



Project Document Cover Sheet

Project Information			
Project Acronym	Shintau		
Project Title	Shib-Grid Integrated Authorization		
Start Date	1 March 2007	End Date	31 March 2009
Lead Institution	University of Kent		
Project Director	Professor David Chadwick		
Project Manager & contact details	Professor David Chadwick University of Kent, Computing Laboratory, Canterbury, CT2 7NF. Email: d.w.chadwick@kent.ac.uk Mobile: +44 77 96 44 7184		
Partner Institutions	Internet 2		
Project Web URL	http://sec.cs.kent.ac.uk/shintau/		
Programme Name (and number)	e-Infrastructure (security)		
Programme Manager	James Farnhill		

Document Name			
Document Title	Project Plan		
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Author(s) & project role	D Chadwick, Project Manager		
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Document History		
Version	Date	Comments
0.9	14 July 2007	First draft circulated to project team for comments
1.0	4 August 2007	Version 1.0 of the project plan
1.1	18 Oct. 07	Corrected budget figures
1.2	5 April 2008	Revised objectives
1.2.1	27 April 2008	Minor corrections



JISC Project Plan

Overview of Project

1. Background

Integration of grids and Shibboleth is being hampered because a user's attributes are typically held in different locations with different Identity Providers (IdPs) using different identifiers for the same user. Consequently there is no coherent way of collecting them together and validating that they all belong to the same user so that they can be used for authorization of the user's request. In general users have multiple IdPs, and they are usually unwilling for "big brother" to know what their different identities are, as this compromises their privacy. Consequently, the process of attribute aggregation has to be undertaken with respect to the user's privacy. This project aims to do just that.

2. Aims and Objectives

The first objective of this project is to work with the international community, primarily the Internet2 consortium and the Globus Consortium, but including SWITCH, TERENA and others, to develop the Shibboleth protocol specifications, based on SAMLv2 and other protocols, that will allow a Shibboleth service provider (SP) to collect together a user's attributes from multiple authorities, whilst preserving the user's privacy, so that the aggregated attributes can be used to authorise the user's request. This will significantly ease the integration of Shibboleth with grids. However, the resulting attribute aggregation protocol will be of benefit to any Shibboleth enabled SP be it a web service, a grid service, or a conventional Shibboleth SP etc.

The second objective is build a prototype attribute aggregation system that will allow a user to control the linking of his various Identity Provider attributes at a Service Provider. The system will be built according to the Conceptual and Detailed Design documents that will be developed during the project.

The third objective is to implement the aggregation system so that it is capable of collecting the attributes from the multiple authorities, prior to validation.

The fourth objective is to build a pilot demonstrator for the National Grid Service that will show how attributes from multiple AAs can be integrated together and used in authorisation decision making at grid sites that use shibboleth IdPs.

The final objective is to release all the developed software as open source code through NMI/OMII to the community at large, with a full set of specifications and documentation.

3. Overall Approach

Our overall approach will be to work with the world wide community to ensure that whatever protocols we define and implement will have wide acceptance. To this end we will initially circulate a questionnaire to capture user requirements, then produce a conceptual model for wide circulation and appraisal, followed by the set of protocols that we plan to implement. We will also take the protocols to a standards body (probably Liberty Alliance) for further review and refinement, before we start implementation. Only after we are sure that the protocols will be widely accepted, will we start the implementation of the open source software. Consequently a critical success factor for this project is producing a set of protocols and implementation that will gain wide approval.

4. Project Outputs

- D1.1** A User Requirements Questionnaire
- D1.2** Analysis of User Requirements
- D1.3** A conceptual model for attribute aggregation
- D1.4** SAMLv2 profiles for attribute aggregation

D1.5 One or more papers to international conferences describing the user requirements, conceptual model and SAML profiles

D2.1 Modified IDP software that is capable of storing and returning links to other IDPs

D2.2 A new Linking Service that stores links for users

D3.1 An attribute aggregating CVS that is capable of validating signed and encrypted SAML attribute assertions received from multiple IdPs

D3.2 An attribute aggregating PIP that is capable of attribute aggregation by pulling signed and encrypted SAML attribute assertions from multiple IdPs

D4.1 A modified mod_permis module for Apache that picks up the collection of attributes from multiple IdPs and pushes them to the backend PERMIS attribute aggregating PIP and PDP

D5.1 An enhanced Globus Toolkit with a customizable attribute aggregating PIP

D7.1 A working demonstration of the attribute aggregating PIP in a current Grid project that will retrieve attributes from at least 3 IdPs.

