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ABOUT SINGLE SIGN-ON

Single sign-on is a process that allows network users to access all authorized network resources without having to log in separately to each resource. Single sign-on allows you to validate usernames and passwords against your corporate user database or other client application rather than having separate user passwords managed by Salesforce.

Salesforce offers the following ways to use single sign-on:

- Federated authentication using Security Assertion Markup Language (SAML) allows you to send authentication and authorization data between affiliated but unrelated Web services. This enables you to sign on to Salesforce from a client application. Federated authentication using SAML is enabled by default for your organization.

- Delegated authentication single sign-on enables you to integrate Salesforce with an authentication method that you choose. This enables you to integrate authentication with your LDAP (Lightweight Directory Access Protocol) server, or perform single sign-on by authenticating using a token instead of a password. You manage delegated authentication at the permission level, allowing some users to use delegated authentication, while other users continue to use their Salesforce-managed password. Delegated authentication is set by permissions, not by organization.

The primary reasons for using delegated authentication include:

- Using a stronger type of user authentication, such as integration with a secure identity provider
- Making your login page private and accessible only behind a corporate firewall
- Differentiating your organization from all other companies that use Salesforce in order to reduce phishing attacks

You must request that this feature be enabled by Salesforce. Contact Salesforce to enable delegated authentication single sign-on for your organization.

- Authentication providers let your users log in to your Salesforce organization using their login credentials from an external service provider. Salesforce supports the OpenId Connect protocol that allows users to log in from any OpenID provider such as Google, Paypal, LinkedIn and other services supporting OpenID Connect. When authentication providers are enabled, Salesforce does not validate a user’s password. Instead, Salesforce uses the user’s login credentials from the external service provider to establish authentication credentials.

When you have an external identity provider, and configure single sign-on for your Salesforce organization, Salesforce is then acting as a service provider. You can also enable Salesforce as an identity provider, and use single sign-on to connect to a different service provider. Only the service provider needs to configure single sign-on.

The Single Sign-On Settings page displays which version of single sign-on is available for your organization. To learn more about the single sign-on settings, see Configuring SAML Settings for Single Sign-On. For more information about SAML and Salesforce security, see the Security Implementation Guide.

Benefits of Single Sign-On

Implementing single sign-on can offer the following advantages to your organization:

EDITIONS

Federated Authentication is available in: All Editions
Delegated Authentication is available in: Professional, Enterprise, Performance, Unlimited, Developer, and Database.com Editions
Authentication Providers are available in: Professional, Enterprise, Performance, Unlimited, and Developer Editions

USER PERMISSIONS

To view the settings:
- “View Setup and Configuration”

To edit the settings:
- “Customize Application”
  AND
- “Modify All Data”
• **Reduced Administrative Costs:** With single sign-on, users only need to memorize a single password to access both network resources or external applications and Salesforce. When accessing Salesforce from inside the corporate network, users are logged in seamlessly, without being prompted to enter a username or password. When accessing Salesforce from outside the corporate network, the users’ corporate network login works to log them in. With fewer passwords to manage, system administrators receive fewer requests to reset forgotten passwords.

• **Leverage Existing Investment:** Many companies use a central LDAP database to manage user identities. By delegating Salesforce authentication to this system, when a user is removed from the LDAP system, they can no longer access Salesforce. Consequently, users who leave the company automatically lose access to company data after their departure.

• **Time Savings:** On average, a user takes five to 20 seconds to log in to an online application; longer if they mistype their username or password and are prompted to reenter them. With single sign-on in place, the need to manually log in to Salesforce is avoided. These saved seconds add up to increased productivity.

• **Increased User Adoption:** Due to the convenience of not having to log in, users are more likely to use Salesforce on a regular basis. For example, users can send email messages that contain links to information in Salesforce such as records and reports. When the recipients of the email message click the links, the corresponding Salesforce page opens automatically.

• **Increased Security:** Any password policies that you have established for your corporate network will also be in effect for Salesforce. In addition, sending an authentication credential that is only valid for a single use can increase security for users who have access to sensitive data.

