

CERN COMPUTER NEWSLETTER

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CERN participates in Telecom World 2009



The popular "Lake Geneva Region" stand, including the seven screens connected to the CERN intranet to showcase the Large Hadron Collider. Photo courtesy of CERN.

Telecom World 2009 took place at Geneva's Palexpo on 5–9 October. This high-profile internationally renowned show, organised by the International Telecommunications Union (ITU), attracts visitors from the public and private sectors sharing a common interest in information technologies and communication. While the show was significantly smaller than in previous years, Asia and Africa were strongly represented.

Why did CERN participate?

The theme of Telecom World 2009 was "open networks, connected minds" and CERN perfectly matches this with its worldwide distributed community of scientists and its long-standing leading role in applying networks for scientific collaboration. In fact, CERN has participated in previous Telecom events, notably in 2003, where the land-speed record in long-distance data transmission

over 10 Gb/s was demonstrated. Today this technology is readily available and the next-generation optical links are starting to appear.

For this Telecom 2009 event we also wanted to highlight CERN's integration in the local area and teamed up with "Lake Geneva Region", who organised a 700 m² stand hosting several established companies as well as a group of start-up companies from the area.

When we first planned the event in spring 2009, we expected that the LHC would be running, so we wanted to show the machine and the experiments in action. A console similar to the one in the CERN Control Centre was set up and equipped with seven screens and a full-HD videoconferencing unit. This console was directly connected to the CERN intranet via an extension of the optical fibre supplied by the Geneva "Services Industriels" (SIG), providing a connection speed of 10 Gb/s.

The set-up was installed and tested entirely at CERN, even using a fibre link from CERN to Palexpo and back, to avoid any last-minute surprises.

The project was supported by colleagues from IT, BE and PH, bringing in their expertise in setting up the stand, the computing equipment and the demonstrations. We showed various video clips, collections of photos from the LHC and the experiments, and the LHC computing. We also linked the console to the CMS distributed control centre and followed the preparation for cosmic muon data-taking live.

What happened during the week?

While Telecom saw fewer visitors than expected, CERN's stand proved to be one of the show's most popular attractions. People were keen to find out about the LHC restart and they were curious about the computing and communication environment put into place to deal with the extraordinary amount of data. The presence of the WLCG Globe was a useful eye catcher, but because science fiction is sometimes more attractive and better known by the general public, we were happy to display one of the three original antimatter bottles from the film *Angels and Demons*, based on the book

by Dan Brown. This definitely attracted additional people.

Members of the experiments, and people from the BE and IT departments took turns on the stand to answer the many questions raised by the videos, diagrams and monitoring interfaces presented. Over the course of the week, three lectures were held in the "Lake Geneva Region" auditorium, presenting CERN in more detail, along with the LHC and the collaborative tools developed at CERN. The lectures were streamed live on a CERN webcast and the recordings are now available on the website of CERN's partner for the event, Swiss start-up firm Klewel (www.klewel.ch).

State-of-the-art tools

Although well known to the HEP community, the Indico software has never been presented outside of the academic network before, and this was an excellent opportunity to reveal its numerous features to the world. We showed how you can have access to managing lectures, meetings and big conferences at your fingertips via Indico's shiny new web interface (described in the previous issue of *CNL*).

The lecture was also a great occasion to demonstrate brand new features such as the booking of collaboration resources

(Evo meetings, Multipoint Control Unit videoconferences) and the request for video services (video recording, live webcast) directly from Indico. These new features have been made exclusively available to CERN users since mid-October.

Eye-catching Grid with worldwide reach

The computing Grid's new visual display tool developed by a team of engineers from the IT Department's Grid Support Group also captured the public's attention. By coupling the Google Earth interface to the "Dashboard" (a system overseeing the various computing activities of the LHC experiments), this tool provides a visualization of the data flow and the jobs submitted via the Grid over the past 10 minute time period.

During two of the lectures we used CERN's "Multipoint Control Unit" videoconferencing system and two terminals provided by Tandberg to connect live to our partners in Taiwan, India, Moscow, Germany and France. This enabled the 10 partner centres around the world to take part and interact in real time with the visitors, exemplifying the international nature of collaboration found at CERN.

Wolfgang von Rueden, IT-DI, and Thomas Baron, IT-UDS

Linux 'phonebook' rejuvenates ageing 'phone'

The Linux "phone" command, well known to all CERN UNIX users, is based on the ageing "Xwho" application, which is marked for replacement because of software portability issues and lack of support for the current legacy software.

The old Linux "phone" command is going to be deprecated on Linux SLC4 central services by the end of November and replaced by the new "phonebook" command, available on SLC4 and SLC5.

The command searches the CERN database for user information and displays the output according to certain defined search criteria.

The "phonebook" command does not provide a substitute for the thorough functionality of the "phone" command and does not support all of the different output formats of the old command. The main purpose of "phonebook" is to provide basic

user information and cover the majority of user requests, including phone numbers, e-mail addresses, offices, login name, shell and home directory.

A recent consultation of the "phone" power users at CERN has resulted in enhanced functionality of "phonebook" to provide information about the computing accounts. We thank our collaborators for this useful improvement.

From the command line, issue "phonebook -h" or "man phonebook" to get information on all of the available options and output formats or consult the FAQ at <https://espace.cern.ch/it-faqs/Lists/faqs/DispForm.aspx?ID=233>.

Technically speaking, "phonebook" is a full Perl application making LDAP calls (Lightweight Directory Access Protocol, i.e. a protocol used to access a directory listing) to get the data. Please note that

"phonebook" does not work outside the CERN network because `xldap.cern.ch` is only accessible from the CERN network.