D8.1 The integrated software packaged with GT4, released as binaries and open source

D8.2. User, developer and administrator documentation for the package including information needed for its support in a Shibboleth-enabled environment

D8.3 A paper for an international conference or journal publicizing the work

D8.4 Final report to JISC

5. Project Outcomes

This project will have a major international impact, because R&D groups the world over who are currently experimenting with Shibboleth and grid middleware are hitting the problem identified in this proposal. The project deliverables will enable a wider group of users to use Shibboleth for their authentication and authorisation needs. An internationally standardized solution is required in order to gain wide acceptability, and this proposal suggests how one can be arrived at. It has the support of major international players, notably Internet 2, Terena and the Globus Consortium, and the offers of internationally recognized experts to help in the formation of the solution. This project will serve to confirm to the world that the UK is a leading player in federation technologies, and will contribute to the advancement of these technologies.

6. Stakeholder Analysis

Stakeholder	Interest / stake	Importance
Internet2	Project partner	Very high
JISC	Funding body	medium
University of Kent	Major project partner	high
Globus consortium	Potential major customer	high
NGS	Potential major customer	high
OMII-UK	Potential major customer	high
TERENA	Publicity channel	medium

7. Risk Analysis

Risk	Probability (1-5)	Severity (1-5)	Score (P x S)	Action to Prevent/Manage Risk
Staffing problems at Kent (e.g. RA leaves)	3	3	9	We have a team of people at Kent and therefore will have substitutes if the main RA leaves.
Beating the March 2009 Deadline	3	3	9	This is a PM issue and good project management is needed to prevent delays
Failure to find appropriate technical solution.	1	3	3	Many solutions are possible. It is low risk that no solution will be found. The higher risk is wide acceptability of the solution
Reliant on Internet2	2	5	10	Nate Klingenstein from Internet2

agreeing in a timely manner to the SAMLv2 profile we define				has committed to participate in the work and is liaising with us to help guide our work
Insufficient voluntary input from international experts	3	1	3	This risk cannot be effectively managed since it is outside the control of the project partners
Failure to get world wide acceptability of the protocol we define in time for this project	3	5	15	Whilst agreements are usually possible given sufficient time and effort, it is a significant risk that an agreement will be reached in time for this project since different people have different ideas. We need to consult widely, and ensure Internet2 supports us, and be flexible in our approach.
Reliant on the Internet2 implementing Shibboleth 2 SP in Java. (This project has been delayed by more than a year so far)	4	5	20	We have no control over this project, other than to make our requirements known. It is currently running even later than anticipated (see Appendix B). We will need to review this in Dec 2007
Reliant on the OGF completing the specification of the 2 nd generation OGSA AuthZ protocols	3	3	9	Fallback strategy of performing the integration and demonstrator using the existing 1 st generation Authz protocol or, for GT4, the existing Java interface
Data Corruption/Hardware malfunction	1	5	5	Use versioning system and regular backups
Legal. None	1	1	1	All our code will be open source with BSD license

8. Standards

Name of standard or specification	Version	Notes
SAML	V2	This will be the main protocol for attribute aggregation and attribute assertions. Extensions may be needed to the protocol, but these will be in a standards conformant way, and will be minimised
XACML (request context)	V2	This will be the format for the PEP-PDP interactions
WS-Trust		This will be the format for the PEP-CVS interactions
Liberty Alliance ID-WSF		This is used to map the different identities in SAML request and responses between the IDP and SP

9. Technical Development

The attribute aggregation protocol will be specified and internationally scrutinised before any implementation begins.

During the project all the software will be designed before any code is written. The designs will be quality assured by experienced staff at Kent and will be distributed widely to the international

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community for comment. All designs at Kent are held in a local Subversion SVN system for ease of distribution and tracking changes.

