



## NeSC III Annual Report 2008

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22 September 2008

### Abstract:

This document reports the contributions made to the continuing success of the National e Science Centre (NeSC) from the second and final year of the EPSRC-funded NeSC III project, which covered the period from August 2007 to July 2008. For each project activity, it describes the work completed during this period, reports the achievement against the planned milestones and deliverables, and discusses how this work will be sustained beyond the NeSC III project.

The project has continued to be successful. It has run several events on behalf of the UK e-Science community, including the High Throughput Computing week and Building Data Centres with iRODS. It has supported the e-Science All-Hands Meetings of 2007 and 2008. It has maintained a central knowledge base for the community and contributed to e-Infrastructure locally, regionally, nationally and internationally.

Successful bids for the NeSC Information Network, the AHM Network and the NeSC Research Platform will sustain this success in the future.

## UK e-Science Technical Report Series

### Report UKeS-2008-05

Available from [http://www.nesc.ac.uk/technical\\_papers/UKeS-2008-05.pdf](http://www.nesc.ac.uk/technical_papers/UKeS-2008-05.pdf)

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# *Annual Report 2008*

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**DATE: 22<sup>ND</sup> SEPTEMBER 2008**

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# DOCUMENT CONTROL

Document Reference: NeSC III Annual Report 2008

Document Type: Annual Report

Distribution: External

Revision Date: 22<sup>nd</sup> September 2008

## REVISION HISTORY

Revision date	Version	Summary of Key Changes
5/9/2008	0.1 DRAFT	First, incomplete, version
18/9/2008	0.2 DRAFT	First complete version
22/9/2008	1.0	Published version

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# 1 Abstract

This document reports the contributions made to the continuing success of the National e-Science Centre (NeSC) from the second and final year of the EPSRC-funded *NeSC III* project, which covered the period from August 2007 to July 2008. For each project activity, it describes the work completed during this period, reports the achievement against the planned milestones and deliverables, and discusses how this work will be sustained beyond the NeSC III project.

The project has continued to be successful. It has run several events on behalf of the UK e-Science community, including the *High Throughput Computing week* and *Building Data Centres with iRODS*. It has supported the e-Science All-Hands Meetings of 2007 and 2008. It has maintained a central knowledge base for the community and contributed to e-Infrastructure locally, regionally, nationally and internationally.

Successful bids for the *NeSC Information Network*, the *AHM Network* and the *NeSC Research Platform* will sustain this success in the future.

# 2 Background

The National e-Science Centre has been hosted by the Universities of Edinburgh and Glasgow since 2001. It embodies a very wide range of activities which have provided a focus for UK e-Science. These activities enable and promote e-Science within the UK, as well as representing the UK programme internationally.

*NeSC III* was a two-year project, running from 1st August 2006, which continued core activities of this work. It aimed to provide a central focus for leadership, coordination and promotion of the UK e-Science programme and to foster excellence in interdisciplinary research.

The *NeSC III* project was one of a number of projects that provided national support to the UK e-Science programme. Others included *Gridnet2*, which supported standardisation activity; *E-STORM*, which funded the annual e-Science All-Hands Meeting (AHM); the *UK e-Science Envoy*; and *E-SciNet*, which provides travel and networking facilities to support the uptake of e-Science technologies. In addition, of course, the UK e-Science programme funds regional e-Science centres and institutes such as the e-Science Institute, OMII-UK and the Digital Curation Centre.

## 3 Project Structure

### 3.1 OVERVIEW AND GOALS

The NeSC project is a small part of the work actually undertaken at the National e-Science Centre. This section describes the goals of the project as set out in the proposal to EPSRC, which includes funded and unfunded work. Later sections concentrate on the operation of the funded activities.

