The Swedish Computing Infrastructure

Erwin Laure

Sweden aims at providing a full range of compute and storage services, ranging from high-throughput Grid systems to leading edge massively parallel HPC systems to Swedish scientists. This infrastructure is coordinated by a metacentrum, SNIC, the Swedish National Infrastructure for Computing, responsible for the strategic and scientific development and funding of computing and storage resources in Sweden.

This infrastructure is being used by a wide variety of Swedish scientists and builds the backbone of the recently launched national e-Science special research programs. It also builds the basis for Sweden's participation in major European infrastructures, particularly EGI and DEISA/PRACE.

In this talk we give an overview on the Swedish Computing Infrastructure with a particular focus on its usage and relations to international efforts.

Extending Service Grids with Desktop Grids

Peter Kacsuk

Current Grid systems can be divided into two main categories: service grids (SG) and desktop grids (DG). Service grids are typically organized from managed clusters and provide a 24/7 service for a large number of users who can submit their applications into the grid. The service grid middleware is quite complex and hence relatively few managed clusters take the responsibility of providing grid services. As a result the number of processors in SGs is moderate typically in the range of 1.000-50.000. Even the largest SG system, EGEE has collected less than 200.000 computers.

Desktop grids are collecting large number of volunteer desktop machines to exploit their spare cycles. These desktops have no SLA requirement, their client middleware code is extremely simple and hence typical number of volunteer desktops in desktop grids is in the range of 10.000-1.000.000. However, their drawback is that they can execute only some very limited number of pre-registered applications, typically compute-intensive bag-of-task applications. The most well-known volunteer desktop grid is SETI@home that collected over 2 Million CPUs.

Comparing the price/performance ratio of SGs and DGs the creation and maintenance of DGs is much cheaper than the one of SGs. Therefore it would be most economical if the compute-intensive bag-of-task applications could be transferred from the expensive SG systems into the cheap DG systems and executed there. The recognition of these advantages of extending SGs with DGs led to the initiation of the EDGeS (Enabling Desktop Grids for e-Science) EU project that was launched in January 2008 with the objective of integrating these two kinds of grid systems into a joint infrastructure in order to merge their advantages into one system. The EDGeS project extended gLite-based service grids with BOINC and XtremWeb DG systems.

To make these systems interoperate EDGeS has developed the 3G Bridge (Generic Grid-Grid Bridge) technology that enables the interconnection of any service and desktop grids. This bridge was used in EDGeS to create the gLite ↔ BOINC and gLite → XtremWeb bridges. The concept of 3G Bridge is so generic that it was successfully applied in the EELA-2 project, too in order to interconnect the OurGrid P2P desktop grid with gLite service grids. Based on the 3G Bridge technology EDGeS has created a production infrastructure where any gLite VO can be extended with volunteer and institutional DG systems. EDGeS has also ported 12 gLite applications from various scientific areas to the EDGeS infrastructure and created an application repository from where gLite users can access these applications.

Built on the success of EDGeS a follow-up project, called as EDGI (European Desktop Grid Initiative), was launched in June 2010. The objectives of EDGI include the extension of the EDGeS infrastructure with ARC and Unicore service grid support and to enable the execution of even data-intensive applications. Further on to provide QoS for the integrated infrastructure DG systems of the EDGI infrastructure will be extended with Cloud resources when required.

All these experiences of EDGeS will be explained in detail in the talk. At the end, some future plans of the EDGI project will be shown giving details how to support QoS requirements in the DG part of the integrated SG-DG infrastructure by supporting DG systems with some dedicated local academic clouds.

