Delegated Authentication with Shibboleth

Andrew Petro
Software Developer
Unicon, Inc.

Fall 2010 Internet2 Membership Meeting
Atlanta, GA
03 November 2010

UNICON

This Talk

- Delegated authentication using SAML and Shibboleth
  - Why you need it
  - What it is
  - Software for implementing it

Goals for this talk

- Understand delegation use case in abstract
- See why this is important in enterprise portals
- Understand that standard support and implementation of relevant features are in Shibboleth IdP and SP today
- Awareness of Java library and example code making use of this

Agenda

1. Introduction
2. Use Case
3. How It Works
4. Software
5. Next Steps

Introduction

Introduction

- Andrew Petro; Software Developer; Unicon, Inc.
  - Jasig CAS steering committee
  - Jasig uPortal committer
  - etc.

My employer: Unicon

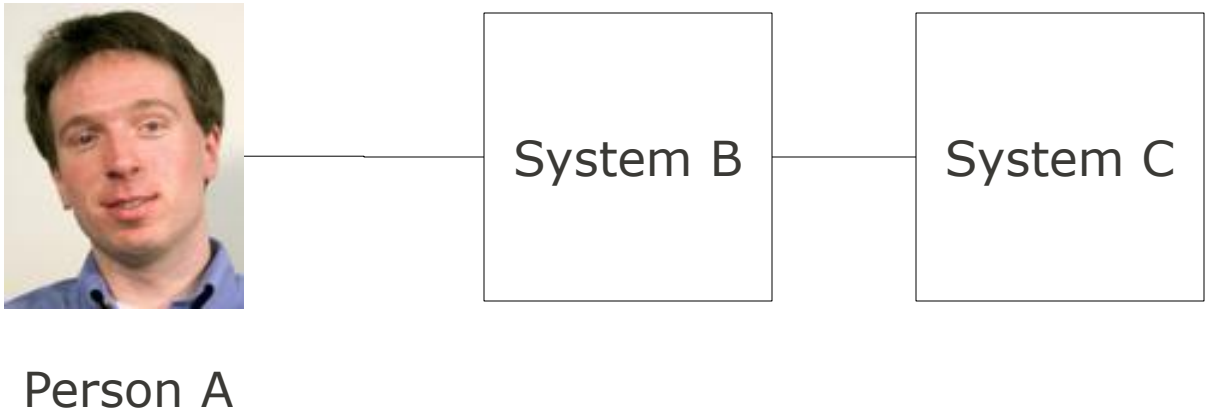
- Jasig CAS Solutions Provider
- InCommon Affiliate

www.unicon.net

Use Case

Delegated Authentication

- System B authenticates to System C on behalf of Person A
- That is, A authenticates to B and delegates authority to B for the purpose of authenticating to C as "B on behalf of A"