To ensure that the developers are using the most up-to-date code, and to make coherent and retractable changes to it, the CVS versioning system will be used. All the core PERMIS software is already held in this system. The CVS content is frequently backed up onto a second hard disk, and a quarterly back-up is burnt onto a CD-RW. This protects the development process against hardware failure.

Any changes to the existing PERMIS codebase will be regression tested to ensure that no bugs are introduced. An automated regression testing facility has been developed for PERMIS containing a test suite with well over a 1000 test cases. New test cases are continually being added. All new functionality produced under this project will have regression tests developed for it. This will ensure that any future development will remain compatible with the ones developed under Shintau.

10. Intellectual Property Right

Any IPR developed under this project will be owned by the University of Kent, but will be made freely available to the world wide community through the release of open source software with a BSD-like license.

Any other third party software that will be used will also be open source with a zero cost license so that no encumbrances will be places on users of the project deliverables.

Project Resources

11. Project Partners

Primary Contractor: University of Kent

Main Contact: Professor David Chadwick, University of Kent, Computing Laboratory.

Fax: +44 1227 762 811

Mobile: +44 77 96 44 7184

Email: D.W.Chadwick@kent.ac.uk

Role: Designer, Developer, Implementer and Tester

Project Partner: Nate Klingenstein, Internet2 Consortium

Email: ndk@internet2.edu

Role: Designer

Supportive Partners: The following organisations provided letters of support and their members are providing useful contributions in kind: Globus Consortium, TERENA, SWITCH, RedIRIS

Role: Reviewers of protocol definitions

Consortium Agreement. There will not be one, since the effort of the project partners (other than the primary contractor) is purely voluntary and on a best efforts basis.

12. Project Management

Project Management will be based loosely on PRINCE, but will be simplified significantly.

Staff working on the project will be given weekly work sheets, and will produce weekly progress reports. Technical day to day decisions will be made by the project manager and the development staff concerned. Important issues and exceptions will be reported to the project manager.

There will be no Project Board, but the Project Manager and Nate Klingenstein will be in daily contact via email. Strategic decision making will be made by the Project Manager in consultation with Nate Klingenstein from Internet2.

The project manager is Professor David Chadwick from the University of Kent. He will spend approx 15% of his time on this project overall.

George Inman (g.inman@kent.ac.uk) will be the RA working on the architectural design and protocol specification. He will spend 25% of his time on this project during the first year, and then 100% of his time during the second year.

Linying Su (L.Su-97@kent.ac.uk) will join the project midway through year 2, when VPMan is finished, and will work full time on the project during the implementation phase.

Other members of the ISSRG will work on the project as and when necessary to lend their particular expertise

13. Programme Support

The project will benefit hugely from the support of the program manager in facilitating links with other projects and with external bodies where this is appropriate, and in particular with Internet2 and its Java SP developments.

14. Budget

See Appendix A.

Detailed Project Planning

15. Work Packages

Please see Appendix B

16. Evaluation Plan

Timing	Factor to Evaluate	Questions to Address	Method(s)	Measure of Success
M6-M20	Standardisation of attribute aggregation specifications (formative)	Is there sufficient support of the specification for a standards body to progress the work?	Talking to standardisation participants, sharing ideas and specs with them	Acceptance by a standards body to progress the protocol as a standard
M23-25	Software deliverables (summative)	Will the software allow users to easily aggregate their attributes in order to gain access to resources? Is the software easy to install and configure by administrators?	Testing with application demonstrator and questionnaire of participants	>75% of users and administrators are satisfied or very satisfied
Year after completion	Take up of open source software (summative)	Is there take up by the community at large?	Count number of downloads	200+ downloads in initial 12 months after release.

