Identity Federation and SSO across Organizations

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Presentation Focus

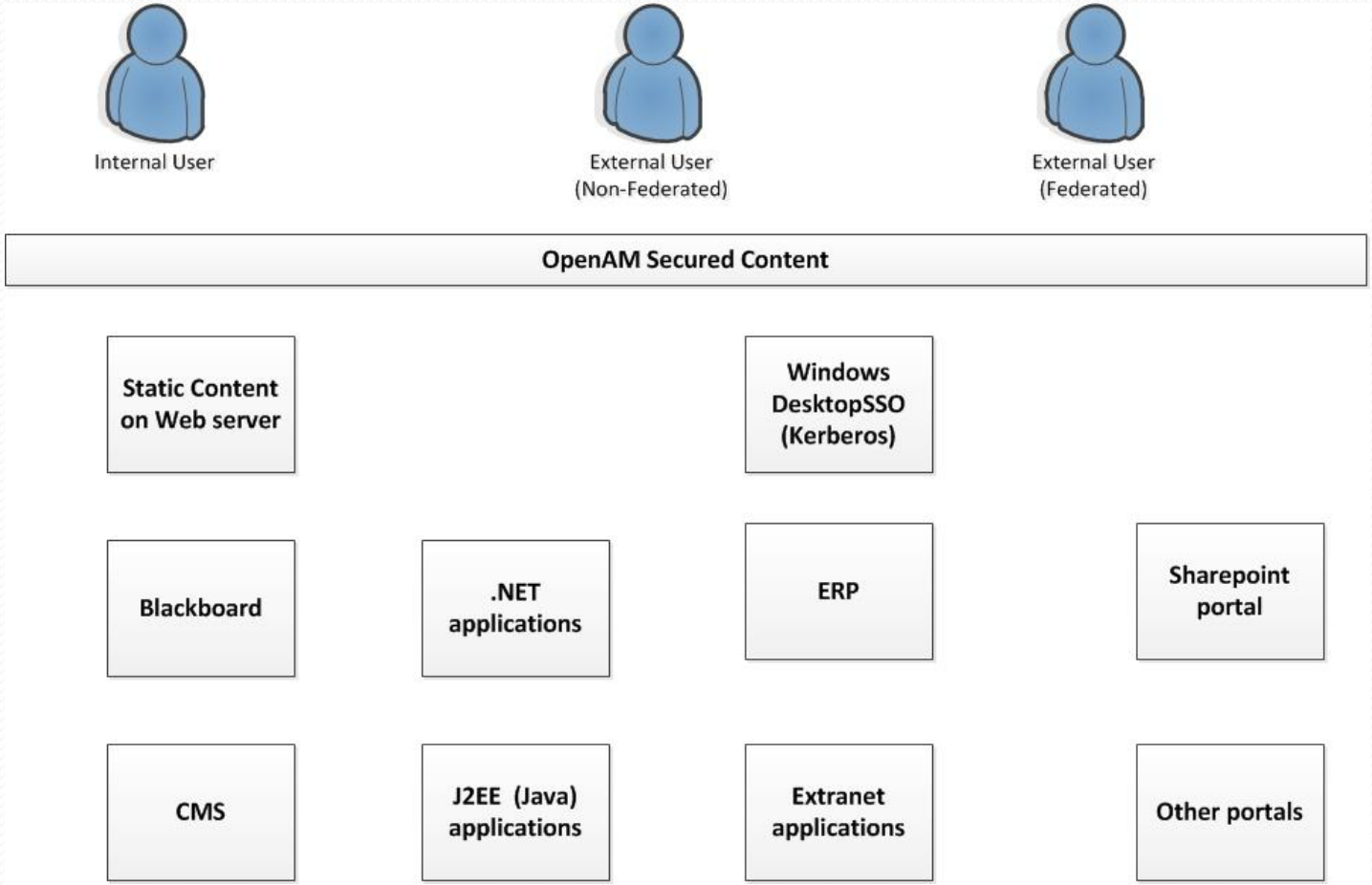
- Touch upon background of SSO
- Federation terms
- Sample SAML documents
- Implementation choices
- Benefits

Background

- Within organization (within the domain name)
- Authentication (User Id/Password, Certificate based, Other choices)
- Authorization (Group membership or User attribute – Position in the organization)
- Accounting (Who accessed what resource)

Across platforms, webserver(s) and middle ware platforms

Typical Web-SSO within an organization



Web-SSO and Federated SSO

- SSO is within an organization domain
- Federated SSO crosses the organization domain boundaries

How does Federation simplify life?