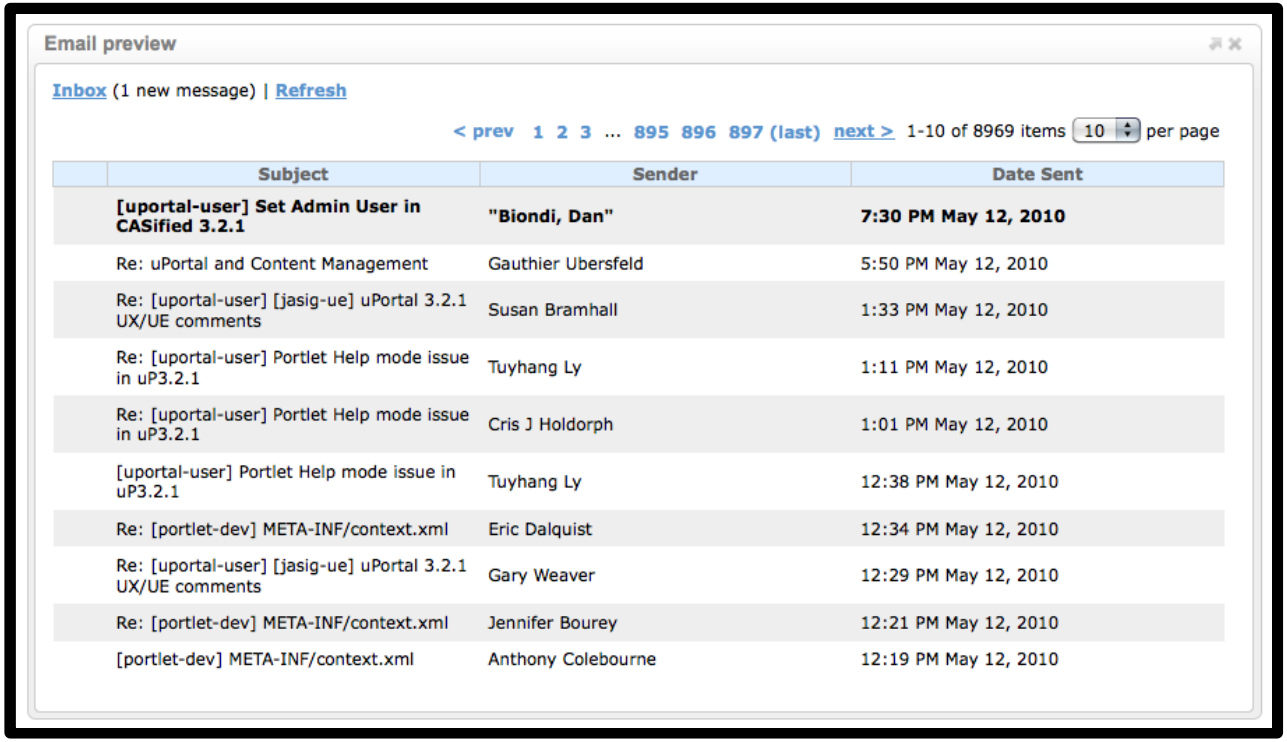


Delegation example

uPortal

Email Preview Portlet

IMAP Server

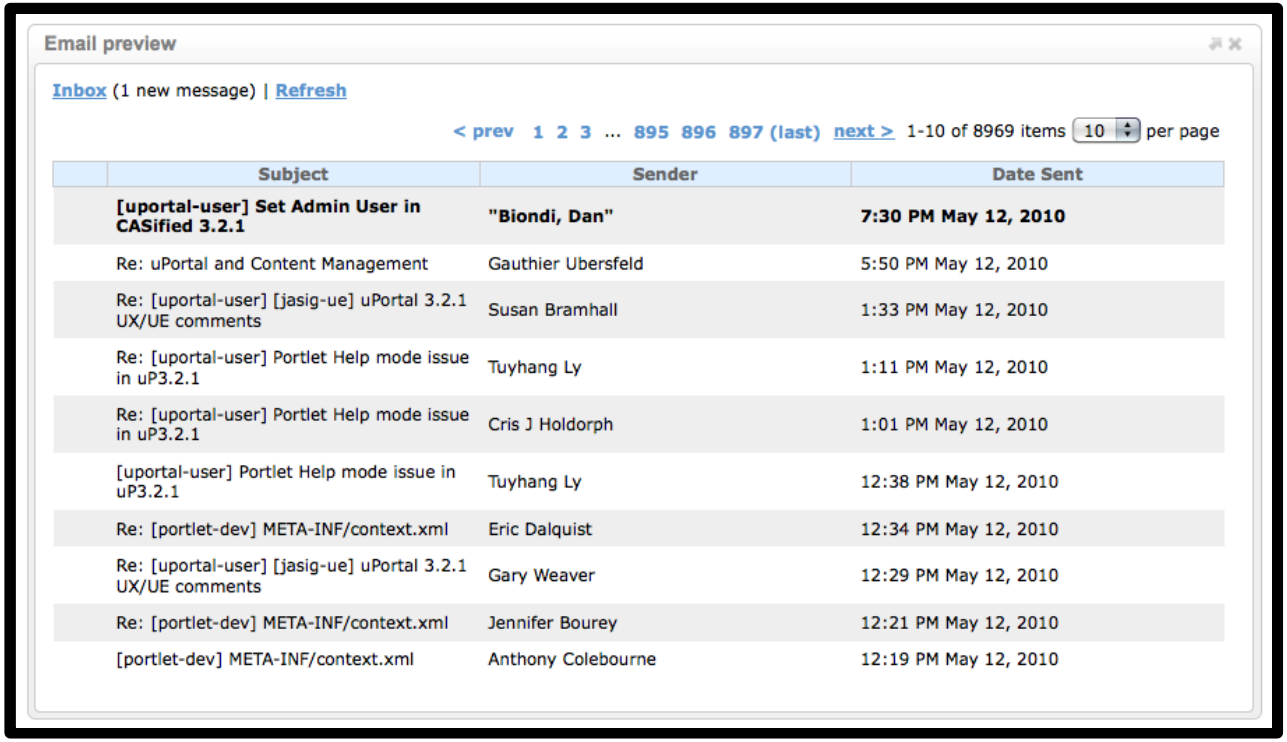


Delegation example *

uPortal

Email Preview Portlet

IMAP Server

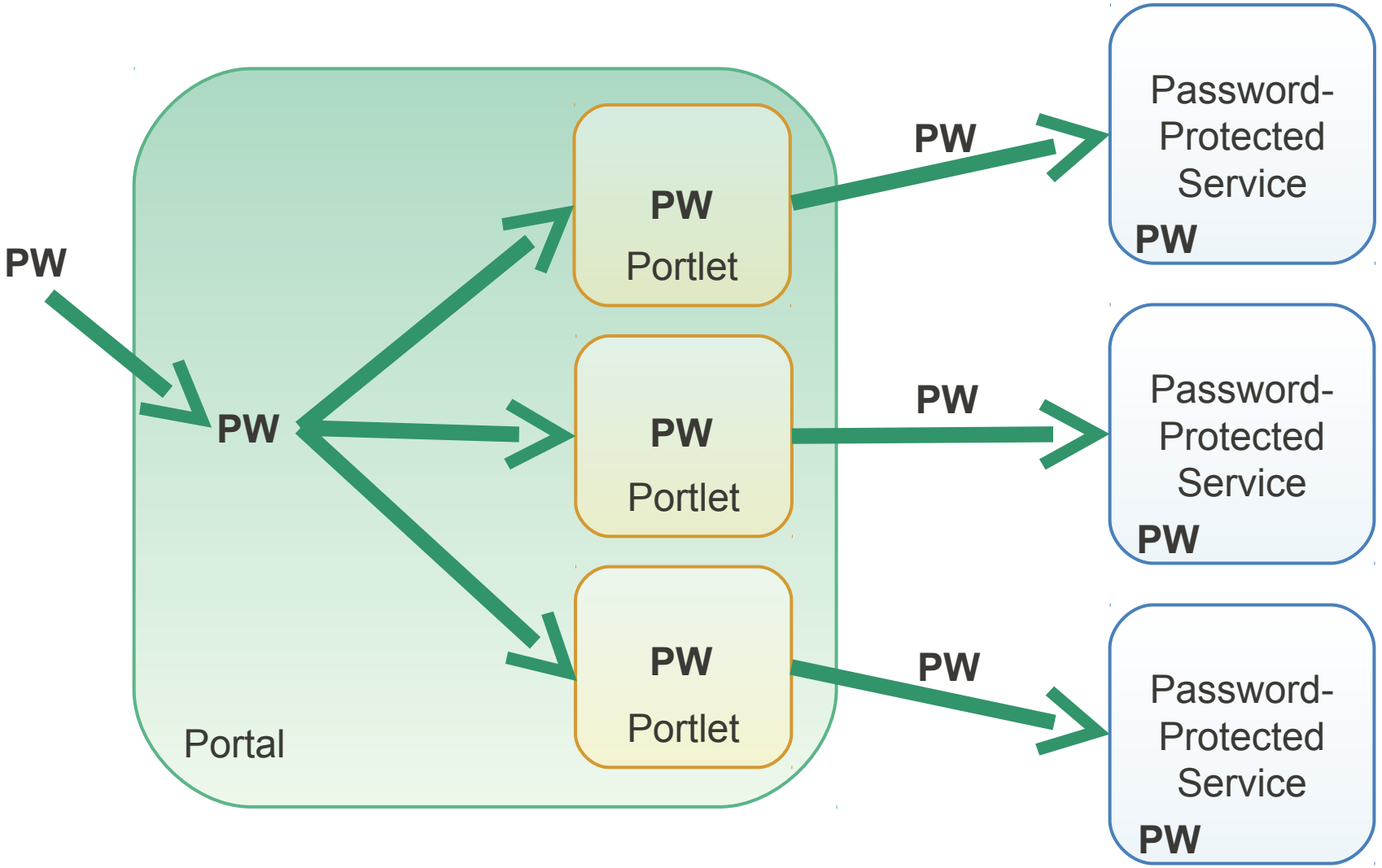


* Warning: this is a bad example because IMAP is an anemic protocol. This slide motivates delegation concept, not implementation.

Credential Replay

- Special (blunt) case of delegated authentication
- System B can authenticate on behalf of Person A because B borrows the credentials (password!) of A

Password Replay



Authenticating Services to Services

- Credential replay?
- Service credentials and trust relationships?
- Topological restrictions?

- Sure, but what about the “on behalf of a user” part?

RDBMS / JDBC Example