### About SAML

Security Assertion Markup Language (SAML) is an XML-based standard that allows you to communicate authentication decisions between one service and another. It underlies many Web single sign-on solutions. Salesforce supports SAML for single sign-on into Salesforce from a corporate portal or identity provider.

Much of the work to set up single sign-on using SAML occurs with your identity provider:

1. Establish a SAML identity provider and gather information about how they will connect to Salesforce. This is the provider that will send single sign-on requests to Salesforce.
2. Provide information to your identity provider, such as the URLs for the start and logout pages.
3. Configure Salesforce using the instructions in Configuring SAML Settings for Single Sign-On. This is the only step that takes place in Salesforce.

Your identity provider should send SAML assertions to Salesforce using the SAML Web Single Sign-on Browser POST profile. Salesforce sends SAML responses to the Identity Provider Login URL specified under Setup, in Security Controls > Single Sign-On Settings. Salesforce receives the assertion, verifies it against your Salesforce configuration, and allows single sign-on if the assertion is true.

If you have problems with the SAML assertion after you configure Salesforce for SAML, use the SAML Assertion Validator to validate the SAML assertion. You may need to obtain a SAML assertion from your identity provider.

If your users are having problems using SAML to login, you can review the SAML login history to determine why they were not able to log in and share that information with your identity provider.

If your identity provider supports metadata, and if you’ve configured SAML using version 2.0, you can click Download Metadata to download an XML configuration file to send them, which they can then upload to automatically configure their settings for connecting to your Salesforce organization or community.
Working With Your Identity Provider

1. You must gather the following information from your identity provider before configuring Salesforce for SAML.
   - The version of SAML the identity provider uses (1.1 or 2.0)
   - The entity ID of the identity provider (also known as the issuer)
   - An authentication certificate.
     Tip: Be sure to store the certificate where you can access it from your browser. This will be uploaded to Salesforce in a later step.
   - The following SAML assertion parameters, as appropriate:
     - The SAML user ID type
     - The SAML user ID location
     - Attribute Name
     - Attribute URI
     - Name ID format
   
     Tip: To set up single sign-on quickly, you can import SAML 2.0 settings from an XML file (or a URL pointing to the file) on the Single Sign-On Settings page. Obtain the XML from your identity provider.
   
     You may also want to share more information about these values with your identity provider.

   Tip: Enable Salesforce for SAML and take a screenshot of the page for your identity provider. From Setup, click Security Controls > Single Sign-On Settings, click Edit, then select SAML Enabled.

2. Work with your identity provider to setup the start, login, and logout pages.

3. Share the example SAML assertions with your identity provider so they can determine the format Salesforce requires for successful single sign-on.
Customize SAML Start, Error, Login, and Logout Pages

You can customize the start, error, login, and logout pages for single sign-on users using SAML 1.1 or 2.0. As part of your configuration, decide the following:

- The URL to direct the user to when they click the Logout link in Salesforce (known as the logout page). The default is `https://login.salesforce.com`, unless MyDomain is enabled. If My Domain is enabled, the default is `https://customdomain.my.salesforce.com`.

- If your identity provider uses SAML 1.1, the URL to direct the user to when single sign-on successfully completes (known as the start page). This URL can be absolute, such as `https://na1.salesforce.com/001/o` or it can be relative, such as `/001/o`. This URL must be an endpoint that accepts SAML authentication requests.

  In SAML 2.0, the start page is the page the user attempted to access before they were authenticated. The SAML 2.0 start page must support Sp-init single sign-on.

  If you are using SAML 2.0, you can also use the `RelayState` parameter to control where users get redirected after a successful login.

- The single sign-on start page where Salesforce sends a SAML request to start the login sequence.

  We recommend that if you specify a single sign-on start page that you also specify a logout page. When you specify a logout page, when a user clicks logout or if a user’s session expires, the user is redirected to that page. If you don’t specify a logout page, the user is redirected to the general Salesforce login page.