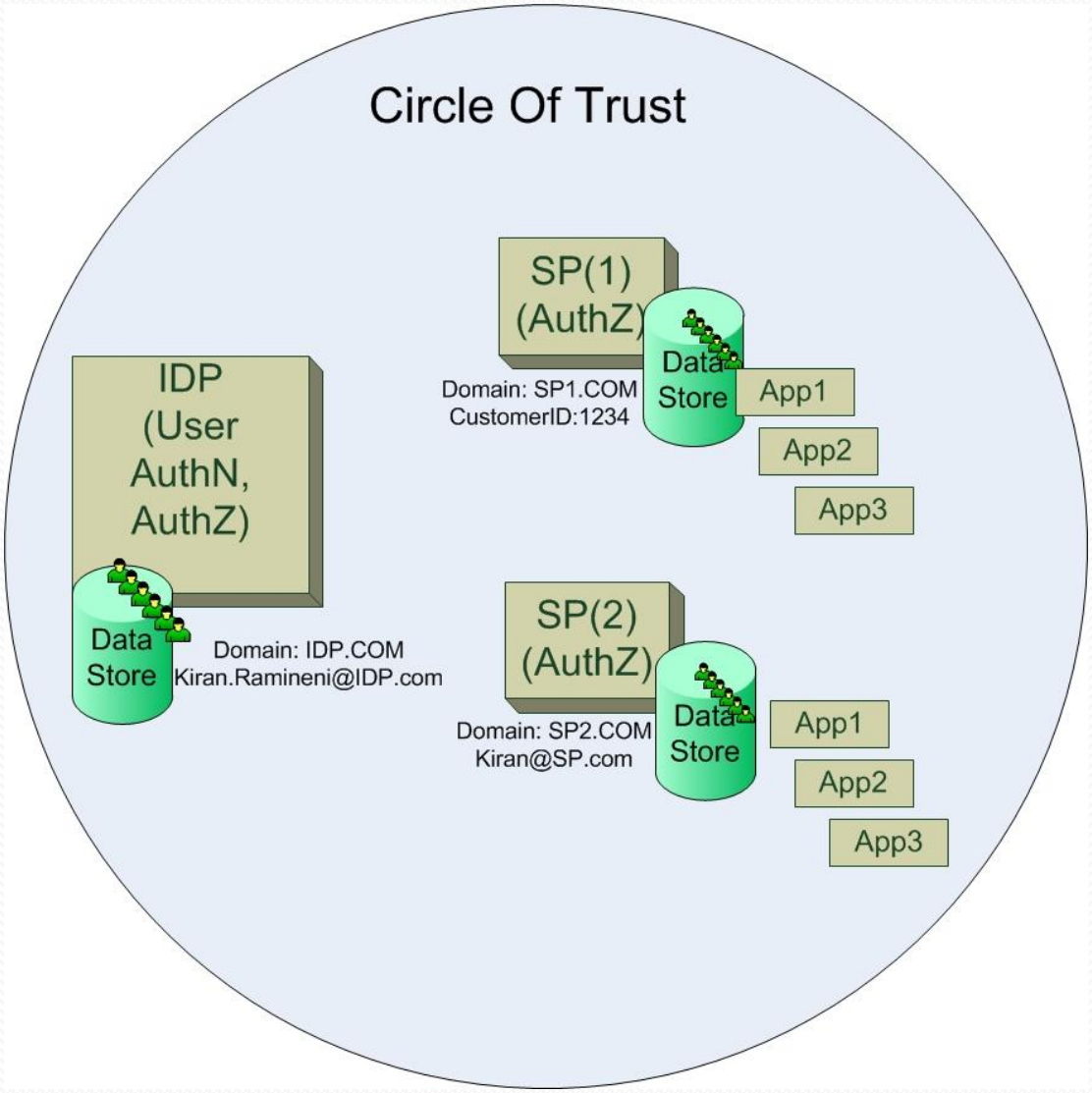
- Look at a use case of booking a travel from Chicago to San Francisco, CA.
  - Booking an airline ticket (login # 1)
  - Continuing to book a car rental (login # 2)
  - Continuing to book a hotel (login # 3)

- By Federating (uniting) your identity with all these partners, your identity is securely transferred between these organization.