Goal	To be achieved through
Provide national leadership and coordination, and international representation of UK e-Science.	<ul style="list-style-type: none"> <li>▪ Continued participation by NeSC members in a range of high impact national and international activities</li> <li>▪ Provision of an authoritative published knowledge base (based upon the website) to be an authoritative source for all UK and international e-Scientists.</li> <li>▪ A set of high quality key e-Science events to be run on behalf of the community each year</li> <li>▪ Hosting other e-Science events on a cost recovery basis for a wide range of communities and strategic partners.</li> <li>▪ Hosting of, and participation in, international delegations.</li> <li>▪ Developing an advisory role for e-Infrastructure for the JISC</li> <li>▪ Continuing support of the AHM in 2006 and 2007</li> <li>▪ Acting as a home for the GridNet and eStorm national enablement projects.</li> </ul>
Promote research excellence based upon existing and newly developing areas of strength	<ul style="list-style-type: none"> <li>▪ Continuing to lead research in our existing areas of technical strength.</li> <li>▪ Establishing projects in two new areas.</li> <li>▪ Further strengthening our links with major research groups regionally, nationally and globally.</li> </ul>
Inform and contribute to development of the national e-Infrastructure and international standards	<ul style="list-style-type: none"> <li>▪ Participation in the ETF, GOSC, NGS, STF, ATF and their successors</li> <li>▪ Participation in the OGF and other standards bodies</li> <li>▪ Leading the development of regional e-Science infrastructure and extending this to become the Scottish element of the NGS</li> <li>▪ Provision of Access Grid facilities</li> </ul>
Enable e-Science outreach and uptake in the regional community	<ul style="list-style-type: none"> <li>▪ Organising events aimed specifically at regional institutions to promote e-Science understanding and engagement</li> <li>▪ Fostering grant proposals from the regional community.</li> <li>▪ Running an annual outreach event for Scottish Industry.</li> </ul>
Stimulate e-Science education	<ul style="list-style-type: none"> <li>▪ Leverage our MSc courses, and our leadership of the ICEAGE project</li> <li>▪ Run an annual UK education event.</li> </ul>
Optimise benefit to the UK community through synergy with other activities.	<ul style="list-style-type: none"> <li>▪ Synergy from our co-location with e-Science Institute, EPCC, the training activity, the DCC and our role in projects such as EGEE.</li> <li>▪ Leading UK and European training and staff development activities.</li> <li>▪ Interaction with industry and the IECnet knowledge transfer network.</li> </ul>

## 3.2 ACTIVITIES

The NeSC III project is structured into several activities. Each activity has defined goals and milestones and is led by a nominated member of staff. Section 4 of this document gives a detailed report of the work of each activity over the past year.

The activities are as follows:

- Community Events
- AHM Web Support
- Regional Outreach
- Web Site Redesign
- Knowledge Base
- E-Infrastructure
- IT Support
- Stimulating e-Science Education
- National Leadership

In addition, the NeSC III project has indirectly enabled a wide range of research activities in both universities (Edinburgh and Glasgow). It has also enabled engagement with standards development work via the OGF and OGC.

## 3.3 COMMUNITY REQUIREMENTS

The NeSC III project serves the UK e-Science community. Therefore the project staff set out to discover and collect the requirements of the community, in order to better direct the project activities.

Actions to solicit community requirements have included the following:

- Visiting other regional e-Science centres with the explicit aim of soliciting requirements.
- Soliciting input from the e-Science Directors' Forum.
- Supporting the UK e-Science envoy. The e-Science envoy has requested support in the form of particular events, hosting international delegations, and similar activities.
- Supporting the Director of the ICT and e-Science Programme in EPSRC.
- Soliciting input from the Research Councils and JISC.

## 3.4 PROJECT DELIVERABLES

The only deliverable required by this project is the annual report, i.e. this document.

## 3.5 STAFF

All staff originally assigned to the project remain in place. Lee Callaghan took maternity leave during the year: cover was provided by Kate Lindey on a short-term contract.

## 4 Project Activities

This section of the report describes the funded activities of the NeSC III project. For each activity, we describe the work done over the period of the report, compare this progress against the original project plan, and then discuss plans for the second year of the project.

### 4.1 COMMUNITY EVENTS

**Leader:** Dave Berry

This activity supports the UK e-Science community by providing infrastructure and a venue for community events.

NeSC continued to host workshops and events throughout the year. Highlights included the *High-Throughput Computing week*, *Building Data Grids with iRODS* and the *EPSRC/TSB e-Science Projects meeting*. We solicited input and suggestions via the e-Science Directors' Forum and the E-SciNet network.

The following table shows the events hosted. These include events of general community interest and also meetings of particular projects or committees. It does not include meetings at NeSC organised by the e-Science Institute, Grid Computing Now!, or the NeSC training team. It also excludes meetings of purely local projects, unless these meetings were open to the national community.

Title	Date	Type
Final NextGRID Project Appraisal Meeting	9-11 Oct	Unfunded, Closed
High Throughput Computing Week	27-30 Nov	Funded, Open
Grids and other e-Infrastructures for Education	26-27 Nov	Unfunded, Open
HPC-Europa++ kick-off meeting	31 Jan	Unfunded, Closed
LHCb UK Workshop on Proper Times	28 Feb	Unfunded, Closed
A Data Grid for Cell Biology, Project Kick-off Meeting	10 Mar	Unfunded, Closed
Century-of-Information Research (CIR) Strategy Workshop	13-14 Mar	Funded, Open
Edikt2008: Using Computing in your Research	9 Apr	Unfunded, Open
DGEMap Annual Meeting	17 Apr	Unfunded, Closed
PRACE Project WP4 and WP6 Face2Face Meeting	30 Apr	Unfunded, Closed
ICEAGE Final review	8 May	Unfunded, Closed
Building data grids with iRODS	27-30 May	Funded, Open
Real-time qPCR Biostatistics and Gene Expression Profiling	9-10 Jun	Unfunded, Closed
DCC / Edinburgh e-Science Collaborative Workshop	12 Jun	Unfunded, Closed
e-Science Directors' Forum	2 Jul	Funded, Closed
EPSRC/TSB e-Science Projects Meeting	17-18 Jul	Funded, Open

The NeSC III grant includes funding to cover running costs for a limited set of six key community events per annum. These costs typically cover catering, and the table shows which events received such funding. Other events were hosted on a cost recovery basis, in which NeSC provided the venue and registration services.