If you use scripts referring to the "phone" command, make sure that these are updated accordingly to use the "phonebook" command.

In addition, note that the purpose of this command is to provide directory information. For other tasks like local account creation, use specialized commands such as `/usr/bin/addusercern` and avoid hard coding the "phonebook" command for such purposes.

The IT Service Status Board (<http://cern.ch/ssb>) under "Service changes" will provide you with the latest information about the deployment of "phonebook".

Catherine Delamare, IT-UDS, Jan Van Eldik, IT-FIO, Jarek Polok, IT-FIO, Emmanuel Ormancey, IT-IS, and Alexandre Lossent, IT-IS

The deadline for submissions to the next issue of CNL is

19 February

Please e-mail your contributions to cnl.editor@cern.ch

Computing Helpdesk becomes IT Service Desk on 1 January

CERN has outsourced the Desktop Support services to a company for many years. The Computing Helpdesk formed part of this contract and from 2005 the Helpdesk has become the entry point for most IT support lines covering all kinds of computing-related requests. This contract will end on 31 December.

The IT Service Desk and new contract

IT management is currently reviewing how the IT Department will deliver services. This was defined as a priority in the Program of Work. This review initially considered emerging best practices as defined in the commonly adopted Information Technology Infrastructure Library (ITIL) and process implementation, which are essential for Service Level Management. As a first step it was decided that in the new Computing Support contract, which will replace the Desktop Support contract, the old Computing Helpdesk will be changed into the IT Service Desk. The aim of the new Service Desk is to be user-oriented and fully integrated with the service delivery processes of the department.

To put this new contract in place, IT has consulted with representatives from all CERN departments and launched a market survey and call for tender. Benefiting from new procurement procedures, it was possible to base the adjudication on a best-value-for-money basis. The result was presented to the Finance Committee in September and the new contract has been officially awarded to SERCO UK.

This new contract will start on 1 January 2010 and includes some major changes, for example:

- A detailed Service Level Agreement (SLA) has been drawn up between CERN and the contractor to describe all of the services required and the service level expected. Key Performance Indicators (KPIs) and related penalties have also been defined.
- Specific sub-SLAs for “service extensions”, i.e. for services and tasks not included in the standard SLA, can be added to the general SLA.

- As is the case today, in order to measure performance and ensure compliance with the SLA, a “ticket” will be generated in a well defined incident and request tracking tool for all queries submitted to the Service Desk. However, unlike today, the contractor will take responsibility for the correct closure of this ticket, regardless of whether it is dealt with by the Service Desk or passed onto other IT services.

SLAs, OLAs and benefit for users

The SLA for the new contract defines the service level that the contractor will deliver to CERN. When a request cannot be treated by the contractor, for example, because it is outside the SLA scope, it will be escalated to a service external to the contract.

However, there are currently no SLAs defining the end-to-end service level that CERN IT delivers. This issue has often been raised by users who are not informed of the expected time before their request will be answered.

To resolve this issue and improve service, the IT management together with service managers will work on Operational Level Agreements (OLAs) for all IT services and support lines. These will define the service delivery between IT groups, and/or between IT groups and the Service Desk.

This is a real cultural change and will be a major task during 2010. These OLAs will be implemented service after service and will be made available to users as they are ready. Users will be able to track the situation with respect to their ticket and will have a sole entry point for any queries about their requests: the IT Service Desk.

New tools

Another important point raised by IT management’s global review of services was to ensure that “techniques, tools and processes are applied consistently”. With this aim, the forthcoming changes concern the Request Tracking and Change Management processes and tools.

For the new contract start, IT is actively working on a new tool for request tracking,

which will be used by the contractor (Service Desk) and all IT support lines. This tool will replace the current system, i.e. the Problem Request Management System (PRMS) application, a CERN-written application based on the BMC Remedy AR Request system.

The choice of solution was made after analysing the broad requirements and checking the options available in the market and open-source community. A commercial solution has been selected from BMC Remedy and it is a full suite of various ITIL compliant tools. The first key components are a request tracking tool (also referred to as Service Desk application) and a Service Level Management system. The suite also includes a Knowledge Management system that will be used to maintain a knowledge database/FAQ, available to service providers and end users.

The new system will be based on a service catalogue defined by the IT management. This tool also gives the possibility to measure performance of both the contractor (as defined by the KPIs in the SLA) and the IT Department (based on the OLAs) via the Service Level Management system. The tool will allow users to check the progress of their requests and enable them to provide feedback.

The priority today is the request tracking tool, where significant work is still required to configure the tool according to our requirements. The aim is to have this new tool in production during the first few months of 2010. The new tool will introduce changes for the end users too, for example, changing the way that request submission will be made to the Service Desk. Thorough testing and an information campaign will be done before it is put into production.

Useful links

CNL articles on the previous contract (Desktop Support and Helpdesk):
<http://cern.ch/cnlart/2004/002/7> and
<http://cern.ch/cnlart/2005/001/6>

Nicole Cremel, IT-UDS, for the User Support team

CNL is available on the web at <http://cern.ch/cnl>
You can also subscribe to the mailing list from here

openlab and Intel continue to deliver training to programmers

CERN openlab has been teaming up with Intel to organize regular training for CERN's programmers. Even though the schedule of four regular workshops on two major computing topics was established more than two years ago, these sessions are usually over-subscribed.

Thanks to openlab's collaboration with Intel and Hewlett-Packard, each participant at these workshops has the comfort of working on a dedicated 8-core machine with a suite of tools, including Intel Software tools such as compilers and multi-threading optimizers.