Federation Terms

- COT
- IDP
- SP
- SAML (Security Assertion Markup Language)
- Assertion

COT (Circle Of Trust)



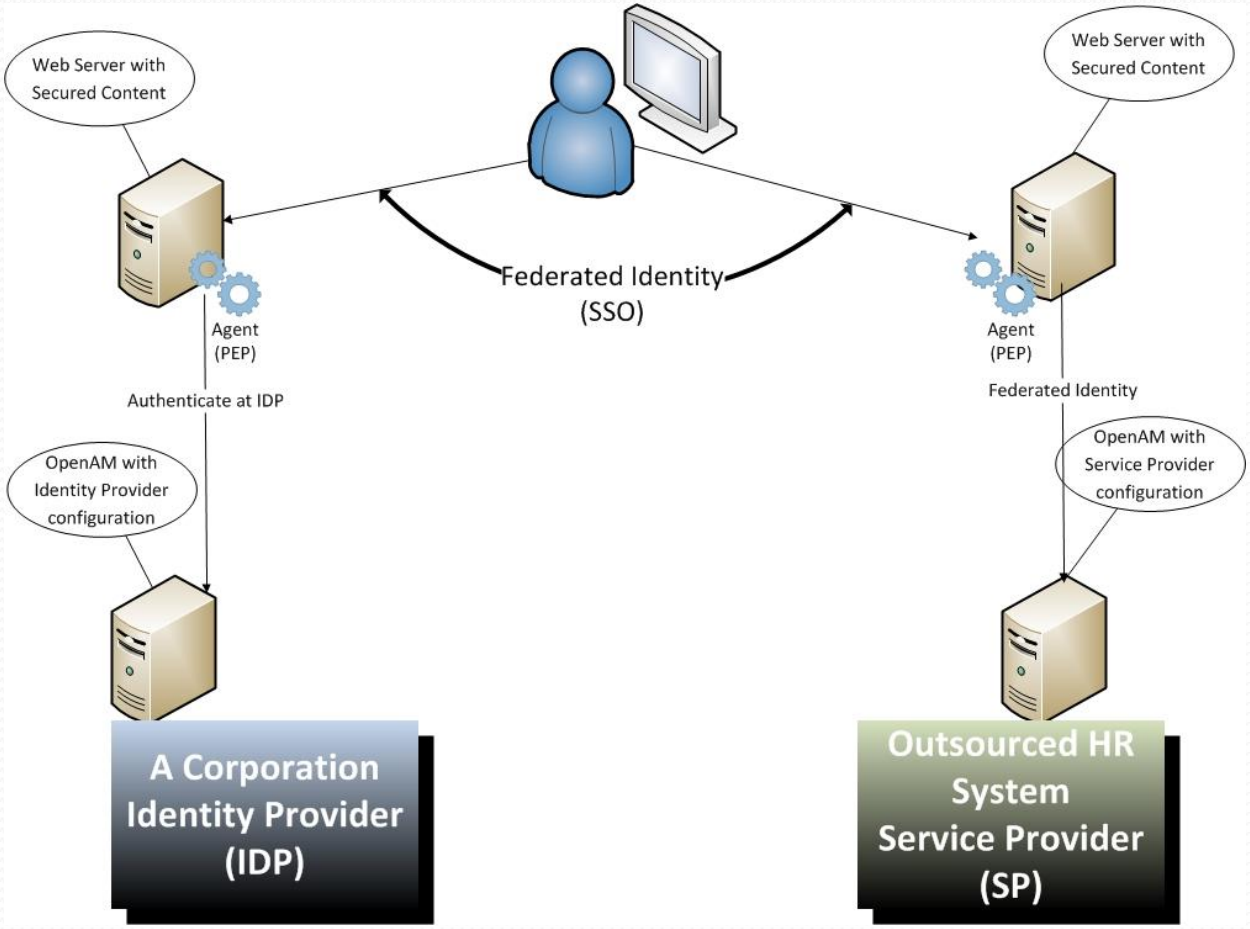
Identity Provider (IDP)

- Provides Authentication service
- Service provider redirects the users to IDP for authentication
- Asserts the user validity (based on the authentication mechanism chosen)
- Upon successful authentication, redirects to service provider with user attributes
- Can provide authentication to multiple service providers