**Progress against plans:** This activity has performed well, delivering events of interest to the UK and bringing international experts to share their knowledge.

**Future Work:** This activity will be continued in a modified form under the aegis of the NeSC Information Network. This will focus on two major events a year along the lines of the High-Throughput Computing Week and Building Data Grids with iRODS. Plans are well advanced for a week focussing on the Simple API for Grid Applications (SAGA).

## 4.2 AHM WEB SUPPORT

**Leader:** Susan McCafferty

This activity supports the UK e-Science All-Hands Meeting through web-based paper submission and registration as well as review processing and subsequent production of proceedings. The event itself was run from the E-STORM project and is now supported by the AHM-net grant.

**AHM2007:** Presentations from the AHM 2007 were uploaded via the AHM website and automatically made available via the programme. To date there have been 35678 downloads of AHM 2007 Papers and 29729 downloads of AHM 2007 Presentations via the AHM website.

**AHM2008:** The AHM 2008 website went live in January 2008. The submission and review systems were further developed to deal with the new Journal options. We received and processed 250 submissions to this year's conference, which were reviewed using our online system in late May, early June 2008. The PC meetings were fully supported, decisions were uploaded and NeSC informed the authors of the outcome of their submissions as conference presentations and Journal Papers.

The programme is managed online and was published mid July. The website continues to be the main source of information for the conference.

We have provided a mechanism for presenters to upload their presentations to the AHM 2008 website.

**Progress against plans:** This activity proceeding according to schedule.

**Future Work:** Web support for future AHMs will be supported directly by the AHM-net project. Staff on this project will be based at NeSC Edinburgh.

## 4.3 REGIONAL OUTREACH

**Leader:** Richard Sinnott

**Outreach Events:** We have continued our efforts with regard to the transfer of e-Research know-how to the wider Scottish communities. These have included the following presentations and outreach events:

- R.O. Sinnott, *Inter-disciplinary Research at Glasgow*, University of Glasgow, October 2007.
- R.O. Sinnott, *To the Power of "e-"*, invited talk at Computer Science Meets Systems Science Workshop, Glasgow Caledonian University, November 2007.
- R.O. Sinnott, *e-Science and the NHS*, talk given at NHS-HE Forum, University of Edinburgh, November 2007.

- R.O. Sinnott, *Security and Geospatial Systems*, talk given at EDINA workshop, Edinburgh, April 2008.
- R.O. Sinnott, *e-Infrastructures, e-Health, e-Ageing...?*, talk given at Research in Ageing Workshop, Glasgow, May 2008.
- R.O. Sinnott, *Lessons Learned in Developing and Supporting e-Biomedical Research*, invited talk given at Workshop on Building the e-Library, the University Health and Medical Librarians Group, Kelvin Conference Centre, Glasgow, Scotland, June 2008.

In addition, the NeSC Training, Outreach and Education (TOE) team ran a two-day induction on *Grid Computing and the National Grid Service* in Edinburgh on Sep 26-27 2008. The team ran this induction at several institutions around the UK; this one particularly covered Scotland.

The TOE team also gave a presentation to policy makers in the Scottish Funding Council.

In Edinburgh, the NeSC Middleware Team have made over 90 requirements-gathering visits to Edinburgh research groups. We have formed user community groups for specific research tools (such as R and BLAST) and have held meetings for researchers to exchange ideas on their use and encourage uptake.

**Progress against plans:** As noted in last year's report, we have found shorter seminars at other institutions a more valuable way of conducting outreach, rather than the three central outreach workshops that we suggested in the original grant proposal. We have established good contacts with other Scottish universities and the Scottish NHS via these outreach activities.

**Future Work:** We will continue to work with other Scottish universities on joint research. This will leverage our funding from the NeSC Research Platform and will build on links with the Scottish research pooling initiatives, such as SINAPSE, SULSA, SICSA, ScotChem and SUPA. Regional outreach is not one of the aims of the NeSC Information Network, which concentrates on UK support.

The proposed Scottish Grid Service, if funded, will include funds for continuing this regional outreach and backing it up with regionally-focused e-Science training and support for application-specific user interfaces.

## 4.4 WEB SITE REDESIGN

**Leader:** Anna Kenway

In our previous annual report we stated, "Our present web site has grown organically since the establishment of NeSC and it has become apparent that it is in need of a redesign". We then reported how we had gathered requirements for the new design, eliciting input from a range of different users. We expected to begin the implementation of the new design during the period covered by the current report.