17. Quality Plan

Output and Timing	Quality criteria	QA method(s)	Evidence of compliance	Quality responsibilities	Quality tools (if applicable)
User	Fitness for	Review and	Test report	Project Manager	Word

Documentation M21-M25	purpose	test by independent users e.g. students			processor
Dissemination papers M3-M25	Leading edge	Review by external reviewers	Accepted for conference or journal	Authors of paper	Word processor
Attribute Aggregation Specification M2-M20	Fit for purpose, Accepted for standardisation	External reviews	Accepted by standards body	Project Manager	Word processor, SVN
Software deliverables M10-M22	Fit for purpose	Code inspections	Integrated into application demonstrator	Project Manager	CVS, Regression testing

18. Dissemination Plan

Timing	Dissemination Activity	Audience	Purpose	Key Message
M1	Web site	International academic community	To raise awareness	Project objectives
M1-3	Requirements Questionnaire	Shibboleth and Grid community	Raise awareness and capture requirements	Project has started. What are your requirements
M4-20	Attribute Aggregation conceptual model and protocol specification	Standards community, Shibboleth and Grid developers and implementers	Ensure wide acceptance of the proposed model and protocols	This is what is being proposed, what do you think?
M12-25	Conference and Workshop presentations	Conference/OGF/AH /Workshop attendees	To publicise the project and its results	A new security service is being developed
M12-24	Application Demonstration	Grid community	Recruit an application and promote our project	New service and software is available that can help you
M23-M25	Distribute via US-NMI	Global grid and Shibboleth community	Promote the project's outputs	New open source attribute aggregation software is available

19. Exit and Sustainability Plans

Project Outputs	Action for Take-up & Embedding	Action for Exit
Knowledge.	George Inman will use this to write up an MSc by research Dissertation	
Attribute aggregation software	Find an application demonstrator. Pass work onto Shibboleth/Internet2 team for incorporation in their software releases and onto Globus	Access. Have software available for download. Preservation. ?? Maintenance. See table below.

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	for incorporation into GT4	IPR. None needed. All software will be open source BSD
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Project Outputs	Why Sustainable	Scenarios for Taking Forward	Issues to Address
Attribute aggregation software	Standards based, open source, application independent addition to authz infrastructures, modular, extensible	<ol style="list-style-type: none"> 1. Encourage open source community to build around it 2. Further RTD grants to continue its development 	<ol style="list-style-type: none"> 1. How to fund coordinator of this project 2. Finding appropriate calls for proposals

Appendixes

Appendix A. Project Budget

Note that the following budget does not include the cost of the international experts, whose expertise will be provided without charge to this project. Thus the actual cost will be higher and the contribution from JISC will be lower than the figures presented below.

	March 07	Apr 07– Mar 08	Apr 08– Mar 09	TOTAL £
Directly Incurred Staff at Kent				
Total Staff (A)	0	12,000	79,379	91,379
Non-Staff at Kent				
Travel		4,000	2,000	6,000
Consumables		750	750	1,500
Laptop & PC	2,000			2,000
Subcontracting (4mm+overheads)			30,000	30,000
Total Non-Staff (B)	2,000	4,750	2,750	39,500
Directly Incurred Total (A+B=C)	2,000	16,750	112,129	130,879
Directly Allocated				
Estates	70	1,625	10,351	12,046
Directly Allocated Total (D)	1,029	13,366	22,700	37,095
Indirect Costs (E)	352	8,206	52,233	60,791
Total Project Cost	3,381	38,322	187,062	228,765
Amount Requested from JISC	2,705	30,658	149,649	183,012
Institutional Contributions	676	5,264	39,812	45,753
Percentage Contributions over the life of the project		JISC 80 %	UK Partner 20 %	Total 100%

Appendix B. Work packages



JISC WORK PACKAGE

WORKPACKAGES months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1: Work with Internet2 Consortium to define SAMLv2 profile(s)	X	X	X	X	X	x	x	x	X	x	x	x	X	x	x	x	x	x	x	X					
2: Build IDP linking capability										X	X	X	X	X											
3: Build SP multiple IDP capability															X	X	X	X	X	X					
4: Integrate with the Internet2 Shibboleth 2 Java SP implementation for Apache																				X	X				
5: Integrate with GT4																					X	X			
6: Application demonstrator												x	x	x	x	x	x	x	x	x	X	X	X	X	
7: Dissemination	X	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	X	X