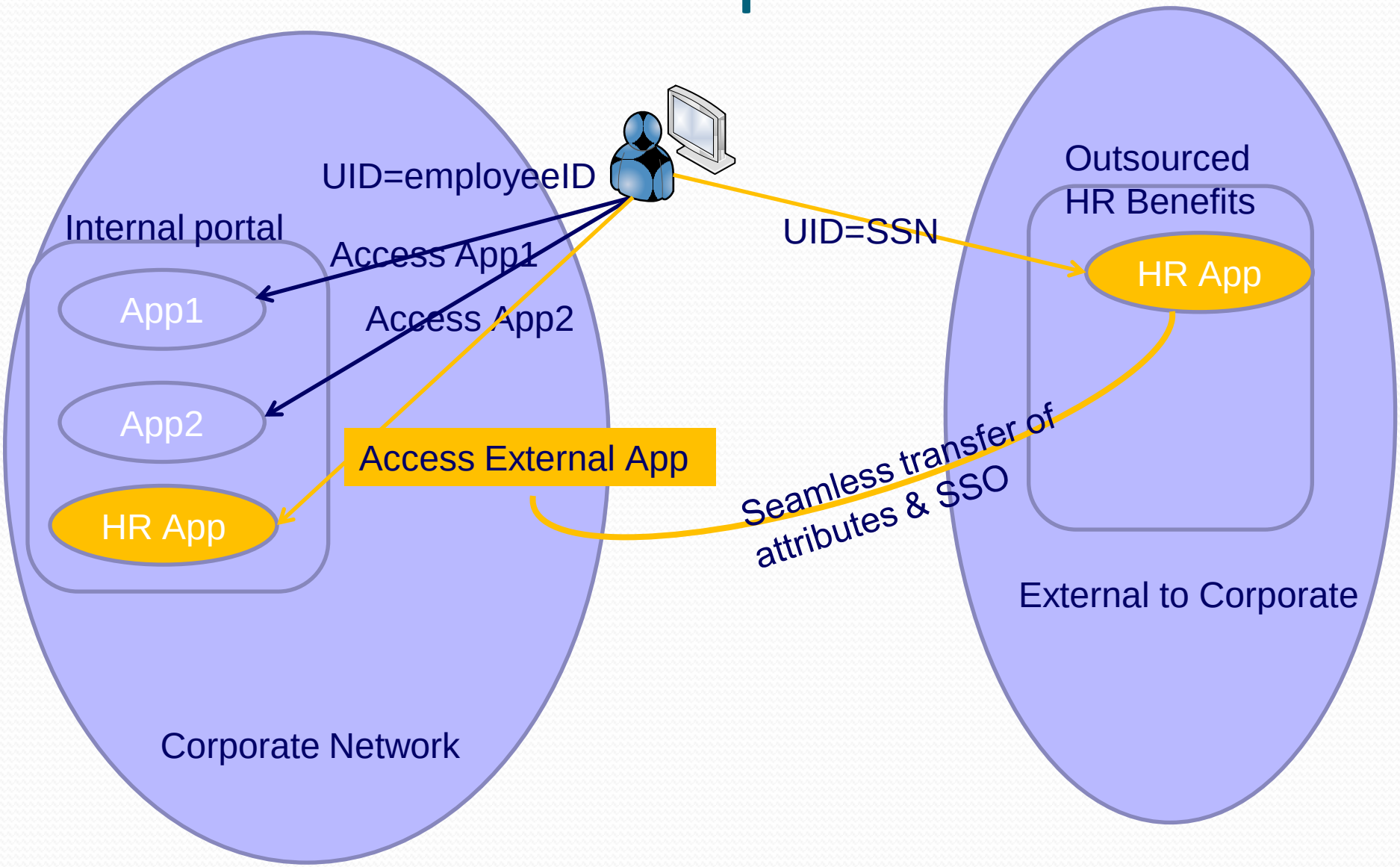
Service Provider (SP)

- Provides a service (access to applications)
- Refers to Identity provider for authentication
- Relies on IDP provided assertion
- May authorize access to content/applications at Service provider
- Can provide service to multiple IDPs

A Simplified use case



Federation Example



Federation begins with COT (Meta Data Exchange)

- SAML Meta Data exchange initiates the COT prior to Federation
- IDP provides their meta data to SP
- SP provides their meta data to IDP
- Critical information for Federation is exchanged
  - Includes identifiers
  - Certificates
  - End points for various requests