Our experience during the current year has led us to conclude that we additionally need to replace the technology used to implement the web site. We now intend to adopt a content management system (CMS) such as Silverstripe. This will allow different parts of the site to be managed by the relevant members of staff, supporting them in the processes of adding and maintaining different types of web site content.

**Progress against plans:** The redesign has hit several delays over the course of the project. We have a design based on a good understanding of the needs and requirements of our users, but the web site still remains to be implemented.

**Future work:** We will use funding from a number of sources to recruit a web architect for a year. The architect's task will be completely re-engineer the website and its databases, deploy a CMS system where appropriate and populate it with the existing web site content, based on the design we have already created from last years' requirements gathering exercise.

## 4.5 KNOWLEDGE BASE

**Leader:** Iain Coleman

**Knowledge base:** NeSC has committed to maintaining its provision of a high quality knowledge base founded on the web site. This includes news and information about UK e-Science and NeSC activities, links to e-Science resources in the UK and worldwide, an index of information on current e-Science projects that involve UK researchers, and a repository of papers and technical reports. The website also hosts information on events and research themes at the e-Science Institute, the All-Hands Meeting and the NeSC Training, Outreach and Education web pages (which include information about EGEE training courses throughout Europe).

NeSC has continued to provide technical papers and reports on the web site, with consistent presentation and professional editorial oversight. Technical reports and other research documentation have been actively solicited, in a proactive effort to acquire material from UK e-Science researchers. There have been eight new reports this year in the UK e-Science Technical Reports Series, one of which is accompanied by an OWL-DL ontology representation.

The task of updating and maintaining NeSC records of UK-wide e-Science activities was enhanced this year by a programme of visits by the NeSC/eSI Science Writer to regional e-Science Centres. This has enabled the acquisition of more up-to-date and detailed information on e-Science projects.

**NeSC newsletter:** We have continued to produce a regular monthly newsletter. This includes regular articles by the NeSC/eSI Science Writer and editorials by the UK e-Science Envoy, as well as input from other e-science centres. The EPSRC/JISC and GridPP press officers also regularly contribute information and announcements. Each month, the newsletter is typically among the top 20 downloads from our web site, with a readership between 2,000 and 3,000.

**UK e-Science reports:** The following technical reports were published in the UK e-Science series during the period covered by this report:

- UKeS-2008-04 *GridNet2 Final Report*, edited by Katharine Woods, published Aug 08
- UKeS-2008-03 *Science Knowledge Infrastructure Ontology 3.0*, Boyan Brodaric, published Apr 08
- SKIo OWL-DL Representation (accompanies report UKeS-2008-03, *Science Knowledge Infrastructure Ontology 3.0*)
- UKeS-2008-02 *Evaluation of the Matlab Distributed Computing Engine and Distributed Computing Toolbox*, Michael Griffiths and Deniz Savas, published Apr 08
- UKeS-2008-01 *E-SciNet Project Report 2007*, Dave Berry, Clare Gryce, Alex Hardisty, Cliff Addison, Mark Birkinshaw, Ian Bland and Andrew Parker, published Apr 08
- UKeS-2007-08 *An Evaluation of the Application Hosting Environment*, Matteo Turilli, published Nov 07
- UKeS-2007-07 *NeSC III Annual Report 2007*, Dave Berry, published Nov 07
- UKeS-2007-06 *An Evaluation of GridSAM for the Engineering Task Force*, Mark Hewitt and Terry Harmer, published Sep 07
- UKeS-2007-05 *Workshop on Sustainability and Future Business Models for the UK National Grid Service*, by The National Grid Service Board, published Aug 07

**Progress against plans:** The newsletter and UK e-Science reports progressed according to plan. Our UK-wide information is now more up to date and comprehensive than in previous years, although it is in the nature of this task that the effort is always playing catch-up with the latest developments.

**Future Work:** The work of this activity will be continued by the NeSC Information Network project.

## 4.6 E-INFRASTRUCTURE

**Leader:** Richard Sinnott

This activity covers our contribution to UK-wide e-Infrastructure efforts such as the ETF, STF and Campus Grids SIG. It also includes our work in leading the development of regional e-infrastructure. Much of this activity is the result of staff funded from other sources; the principal exception being our “ETF engineer” at Glasgow, Christopher Bayliss, who is 50% funded to work on ETF and related NeSC activities.

**Technical development:** Staff at both Edinburgh and Glasgow have participated in technology evaluations for the ETF. Since August 2007 we have been heavily involved in the performance evaluation of SRB and undertaken an evaluation of the Andrew File System (AFS). This work was done in conjunction with the EPSRC-funded nanoCMOS project. NeSC Glasgow developed an automated tool for analysing upload performance of SRB. We were co-authors of the SRB evaluation report. On the AFS evaluation we have undertaken a security and performance evaluation of this technology. This was done in conjunction with the nanoCMOS project where security and large scale data management is essential, and has resulted in the roll-out of this technology across most nodes of the NGS. Further investigation of AFS is planned at Edinburgh, where we are looking to integrate the AFS with Condor.