X=major activity x=minor activity

Project start date: 1 March 2007

Project completion date: 31 March 2009

Duration: 25 months

				Milestone	Responsibility
YEAR 1	M1	M20			
WORKPACKAGE 1: <i>Objective: Work with Internet2 Consortium to define SAMLv2 profile(s) for attribute aggregation</i>					
1. Produce user requirements questionnaire	M1	M1	D1.1 A User Requirements Questionnaire		DC, NK, GI
2. Complete requirements questionnaire	M1	M3			IC
3. Evaluate user requirements questionnaire	M3	M3	D1.2 Analysis of User Requirements		GI
4. Produce conceptual model for attribute aggregation	M4	M4	D1.3 A conceptual model for attribute aggregation		DC, NK, GI
5. Produce first set of protocol specifications	M5	M5	D1.4 Draft profiles for attribute aggregation		GI
6. External reviews of model and protocols	M6	M8			IC
7. Produce second set of model and protocol specifications	M9	M9	D1.4 Draft profiles for attribute aggregation		GI
8. External review of model and protocols	M10	M12			IC

9. Produce final draft set of implementation specifications	M13	M13	D1.4 Draft profiles for attribute aggregation		GI
10. External review and implementation feedback	M14	M19			All
11. Produce final set of implemented specifications	M20	M20	D1.5 Final profiles for attribute aggregation		GI
YEAR 2					
WORKPACKAGE 2:					
<u>Objective:</u> : Build IDP linking capability					
1. Modify IDP software to store and return links	M10	M11	D2.1 Modified IDP software that is capable of storing and returning links to other IDPs		GI
2. Build Linking Service	M12	M14	D2.2 A new Linking Service that stores links for users		GI
WORKPACKAGE 3:					
<u>Objective:</u> Build SP multiple IDP capability					
1. Build service capable of validating signed and encrypted SAML assertions from multiple IDPs (push model)	M15	M17	D3.1 An attribute aggregating service that is capable of validating signed and encrypted SAML attribute assertions received from multiple IdPs		GI
2. Build service capable of pulling multiple SAML assertions from multiple IDPs (pull model)	M18	M20	D3.2 An attribute aggregating service that is capable of attribute aggregation by pulling signed and encrypted SAML attribute assertions from multiple IdPs		LS

WORKPACKAGE 4:					
<u>Objective:</u> Integrate with the Internet2 Shibboleth 2 Java SP implementation for Apache					
1. Integrate with Shibboleth/PERMIS implementation for Apache	M20	M21	D4.1 An enhanced Shibboleth/PERMIS that is capable of receiving assertions from multiple IDPs and making authorisation decisions based on them		GI
WORKPACKAGE 5:					
<u>Objective:</u> Integrate with GT4					
1. Integrate the service from WP3 into GT4			D5.1 An enhanced GT4 that is capable of receiving or pulling assertions from multiple IDPs and making authorisation decisions based on them		LS
WORKPACKAGE 6:					
<u>Objective:</u> Application demonstrator					
1. Choose application	M12	M20			DC
2. Set up application	M21	M22			GI
3. Run demonstration experiments	M23	M24	D6.1 A working demonstration of attribute aggregation in a current Grid project that will retrieve attributes from at least 3 IdPs.		GI
WORKPACKAGE 7:					
<u>Objective:</u> Dissemination					

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1. Set up Website	M1	M1			GI
2. Package the final software for Open Source Release (BSD license) along with Globus Toolkit for release with the NMI. Produce user friendly documentation, installation guides and tools.	M24	M25	D7.1 The integrated software packaged with GT4, released as binaries and open source D7.2. User, developer and administrator documentation for the package including information needed for its support in a Shibboleth-enabled environment		GI
3. Write one or more papers for international conferences	M2	M25	D7.3 A paper for an international conference or journal publicizing the work		DC
4. Write final report to JISC	M25	M25	D7.4 Final report to JISC		DC

Members of Project Team:

GI= George Inman

DC = David Chadwick

LS = Linying Su

NK = Nate Klingenstein

IC = International Community of Experts

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Appendix C. Risk from Shibboleth 2 Java Implementation

From: Nate Klingenstein <ndk@internet2.edu>
Subject: Re: Shintau project plan - Shib2 Java
Date: Sat, 14 Jul 2007 19:43:12 +0000
To: David Chadwick <d.w.chadwick@kent.ac.uk>

Ugh. Time to add a big bullet point there.