IDP Meta data sample

```
<EntityDescriptor entityID="https://vapp1.rampinfoes.com/opensso" xmlns="urn:...:metadata">
    <IDPSSODescriptor WantAuthnRequestsSigned="false" ...>
    <ArtifactResolutionService index="0" isDefault="true" Binding="..."
          Location="https://vapp1.../opensso/ArtifactResolver/metaAlias/idp" />
     <SingleLogoutService Binding="...HTTP-POST" Location="..." ResponseLocation="..."/>
     <ManageNameIDService Binding="...HTTP-Redirect"
          Location="https://vapp1.../opensso/IDPMniRedirect/metaAlias/idp"
          ResponseLocation="https://vapp1.../opensso/IDPMniRedirect/metaAlias/idp" />
      <ManageNameIDService Binding="...HTTP-POST" Location="..." ResponseLocation="..."/>
      <NameIDFormat>urn:...:nameid-format:persistent</NameIDFormat>
      <NameIDFormat>urn:...:nameid-format:transient</NameIDFormat>
      <NameIDFormat>urn:...:SAML:1.1:nameid-format:emailAddress</NameIDFormat>
...
<SingleSignOnService Binding="...HTTP-POST"  Location="https://vapp1.../opensso/SSOPOST/metaAlias/idp" />
 <SingleSignOnService Binding="...SOAP" Location="https://vapp1.../opensso/SSOSoap/metaAlias/idp" />
 <NameIDMappingService Binding="...SOAP" Location="https://vapp1.../opensso/NIMSoap/metaAlias/idp" />
<AssertionIDRequestService Binding="..SOAP"Location="https://vapp1../opnsso/AIDReqSoap/IDPRole/metaAlias/idp"/>
<AssertionIDRequestService Binding="...URI" Location="https://vapp1.../opensso/AIDReqUri/IDPRole/metaAlias/idp"/>
   </IDPSSODescriptor>
 </EntityDescriptor>
```

SP Meta data sample

<EntityDescriptor entityID="https://sp.rampinfo.com/opensso" xmlns="...metadata">
<SPSSODescriptor AuthnRequestsSigned="false" WantAssertionsSigned="false" protocolSupportEnumeration="...protocol">
<SingleLogoutService Binding="...HTTP-Redirect" Location="http://sp..../opensso/SPSloRedirect/metaAlias/sp"
ResponseLocation="http://sp..../opensso/SPSloRedirect/metaAlias/sp" />
<SingleLogoutService Binding="...HTTP-POST" Location="http://sp..../opensso/SPSloPOST/metaAlias/sp"
ResponseLocation="http://sp..../opensso/SPSloPOST/metaAlias/sp" />
<SingleLogoutService Binding="...SOAP" Location="http://sp..../opensso/SPSloSoap/metaAlias/sp" />
<ManageNameIDService Binding="...HTTP-Redirect" Location="http://sp..../opensso/SPMniRedirect/metaAlias/sp"
ResponseLocation="http://sp..../opensso/SPMniRedirect/metaAlias/sp" />
<ManageNameIDService Binding="...HTTP-POST" Location="http://sp..../opensso/SPMniPOST/metaAlias/sp"
ResponseLocation="http://sp..../opensso/SPMniPOST/metaAlias/sp" />
<ManageNameIDService Binding="...SOAP" Location="http://sp..../opensso/SPMniSoap/metaAlias/sp"
ResponseLocation="http://sp..../opensso/SPMniSoap/metaAlias/sp" />
<NameIDFormat>...nameid-format:persistent</NameIDFormat>
<NameIDFormat>...nameid-format:transient</NameIDFormat>
<NameIDFormat>...SAML:1.1:nameid-format:emailAddress</NameIDFormat>
...
<NameIDFormat>...SAML:1.1:nameid-format:X509SubjectName</NameIDFormat>
<AssertionConsumerService index="0" isDefault="true" Binding="..HTTP-Artifact"
Location="http://sp.../opnsso/Consumer/metaAlias/sp"/>
<AssertionConsumerService index="1" Binding="...HTTP-POST" Location="http://sp..../opensso/Consumer/metaAlias/sp" />
<AssertionConsumerService index="2" Binding="...PAOS" Location="http://sp..../opensso/Consumer/ECP/metaAlias/sp" />
</SPSSODescriptor>
</EntityDescriptor>