About the workshops

- The "Multi-threading and Parallelism" workshop aims to prepare the attendees for

the multi-core future.

- The "Computer Architecture and Performance Tuning" workshop teaches programmers how to write efficient code for today's computing cores based on the Intel Architecture.

Both workshops are held twice a year, last for two days each and are free of charge, with registration on a first-come first-served basis – see the links below for more details.

The most recent openlab workshop was on Computer Architecture and Performance Tuning, held on 6–7 October at CERN. openlab lecturers Sverre Jarpe and Andrzej Nowak, assisted by Jeff Arnold from Intel, covered topics such as computer architecture, benchmarking, optimization

and compilers, plus high-level issues seen in specific programming languages.

In addition, Intel and openlab recently organized a special two-day workshop for CERN's key developers in mid-September. This event was focused on getting the best performance out of applications and hardware by using tools such as the Intel Performance Tuning Utility. Another event of this type is foreseen for late November and is again targeting an expert audience.

Useful links

CERN Training Catalogue: <http://cta.cern.ch/cta2/f?p=110:9>

openlab events site: <http://cern.ch/openlab-events>

Andrzej Nowak, IT-DI (CERN openlab)

Solaris License servers stopped in October

As from 18 October, the old Solaris-based license servers were stopped. All supported engineering, mathematics and software development tools that were relying on these servers have been migrated to use new license servers on Linux or Windows. This migration should have been transparent to users.

However, users of old versions of engineering or mathematics software with local installations of the package on Windows may be affected.

Please install the latest version of your package via CMF, or use the generic FAQ below for details on how to update your installation. Links to specific FAQ entries for Ansys, Mathematica and Matlab exist on the TWiki site that is mentioned in the

Useful links below.

Discontinued products

As announced in the Desktop Forum in February 2008, the Software Development Tools (SDT) service has been stopped. This implies that no valid maintenance contract for the tools is available and thus the licenses for the following products will no longer be served:

- Codesurfer from Grammattech
- Logiscope from Telelogich
- Purify Plus, Requisite Pro, Robot, Rose, the Rational Suite and Soda from IBM Rational
- Sniff from Wind River
- IC++ Test and Insure++ from Parasoft
- Xdesigner from IST

- VisualThought from Confluent
- NAG version 7.2 with F95 support and NAG version 8 (NAG 7.2 has been moved to Linux license servers).

Users who are interested in these products or need advice about alternatives should e-mail sdt.support@cern.ch.

Useful links

Engineering software: <http://cern.ch/engineering-software/>

Solaris License Server stoppage FAQ: <https://espace.cern.ch/it-faqs/Lists/faqs/DispForm.aspx?ID=319>

TWiki page on Solaris License stoppage: <https://twiki.cern.ch/twiki/bin/viewauth/DESgroup/SolarisLicenseStoppage>

IT-DES

Student programme invites 2010 applications

The openlab student programme is open for applications from bachelor, master and PhD students in computer science and physics.

Successful applicants will spend two months at CERN, during the period June to September 2010, to work with some of the latest hardware and software technologies.

The programme is more than just a summer at CERN: it can lead to follow-on projects at the home institute and may even inspire entrepreneurs in cutting-edge computing technologies.

A series of lectures by experts in various domains of CERN related to high-throughput computing, and study tours to universities and CERN facilities are



also part of the programme.

All nationalities are welcome to apply, as long as the home institute supports the application. Note that partial funding is available and normally the home institute is expected to co-fund the stay at CERN.

Please visit www.cern.ch/openlab for

more information. Candidates should send a CV and letter of support from a supervisor to sverre.jarpe@cern.ch. The closing date is 31 March 2010. Please pass this information on to students, institutes and contacts that you may have in this area.

Mélissa Le Jeune, IT-DI (CERN openlab)

Connecting to CERN from home

With an eye on news reports and concerns raised by various flu viruses currently circulating, this article outlines the best practices for connecting to the CERN computing environment should you need to work from home.

- Webmail: access to your CERN mail via the web.
- Windows Terminal service: access to a standard CERN Windows environment, making your own folders and files stored in “My Documents” available to you.
- Windows Remote Desktop Gateway: access to your own CERN PC via this pilot project – which is only recommended if you need to use specialized locally installed programs, or files stored on your local drive.
- Secure Shell (SSH) at CERN: for connecting to LXPLUS and SSH tunnelling for Linux, Macintosh and Windows systems. See <http://cern.ch/security/ssh> for details.

Webmail

The MMM website – My Mail and More (<https://cern.ch/mmm/services/>) allows you to log on to the Outlook Web Access interface. All of your CERN mail folders stored on the server are available through this simple-to-use webmail interface. Your contacts and calendar are also there, making this an effective method for staying in touch.

From the MMM page you can also make use of the CERN Mail Tools, such as setting your out-of-office message, your mail forwarding rules, etc.

This practical service is recommended for all users because this simple webmail interface works with all standard browsers on the usual platforms.

Windows Terminal Service

This service gives you immediate access to the most common applications used at

CERN in addition to your own folders.

The Windows Terminal Service (WTS) is easy to connect to, all you have to do from a Windows PC is:

- Register to use this service: <https://cern.ch/winservices/tsc/Tools/Register.aspx>.
- From home, open the Remote Desktop Connection (Start menu – All programs – Accessories) and enter “cern.ch” in the “Computer” field.
- Login with your CERN username and password.

There are clients available for Linux and Macintosh, and it is also possible to use Internet Explorer directly from Windows. More information is available on the internet at <https://cern.ch/winservices/Help/?fdid=30>.

