To be Started ■ Started ■ DONE ■ Not Applicable
Meaning: ■ To be Started ■ Started ■ DONE ■ Not Applicable

Porting in Europe

The current LCG2/EGEE porting activity in Europe

Building the global grid: Enabling Grids for E-Science

Over the past ten years Grid computing has evolved from a research concept to a vital tool for performing scientific computation on a global scale. While there are still technical challenges involved (the software can always be improved), the more significant challenges now emerging are operational: ensuring that an infrastructure spanning the entire globe is a stable system suitable for doing serious scientific research.

One of the largest initiatives working towards this goal is the *Enabling Grids for E-science* project funded by the EU:

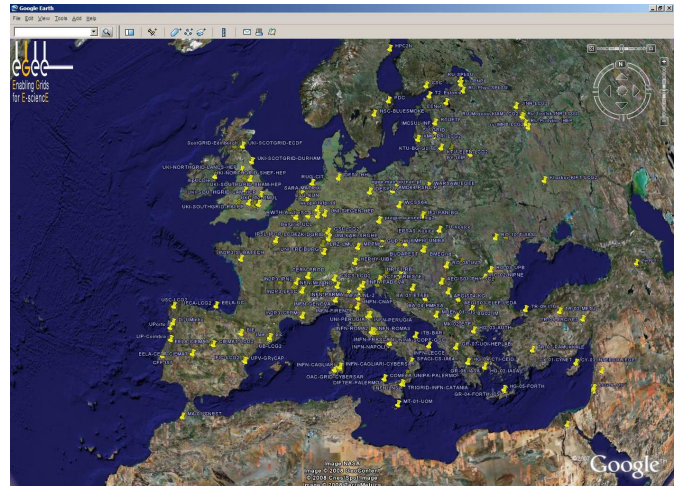
“The Enabling Grids for E-science project brings together scientists and engineers from more than 240 institutions in 45 countries world-wide to provide a seamless Grid infrastructure for e-Science that is available to scientists 24 hours-a-day. Conceived from the start as a four-year project, the second two-year phase started on 1 April 2006, and is funded by the European Commission.

Expanding from originally two scientific fields, high energy physics and life sciences, EGEE now integrates applications from many other scientific fields, ranging from geology to computational chemistry. Generally, the EGEE Grid infrastructure is ideal for any scientific research especially where the time and resources needed for running the applications are considered impractical when using traditional IT infrastructures.

The EGEE Grid consists of 41,000 CPU available to users 24 hours a day, 7 days a week, in addition to about 5 PB disk



The new 768-core Dell Grid cluster at TCD



The European Grid as seen on Google Earth

(5 million Gigabytes) + tape MSS of storage, and maintains 100,000 concurrent jobs. Having such resources available changes the way scientific research takes place. The end use depends on the users' needs: large storage capacity, the bandwidth that the infrastructure provides, or the sheer computing power available.” [from <http://www-eu-egee.org>]

As the Irish partner in EGEE, TCD is responsible for the entire Irish grid infrastructure. The Computer Architecture and Grid group runs the Grid-Ireland Operations Centre, which is responsible for managing core services that tie the various sites together into a grid. We have also recently installed a new cluster of computers from Dell which makes the equivalent of 768 desktop processors available to Irish and European scientists wishing to run their computations on the Grid.

In addition, the CAG research group is currently taking a leading role in some important initiatives within EGEE which will make Grid software useful to a wider community of users:

- **Improving support for parallel programs:** The initial users of the Grid were mainly interested in running many 1000s of independent jobs, and so the support for running compound jobs made up of multiple communicating programs was limited. CAG has developed tools to help configure sites to support parallel jobs and to test functionality at sites.
- **Making the Grid middleware work on a wider range of operating systems:** TCD has been working on porting the Grid software to a wide range of platforms and now coordinates porting efforts across the whole EGEE project.
- **Developing software for managing large and complex systems of clusters and servers:** We are active contributors to the Quattor toolkit for installing and configuring Grid infrastructures.

Grid-Ireland closure on 31 December 2012. Please note that all Grid-Ireland service will be shut down. [Grid services CA](#)

Grid-Ireland closure on 31 December 2012

As a result of a funding decision in mid-2011, the Grid-Ireland Operations Centre at TCD cannot be sustained beyond the end of 2012.

We would like to thank all of our users, site administrators, supporters and staff for contributing to Grid-Ireland's successes over the years.

- [Grid services closure information](#)
- [CA closure and migration](#)
- [News item: Grid-Ireland Operations Centre Closure on 31 December 2012](#)

News

- [Grid-Ireland CA closure and migration](#)
October 24 2012 10:45:03.
- [Grid-Ireland decommissioning is under way](#)
October 22 2012 15:01:09.
- [Grid-Ireland Operations Centre Closure on 31 December 2012](#)
July 27 2012 13:00:03.
- [A Higgs Boson is found at CERN](#)
July 05 2012 13:35:01.

Grid-Ireland involvement in the LHC: The [Grid-Ireland Operations Centre](#) is involved in data storage and processing for the ATLAS and LHCb experiments.

Higgs boson observed at CERN.
70 million CPU hours contributed by TCD over 5 years for LHC.

ATLAS Preliminary
 2011 + 2012 Data
 - - CL_s 1σ
 - - Exp. 1σ
 - - CL_s 2σ
 2011 Data
 - - CL_s 1σ
 - - Exp. 1σ
 - - CL_s 2σ

90% CL Limit (σ)

100 200 300 400 500 600
m_H (GeV)

Higgs Boson

www.grid.ie

Grid-Ireland at TCD provides computing resources to the ATLAS and LHCb experiments. "CPU hour" refer to normalised HEPSPROC CPU hours.
 First ATLAS Experiment © 2012 CERN used for informational purposes.

e-INIS eGI

Press Coverage

4th July 2012: Higgs Boson discovered! See [press coverage](#).

The aim of Grid-Ireland is to enable **communities of users**, for example, astrophysicists, geneticists or linguists, to construct virtual organizations above Grid-Ireland. The guiding principle is that there may be **many virtual organizations**, but there only needs to be **one grid layer**. The benefit is a research platform for scientists and an object of research for computer scientists, and a natural symbiosis between the two.

e-INIS The Grid-Ireland Operations Centre is a partner in the [e-INIS](#) project to develop a national e-Infrastructure for Ireland. e-INIS is funded by HEA under PRTL1 cycle 4 as part of the National Development Plan and with support from EU structural funds.

GridCafé To learn more about grid computing you can visit the [Grid Café](#) at [CERN](#). Find out how grid computing works, what grid computing can do, what it could mean for you, and much more.

The [Grid-Ireland Operations Centre](#) participates in:

- [e-INIS](#), the [Irish National e-Infrastructure](#)
- [EGI](#), the [European Grid Infrastructure](#)
- [EMI](#), the [European Middleware Initiative](#)
- [StratusLab](#), with the aim of [enhancing grid infrastructures with virtualization and cloud technologies](#)
- [HELIO](#), the [Heliophysics Integrated Observatory](#)
- [Mantychore](#), [IP Networks as a Service](#)
- [SCI-BUS](#) [Scientific gateway-based user support](#)
- ER-Flow, Scientific workflows