SAML Framework

- XML based
- Enables business partners to exchange security information
- SOAP Protocol
  - SAML Protocol
    - Request/Response
    - Assertion
      - Authentication/Subject
      - Attributes

SAML Framework

- Mostly used SAML Profiles
  - Web Based SSO profile (Focus of this presentation)
  - Enhanced Client and Proxy Profile (ECP)
  - IDP Discovery Profile
  - Single logout

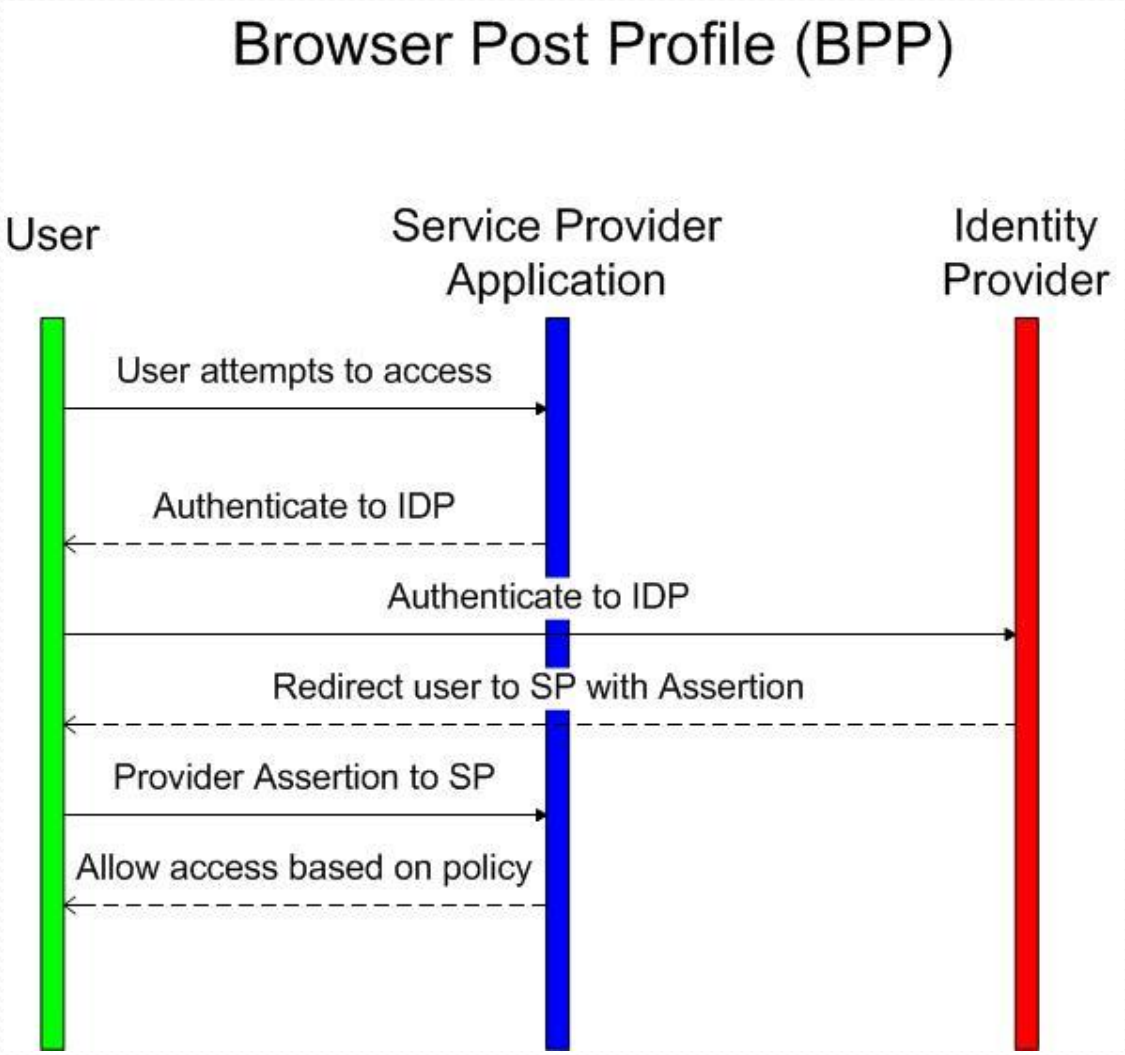
Web based SSO profiles

- Two mostly used Profiles to support Browser based SSO
  - Browser post profile (BPP)
  - Browser artifact profile (BAP)