For SAML 2.0, these values can be set either during the single sign-on configuration, or by your identity provider in the login URL or SAML assertion. The order of precedence is:

1. Session cookie—if you’ve already logged in to Salesforce and a cookie still exists, the login and logout pages specified by the session cookie are used.

2. Values passed in from the identity provider.

3. Values from the single sign-on configuration page.

If you decide not to add these values to the single sign-on configuration, share them with your identity provider. The identity provider must use these values either in the login URL or the assertion.

You can also decide if you want users to be directed to a custom error page if there’s an error during SAML login. It must be a publicly accessible page, such as a public site Visualforce page. The URL can be absolute or relative. Use this value when you configure SAML.

EDITIONS

Federated Authentication is available in: All Editions

Delegated Authentication is available in: Professional, Enterprise, Performance, Unlimited, Developer, and Database.com Editions

Authentication Providers are available in: Professional, Enterprise, Performance, Unlimited, and Developer Editions

USER PERMISSIONS

To view the settings:
- “View Setup and Configuration”

To edit the settings:
- “Customize Application”
  AND
  “Modify All Data”

4
Example SAML Assertions

Share the example SAML assertions with your identity provider so they can determine the format of the information Salesforce requires for successful single-sign on. The assertion must be signed according to the XML Signature specification, using RSA and either SHA-1 or SHA-256.

In addition to the general single sign-on examples for both SAML 1.1 and SAML 2.0, use the following samples for the specific feature:

- assertions for portals
- assertions for Sites
- SOAP message for delegated authentication
- assertion for just-in-time provisioning

**SAML User ID type is the Salesforce username, and SAML User ID location is the**

```
<NameIdentifier> element in the <Subject> element
```

SAML 1.1:
```
<Subject>
  <NameIdentifier>user101@salesforce.com</NameIdentifier>
</Subject>
```

SAML 2.0:
```
<saml:Subject>
  <saml:NameID Format="urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified">user101@salesforce.com</saml:NameID>
  <saml:SubjectConfirmation Method="urn:oasis:names:tc:SAML:2.0:cm:bearer">
  </saml:SubjectConfirmation>
</saml:Subject>
```

**SAML User ID type is the Salesforce username, and SAML User ID location is the**

```
<Attribute> element
```

SAML 1.1:
```
<AttributeStatement>
  <Subject>
    <NameIdentifier>this value doesn't matter</NameIdentifier>
    <SubjectConfirmation>
```

**About Single Sign-On**
<ConfirmationMethod>urn:oasis:names:tc:SAML:1.0:cm:bearer</ConfirmationMethod>

</SubjectConfirmation>
</Subject>

<Attribute AttributeName="MySfdcName" AttributeNamespace="MySfdcURI">
<AttributeValue>user101@salesforce.com</AttributeValue>
</Attribute>
</AttributeStatement>

SAML 2.0:

<saml:AttributeStatement>
  <saml:Attribute FriendlyName="fooAttrib" Name="SFDC_USERNAME" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
  </saml:Attribute>
</saml:AttributeStatement>

SAML User ID type is the Salesforce User object’s FederationIdentifier field, and SAML User ID location is the <NameIdentifier> element in the <Subject> element

SAML 1.1:

<AttributeStatement>
  <saml:Subject>
    <saml:NameIdentifier Format="urn:oasis:names:tc:SAML:1.0:assertion" NameQualifier="www.saml_assertions.com">MyName</saml:NameIdentifier>
  </saml:Subject>
</AttributeStatement>

SAML 2.0:

<saml:Subject>
  <saml:NameID Format="urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified">MyName</saml:NameID>
  <saml:SubjectConfirmation Method="urn:oasis:names:tc:SAML:2.0:cm:bearer">
  </saml:SubjectConfirmation>
</saml:Subject>

Note: The name identifier can be any arbitrary string, including email addresses or numeric ID strings.

