Session 2.2: Federations: Implementations

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SAML Metadata

Why should an IdP and SP interoperate?

Why should an IdP accept an authentication request from an SP?

Why should an IdP authenticate a user and then assert details about that event and identity information to the SP?

Why should an SP trust an assertion about a user sent to it from an IdP?

Trust

- IdP maintains a "list" of trusted relying parties (SPs)
  - Only accept authentication requests from trusted SPs
  - Only send assertions to URLs for SPs that it trusts
  - Should sign/encrypt assertion/response so only the trusted SP can decrypt and consume
- SP maintains a "list" of trusted relying parties (IdPs)
  - Only send authentication requests to trusted IdPs
  - Only send authentication requests to URLs for IdPs that it trusts
  - Only accepts signed/encrypted assertion/response from IdPs that it trusts

SAML Metadata Establishes Trust

- XML description of the SAML entity
  - entityID
  - SAML role (IdP or SP)
  - URL endpoints for consuming SAML messages
  - signing/encryption public key material
  - organization information including contacts

```
<EntityDescriptor entityID="https://idp.ncsa.illinois.edu/idp/shibboleth">
  <IDPSSODescriptor errorURL="https://idp.ncsa.illinois.edu/error" protocolSupportEnumeration="...">
    <Extensions>
      <shibmd:Scope regexp="false">ncsa.illinois.edu</shibmd:Scope>
      <mdui:UIInfo>
        <mdui:DisplayName xml:lang="en">National Center for Supercomputing Applications</mdui:DisplayName>
        <mdui:Description xml:lang="en">National Center for Supercomputing Applications</mdui:Description>
        <mdui:PrivacyStatementURL xml:lang="en">...</mdui:PrivacyStatementURL>
        <mdui:Logo height="100" width="148" xml:lang="en">...</mdui:Logo>
      </mdui:UIInfo>
    </Extensions>
    <KeyDescriptor use="signing">SNIP</KeyDescriptor>
    <SingleSignOnService Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-Redirect"
                         Location="https://idp.ncsa.illinois.edu/idp/profile/SAML2/Redirect/SSO"/>
    <SingleSignOnService Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST"
                         Location="https://idp.ncsa.illinois.edu/idp/profile/SAML2/POST/SSO"/>
  </IDPSSODescriptor>
  <Organization>SNIP</Organization>
  <ContactPerson>SNIP</ContactPerson>
</EntityDescriptor>
```

```
<EntityDescriptor entityID="https://cilogon.org/shibboleth">
  <SPSSODescriptor protocolSupportEnumeration="urn:oasis:names:tc:SAML:2.0:protocol">
    <Extensions>...</Extensions>
    <KeyDescriptor>SNIP</KeyDescriptor>
    <AssertionConsumerService
           Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST"
           Location="https://cilogon.org/Shibboleth.sso/SAML2/POST"/>
    <AttributeConsumingService index="1">
      <ServiceName xml:lang="en">CILogon</ServiceName>
      <ServiceDescription xml:lang="en">...</ServiceDescription>
      <RequestedAttribute FriendlyName="displayName" Name="urn:oid:2.16.840.1.113730.3.1.241"
                          NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri"/>
      <RequestedAttribute FriendlyName="eduPersonPrincipalName" Name="urn:oid:1.3.6.1.4.1.5923.1.1.1.6"
                          NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri"/>
           <RequestedAttribute FriendlyName="mail" Name="urn:oid:0.9.2342.19200300.100.1.3"
                          NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri"/>
    </AttributeConsumingService>
  </SPSSODescriptor>
  <Organization>...</Organization>
  <ContactPerson>...</ContactPerson>
</EntityDescriptor>
```

```
    <KeyDescriptor use="signing">
      <ds:KeyInfo>
        <ds:X509Data>
          <ds:X509Certificate>
MIIDITCCAgmgAwIBAgIJAKu+jRod+TYIMA0GCSqGSIb3DQEBBQUAMCkxJzAlBgNV
BAMTHndlYmF1dGguc2VydmljZS5vaGlvLXN0YXRlLmVkdTAeFw0xMDAyMDkyMDA3
MzdaFw0zMDAyMDQyMDA3MzdaMCkxJzAlBgNVBAMTHndlYmF1dGguc2VydmljZS5v
aGlvLXN0YXRlLmVkdTCCASIwDQYJKoZIhvcNAQEBBQADggEPADCCAQoCggEBAMpZ
P+xV7kNCuuUtg4X8MTxTnS2TSU/tompvYjI0af4q7N5od7uzEqHBD9FMvh9bZ7GS
CACX5yYjBYZCb59i0tstfpCsDBho2Wi497EjmaTw81EQ1AjM6EhRb/we0MLj0er8
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XbDBWxd1CplgHwZvrbWxYxf5gTCaPvHuLY5WeA8Ky5SUZifO/szEDvEm8K0rHStK
H/blQiX5fUQ6t3SfxbsCAwEAAaNMMEowKQYDVR0RBCIwIIIed2ViYXV0aC5zZXJ2
aWNlLm9oaW8tc3RhdGUuZWR1MB0GA1UdDgQWBBR70C49vjOa/Ikk86hkX998wqQt
UDANBgkqhkiG9w0BAQUFAAOCAQEAlgMMaTIwrly4U896lUa92iif3bLGADPjc0Is
6a6k6RytjJm/r0lbtjCWW6zs1T6L7458Ow+57fyF0Oh/iXvj65m+dvCBWXnag7hN
1yMBJQMRpSjH7dLko7y0EJ/ZrKEYQwYnBGmCILvJB/MIj2eEkq2Z47uWpvrehJfb
zsEeAbjNqw1V/AJN7E4paw8aYg8TXEXAdOvNL5h7KRQw8Ui0kCw2DeTTIXExSxZd
bqw6ldfQD2fVYnLxDGTFqITCi1a9TidA4xCXD95F7uQaEao3O8ArZcyag62uiMtv
i24RvCRvD/vsnUhI82pV/DK+2icz6UDtiiKrFNAmIiR14TanfA==
          </ds:X509Certificate>
        </ds:X509Data>
      </ds:KeyInfo>
    </KeyDescriptor>
```