Prior to these efforts we were involved in a range of activities including Condor, RAVE, GT4, OMII-UK evaluations and security related evaluations amongst others.

We have also contributed to the Campus Grids SIG, sharing best practice of technologies such as resource brokers and Condor. Extra support for this SIG comes from the EPSRC E-SciNet network project, which is held at NeSC with UCL as co-investigators.

We have also been working with National Data providers such as EDINA in making available geographical data available in an e-Research environment. This builds upon the results of the NeSC Glasgow SPAM-GP project which simplifies Shibboleth-oriented access to services and data made available through a portal. We are also working with other data providers such as the UK National Data Archives through the ESRC funded DAMES project. Once again, fine grained security is essential and builds upon the various security oriented projects at NeSC Glasgow.

**Local and Scottish infrastructure:** As documented in the previous report, NeSC is a key driving force behind the efforts to establish a Scottish Grid Service (SGS). This will build on the major new hardware resources at Scottish universities and will, if successful, underpin a range of research. It will particularly support the numerous cross-Scotland research pooling bids such as SICSA (Informatics & Computing Science), SINAPSE (Brain Imaging), SULSA (Life Sciences) and others. The development of the case for support included a major assessment of the requirements of an e-Infrastructure across multiple disciplines with over 80 completed detailed questionnaires from a range of end users and administrators from a range of disciplines. The completed case has been endorsed by eight major universities across Scotland with letters of support from their Vice Principals and has now been submitted for review. If funded, the SGS would provide considerable personnel covering areas, including systems support, grid operations management and the development of research environments (such as portals) for specific application domains. We are still awaiting the outcome of this submission.

At Glasgow, the NeSC activity is fully integrated into Computer Services both administratively and technically through a variety of projects. NeSC also supports campus grid efforts through projects such as nanoCMOS, where we are now able to use a variety of heterogeneous resources across the university including the major new ScotGrid cluster; Condor pools and Sun Grid Engine resources in the department of electronics. As part of nanoCMOS, we are also working on interoperability efforts between EGEE and other job submission software solutions such as OMII-UK GridSAM and GT4. We are also helping with the roll-out of technologies such as VOMS across the NGS.

In Edinburgh, engagement with researchers identified a need for general-purpose data storage and archive of research data, with different performance requirements from that which already existed (existing data services were tightly coupled to compute services). This has led to a new service for researchers to address these needs. The University now supports BLAST, with centrally-supported access to common databases for BioMed researchers, alleviating the need for research groups to maintain their own local copies. The NeSC Middleware Team are mid-way through a trial of Condor infrastructure, with the aim of promoting and enabling University-wide compute resources. We are involved with a number of projects (e.g. SAGES, GridQTL, SINAPSE, EastChem) which aim to collaborate with other institutions across Scotland.

**UK infrastructure:** At Glasgow, we have procured the ScotGrid cluster (a 140 node dual core Opteron cluster with 100Tb storage) and this has been integrated and made available as a full partner node of the NGS. David Martin in NeSC Glasgow now sits on the NGS Technical Board and attends weekly meetings. We are currently in the process of renovating new server rooms for hosting of a further major new cluster at Glasgow. This is currently under procurement and is intended for use across campus and in projects such as EGEE. We note that through projects such as nanoCMOS, the electronics researchers are the primary end users of the ScotGrid cluster with a higher utilisation than any other virtual organisation.

NeSC Glasgow have also built services and data resources to support neuroscientists at Kings College London and numerous international members of the COSBID consortium; we have established and populated a Drug Discovery Portal with the university of Strathclyde; we have built a demonstrator in secure access to geospatial and census data with EDINA and MIMAS; we are also (through the ESRC funded) DAMES project and the upcoming Wellcome Trust funded SHIP project establishing secure infrastructures for access to clinical data for a variety of social and e-Health related studies.

In Edinburgh, we have continued to work with the NGS and the ETF and now support the NGS Resource Broker, enabling local users to make transparent use of local/NGS resources. We intend to become a full Partner once an NGS agreement is in place. It has been a busy year with regards to EGEE/GridPP – we now support many Physics and BioMed Virtual Organisations at Edinburgh, and play a part in the CERN LHC experiments.

**Progress against plans:** We have clearly performed well, contributing actively to ETF activities and the NGS while leading regional developments.

**Future Work:** We will continue to contribute to the NGS and Campus Grids SIG although, as this effort is no longer funded, our level of contribution will be based purely on local needs. If the bid for a Scottish Grid Service is successful, we will contribute resources and staff to that activity.