There are many benefits to using this service, such as having MS Office applications available, including Outlook and PowerPoint which are not included in home editions of Windows. You also gain access to your browser favourites stored at work, making this environment feel very similar to your work desk.

The “My Documents” folder will be available with any other files stored on the server. As this service means you are connected to the CERN network, you can access websites that are restricted to the CERN domain, and populate the links in “My Network Places” to edit webpages as if you were at CERN.

The standard WTS profile is also simple to customize, for example by adding quick launch shortcuts and desktop shortcuts to specific applications or folders. Although this basic CERN Windows environment will not include any application customizations you might have made on your work computer, e.g. customized toolbars, you can add them so that they are included in your profile for the next time you use the service.

Windows Remote Desktop Gateway – pilot phase

The pilot Remote Desktop Gateway is available for advanced PC users who need to access their CERN computer from home – either for specialized locally installed software, or to access local files/folders.

For the Remote Desktop Gateway to work, your office computer must be:

- left powered on and running (not hibernated or on stand-by);
- connected to the network;
- running Windows;
- and a member of the “cern.ch” domain.

In addition, your home computer must be running Windows.

Although this method may be easier to set up than the alternative SSH tunnelling via LXPLUS, it is difficult to track down any errors and it is not possible to resolve problems remotely via the Helpdesk.

The basic setup procedure is to:

- Prepare your desktop computer by following the instructions at <https://cern.ch/winservices/tsc/gateway/SetRemoteAccessAccounts.aspx>.
- Use the “Download Remote Desktop Connection Shortcuts” to download the “From the internet” shortcut. If you download this at CERN, save the shortcut and copy it to the PC you will be using at home. See <https://cern.ch/winservices/Help/?kbid=350001> for details.

General security recommendations applicable to all methods

Please ensure that your computer is properly protected before you connect to CERN: both with the latest patches and a suitable up-to-date anti-virus program. Don’t forget that CERN has a license for Windows users at home for MS Forefront Client Security. Details are available from <https://cern.ch/winservices/Help/?kbid=051092>.

IT Department

New training improves code quality and security

Software applications often suffer from security vulnerabilities, i.e. design flaws or programming bugs that remained undetected during the whole software development cycle. In production these vulnerabilities become security holes, providing an opportunity for exploitation and can pose immense security risks to an organization (and there is no reason to believe that CERN is immune to this).

The costs associated with eliminating these bugs is loosely described by the “1:10:100 rule”. The relative costs for fixing bugs are 1:10:100 for fixing them in the programming:testing:production

phases. Thus, the earlier that vulnerabilities are detected, the cheaper it is to fix them. This also prevents a bug from being exploited.

To help software developers at CERN to create secure software, to make them aware of critical areas when programming and to give them the tools to avoid introducing security holes, the Technical Training and Computer Security teams have organized five specialized hands-on security courses for software and web application developers. These courses are intended for people who spend the majority of their time programming software

applications and/or websites, and already have a good understanding of the particular language in use. The courses currently available are:

- Secure coding for C++ (two days)
- Secure coding in Java (one day)
- Secure coding for Perl (four hours)
- Secure coding for Python (four hours)
- Secure coding for web applications and web services (one day).

These courses are given by trainers from the Siemens Computer Emergency Response Team in English. Details can be found at <http://cta.cern.ch/cta2/f?p=110:9>.

Computer Security Team

AFS revisited: job authentication

These “AFS revisited” articles are intended to act as short reminders. Here we look at standard AFS commands, common pitfalls and some tips and tricks to get more out of AFS at CERN.

In AFS, data access is granted through “AFS tokens”, in-kernel derivatives of the user’s Kerberos credentials. Tokens are typically acquired automatically at login time or by running `kinit`, which at CERN acquires a Kerberos ticket and an AFS token.

For security reasons, Kerberos credentials and AFS tokens have a limited lifetime and can expire. The default lifetime of Kerberos tickets at CERN is 25 hours and because AFS tokens are derived from the Kerberos credentials, tokens expire after 25 hours as well.

It is not uncommon to have processes that need credentials beyond this one-day limit, or that jobs need to be started long after the user credentials have expired. Depending on the situation, AFS at CERN provides different options to deal with these requirements.

acron

The `acron` facility is an AFS-aware extension of the `cron` daemon. In addition to `cron`’s ability to run a command at any given time or at regular intervals, `acron` will schedule the job on a given node and equip the environment with Kerberos credentials and an AFS token on the user’s behalf. The user interface to `acron` is the `acrontab` command, which resembles the usual System V `crontab` command:

- `acrontab -l` lists your `acron` jobs
- `acrontab -e` lets you edit your `crontab`
- `acrontab -r` deletes all your `acron` jobs
- `acrontab` (without option) reads your commands from standard input.

The format of the `acrontab` entries is very similar to the one in Unix System V, with a few additions. For example:

- the hostname of the target host must be specified along with the command
- comments will be removed
- to protect the service, some limits on the frequency of commands are imposed.

An `acrontab` entry hence follows the schema:

```
Minute Hour DayOfMonth Month
Weekday TargetHost Command
```

The “*” character is allowed for all fields from Hour to Weekday. The entry

```
21 10 * * * lxplus.cern.ch date >>
cron.test
```

would run the command “`date >> cron.test`” on an `lxplus` node every day at 10.21 a.m. Because `acron` jobs are executed relative to a user’s home directory, we would expect to find the file `cron.test` there. Note that a user needs to have a valid Kerberos ticket when editing their `acrontab` and that the target node must have the `arc` environment properly set up to accept commands sent by the `acrontab` server.