- How 'bout a portlet that reflects library account?

My Library Account

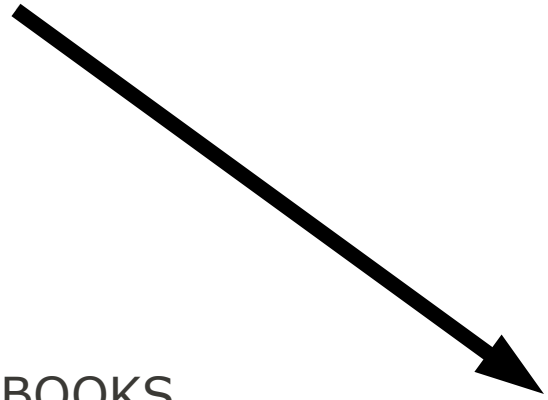
You have **6** checked out books.
4 of these are overdue, accumulating **$1.00** in fines each day. You should return them.

You currently owe the library **$10.25**. You should pay this fine or, like, you won't graduate.

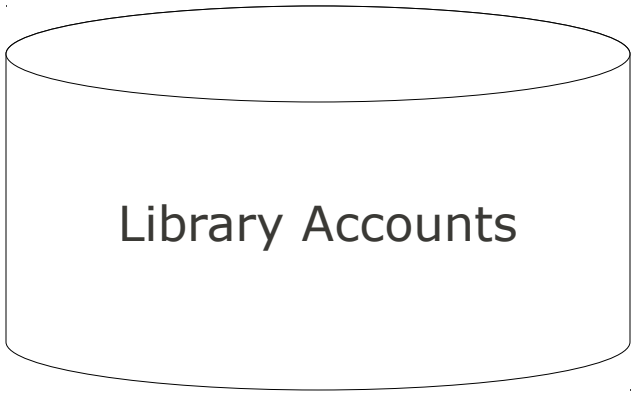
RDBMS / JDBC Example

My Library Account

You have **6** checked out books.



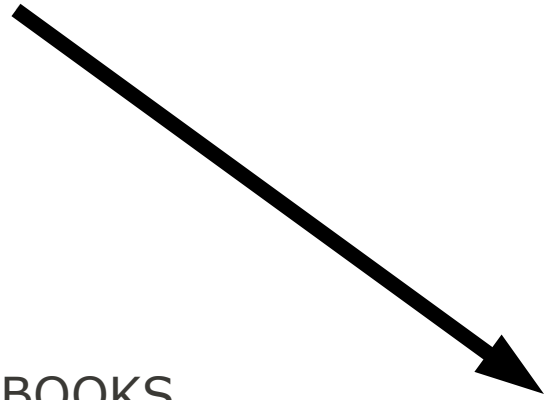
```
SELECT * FROM
CHECKED_OUT_BOOKS
WHERE PATRON_ID = ?;
```



RDBMS / JDBC Example

My Library Account

You have **6** checked out books.



```
SELECT * FROM
CHECKED_OUT_BOOKS
WHERE PATRON_ID = ?;
```

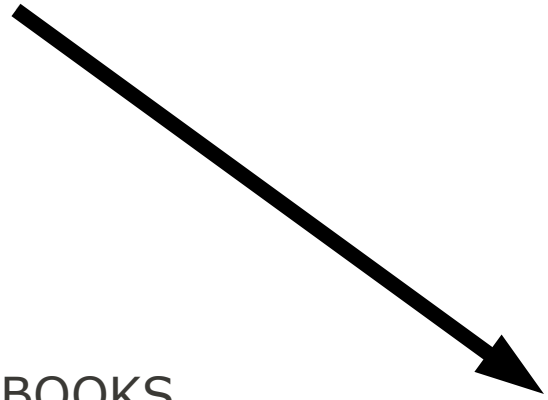
Library Accounts

Portlet asserts identity of user.