We will continue to identify needs amongst research groups that they are unable to meet themselves due to lack of resources and to reduce duplication of effort, with staff funded from a variety of sources.

In Edinburgh, the Middleware Team have identified a need for a University-wide Version Control System, intended for, but not limited to, the collaborative working on software, papers and course material both within the University and with other institutions. We hope to see this project funded and implemented during the next year. We will also build on the work already done with common bio-science databases, to extend the number and type of services available to researchers. We will complete the Condor infrastructure trial, enabling small pools of Condor use around the University to become part of a larger, University-wide resource.

## 4.7 IT INFRASTRUCTURE

**Leaders:** David McNicol and Christopher Bayliss

In December 2007 we transferred responsibility and funding for NeSCForge development to Christopher Bayliss from David McNicol, to achieve a better balance of IT effort between our staff.

**Web site hosting:** As reported in last year's report, we decided to find a web hosting solution from the University of Edinburgh's Information Services group, rather than to buy a new server of our own. This approach offers better reliability and would reduce the load on the NeSC IT team. Since August 2007, our activity has focussed on planning this migration. In the meantime, our existing web server has continued to provide good service to the community.

The migration is planned in two phases. The first phase, which is almost complete, will be to migrate the database that underlies the site. Information Services have set up the databases and roles required. We discovered that some of our web sites needed substantial tidying in order to support this migration and this has delayed the migration while the Cold Fusion code is made portable. Susan McCafferty is in the process of restoring our web site data to the new test database, to check that it works as planned. Once we have a populated test database, we can test connectivity from ColdFusion and from ODBC on desktop PCs. Successful tests will give the all clear for the migration.

The second phase will be to migrate the web site itself. As described in section 4.4, we have decided to rewrite the site rather than to continue with an old and much-patched design. We will use a content management system to build the new site, which will support the maintenance of material by all relevant staff. We have investigated potential systems and currently Silverstripe looks suitable.

**NeSCForge:** We have developed this service on two fronts. Firstly, we have migrated the existing services to new hardware to ensure continuity of service. Secondly, we have elicited requirements from the community for an updated service, as the current NeSCForge software is several years old. The main requirement, as we expected, was for a more recent source-code control system than CVS.

To address these requirements, we are investigating several possible systems. At the current time, TRAC looks to be a suitable candidate. Indeed, we have already used it with some success on the nanoCMOS project.

In the meantime, the current NeSCForge has continued to provide a reliable and useful service to the community.

**Progress against plans:** Plans for NeSCForge are progressing well. We remain behind schedule with the deployment of a new database server and web server. The database migration is in hand, while the adoption of a content management system will provide a higher level of service.

**Future Work:** The NeSC Information Network will only supply enough funds to maintain an existing web system. Therefore we are using other funds to recruit a member of staff to complete the update of the web site.

## 4.8 STIMULATE E-SCIENCE EDUCATION

**Leader:** David Fergusson

Although this work is not funded by the NeSC III grant, we manage it as a project activity. This activity leverages our existing work in e-Science education locally, nationally and at the EU level, to stimulate further development of e-Science education in the UK.

**High Profile Events:** As part of the activities of the ICEAGE project the NeSC Training, Outreach and Education (TOE) group has managed the provision of the International Summer School for Grid computing. The 2007 school was held in Mariafred in Sweden (65 students) and the 2008 school in Balton Fured (45 students) in Hungary. These events have strong contributions from the UK community (OMII, OGSA-DAI, etc). There is also a strong attendance by students from the UK. Feedback from both students and presenters indicates that the summer schools continue to improve year on year.

TOE was also involved in the running of the Biomed Grid Summer School (which was initiated by NeSC under the ICEAGE project). Again this school has a strong UK component (OGSA-DAI & MyGrid).

Both of these schools are being continued by the client communities in the future.

In February 2007 a month long online “Winter School for Grid Computing” was held under ICEAGE. This school re-used video/presentation content collected at the ISSGC in conjunction with contributed tutor effort from the technologies involved (Condor, gLite, Globus, OGSA-DAI). This format allows students who are unable to attend the summer schools to experience some of the content of the summer school. This event had 35 students who remained fully engaged for the whole period of the Winter School. The Winter School also had live interactive lectures given by Malcolm Atkinson, Miron Livny and Ian Foster. These were supported using Adobe Connect, the overall school was supported using WebCT from Edinburgh, the GILDA international t-infrastructure and specific student support services developed by ICEAGE.

These ICEAGE student and tutor support services have also been used to support academic teaching delivery in Edinburgh and elsewhere. They will continue to be developed by IT services in the University of Edinburgh.

**NGS 2 activities:** The NeSC TOE took part in a very successful review of the NGS 2 project. We reported 29 events in 9 locations around the UK. These attracted more than 304 participants and over 1754 participant days. Our support for NGS continues beyond the current reporting period for NeSC.

