



## JISC Project Plan

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- *Please expand tables as appropriate.*
- *Fill in the information for the header, e.g. project acronym, version, and date.*
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## ***Overview of Project***

### **1. Background**

Single sign-on and delegation of privileges are key requirements for e-Infrastructures and Grids. The realization of single sign-on and delegation of privileges in accessing resources such as the UK e-Science National Grid Service (NGS - [www.ngs.ac.uk](http://www.ngs.ac.uk)) is usually facilitated by X.509-based Public Key Infrastructures (PKI) and exploitation of proxy certificates. However, proxy certificates can potentially be obtained and abused by a malicious third party without the knowledge of the holder. There is currently no method for end users to detect such misuse. In this project we intend to address this issue directly.

### **2. Aims and Objectives**

We will develop a proxy certificate auditing infrastructure and demonstrate a solution that enables a thorough auditing and monitoring of proxy credential usage in widely distributed and heterogeneous research environments exemplified by NGS. In undertaking this we shall develop a secure service through which auditing information can be tracked and used for user-level monitoring, virtual organization (VO)-level usage and monitoring, and resource provider-level usage and monitoring. We aim to make this auditing service available to the NGS for longer term auditing and monitoring of its customer and research base, and demonstrate use of this auditing service in international settings.

### **3. Overall Approach**

This project will be undertaken in two phases. Each of these two phases will have associated deliverables demonstrating progress made. In the first phase (start Jan 2010 – end Jun 2010), we shall establish a GSI-audit enabled service on a test infrastructure at NeSC, NGS and TVU leveraging software from an associated Globus Incubator Project (we have supporting collaboration letters in this regard). We will develop/extend a secure web service including associate back-end database and proxy credential audit record structures, and conduct initial testing with simple exemplars. In the second phase (start Jul 2010 – end Mar 2011), the infrastructure will be integrated into NGS and demonstrated in numerous projects and application domains, focusing on the monitoring, training and predication of proxy usage. We will explore the deployment of the auditing infrastructure in an international dimension and exploit international Grid resources such as TeraGrid and D-Grid.

## 4. Project Outputs

- An auditing infrastructure middleware and overall methodology to support proxy credential auditing and monitoring
- Integration of a proxy certificate auditing infrastructure into the NGS, and implementation of a range of relevant case studies
- Two project workshops for community engagement and technology transfer
- Publications in a variety of major journals and conferences

## 5. Project Outcomes

- The proxy certification auditing infrastructure developed will be available to the NGS for longer term auditing and monitoring purposes of its customer and research base.
- We will also demonstrate use of the auditing service in an international setting including use of the NGS, ScotGrid, TeraGrid in the US and the D-Grid in the Germany.
- The results of the project will be sustained as part of the NGS and ScotGrid, and will directly shape future efforts such as European Grid Infrastructure (EGI) and UK National Grid Infrastructure (NGI) should this eventually happen.

## 6. Stakeholder Analysis

Stakeholder	Interest / stake	Importance
Grid infrastructure providers, e.g. NGS	Proxy credential auditing infrastructure and solutions	High
Grid middleware developers	Software production & insight into usage	High
Research councils/funding bodies/industry	Greater understanding of Grid security	High
International community	Input to relevant standard, e.g. OASIS, OGF	High
UK academic community	Educational content & security aspects	High

## 7. Risk Analysis

Risk	Probability (1-5)	Severity (1-5)	Score (P x S)	Action to Prevent/Manage Risk
Staffing	1	4	4	We will use a team based approach which means the over-dependency on any individual or issues they may face with learning e-Science technologies are minimal. Two RAs at NeSC Glasgow (part time) and one RA at TVU will work on this project although two RAs are funded through this project. Contingency has been built into the project plan in order to cater for short term illness or unexpected events.
Organisational	1	4	4	For many large projects which involve multiple institutions, the coordination between sites is a