BPP (Browser Post Profile)

- May be initiated by SP or IDP
- IDP initiated
  - Build assertion using the current session
  - Post the assertion to the browser for redirection to SP
  - SP Consumes the assertion and enforces AuthZ
- SP initiated
  - Redirect to IDP
  - IDP verifies/creates a session (after successful authN)
  - Build assertion and post to the browser for redirection to SP
  - SP Consumes the assertion and enforces AuthZ

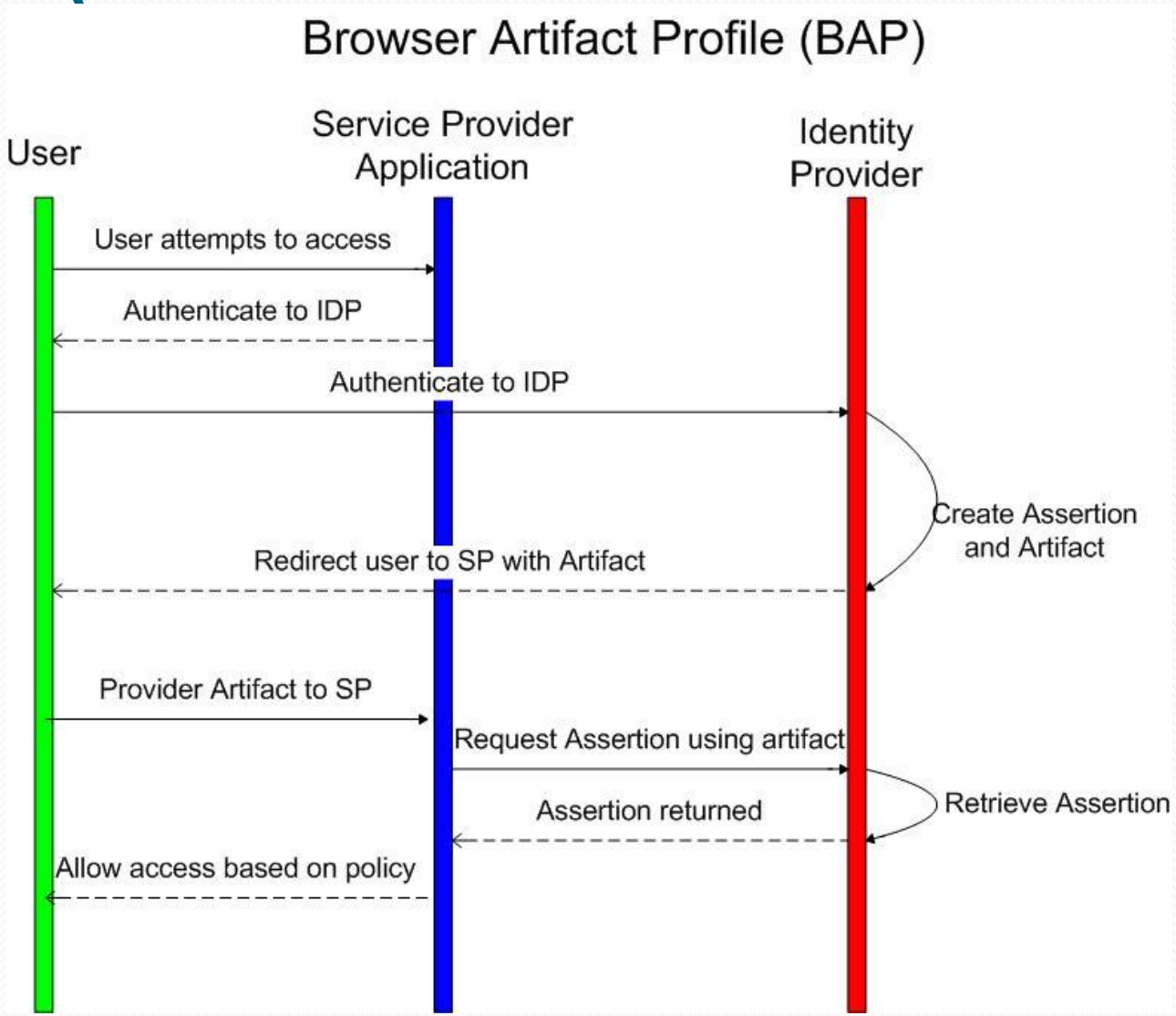
BPP (Browser Post Profile)