Ticket renewal

While `acron` allows a command to be run at any given time or at regular intervals and can provide the job with the user’s credentials, some processes require valid credentials for more than the standard ticket (and token) lifetime of 25 hours. To address this, Kerberos tickets have an attribute “renewal lifetime”. If the ticket has not expired, it can be renewed and the validity extended up to five days, which is the value of the Kerberos renewal lifetime at CERN. The renewal is done by running “`kinit -R`”. Note that the renewal has to happen while the ticket is still valid: a ticket cannot be renewed if it has expired, even if the renewal lifetime has not expired yet.

k5reauth

For jobs that need to run longer than this five-day timespan, the tool `k5reauth` can be used. `k5reauth` runs a command and periodically provides it with renewed Kerberos and AFS credentials – if desired as long as the command runs. In principal, the tool can be run in two different modes. It either:

- reuses the existing Process Authentication Group (PAG) and renews the existing Kerberos and AFS credentials (until the renewal lifetime expires), or
- creates a new PAG, acquires and renews Kerberos and AFS credentials until the command started by `k5reauth` ends (initial authentication is done by password or keytab).

The functionality of `k5reauth` might be familiar to some users because it was provided in a similar way by a tool called “`reauth.pl`”. As the name indicates, `k5reauth` introduces Kerberos5, while the old tool was using the now deprecated Kerberos4 protocol. A benefit of `k5reauth` is that it also keeps track of the child process started and exits if the child process exits. With the old `reauth` tool, the mechanism to renew the credentials continued to run even when the launched command exited, leaving behind a number of processes that renewed obsolete credentials.

Sample calls

Here are some examples to illustrate how to use `k5reauth`. The command

```
$ k5reauth
```

will prompt for the current user’s password, create a new PAG and then start a shell (the default command if none given) with forever-renewed Kerberos and AFS credentials.

```
$ k5reauth -R -- myprog
```

will reuse the existing PAG and the existing credentials to run the program `myprog`. The credentials are renewed up to the renewal expiry lifetime (five days after the initial credentials have been acquired). The double dash “`--`” is used to separate options to `k5reauth` from the options for the program to be launched.

For programs that need to run longer than the five-day renewal lifetime our sample user Phyllis could use

```
$ k5reauth -p phyllis -k ./phyllis_
keytab -- anotherprog
```

This will create a new PAG, using Phyllis’ `keytab` to acquire credentials for her and then launch the command `anotherprog`. The credentials are renewed as long as `anotherprog` runs. Please refer to the `k5reauth` reference manual pages for advice on how to extract a keytab for a user.

A common pitfall

`k5reauth` only watches the command being executed and not any child processes that may have been launched by it. Because many daemons fork off a child and then exit in order to disconnect the original process from the terminal, the exiting parent process causes `k5reauth` to end the renewal of credentials. This leaves the child process running without valid tickets after a while. To address this, `k5reauth` provides the “`-f`” option, which mimics the old `reauth` behaviour of performing the renewal of credentials without the aforementioned cleanup process.

Useful links

The `k5reauth` man page provides information on all of the available options, along with usage examples. The openAFS website provides information on all AFS commands: <http://docs.openafs.org/Reference/index.html>. The CERN AFS User Guide is a much more comprehensive manual, available at <http://cern.ch/service/afs>.

Arne Wiebalck, IT-FIO

Barcelona welcomes EGEE'09

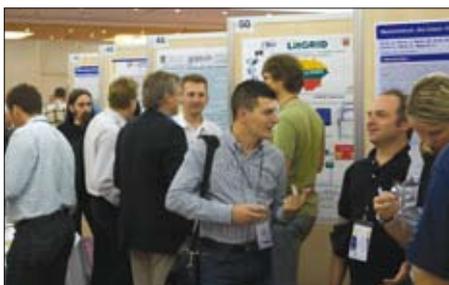
Barcelona had its hands full during the third week of September. In addition to hosting the iconic artwork that the city is known for, the annual Mercè festival filled the streets with music, dancing, human-tower building and gigantic dolls. Among the crowds fighting for space on La Ramblas was a unique group. Hundreds of people from all around the world were on hand to celebrate the final conference of Europe's flagship Grid-computing project and to discuss and plan for the future of computing for scientific research.

Enabling Grids for E-science '09 (EGEE'09) gathered 631 people from 43 countries. The week was exceptional for its rich scientific and technical presentations: attendees chose from 108 programme sessions and were shown 57 posters and 22 demonstrations. Delegates came from a wider-than-usual selection of the Grid community: notably representatives from 11 proposed European Strategy Forum on Research Infrastructures (ESFRI) projects, and from US and EC e-Infrastructure funding offices. There were also meetings of many boards and subgroups – particularly the European Grid Initiative (EGI) Council and the meetings of proposed Specialised Support Centres (SSCs).

ESFRI sessions – big plans on the horizon

EGEE'09 represented a seminal milestone in the preparations of EGI-linked projects and their services to user communities, as well as the planned research infrastructure projects known collectively as ESFRI. These are ambitious, large projects (similar to the LHC in scope), which will require mammoth computing support as they start up over the next five to 10 years. Having a generic infrastructure – such as the one that can be co-ordinated through EGI – will help these projects to build their distributed research environment and avoid wasting time and resources in creating unique infrastructures.

On the Tuesday, John Wood, the chair of the European Research Area Board, opened the plenary session “Operational Grid Infrastructures after EGEE”. Wood highlighted key issues for European research in the future and shared his thoughts on developing a methodology for linking research infrastructures



The poster sessions were well attended, with authors available to answer questions. Photo courtesy of Andrew Maier.

(i.e. the proposed ESFRI projects) and e-Infrastructures, such as GEANT, DEISA/PRACE and EGEE/EGI.