				major issue. Our project is collaboration between TVU and NeSC Glasgow only, and we have collaborated previously through projects and publications. We also have extensive experience in major project development activities and roll-out of e-Infrastructure to a variety of research communities. We use effective collaborative tools and will hold frequent face-to-face meetings to facilitate project coordination, ensure work is on track and any issues can be resolved in a timely manner.
Technical	2	2	4	The project team has a research portfolio across a broad range of areas which will guide this project. In particular, some past/on-going projects are directly relevant to this project and we have extensive knowledge and experience that can be exploited in this project. We will adopt and extend existing technical solutions from a Globus Incubator project, and directly leverage the expertise of project collaborators.
External suppliers	1	1	1	The use of software and/or equipment from external vendors is minimal, with primary software to be produced/evaluated coming from project partners (and the German collaborator Christopher Kunz). As such this poses a minimal risk to the project.
Legal	1	2	2	To avoid any legal issues influencing the successful completion of the project, a consortium agreement is in the process of being drafted which all parties are involved in producing and will subsequently agree to.

## 8. Standards

Name of standard or specification	Version	Notes
X.509	V3	X.509 is an standard for a public key infrastructure (PKI) for single sign-on (SSO) and Privilege Management Infrastructure (PMI)
Web Services Resource Framework (WSRF)		WSRF is a family of OASIS-published specifications for web services

## 9. Technical Development

We do not underestimate the complexity of the work and are not proposing to develop complete new systems. Instead it is our intention to draw upon initial proof of concept project that have demonstrated the technical feasibility of aspects of the work, in particular, the Globus Incubator project – Grid Proxy Auditing Infrastructure. We shall adopt and extend existing software solutions and this will give us a solid start for testing and evaluation in the application domains.

The project will make use of the considerable expertise in project management. Our project is a collaboration between TVU and NeSC Glasgow only (i.e. these are the funded partners), and we have collaborated previously through projects and publications. As such the potential dangers of distributed software development and dependencies between partners are minimised. Feedback and refinements to the software developed will be made at specific time points with associated deliverables produced describing the experiences and general usability of the software.

## 10. Intellectual Property Rights

The precise details of the Intellectual Property Rights and their long term impacts are in the process of being document in the consortium agreement. The consortium agreement itself is currently under development and will be sent through to the programme manager in the near future. It is not envisaged that third party intellectual property will form an integral part of the project. Specifically, the software to be produced will be based on existing intellectual property (the Proxy-Audit package from the German project partner who has agreed to the enhancements to be realised in the project). The educational material to be developed within the project will be of an open nature.

## *Project Resources*

### 11. Project Partners

Funded project partner

- National e-Science Centre, University of Glasgow, Prof. Richard Sinnott

Non-funded collaborators

- UK National Grid Service, Dr Andrew Richards
- Universities of Leeds (NeISS project), Prof Mark Birkin
- University of Manchester (NeISS project), Prof Rob Procter
- University of Stirling (DAMES project), Dr Paul Lambert
- University of Hannover (D-Grid), Dr Christopher Kunz
- University of Louisiana (TeraGrid), Prof Shantenu Jha
- University of Glasgow (nanoCMOS project), Prof Asen Asenov
- University of Glasgow (ENROLLER project), Dr Jean Anderson

### 12. Project Management

The project team is structured as follows:

- Project Director – Prof Richard Sinnott, NeSC, University of Glasgow (0.10 FTE)

The Project Director will oversee the project, provide it with strategic direction and make key decisions on significant matters jointly with the Project Manager.

- Project Manager – Dr Wei Jie, Thames Valley University (0.15 FTE)

The roles of the Project Manager include: (1) to be the project's primary contact (2) conduct day-to-day project management (3) be responsible for financial administration according to the grant (4) to monitor the progress of the project with respect to tasks and deliverables (5) to initiate remedial action in case of slippage or in the event of risks occurring (6) to lead the production of the progress and final reports.

- Work package Leaders

The WP leaders (RAs) report to the Project Manager and are responsible for the timely delivery of the outputs that meet the quality level defined. The RAs who will work on this project include

Christopher Bayliss – NeSC, University of Glasgow  
David Martin - NeSC, University of Glasgow  
1 Research Associate at Thames Valley University

There will be monthly project team meeting to be attended by the Project Director, Project Manager and Work package Leaders. The main purpose of these meetings is to report on progress towards deliverables and to discuss any issues arising.

A monthly work package report is required from each work package leader, stating progress against each task for which they are responsible, as well as any current issues or problems affecting progress.