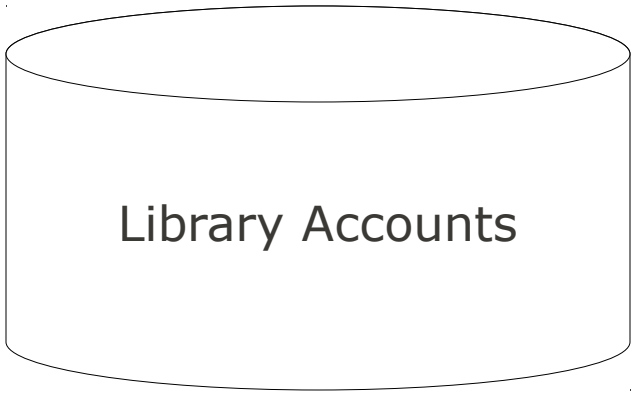
RDBMS / JDBC Example

My Library Account

You have **6** checked out books.



```
SELECT * FROM
CHECKED_OUT_BOOKS
WHERE PATRON_ID = ?;
```



Portlet **arbitrarily** asserts identity of user.

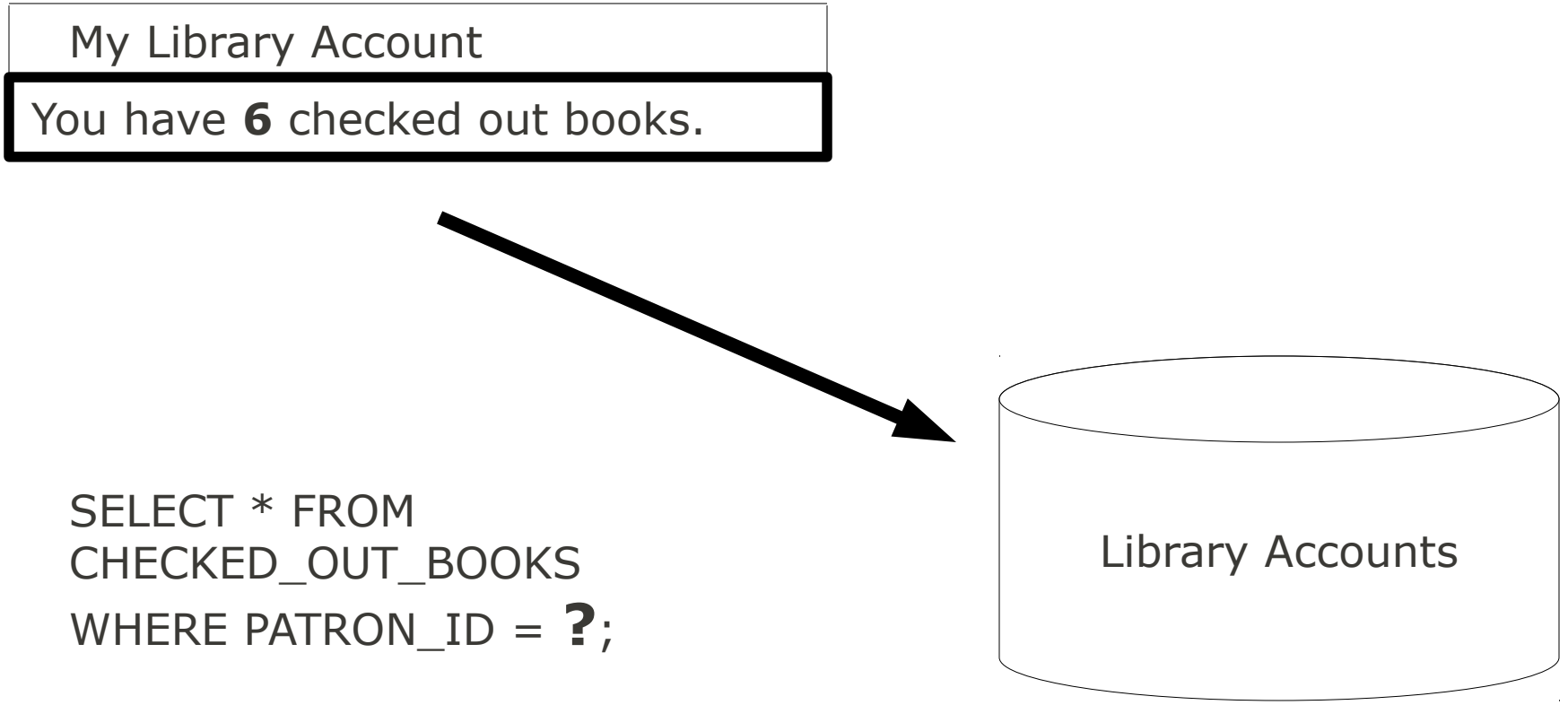
Authenticating Services to Services

- Credential replay?
- Service credentials and trust relationships?
- Topological restrictions?

- Sure, but what about the “on behalf of a user” part?