A number of common organizational and technical needs emerged from the ESFRI presentations. These projects may benefit by using common approaches, in collaboration with Europe's pre-existing e-Infrastructures.

EGEE will be following up on the discussions and contacts made with ESFRI projects. An EU concertation meeting in Brussels in late October allowed these discussions to progress, contacts have been set between members of EGEE (within the Project Management Board) and representatives of the ESFRI projects. The recently formed European E-Infrastructure Forum may be a useful interaction point between ESFRI projects and e-Infrastructures.

Planning for EGI – full steam ahead

During Thursday's meeting the council elected Per Öster of CSC, Finland, as the EGI Council chairman. Öster will drive the agenda of the EGI activity and liaise with the proposal-writing team in preparation for submitting the EGI proposal to the European Commission on 24 November.

The EGI Council also allocated most of the global operational and infrastructure-focused tasks to National Grid Initiatives. These allocations are now being integrated into the proposal. The remaining global tasks, primarily those related to middleware, are available for all NGIs and EIROs (the EIRO forum is a collaboration of seven European Intergovernmental scientific Research Organisations, responsible for

infrastructures and laboratories) to bid for.

And the award goes to...

At each EGEE event, conference attendees vote for the best poster and demo. In a close competition, EGEE'09 delegates elected “Towards a reference model for the LifeWatch ICT infrastructure” by Vera Hernandez and Axel Poigne, both of the Fraunhofer Institute IAIS, as the best poster. All of the demonstrators were invited to submit a short video introducing their demo. You can watch these on *YouTube* at www.youtube.com/enablinggrids. David Manset (MAAT GKnowledge) and Giovanni Frisoni (IRCCS Fatebenefratelli) were honoured with the winning demo award for “neuGRID – A grid-brained infrastructure to understand and defeat brain diseases” (www.youtube.com/watch?v=fpfD6GZ90tQ).

To highlight the innovative research accomplished with EGEE's production grid, the EGEE press office sent out several releases during the week of EGEE'09. *Global grids tackle global science* and *Clouds predicted in Barcelona* (covering the merging grids and clouds) were picked up by several news outlets. You can download the full text from the Press Room section of the EGEE website.

Thoughts from Bob Jones, EGEE project director

“It was a pleasure to be at EGEE'09 – I really felt an upbeat, positive atmosphere permeated the week. Looking towards the next few months I think we all have much more confidence in indeed ‘realizing EGI’.

“We managed to bring together all key stakeholders in e-Infrastructures, and our discussions were very productive. It was also excellent to see so many ESFRI projects present – promising rich interactions with e-Infrastructures for the future.

“Although we were all busy during EGEE'09, now is the time to maintain that level of energy as we continue to hammer out the details of the future infrastructure and its satellite projects. Can we make a success of this next phase? More than ever the answer is a resounding ‘Yes we can!’”

Useful links

EGEE website: www.eu-egee.org

EGEE'09 website: <http://egee09.eu-egee.org>

Danielle Venton, IT-EGE

This is the last issue of CNL in 2009. The editorial team would like to wish you very enjoyable end-of-year festivities.

HEPiX travels to California

The autumn 2009 HEPiX meeting was hosted by the Lawrence Berkeley National Laboratory (LBNL) National Energy Research Scientific Computer Center (NERSC) at the University of California campus in Berkeley. The meeting was held in a conference room on the hills above the town with a spectacular view over the San Francisco bayshore. Around 70 people attended from a variety of US, Canadian and European sites. Almost all of the presentations are available on Indico.

Summary

The key points can be summarized.

- Storage was by far the most popular subject in terms of submitted talks.
- There was an interesting presentation about the new Magellan project.
- The most intriguing presentation was a description of a 3D cube being proposed for computing at the FAIR project at GSI in Germany. A steel frame 26m wide, long and high will house 1000 racks of computers.
- Another hot topic was virtualization.
- Also mentioned several times was research into using Graphics Processing Units (GPUs) for HEP computing.
- The acronym of the week was ARRA: American Recovery and Reinvestment Act. Grants are awarded for new projects and for spending in the US. The NERSC/ALCF Magellan project had received \$32 m, Energy Sciences Network (ESnet) got \$62 m for an “advanced networking initiative” to build a prototype 100Gb network and Jefferson Lab \$5 m for a lattice QCD project.
- The next meetings are 19–23 April 2010 in LIP, Lisbon, and autumn in Cornell (choice of three weeks under consideration, complicated by CHEP timing). The HEPiX board would like to hold the spring 2011 meeting in Asia after the success of the Taiwan meeting but need to identify a host site. Autumn 2011 is likely to be TRIUMF.

Some highlights

The Magellan project was briefly described in the opening talk given by Kathy Yelick, the director of NERSC. It is a \$32 m project at NERSC and the Argonne Leadership Computing Facility (ALCF). The US Department of Energy (DoE) has decided to explore clouds for science computing. Can a cloud serve the DoE’s mid-range computing needs? What part of the workload can be served on a cloud, what features are needed? How does a science computing cloud differ from a commercial cloud? The funds at NERSC will be used to acquire a 100 Teraflops cluster with petabyte-scale storage. Further details were given later in the week including a list of questions to be

answered during the research.

Kathy also discussed the increasing power of processing chips and their growing parallelism, and concluded that single processors are not going to get much faster and memory per core will drop. Parallel flops are “free” but memory is expensive. Adding parallelism will be important for all applications. Power and energy costs will dominate and we will need to work with more experts on software, algorithms and applications. Finally she noted that she does not consider that virtualization will be the answer.