The project will make use of collaboration tools to facilitate the communication and collaboration such as the Sakai Collaboration and Learning Environment.

### 13. Programme Support

We would expect to be kept informed of, and to inform others, of developments in the Core Middleware projects, especially those focusing on Grid/e-infrastructure authentication infrastructures, adoption and application of X.509 PKI based authentication.

### 14. Budget

See Appendix A.

### *Detailed Project Planning*

### 15. Workpackages

See Appendix B.

### 16. Evaluation Plan

Timing	Factor to Evaluate	Questions to Address	Method(s)	Measure of Success
Month 7	Established proxy credential audit test platform	Suitability and practicability of the proxy auditing platform	Initial testing of auditing platform with simple exemplars	Insights into suitability and practicality of establishment of proxy audit test platform
Month 14	Enhanced proxy credential auditing service	Functionality, practicability and scalability of the proxy auditing infrastructure	Integration into NGS and implementations of case studies	Enhanced proxy credential auditing service demonstrated with applications

## 17. Quality Plan

For users to have confidence in outputs produced by this project, deliverables should meet a requisite standard of quality. This is the purpose of Quality Assurance – to ensure that software does what it is supposed to do, and is robust and reliable; and that documents address the issues that they are supposed to, that they are clear and well-formatted. We shall make these outputs directly available to the NGS for feedback on all aspects of usability and clarity of information since they will be the main arbiters to the success of the project.

All project deliverables are subject to the following quality procedure, involving a team worker (who produced the deliverable), a reviewer (nominated project partners) and the Project Manager. Team workers will submit deliverables to reviewers, and reviewers assess each deliverable with respect to appropriate quality criteria. Reviewers will discuss outputs with team workers to identify and clarify any issues arising. Once all issues have been addressed, the deliverable will be submitted to the Project Manager who will conduct a further review to ensure that it meets any other quality criteria before final sign-off.

<b>Output Timing</b>	<b>Quality criteria</b>	<b>QA method(s)</b>	<b>Evidence of compliance</b>	<b>Quality responsibilities</b>	<b>Quality tools (if applicable)</b>
All phases of the project	Software deliverable	Software specification and standard definition, manual code review, functional test	Adherence to specifications and standards, fitness for functionality, best practice for processes	Workpackage leaders, reviewers, and Project Manager	
All phases of the project	Document deliverable	Document specification and definition, document review	Adherence to specifications, fitness for functionality, best practice for processes	Workpackage leaders, reviewers, and Project Manager	

## 18. Dissemination Plan

Dissemination will consist of demonstration, training and outreach, papers to major journal / conferences, and similar activities. In particular, to ensure that maximum exposure to the work is achieved and the results are ingested into the mainstream management of resource providers such as the NGS, we shall organize two major workshops as follows:

<b>Timing</b>	<b>Dissemination Activity</b>	<b>Audience</b>	<b>Purpose</b>	<b>Key Message</b>
Month 7	Project workshop 1	NGS customer & research base and wider UK Grid/e-Science community	Software demonstration, explorations of the practicalities of the use of the software, feedback gathering.	Maximum exposure to the project and wider acceptance by the community
Month 14	Project workshop 2	NGS customer & research base and wider UK Grid/e-Science community	Software demonstration, tutorials, explorations of the deployment and sustainability of the software	Maximum exposure to the project and wider acceptance by the community

## 19. Exit and Sustainability Plans

Project Outputs	Action for Take-up & Embedding	Action for Exit
Proxy credential auditing infrastructure middleware	More widespread adoption by the UK and international Grid communities	Software and documentation (user/admin guides, reports on user experiences)
Educational materials	To be offered to wider community of teaching purposes and will form basis for future Grid/e-Science courses	No action needed.

Project Outputs	Why Sustainable	Scenarios for Taking Forward	Issues to Address
Proxy credential auditing infrastructure	Offer a solution to support proxy credential auditing and monitoring - therefore of great interest to Grid community	Trial in more environments and then consider refining/productising.	Usability, scalability, robustness engineering.
Training materials	Much interest in Grid/e-Science education material	Incorporated as an element of teaching at e-Science Institute	Adapting to standards and technology evolutionary nature

## *Appendixes*

### **Appendix A. Project Budget**

### **Appendix B. Workpackages**