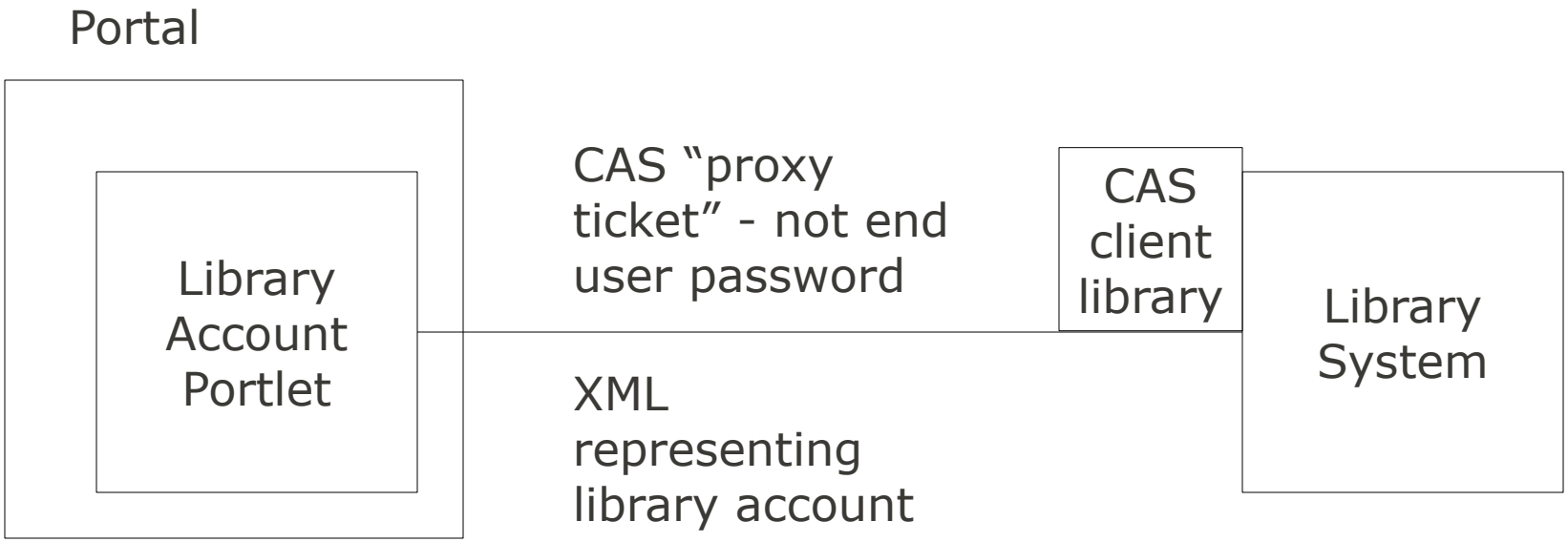
Authenticating only service?

- Service credentials and trust relationships?