Despite the last comment, there were a notable number of talks on virtualization and one in particular – CERN/IT’s “vision for the future” presentation, given by Tony Cass – created lots of discussion. One conclusion was that HEPiX can be an important vehicle for sites to share experiences and gradually help us grow towards a common offering for the experiments. The idea of a dedicated working group was raised. The board agreed and asked Tony to run it. The initial target will be experience sharing. The talk from Tony also asked whether we could imagine a virtualization service for the LCG users. He described a five-step process to get this working, which needs to be accepted by the experiment users and the local site management. He admitted, however, that steps four and five would be hard to achieve, at least in the short-term.

In brief

In the security sessions, two CERN/IT staff presented recent and ongoing vectors of attack concerning different security intrusions, denial of service and viral infections. Several of the system administrators in the audience were seen to squirm during these talks.

ITIL made its appearance at HEPiX for the first time with presentations from KIT/FZK in Karlsruhe, Fermilab and CERN.

There was also an update on Scientific Linux from Troy Dawson of Fermilab, one of the two principle authors. With the audience, he defined end dates for the support of versions 3 and 4 of Scientific Linux: October 2010.

From Intel Corporation, a senior engineer explained how the company is using the power and new features of its latest chips to dramatically improve the performance and turnaround of the computing centres, which are required in the modelling and simulation of the new chips under design.

One of the OpenAFS gatekeepers presented work being funded by the DoE and undertaken by his company to add

new features and better performance to OpenAFS – for many years the main file system shared by HEP centres around the world. A plan is being put together to permit European input to be added to the mix. On the other hand, although it is still alive and well, tales of the Lustre file system seem to have reached a plateau.

Site-report updates

Finally, here are some highlights from the ever-popular site reports:

- Jefferson Lab is celebrating its 25th anniversary plus the approval of a 12 GB upgrade to its electron beam, and a \$5 m grant for its Lattice QCD project.
- GSI is concentrating on the FAIR project. The first problem is the lack of physical space so it is proposing a €9m 3D cube for stacking 1000 19 inch racks in a steel skeleton measuring 26m on each side. It is expected to host 40 000 nodes. Within the cube, the racks will be stored such that there are gaps between racks for human access but the current working temperature within the cube is 30°C, which does not make for a comfortable environment for the staff working in there, e.g. to change a disc.
- RAL’s new computer centre is now fully operational and new Tier 1 procurements were shipped in along with elements of the existing Tier 1 over the summer.
- There has been a major upgrade to the INFN Tier 1 in Bologna this year, tripling the available rack space as well as greatly expanding the chiller and UPS capacity.
- TRIUMF just celebrated its 40th anniversary by adding three new member universities and confirming the funding of the super-conducting RF (SRF) electron linear accelerator (e-linac) project.
- IN2P3 in Lyon is planning a new building to house a 800m² computer room.
- NIKHEF’s new data centre, built inside a room previously used as a library, is now operational with 47 racks and 400 KW of power, but troubles included a water leak.
- The INFN IPv6 working group continues its studies; they have an IPv6 addressing plan and they are ready to move to IPv6 “when necessary”.
- At SLAC, the LCLS (Linac Coherent Light Source) had a spectacular start-up with 94% efficiency and the Fermi Gamma Ray Space Telescope is in orbit collecting data as expected, 15 billion events so far, 225 million of serious interest.

Useful links

HEPiX meeting website: <http://indico.cern.ch/conferenceTimeTable.py?confId=61917>.
HEPiX website: www.hepix.org.

Alan Silverman, IT-DI

Computing school follows in the footsteps of famous physicists



CERN School of Computing participants in front of the Gauss Observatory in Göttingen during the 32nd school in August.

Max Born, Paul Dirac, Peter Dirichlet, Enrico Fermi, James Frank, Karl Gauss, Werner Heisenberg, Gustav Hertz, David Hilbert, Robert Oppenheimer, Walter Nernst, Wolfgang Paul, Wolfgang Pauli, Max Planck, Robert Pohl, Bernhard Riemann, Arnold Sommerfeld and Victor Weiskopf: these are all famous physicists or mathematicians who revolutionized our understanding of the world that surrounds us. They will be remembered for thousands of years to come and they have something else in common: they all worked and taught at the University of Göttingen, for periods ranging from a few months to decades. In particular, during 1900–1935 Göttingen became the Mecca of physics.

Never in the history of science has a single city attracted virtually all of the prestigious scientists in a major discipline at such a key moment in its evolution. Even those who did not work at the university, like Bohr, Einstein or Schrödinger, were frequent visitors to Göttingen to meet with their colleagues. To date, the University of Göttingen has had 45 Nobel prize laureates in physics, chemistry, medicine, literature and peace. In just physics and chemistry, Göttingen has won more Nobel prizes than the great MIT.

It was therefore with considerable

emotion that, as director of the school, I opened the 32nd CERN School of Computing (CSC) on 17 August in the historic Pauliner Kirche church. This opening took place in the presence of Prof. Dr Rolf Heuer (CERN director-general), Wolfgang Meyer (Mayor of the city of Göttingen), Prof. Kurt von Figura (president of the Georg-August University of Göttingen), Frédéric Hemmer (head of the IT Department) and Prof. Arnulf Quadt (chairman of the Local Organizing Committee).

To celebrate this unique venue, a special Göttingen physics history afternoon was organized on Saturday 22 August. A tour of the old town was organized to show the places where some of these famous Göttingen scientists lived and worked. More than 50 participants visited the original mansions of famous physicists in the Eastquarter, the Gauss graveyard in Albany Park, the Gauss Observatory and the old university library. The afternoon ended with a memorable presentation by Prof. Michael Uhrmacher about Göttingen scientific history, followed by an inspiring talk from Dr Beatrix Vierkorn-Rudolph, the head of fundamental research from the Federal Ministry of Science and Education in Germany.