Higher Ed & Research SAML Trust Model

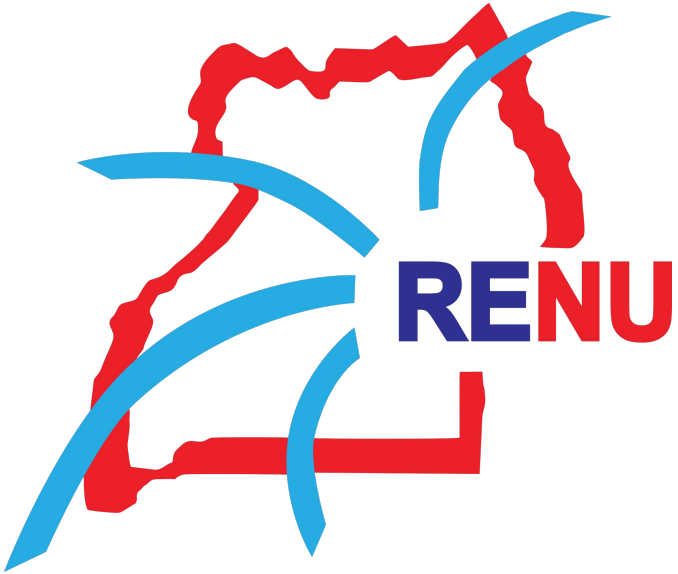
- Explicit Key Trust Model
- IdP/SP explicitly trusts the "keys" it finds in SAML metadata
  - Keys used for digital signing and/or encryption
- Keys obtained from X.509 digital certificates
  - X.509 certs contain a lot of information in addition to keys
  - Only the keys are used! (Mostly)
  - So X.509 certs do NOT need to be part of a public key infrastructure
  - No "well known" certificate authority needs to issue the certificate
- **Self-signed X.509 digital certificates preferred for higher ed & research SAML**

SAML Federations

The Role of Federations

- Enable us to scale up to 1000s of IdPs and SPs
- Publish digitally signed SAML metadata containing public keys, endpoint URLs, and other info about IdPs and SPs
- Set standards for SAML attributes, levels of assurance, etc.
- Provide support and training

RENU Identity Federation



Federation SAML Metadata

- RENU Identity Federation (RIF) SAML Metadata available at

  https://rif.renu.ac.ug/rr/signedmetadata/federation/RIF/metadata.xml

RENU SAML Federation Trust Model

- SAML metadata bootstraps the trust
- Trust federation operators to only let in "good" metadata
- Each entity (IdP or SP) consumes the metadata and has details for all other entities necessary for interoperability
- Before consuming metadata each entity **must** verify it is *properly signed* by federation operator and *still valid*
- TLS is **not** a substitute for verifying signature on metadata