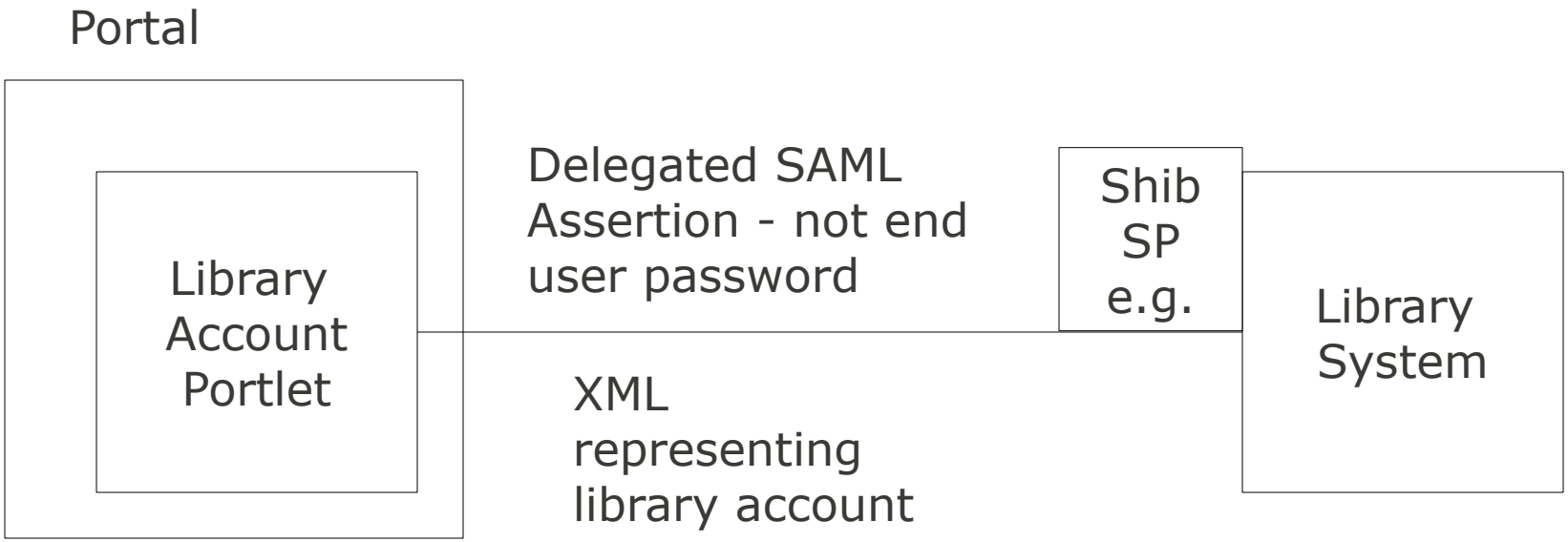
CAS proxy tickets

- CAS proxy tickets authenticate service on behalf of user



Delegated SAML Assertions

- Delegated SAML assertions also authenticate a service on behalf of a user

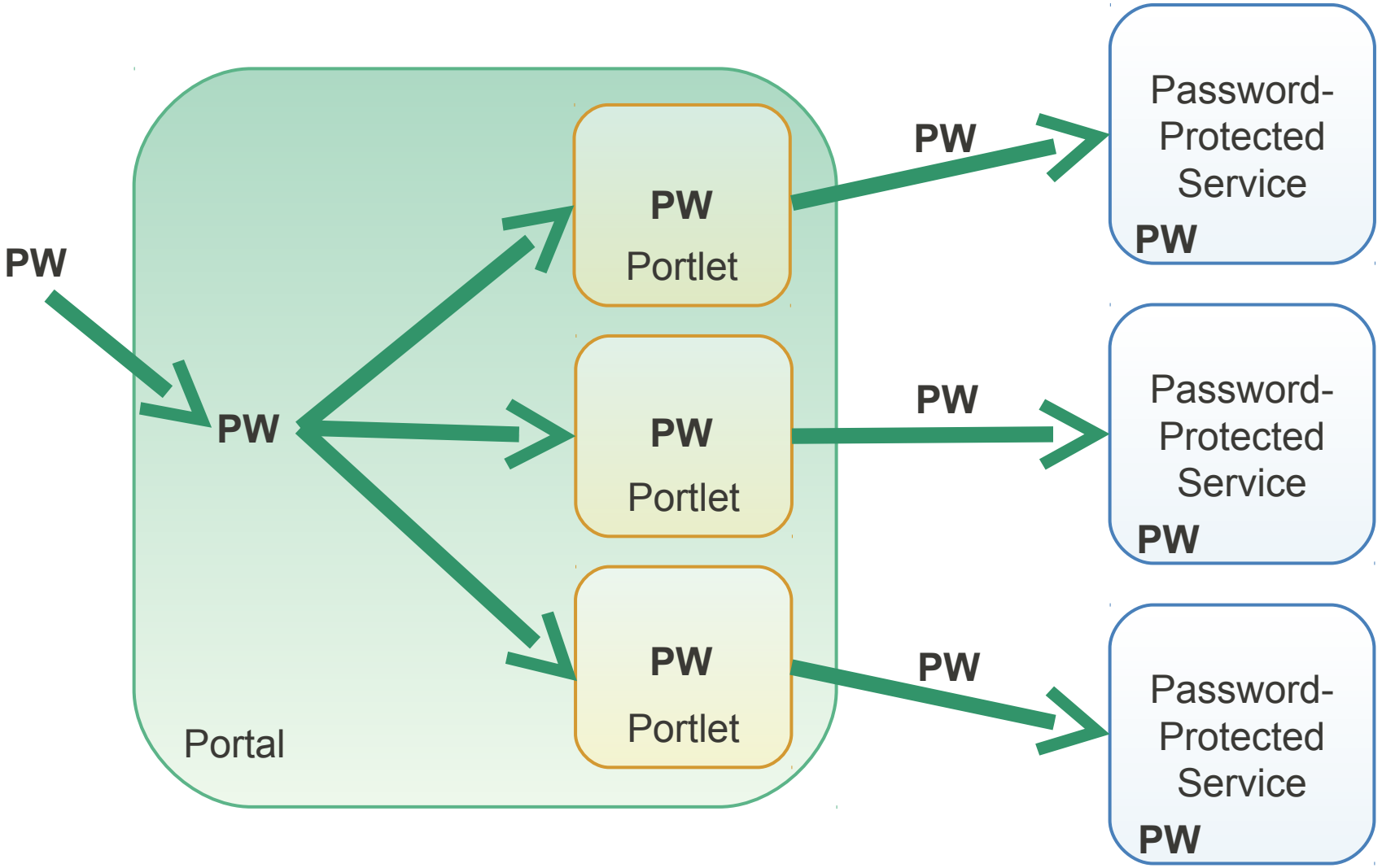


