The University of Dublin | Trinity College
Ollscoil Átha Cliath | Coláiste na Tríonóide

school of | Computer Science & Statistics

Grid-Ireland OpsCentre

Department of Computer Science
Trinity College Dublin

What is Grid-Ireland ?

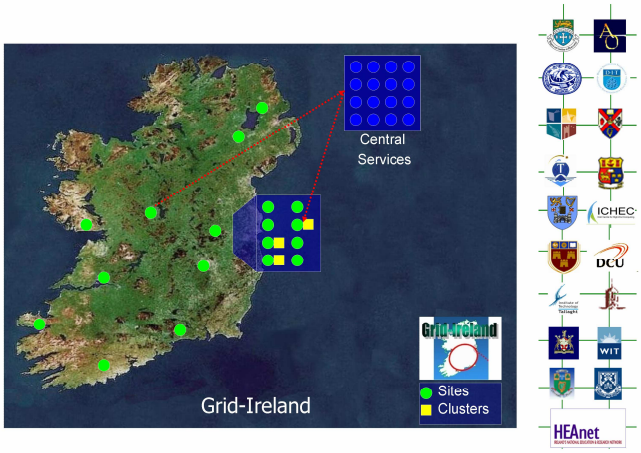
In Ireland, the universities and other institutions of advanced education and research are represented by the Higher Education Authority (HEA), and computing systems at these institutions are interconnected by the HEAnet. Grid-Ireland is a managed layer above HEAnet that provides grid services.

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

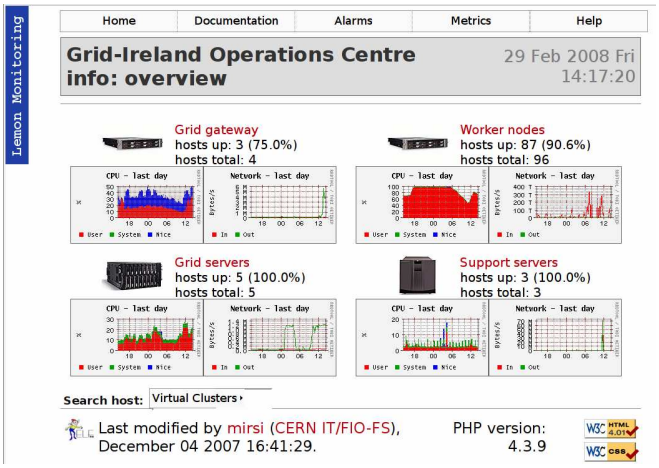
A varied range of projects are supported. These include national VOs such as CosmoGrid and WebCom-G. Grid-Ireland is also a core partner in the HEA PRTLI4 project e-INIS to create a sustainable national e-infrastructure.

European Collaborations

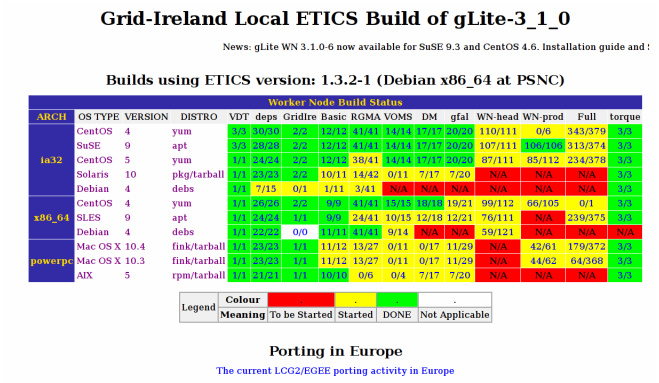
Through the OpsCentre, Grid-Ireland also collaborates in international grid efforts such as EGEE and Int.EU.Grid, and is preparing for the European Grid Infrastructure (EGI), a federation of national Grid infrastructures (NGIs). Grid-Ireland supports Irish academics who wish to participate in EU projects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

Worker Node Build Status

ARCH	OS TYPE	VERSION	DISTRO	VDT	deps	GridIre	Basic	RGMA	VOMS	DM	gfal	WN-head	WN-prod	Full	torque
ia32	CentOS	4	yum	3/3	30/30	2/2	12/12	41/41	14/14	17/17	20/20	110/111	0/6	343/379	3/3
	SuSE	9	apt	3/3	26/26	2/2	12/12	41/41	14/14	17/17	20/20	107/111	106/106	313/374	3/3
	CentOS	5	yum	1/1	24/24	2/2	12/12	38/41	14/14	17/17	20/20	87/111	85/112	234/376	3/3
	Solaris	10	pkg/tarball	1/1	23/23	2/2	10/11	14/42	0/11	7/17	7/20	N/A	N/A	N/A	3/3
	Debian	4	debs	1/1	7/15	0/1	1/11	3/41	N/A	N/A	N/A	N/A	N/A	N/A	3/3
x86_64	CentOS	4	yum	1/1	26/26	2/2	9/9	41/41	15/15	16/16	19/21	99/112	66/105	0/1	3/3
	SLES	9	apt	1/1	24/24	1/1	9/9	24/41	10/15	12/18	12/21	76/111	N/A	239/375	3/3
	Debian	4	debs	1/1	22/22	0/0	11/11	41/41	9/14	N/A	N/A	59/121	N/A	N/A	N/A
powerpc	Mac OS X	10.4	fink/tarball	1/1	23/23	1/1	11/12	13/27	0/11	0/17	11/29	N/A	42/61	179/372	3/3
	Mac OS X	10.3	fink/tarball	1/1	23/23	1/1	11/12	13/27	0/11	0/17	11/29	N/A	44/62	64/368	3/3
	AIX	5	rpm/tarball	1/1	21/21	1/1	10/10	0/6	0/4	7/17	7/20	N/A	N/A	N/A	3/3

Legend	Colour		.		.
	Meaning	To be Started	Started	DONE	Not Applicable

Porting in Europe

The current LCG2/EGEE porting activity in Europe

HEA Higher Education Authority An tÚdarás um Ard-Oideachas | NDP National Development Plan | European Union Structural Funds

e-Inis | int.eu.grid | eGee Enabling Grids for E-sciencE

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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.

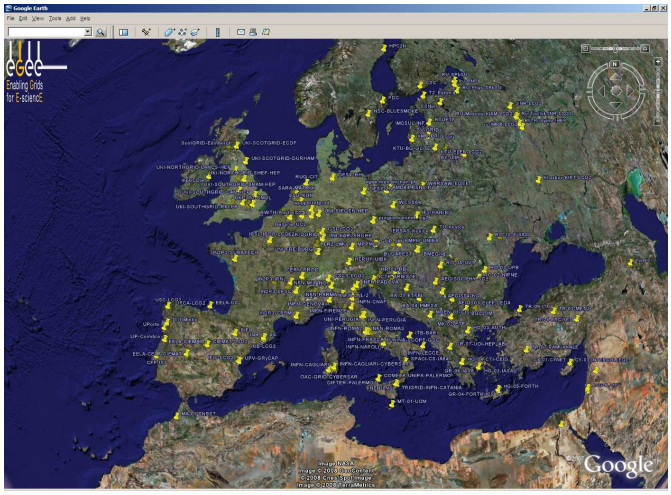
One of the largest initiatives working towards this goal is the *Enabling Grids for E-sciencE* project funded by the EU:

"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 (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]

The new 768-core Dell Grid cluster at TCD



The European Grid as seen on Google Earth

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.

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