The backplane for both the Java IdP and SP was developed as one project. Things like the attribute resolver, OpenSAML 2, metadata, connectors for provisioning, the modularity of protocol handlers, etc. were all done with an eye towards building an IdP and an SP on top of the same code base. Once these underlying pieces were done the IdP and SP were supposed to both be minor amounts of glue code.

It took us longer than we thought to get the underlying Java libraries done, and the strategic decision was made to put off the Java SP until Shibboleth 2.1 so we could get the IdP and C++ SP out expeditiously.

Even that hasn't quite happened as we planned. The 2.0 IdP is currently at Alpha 1 and it's missing a fair amount of functionality. The 2.0 C++ SP is basically done.

CPPSP: <http://svn.middleware.georgetown.edu/view/trunk/doc/RELEASE.txt?revision=2356&root=cpp-sp>

IdP:

From: lajoie@georgetown.edu
Subject: **Re: Release Notes... next alpha release**
Date: Fri 13 Jul 2007 03:44:22 GMT+00:00
To: shibboleth-dev@internet2.edu
Reply-To: shibboleth-dev@internet2.edu

Alpha 1 will have the following features:

- Fetching of metadata from URLs, the filesystem, and inline to the configuration as well as chaining metadata sources.
- REMOTE_USER based user authentication
- Shibboleth SSO with or without attribute push (default is to push)
- SAML 1 Attribute Query via SOAP over HTTP
- SAML 2 Authentication Request via POST and Redirect, with or without attribute push (default is to push)
- SAML 2 Attribute Query via SOAP over HTTP
- Attribute Resolution w/ the following plugins:
 - Direct principal connector (i.e. does no translation between incoming name identifiers and principals)
 - Relational Database data connector
 - LDAP data connector
 - Static data connector (called "echo" connector in the past)
 - Simple attribute definition
 - Scriptlet attribute definition (supporting Javascript only at the moment)

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- Principal Name and Authentication method definitions (just makes those two fields available as attributes)
 - SAML 1 and 2 String value encoders (takes an attribute, calls toString() on all values, and makes SAML 1/2 <Attribute>s from them)
 - SAML 1 NameIdentifier encoder (take an attribute, calls toString() on the first value, and makes a SAML 1 <NameIdentifier>
 - SAML 2 NameID encoder (same as above but creates SAML 2 <NameID>)
- Attribute filtering
- Ability to define policy group wide policy requirements, attribute, and permit value rules and reference them throughout the policy
 - The following functions are supported for constructing policy requirements and attribute permit value rules:
 - Attribute issuer, requester, scope, and value, authentication method, and principal matching based on exact string and regular expression.
 - Boolean functions supporting AND, OR, and NOT for use in composing rules
 - ANY
 - Scriptlet (currently supporting Javascript only)
 - Number of value checking (e.g. ensure there is only 1 value for an attribute)

The following things are not supported in Alpha 1:

- Metadata filters (filters metadata as it is loaded into the system)
- Signing and Encryption
- Anonymous relying parties (since there is no real security in this release)
- Authentication of users based on IP and Username/Password validating against LDAP and Kerberos
- SAML 1 & 2 Artifact
- SAML 2 Logout
- The following attribute authority features:
 - Use of attribute information in query requests or metadata
 - Use of Shib Scope metadata extension
 - Mapped, Composite, Regex, and Scoped attribute definitions
 - SAML Metadata aware filter match functor (e.g. policy requirements based on an entities membership in an group in metadata, etc.)
 - Wild card attribute filter rules (e.g. attribtueID="*")

Configuration file formats are considered to be stable at this point and will only change if some bug is found that would require a change.

Attribute resolution and plugin interfaces are considered to be stable and may be developed against, other plugin interfaces are not stable at this time and may change.

Documentation of attribute resolution and filtering plugins will proceed immediately after the release of Alpha 1.

There are known memory leaks in Alpha 1.

Only bugs reported through JIRA will be addressed.

I will include all of this information with the IdP bundle itself.

On 14 Jul 2007, at 17:21, David Chadwick wrote:

Hi Nate

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I am writing our official project plan for JISC, and doing a risk analysis at the moment. One of the items is that we are reliant on the Internet2 implementing Shibboleth 2 SP in Java. This was scheduled for release in Spring 2007. Can you let me know what the current situation is please

thanks

David