Enterprise Portal

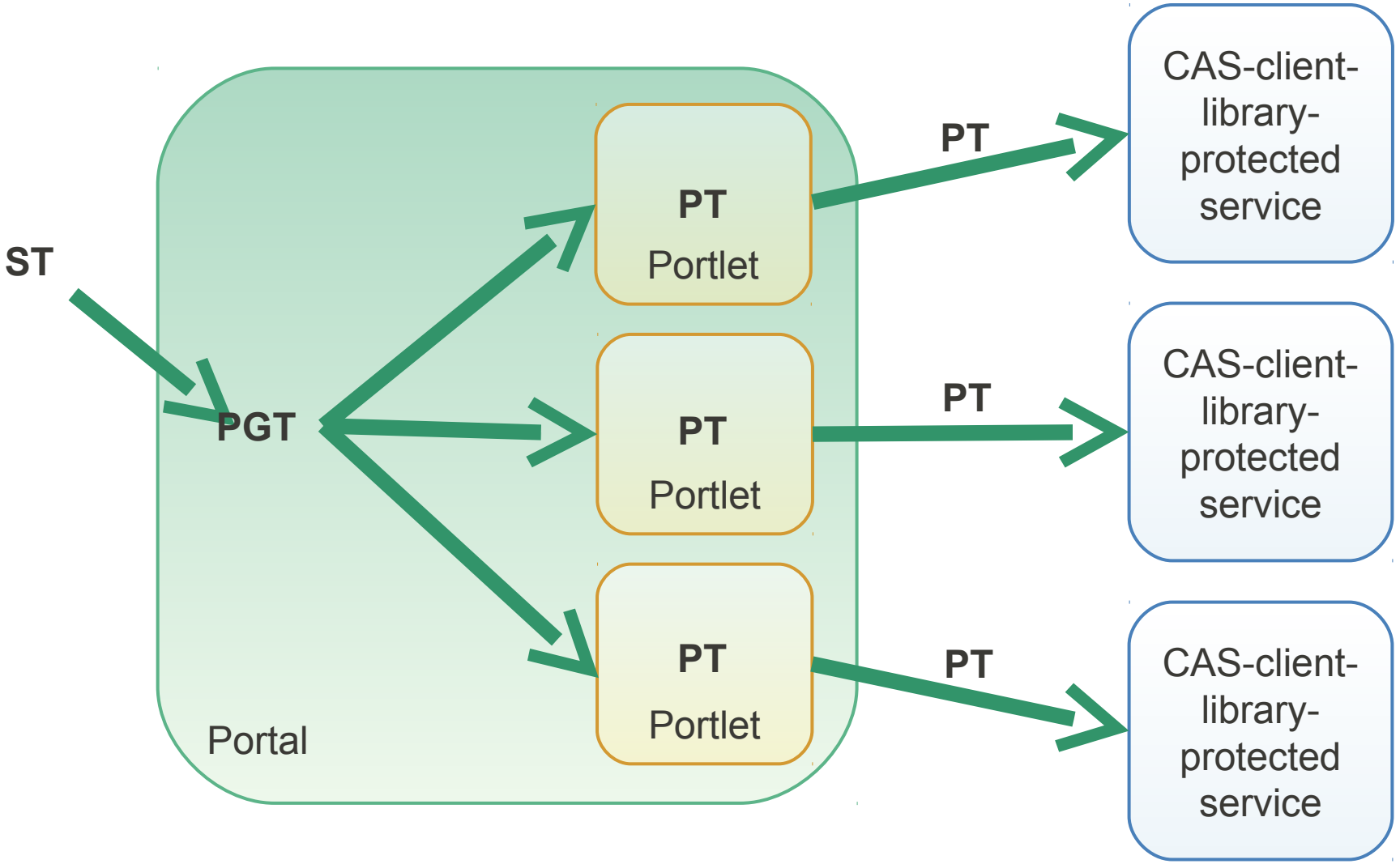
- Dashboards
- Service delivery platform

- Portlets using delegated authentication to access backing services on user's behalf is a common pattern in enterprise portals

