

# Igniting Innovation Across the Globe - SC Global 2003

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No longer do conferences have to be limited to a single physical location. SC Global is the distributed element of the Supercomputing (SC) conference, which focuses on high-performance computing and networking. Speakers at SC Global participated from their home institutions in seven different countries, five sovereign tribal nations (these are what used to be known as the American Indian nations - see <http://www.bluecorncomics.com/sovereign.htm> for an interesting history), distributed across four continents. It was, in the words of Chuck Koelbel, co-Chair of the SC Technical Program, "...clearly one of the most successful parts of the program..." The underlying technology that made all this possible was Access Grid.

Access Grid is videoconferencing on steroids. Typically, Access Grid nodes use a whole wall for display to give the pixel-space to show life-size images of the potentially large number of other participants in any meeting or lecture. They have multiple cameras for close-up views and to support many attendees and have excellent audio that is a pre-requisite for effective communication. But where Access Grid really wins over traditional videoconferencing is the capability for a huge number of sites to take part simultaneously. This gives the technology the potential to support a truly global, distributed conference where participants do not need to travel to take part.

Manchester Computing played a highly significant role in SC Global by taking the lead role in three out of the 11 sessions, ably steered by Kevin Roy at the controls. SVE's Lee Margetts (who joined from Spain's first Access Grid node that he helped to set up) combined with Simon Bee from Salford University to showcase Hydra, a software framework that can deploy and control many interconnected applications, such as Computer Aided Design (CAD) and Finite Element Analysis (FEA) at geographically remote locations. The Manchester Access Grid node also hosted Kelli Dipple, who presented a completely different approach to Access Grid, taking it out of the sometimes staid world of science and showing how the technology may be used as an exciting medium for art.

One of the highlights of the conference was the session "Application Steering in a Collaborative Environment". Three groups, from Jülich, Stuttgart and RealityGrid showcased various techniques for integrating application steering and visualization into the collaborative Access Grid environment. The RealityGrid part featured a live demonstration in which geographically separated scientists migrated running lattice-Boltzmann simulations from systems (CSAR and HPCx) on the UK e-Science Grid to the US TeraGrid, steered them into new regions of parameter space, and monitored their state through real-time visualization using remote systems in Manchester and Phoenix. This demonstration was just one facet of the ambitious TeraGyroid project, which harnessed the combined resources of the US TeraGrid and UK e-Science Grid to produce a major leap forward in soft condensed matter simulation.

The climax of the conference was a demonstration of distributed Karaoke from AIST, Japan. Much to my amazement, there were plenty of volunteers to sing - highlights included a rendition of 'Living on a Prayer' by Bon Jovi, complete with enthusiastic air guitar from revellers in Boston, and a frighteningly lifelike Michael Jackson impression by Donnel Sanders (known as 'Biggie Don') from Winston Salem State University during the group sing-along 'We Are the World'.

The conference as a whole was made possible by a complex global technical infrastructure distributed across many institutions to decrease lags and increase stability and robustness. The major elements of this infrastructure comprised venues servers, multicast-unicast bridges, presentation software servers, Question Tool servers and recording servers.

There are many software routes that may be taken by sites to utilise Access Grid. The newest release of the research project software is known as AG2. However, AG2 has some stability issues, so the decision was made to allow remote sites to connect to SC Global using any of the available methods - AG2, AG1 (the original, prototype Access Grid software), inSORS (the commercial version) or bypassing the venues servers altogether and connecting directly using vic and rat, the

video and audio Mbone tools. Five venues servers were established to support this using hardware sited in different institutions.

Video and audio streams in Access Grid are distributed using multicast, a set of network protocols that allow for efficient utilisation of bandwidth. However, multicast is by no means ubiquitous and in some parts of the network is not reliable. Therefore, bridges are required to support sites that do not have good multicast connectivity. For SC Global 2003, we established 12 such bridges, based in nine institutions in Australia, Korea, the UK and the US.

different locations and putting hands up for questions is not effective. The audience submitted questions via a web interface, which also allowed for submitters who did not have access to a microphone. This software was specially written for SC Global.

The event was recorded using another inSORS product, IG Recorder, that allows the event to be played back over the Access Grid at a later date. A Windows Media stream was shown to allow people who did not have access to an Access Grid node to view the event. This was also recorded.



Figure 1: SC Global 2003 in Phoenix. On the platform (L to R): Jennifer Teig von Hoffman (Chair SCG03), Jim McGraw (Conference Chair), Jackie Kern (Chair SCG04)

Many of the sessions involved presentations of PowerPoint slides. These were distributed to remote sites using an inSORS product known as IG Pix. This gives the capability for the local site to deliver a presentation as normal on a laptop; remote sites can view the slides via a web page that is updated as the different slides are shown.

The Question Tool allowed for question management - always a difficult issue when your audience is in many

SC Global was a thoroughly enjoyable, successful and high profile addition to SC that is sure to continue to make an impact in coming years.

### *Further Information*

For more information, see <http://www.sc-conference.org/sc2003/global.html>, <http://www.insors.com>, <http://www.accessgrid.org>, or you can contact the author at [michael.daw@man.ac.uk](mailto:michael.daw@man.ac.uk).