**International policy and standards:** Under the ICEAGE, EGEE, NGS and eUptake projects, NeSC TOE has established and supported a number of international groups which are developing standards and policies to support collaboration in education and training for grids. These include the Open Grid Forum Education and Training Community Group and the e-Infrastructures Reflection Group. The former was recognised by the OGF organisers as the most active of the community groups, and in the latter NeSC TOE has been leading the development of content for the e-IRG White Paper to be published shortly.

NeSC TOE has also been a leader in developing future EU policy through contributing to EGI\_DS documents and discussion. In the UK we lead a work package in the JISC eUptake project which is expected to help shape policy towards the future development of training support.

As part of these activities a number of events have taken place which brought together stakeholders in education and training, including workshops at NeSC.

**Project outcomes:** The ICEAGE project has now been completed and awarded an “excellent” rating by the EU reviewers. NeSC TOE activities in coordinating and stimulating EU partners in training for EGEE II were again recognised as excellent during the final EGEE II review. NeSC TOE activities in coordinating and stimulating UK partners in training for NGS II were again recognised as excellent during the NGS 2 review.

**Progress against plans:** NeSC has been able to exceed the plans for the volume and quality of events and also in galvanising a strong set of community actions to influence policy makers.

**Future Work:** NeSC TOE will continue its work in NGS II and EGEE III in developing and delivering grid training. Analysis of UK requirements and provision will continue under the JISC eUptake project. We will further develop high profile summer schools including a UK Summer School (Advanced Distributed Services Summer School, September 2009). Our online services and materials will also be extended.

## 4.9 NATIONAL LEADERSHIP

**Leader:** Dave Berry

Staff at NeSC undertake a number of leadership tasks and activities beyond those funded by the project itself. These include organising visits from international delegations, the work of the UK e-Science Envoy, contributions to OGF, supporting the e-Science Directors' Forum, and participating in steering groups and JISC committees, among other work.

**International delegations:** We hosted a visit from Australia CAUDIT group on Sep 14<sup>th</sup> 2007 and another from the Korea Institute of Science and Technology Information (KISTI) on Feb 8<sup>th</sup> 2008.

**International policy on education and training:** As reported in section 4.8, the NeSC Training, Outreach and Education team have established and supported a number of international groups that are developing policies and standards to support collaboration in education and training.

**Open Grid Forum (OGF):** Malcolm Atkinson represented UK e-Science on the OGF board, thanks to the sponsorship of OGF provided by the Gridnet2 grant (which has now ended).

NeSC and EPCC also contribute to OGF working groups. Dave Berry was co-chair of the OGSA Data working group until its completion in December 2007. Neil Chue Hong is co-chair of the OGSA ByteIO working group. Mario Antonioletti is co-chair of the DAIS and OGSA-DMI working groups.

Malcolm Atkinson and David Fergusson are co-chairs of the OGF Education and Training community group. Richard Sinnott is acting chair of the OGF OGSA-DAI User Group.

**UK e-Science Envoy:** NeSC hosts the UK e-Science Envoy, who represents and co-ordinates the UK e-Science Core Programme. His activities for the year include, among others:

- Leading the UK e-Science strategy group, producing its draft documents and circulating them to key interested parties (including the Technology Strategy Board, the British Library, JISC and the Research Councils). This had led to the formation of the JISC Strategy Working Group.
- Representing the UK on the EU e-Infrastructure Reflection Group and concluding the work of its Education and Training Task Force
- Attending quarterly meetings of bodies such as the e-Science Strategy Advice Team.
- Attending quarterly meetings of the Research Councils' e-Science Representatives.
- Contributing to JISC committees, including the Strategic e-Content Alliance, the Joint Committee for Support of Research and the JISC Board.
- Giving a keynote at DADC 2008 in Boston, appearing on a panel at the 4<sup>th</sup> International Conference on e-Social Science in Manchester and giving the welcome speeches at AHM2007.
- Attending other national and international conferences, such as the Mardi Gras conference in Baton Rouge, OGF21 in Seattle and OGF23 in Barcelona.

**Other activities:** Peter Clarke is also a member of JISC committees, including the Joint Committee for Support of Research. He is a member of the e-Science SAT and chair of the STFC Strategic Computing Advisory Panel. He is also a member of the project management board of GridPP.

Richard Sinnott is a member of the e-Science SAT, the EPSRC User Group and the Open Middleware Infrastructure Institute (OMII-UK) User Group. He was also co-author of the report outlining the roadmap for e-Science digital repositories across Europe. This was presented to the EU president in September 2007 and is to be used to shape future funding and research agendas dealing with large scale e-Science data sets across Europe.

Dave Berry is the technical lead of the *Grid Computing Now!* Knowledge Transfer Network, which encourages the uptake of e-Science technologies by UK industry. He has organised several webinars and other events that have brought together industry and academia.