SAML User ID type is the Salesforce User object’s FederationIdentifier field, and SAML User ID location is the <Attribute> element

SAML 1.1:

<AttributeStatement>
  <Subject>
    <NameIdentifier>who cares</NameIdentifier>
    <SubjectConfirmation>
      <ConfirmationMethod>urn:oasis:names:tc:SAML:1.0:cm:bearer</ConfirmationMethod>
    </SubjectConfirmation>
  </Subject>
</AttributeStatement>
SAML 2.0:

```xml
<saml:AttributeStatement>
  <saml:Attribute FriendlyName="fooAttrib" Name="SFDC_ATTR"
NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
    <saml:AttributeValue xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">
      user101
    </saml:AttributeValue>
  </saml:Attribute>
</saml:AttributeStatement>
```

**SAML User ID type is the Salesforce username, and SAML User ID location is the** `<NameIdentifier>` **element in the** `<Subject>` **element**

The following is a complete SAML response for SAML 2.0:

```xml
<samlp:Response ID="_257f9d9e9fa14962c0803903a6ccad931245264310738" IssueInstant="2009-06-17T18:45:10.738Z" Version="2.0">
  <saml:Issuer Format="urn:oasis:names:tc:SAML:2.0:nameid-format:entity">
    https://www.salesforce.com
  </saml:Issuer>
  <samlp:Status>
  </samlp:Status>
  <saml:Assertion ID="_3c39bc0fe7b13769cab2f6f45eba801b1245264310738" IssueInstant="2009-06-17T18:45:10.738Z" Version="2.0">
    <saml:Issuer Format="urn:oasis:names:tc:SAML:2.0:nameid-format:entity">
      https://www.salesforce.com
    </saml:Issuer>
    <saml:Signature>
      <saml:CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#"/>
      <saml:SignatureMethod Algorithm="http://www.w3.org/2000/09/xmldsig#rsa-sha1"/>
      <saml:Reference URI="#_3c39bc0fe7b13769cab2f6f45eba801b1245264310738"/>
      <saml:Transforms>
        <saml:Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature"/>
        <saml:Transform Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#"/>
        <ec:InclusiveNamespaces PrefixList="ds saml xs"/>
      </saml:Transforms>
    </saml:Signature>
  </saml:Assertion>
</samlp:Response>
```
Example SAML Assertions

<snmp:DigestValue>vzR9Hfp8d16576tEDeq/zhpmLoo=
</snmp:DigestValue>

<saml:Reference/>

<saml:SignedInfo>
<saml:SignatureValue>
AzID5hhJeJlG2llUDvZswNUr1rPtR7S37QYH2W+Un1n8c6kTC
Xr/1ihEKpcA2P2t86eBntFBVDWTrih/W3yUgGOoqQB0MFOVbhK
M/CbLBbBUVT5TcxIqvsNvIFdjIGNkf1W0SBqRKZ0J6txxCcLo
9dXqAyAUKqdpX5+AyltwrdCPNmncUM4dtRFj105CL1rRaGeyX
3kkgOL8p0vjm0fazU5tCAJLbYy9U1LivPSahWNcvrS1CI4e
Pn2oIVDyrc4et12inMTMc21GlIWWWjyHOPSiXRSkEAIwQVjf
QM5clp144Pv8FCrdGWpE0yXsPvDkM9jIzwCYYG2fKaLBag==
</saml:SignatureValue>
<saml:KeyInfo>
<saml:X509Certificate>
MIIEATCCAumgAwIBAgIBBTANBgkqhkiG9w0BAQ0FADCBgzELM
[Certificate truncated for readability...]
</saml:X509Certificate>
</saml:KeyInfo>
</saml:Signature>

<saml:Subject>
<saml:NameID Format="urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified">
saml01@salesforce.com
</saml:NameID>

<saml:SubjectConfirmation Method="urn:oasis:names:tc:SAML:2.0:cm:bearer">
<saml:SubjectConfirmationData NotOnOrAfter="2009-06-17T18:50:10.738Z"
</saml:SubjectConfirmation>
</saml:Subject>

<saml:Conditions NotBefore="2009-06-17T18:45:10.738Z"
NotOnOrAfter="2009-06-17T18:50:10.738Z"/>