Structure and Recent Advancements of National Grid Infrastructure in Poland

Jacek Kitowski

The Polish Grid Initiative commenced in 2009 in the context of the PL-Grid Project funded under the framework of the Innovative Economy Operational Programme. The main purpose of this Project is to provide the Polish scientific community with an IT platform based on Grid computer clusters, enabling e-science research in various fields. The Project is establishing a country-wide Polish Grid infrastructure, which supports scientific research through integration of experimental data and results of advanced computer simulations carried out by geographically-dispersed teams. PL-Grid aims at significantly extending the amount of computing resources provided to the Polish scientific community and constructing a Grid system facilitating effective and innovative use of the available resources. In the paper some basic facts concerning the PL-Grid Project goals are outlined together with achieved results represented by several examples of innovative grid services and software developed within PL-Grid as well as user support procedures. Polish Grid Initiative has been considered to be the first working NGI in Europe.

D-Grid Infrastructure

Stefan Freitag

Like similar endeavors in other countries, the D-Grid initiative sponsored by the Federal Ministry of Education and Research has been started in 2005 to establish a national e-infrastructure that is particularly targeted towards public research and private-public partnerships involving small and medium enterprises. During the last five years, more than thirty projects of D-Grid have produced new insights and technological advances. Amongst others these projects helped to identify future challenges by extensively utilizing the D-Grid infrastructure with altogether more than 145 Mio CPUh in 2009.

This talk gives an overview on the organizational and structural aspects of D-Grid and describes its characteristics on the technical level. Furthermore, it addresses Cloud computing and quality- of-service provisioning as two of the identified technical challenges.

Preliminary program:

Monday	8.11.2010	13:00 – 13:30	Registration
		13:30 – 14:00	Opening session
		14:00 – 14:45	**Invited lecture** ***Jacek Kitowski***
		14:45 – 15:30	**Invited lecture** ***Peter Kacsuk***
		15:30 – 16:00	Coffee break & Press conference
		16:00 – 16:45	**Invited lecture** ***Erwin Laure***
		16:45 – 17:30	**Invited lecture** ***Stefan Freitag***
		17:30 – 18:00	**Vendor session**
		18:00 – 18:30	**Panel discussion**
		18:30	**Reception**
Tuesday	9.11.2010	9:00 – 9:40	Invited lecture
		9:40 – 11:00	Session 1
		11:00 – 11:15	Coffee break
		11:15 – 12:35	Session 2
		12:35 – 13:30	Lunch
		13:30 – 14:00	Invited lecture
		14:00 – 15:00	Session 3
		15:00 – 15:15	Coffee break
		15:15 – 15:55	Session 4
		15:55 – 17:15	Session 5
Wednesday	10.11.2010	9:00 – 9:40	Invited lecture
		9:40 – 10:20	Session 6
		10:20 – 10:35	Coffee break
		10:35 – 11:55	Session 7
		11:55 – 12:30	Consortium "SlovakGrid"
		12:30 – 13:00	Program committee meeting
		13:00	Closing ceremony
Wednesday	10.11.2010	13:30 – 15:30	Course on Development of Grid Applications

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6th International Workshop on Grid Computing for Complex Problems GCCP 2010

November 8-10, 2010
Institute of Informatics, Slovak Academy of Sciences, Bratislava, Slovakia
Website: http://conference.ui.sav.sk/gccp2010/

The yearly meeting place of top researchers and practitioners in e-Science related to Grid Technologies, GCCP is one of the largest conferences in Central Europe in its area organized on a yearly basis, where many top researchers are regularly presenting their work. During its previous 5 years of existence, 23 distinguished keynote speakers were invited to attend and share their knowledge, thus reinforcing GCCP quality.

The aim of the conference is to inform the wide professional public, special and scientific workers from industry, research institutions, Academy of Sciences, project and supplying organizations, and technical universities and high schools about the newest knowledge in the area of grid computing and to ensure exchange of their experience.

We invite researchers and scientists interested in distributed high-performance computing to attend **invited lectures** given on **Monday, November 8, 2010** at **14^{00}** in the great hall of the SAS. After the presentations, a **panel discussion** will be organized, which may continue during a **reception**.
Attendance to the first day events of the workshop is **free of charge** (for organizational reasons, please register by e-mail conference.ui@sav.sk up to November 2, 2010).