## 5 Project Roles

### 5.1 PETER CLARKE - DIRECTOR AND PRINCIPAL INVESTIGATOR

Professor Peter Clarke is Director of the National e-Science Centre and Professor of e-Science at Edinburgh. He was head of Particle Physics at University College London, and a Director and of the Network Centre of Excellence. He has worked at CERN for many years in the LEP and LHC programmes. He was a principal proponent leading to the UKLight R&D network for the UK, and now leads the ESLEA project to exploit optical networks for research applications. He has been on the PMB of the UK grid for particle physics (GridPP), the European Data Grid and the EGEE projects. He was a member of the Global Grid Forum Steering Committee and currently the JISC JCN and JCSR.

Project responsibilities include:

- Strategic decision making
- Liaison with ESI SAB
- Awareness raising and (human) networking activities

### 5.2 RICHARD SINNOTT - TECHNICAL DIRECTOR

Richard Sinnott holds a PhD from the University of Stirling. He was responsible for establishing an environment for e-Science at Glasgow. At Glasgow he lectures in Grid Computing and on the Modelling of Reactive Systems. He ran his own consultancy company based in Germany specialising in the area of formal technologies and their application to real time systems development, especially in the telecommunications domain. His current research is focused around Grid computing and its application to a broad spectrum of scientific areas especially the life science domain. He also maintains an interest in formal methods and their application to real time, distributed systems development.

Project responsibilities include:

- Leading the *Regional Outreach* activity and fostering projects across communities
- Leading the *e-Infrastructure* activity
- Managing the software engineer
- Interaction with Glasgow management on matters of facilities provision, sustainability of e-Science and strategic funding.
- NeSC III time commitments: 25%

### 5.3 DAVE BERRY – PROJECT MANAGER

Dave Berry has a Ph.D. in Computer Science from the University of Edinburgh and over 10 years' experience of software development management in industry, with particular expertise in compilers, runtime environments and distributed systems. In the area of Grid computing he is primarily interested in Grid architecture. He is technical lead of the IECnet knowledge transfer network. He leads the OGSA Data working group of the GGF. He has also organized the programmes of many workshops at the e-Science Institute.

Project responsibilities include:

- Keep overview of the NeSC project plan, organise and execute the management plan described, ensure timely delivery on all promised elements, ensure regular documentation and reporting by deadlines,

- Convene the management committee
- Lead the *Community Events* activity
- Lead the *National Leadership* activity
- Manage promotion and representation at relevant events including AHM.
- NeSC III time commitment: 25%

#### 5.4 SUSAN McCAFFERTY – WEB AND DATABASE DEVELOPER

Project responsibilities include:

- Design and provide the implementation of the website in accordance with the content design.
- Advise on feasibility of content design.
- Provide technical support for related services including the AHM support and NeSC event hosting support.
- Susan is shared with the e-Science Institute, ensuring coherence between the two projects.

#### 5.5 IAIN COLEMAN – SCIENCE WRITER

Project responsibilities include:

- Lead the *Web Site Content* activity.
- Design and maintain web site content.
- Ensure that the content is indexed in a clear and uniform way to maximise the opportunity for web-visitors to obtain contact points.
- Ensure that the content is kept constantly up to date, accurate and complete
- Ensure all direct NeSC-related activities are fully described
- Proactively seek information from other centres, projects, research councils and strategic partners such as JISC.
- Work closely with the JISC/EPSRC communications officer in Bristol.
- Manage the UK e-Science technical report series
- Iain is shared with the e-Science Institute, ensuring coherence between the two projects.

#### 5.6 CHRISTOPHER BAYLISS - SOFTWARE ENGINEER

Project responsibilities include:

- Participate in ETF and STF work.
- Develop database services and file management services.
- NeSC III time commitments: 50%.

#### 5.7 DAVID McNICOL - SYSTEMS ADMINISTRATOR

Project responsibilities include:

- Lead the *IT infrastructure* activity
- Provision and maintenance of a reliable and resilient platform for the website
- Provision and maintenance of a reliable and resilient platform for NeSCForge
- Management of Access Grid maintenance, development and operations
- Management of basic computing support and network services
- NeSC III time commitments: 50%.

## 5.8 DAVID FERGUSSON - DEPUTY DIRECTOR, TRAINING OUTREACH & EDUCATION

Project responsibilities include:

- Lead the *Stimulate e-Science education* activity
- Manage the annual large education event

## 5.9 ANNA KENWAY - DEPUTY DIRECTOR, E-SCIENCE INSTITUTE

Project responsibilities include:

- Lead the *Web Site Redesign* activity

## 5.10 EVENTS TEAM

Project responsibilities include:

- Logistics support (registration, accommodation, programme, front desk and delegate services during meeting)
- Technical support (computing infrastructure, demos and open guest network provision). Provide and develop the website.
- NeSC III time commitments: 1 FTE equivalent.