BAP (Browser Artifact Profile)

- The Assertion is not directly posted to the browser
- An artifact (a tag) is exchanged via browser posts/redirects
- SP submits Artifact to IDP for resolution
- IDP dereferences the Artifact and returns Assertion to SP

BAP (Browser Artifact Profile)



Assertion Components

- Assertion
  - Subject
  - Conditions
  - AuthNstatement
  - AttrributeStatement
    - Attribute<Name><Value>

Sample Assertion

<saml:Assertion xmlns:saml="...:assertion" ID="s22...524" IssueInstant="2011-03-04T17:47:00Z" Version="2.0">
<saml:Issuer>https://vapp1.rampinfoes.com/opensso</saml:Issuer>
<saml:Subject><saml:NameID Format="...persistent" NameQualifier="https://vapp1.../opensso" SPNameQualifier="https://sp.../opensso">nI8...Z60</saml:NameID>
<saml:SubjectConfirmation Method="...:bearer">
<saml:SubjectConfirmationData NotOnOrAfter="2011-3-04T17:57:00Z“ Recipient="https://sp.../opensso/Consumer/metaAlias/sp"/>
</saml:SubjectConfirmation>
</saml:Subject>
<saml:Conditions NotBefore="2011-03-04T17:37:00Z" NotOnOrAfter="2011-03-04T17:57:00Z">
<saml:AudienceRestriction><saml:Audience>https://sp.../opensso</saml:Audience></saml:AudienceRestriction>
</saml:Conditions>
<saml:AuthnStatement AuthnInstant="2011-03-04T17:47:00Z" SessionIndex="s20...f01"><saml:AuthnContext>
<saml:AuthnContextClassRef>...:SAML:2.0:ac:classes:PasswordProtectedTransport</saml:AuthnContextClassRef>
</saml:AuthnContext>
</saml:AuthnStatement>
<saml:AttributeStatement><saml:Attribute Name=“emailAddress"><saml:AttributeValue xmlns:xs="..." xmlns:xsi="..." xsi:type="xs:string">Kiran.Ramineni@rampinfoes.com
</saml:AttributeValue>
</saml:Attribute>
</saml:AttributeStatement>
</saml:Assertion>

Security within Federation

- Digital signatures
- Encryption
  - Transport layer
  - AuthN requests
  - Assertion content
  - Artifact resolution
- Meta data exchange
  - Digital signature requirements
  - Encryption requirements
  - Certificates

Federation Implementation choices

- User consented
  - Protects privacy
- Bulk Federated
  - Employees to access to HR system or Health Insurance application
- Auto Federation
  - Simplify user experience
- Transient
  - Just trust any one authenticated at IDP

Shibboleth And SAML

- Shibboleth was conceived for cross domain single sign on
- SAML working group was initiated in OASIS (includes Shibboleth founders)
- Liberty Alliance ID-FF, Shibboleth and SAML 1.0 converged into SAML 2.0 standard
- Shibboleth 2.x and SAML 2.0 are interoperable

Federation Used today:

- Government
  - GSA
  - E-Auth
- Educational institutions
- Commercial
  - Telcos
  - Health Care companies
  - ESPN.COM
  - Comcast.com
  - Google Apps
  - SalesForce.com

Benefits of Federation

- Organizations
  - Easily integrate with Outsourced Applications
  - Cost savings
  - User base (Identity) protection
- Individuals (Users)
  - Limited number of login/passwords to remember
  - Federate their identity between trusted/partnering organizations

Open source Products

- OpenAM
  - J2ee based web SSO and Federation in one product
  - Industrial strength (supports high availability and Load balanced environments)
  - Commercially supported
- Simple SAML
  - PHP based
  - Third party commercial support
- Shibboleth
  - C++ and Java
  - Third party commercial support
- Others?

Questions?

Additional Resources & References

- http://www.oasis-open.org/
- http://Shibboleth.internet2.edu
- http://www.oasis-open.org/committees/download.php/14361/sstc-saml-tech-overview-2.0-draft-08.pdf
- http://docs.oasis-open.org/security/saml/v2.0/saml-metadata-2.0-os.pdf
- http://docs.oasis-open.org/security/saml/v2.0/saml-core-2.0-os.pdf
- http://www.forgerock.com/

Thanks!

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