A summer university

But the CSC is not about physics; it is about scientific computing. 14 lecturers delivered 49 hours of lectures and hands-on exercises, with the 50th hour consisting of presentations given by students selected after a call for proposals.

This year, the programme underwent a significant facelift: more than one-third of the programme was entirely new and the rest has been significantly updated.

- **Data technologies:** this brand new theme was designed and delivered by Alberto Pace and Bernd Panzer-Steindel, with the assistance of Andreas Peters for the exercises. Data technologies is expected to be one of the major challenges in the coming years, not only in scientific but also in general-purpose computing. The theme tackled a whole range of topics such as status and prospects of storage devices, storage architecture, models, performance and reliability aspects.

- **Data analysis** was another new series given by Ivica Puljak and Aatos Heikkinen that focused on aspects like visualization, Bayesian probability and multivariate analysis.

- **Virtualization and cloud technologies:** this was the final newcomer, addressing

Conferences and event reports

one of the current hottest topics, delivered by Pedrag Buncic.

This innovative programme was complemented by our seven other tried-and-tested series covering physics computing (by Rudi Frühwirth), root (by Axel Naumann and Bertrand Bellenot), secure programming (by Sebastian Lopienski), security (by Alberto Pace), computer architecture (by Sverre Jarpe and Andrzej Nowak), software engineering (by Bob Jacobsen) and networking (by the school director).

CSC is about physics computing but it is not a physics-computing conference. It is not a forum to present projects and achievements, but a place to deliver academic knowledge. This is an event with only a few lecturers, to maximize coherence and consistency. The CSC has evolved to become a summer university, and like any university, CSC organizes an examination.

This year 69 students attended the school and 63 of them successfully passed the final examination and received the CSC Diploma as well as the Georg-August University European Certificate of Credits (six ECTS credits awarded). The examination jury was pleased to award special distinctions to:

- Anton Alkin from Bogolubov Institute for Theoretical Physics, Kiev, Ukraine, who obtained the highest mark;
- Luis Munoz Meijias from CERN who ranked second;
- Adrian Vogel from the University of Bonn, Germany, who obtained the third highest mark.

Since the creation of the examination in 2002, CERN has awarded this fully recognized CSC Diploma to 453 students.

Göttingen: the result of a national contest

It is 34 years since the school was last held in Germany. The German co-ordinating Committee for Particle Physics was approached and launched a national contest to select the hosts. The committee, in turn, appointed Volker Gülzow of DESY to oversee the selection process. An unprecedented number of proposals were received (six in total),



A couple of students hard at work at this year's CERN School of Computing in August.

and following a shortlist and site visits, Göttingen was selected.

Two German institutions (the Helmholtz-Alliance and Göttingen International) provided financial support for participants. This resulted in partial or total grants for 15 students: 10 from faraway countries and five from Germany. These contributions help to maintain the global dimension of the school and this year the participants represented 31 different nationalities.

Onsite the school received exceptional support from a team of more than 15 people. We are particularly indebted to the central team: Arnulf Quadt (chairman), Jörn Grosse-Knetter (deputy chairman), Lucie Hamdi (administrative assistant), Jörg Meyer (technical co-ordinator) and Fabian Kohn (sports co-ordinator).

Sports programme: a success story

The sports programme, which was introduced a few years ago, is encountering a growing success. The idea is to propose two to three hours of sport every afternoon to those who are interested. This can be the opportunity to discover a new activity or to enjoy the sports available at nearby facilities. Several of the lecturers act as sport instructors or organizers. This year

we were delighted to see a dozen students taking their first climbing lesson, another dozen starting tennis, a couple of students trying swimming and ladies playing football for the first time. Basketball and volleyball complemented the daily activities. The sports programme is obviously optional and yet 95% of the students participated during the first week.

In addition to this programme, a special sports day has been organized since 2007. Participants can select one of five proposed activities of decreasing physical difficulty. This year the choice was between rock climbing (highest level), river canoeing, "skyrope" adventure park, biking and hiking (lowest level), or resting at a wellness centre.

This sports programme would not be complete without the traditional matches and tournaments: the football match, the mixed-doubles badminton tournament and, new this year, a tennis tournament.

The aim of the programme is not only to provide a healthy work-life balance before the late afternoon working sessions begin, it also provides additional opportunities for interactions between students, lecturers and organizers. After all, social networking is another goal of CSC.

François Flückiger, IT-DI (CSC school director)

Calendar

December

7–9, **5th IEEE International Conference on e-Science**
Oxford, UK
www.escience2009.org/

9–10, **SEE-GRID-SCI User Forum**
Istanbul, Turkey
<http://sgsuf.ceng.metu.edu.tr>

16–19, **International Conference on High**

Performance Computing (HIPC '09)

Kochi, India
www.hipc.org/

January 2010

27–28, **3rd Athens International Forum on Security (AIFS)**
Athens, Greece
<http://conferences.hau.gr/?i=aifs2010.en.home>

February

3–4, **International Symposium on Engineering Secure Software and Systems (ESSoS)**

Pisa, Italy
<http://distrinet.cs.kuleuven.be/events/essos2010/>

March

7–12, **International Symposium on Grid Computing (ISGC)**
Taipei, Taiwan
<http://event.twgrid.org/isgc2010/>

15–19, **Open Grid Forum (OGF28)**
Munich, Germany
www.ogf.org/OGF28/