Password Replay

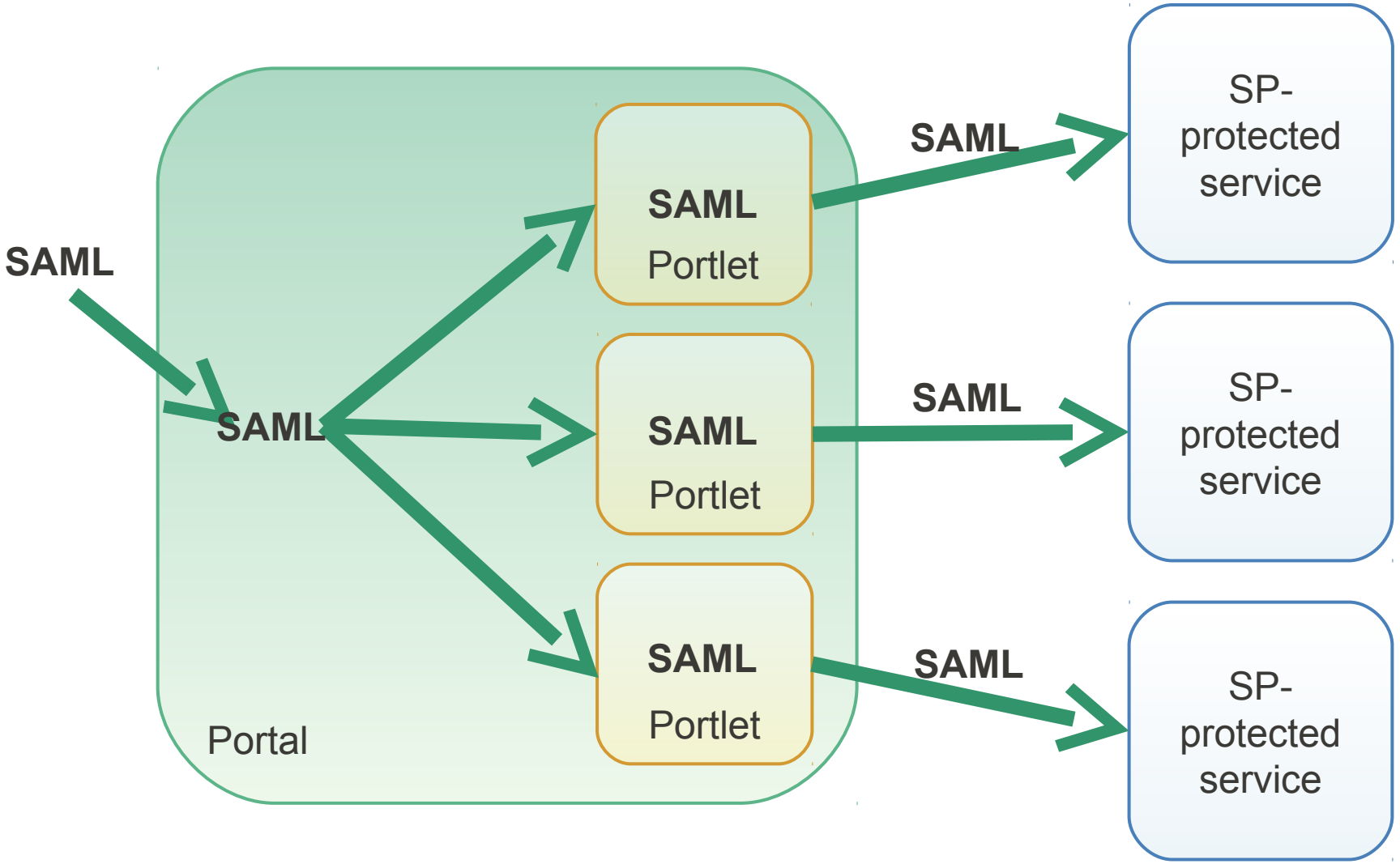


Proxy CAS



* This slide grossly simplifies some nice considerations not shown.

Delegated SAML Authentication



* This slide grossly simplifies some nice considerations not shown.

How It Works

Short version

- Attempt to access resource (WSP), get authentication request
- Modify authentication request with original SAML and present to IdP
- IdP responds with a new SAML assertion successfully responsive to authentication request from WSP
- Present new assertion to WSP, get original resource, set some headers to continue connecting

Portal layer

- User logs in to portal with SAML assertion
- Portal gets raw SAML assertion from SP
- uPortal selectively releases SAML assertion to portlets

Opting in a portlet

In portlet.xml:

```
<user-attribute>
  <description>
        SAML Assertion</description>
  <name>samlAssertion</name>
</user-attribute>
```

Portlet gets assertion from portal

```
PortletRequest request;
Map userInfo = (Map)
    request.getAttribute(
        PortletRequest.USER_INFO);

String samlAssertion = (String)
    userInfo.get("samlAssertion");
```

SAML Delegation Java Library

- Abstracts getting from IdP a delegated SAML assertion from the raw initial SAML assertion
- Abstracts using delegated SAML assertion (via HttpClient abstraction)

Attempts to get the resource

- Response, presumably from the Shibboleth SP, is a request for authentication

- “PAOS”

Process WSP response

- Changes the authentication request response from WSP per Enhanced Client Profile
- Removes some elements
- Adds original SAML assertion that authenticated user to portal

Presents modified request to IdP

- Presents modified request for authentication, including embedded original SAML assertion authenticating user to portal, to IdP

- This authenticates the portal to IdP (via certificate)
- This authenticates the context to IdP (on behalf of the user authenticated by the prior SAML assertion)

IdP responds with SAML assertion

- IdP responds with a SAML assertion suitable for presentation to the backing WSP, authenticating the portal and the delegation

Present delegated assertion to WSP

- Library presents the SAML assertion to the WSP, successfully responding to the authentication request, and finally accessing the originally requested resource.

- Result: an HttpClient instance that will continue setting the appropriate headers and responding to authentication requests by the WSP

Configure SP to accept delegation

```
<PolicyRule type="Delegation" match="oldest"
  <del:Delegate>
    <saml:NameID>
https://portal.example.org/shibboleth
</saml:NameID>
  </del:Delegate>
```

Disclaimer

Quite a bit of detail and formality was just glossed over.

Software

Shibboleth

- IdP (support for vending the delegated assertions)
- SP (releases initial SAML assertion to portal, support for consuming the delegated assertions)

Shibboleth®

Java Delegation Support Library

- Implements using SAML assertion to interact with IdP to get new delegated SAML assertion
- Implements using delegated SAML assertion to retrieve one or more https:// resources from a backing service

uPortal extensions

- Implements support in uPortal for (selectively) making SAML assertion available to portlets so they can successfully use that Java library

Example portlet

- Demonstrates using the uPortal extension and the shibboleth-delegation Java library

Next Steps

Further Test, Use in the Real World

- Needs (more) adopters
- Improve documentation
- Attendant code maturity issues (this code is not bad, but it isn't honed through use either)
- Iterations and release march

Enhance Shibboleth SP

- (This point stolen from Shib SP roadmap discussion, cf. Scott Cantor)
- Move functionality from the Java library into the SP
- Allows maintaining that functionality closer to the rest of the SP code
- Eases implementing delegation support in more languages

Shibboleth®

Improve uPortal-Shib Story?

- uPortal already supports Shibboleth
  - Authentication
  - User attributes
  - And with this, delegated authentication
- Needs better documentation (what doesn't?)
- Certainly needs better marketing

Resources

Shib-uPortal Wiki Space

- http://bit.ly/shib_up_wiki

Shibboleth®

Shibboleth IdP and SP modules

Shibboleth®

Java Library

- Implements interaction with IdP to get delegated SAML assertion
- And basic retrieval of a resource via HTTPS using the assertion

https://source.jasig.org/sandbox/delegated-saml-authentication/

uPortal extensions

- Bridges from SP into the portal framework
- Delivers SAML assertion (selectively) to portlets as user attribute “samlAssertion”

https://source.jasig.org/sandbox/

ShibbolethuPortalIntegration/

Portlet demonstrating use

http://bit.ly/delegated_shib_demo_portlet

Seems like ridiculously little code (Spring PortletMVC and use of Java library)

That's kind of the point.

Questions & Answers

Andrew Petro
Software Developer
Unicon, Inc.

apetro@unicon.net
www.unicon.net/blog/apetro