<saml:AudienceRestriction>
<saml:Audience>https://salesforce.com</saml:Audience>
</saml:AudienceRestriction>
</saml:Conditions>

<saml:AuthnStatement AuthnInstant="2009-06-17T18:45:10.738Z">
<saml:AuthnContext>
</saml:AuthnContext>
</saml:AuthnStatement>

<saml:AttributeStatement>
<saml:Attribute Name="portal_id">
<saml:AttributeValue xsi:type="xs:anyType">060D00000000SHZ</saml:AttributeValue>
</saml:Attribute>
</saml:AttributeStatement>
Sample SAML Assertions for Portals

The following shows the portal_id and organization_id attributes in a SAML assertion statement:

```xml
<saml:AttributeStatement>
  <saml:Attribute Name="portal_id">
    <saml:AttributeValue xsi:type="xs:anyType">060D00000000SHZ</saml:AttributeValue>
  </saml:Attribute>

  <saml:Attribute Name="organization_id">
    <saml:AttributeValue xsi:type="xs:anyType">00DD0000000F7P5</saml:AttributeValue>
  </saml:Attribute>
</saml:AttributeStatement>
```

The following is a complete SAML assertion statement that can be used for single sign-on for portals. The organization is using federated sign-on, which is included in an attribute (see the `<saml:AttributeStatement>` in bold text in the assertion), not in the subject.

```xml
<samlp:Response ID="_f97faa927f54ab2c1f230eee27c2b2a1245264205456" IssueInstant="2009-06-17T18:43:25.456Z" Version="2.0">
  <saml:Issuer Format="urn:oasis:names:tc:SAML:2.0:nameid-format:entity">
    https://www.salesforce.com</saml:Issuer>

  <samlp:Status>
  </samlp:Status>

  <saml:Assertion ID="_f690da2480a8df7fccc1ebee5dc67dbbbb1245264205456">
```

Example SAML Assertions About Single Sign-On
<saml:Conditions NotBefore="2009-06-17T18:43:25.456Z"
    NotOnOrAfter="2009-06-17T18:48:25.456Z">

    <saml:AudienceRestriction>
    </saml:AudienceRestriction>

</saml:Conditions>

    <saml:AuthnContext>
    </saml:AuthnContext>
</saml:AuthnStatement>

<saml:AttributeStatement>
    <saml:Attribute FriendlyName="Friendly Name" Name="federationId"
        NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
        <saml:AttributeValue xsi:type="xs:string">saml_portal_user_federation_id</saml:AttributeValue>
        <saml:AttributeValue xsi:type="xs:string">SomeOtherValue</saml:AttributeValue>
    </saml:Attribute>

    <saml:Attribute Name="portal_id">
        <saml:AttributeValue xsi:type="xs:anyType">060D00000000SHZ</saml:AttributeValue>
    </saml:Attribute>

    <saml:Attribute Name="organization_id">
        <saml:AttributeValue xsi:type="xs:anyType">00DD00000000F7Z5</saml:AttributeValue>
    </saml:Attribute>

    <saml:Attribute Name="ssostartpage"
        NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
    </saml:Attribute>

    <saml:Attribute Name="logouturl"
        NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
    </saml:Attribute>
</saml:AttributeStatement>
Sample SAML Assertion for Sites

The following shows the portal_id, organization_id, and siteurl attributes in a SAML assertion statement:

```xml
<saml:AttributeStatement>
  <saml:Attribute Name="portal_id">
    <saml:AttributeValue xmlns:xs="http://www.w3.org/2001/XMLSchema"
      xsi:type="xs:anyType">060900000004cDk</saml:AttributeValue>
  </saml:Attribute>
  <saml:Attribute Name="organization_id">
    <saml:AttributeValue xmlns:xs="http://www.w3.org/2001/XMLSchema"
      xsi:type="xs:anyType">00D900000008bX0</saml:AttributeValue>
  </saml:Attribute>
  <saml:Attribute Name="siteurl">
    <saml:AttributeValue xmlns:xs="http://www.w3.org/2001/XMLSchema"
      xsi:type="xs:anyType">https://ap1.force.com/mySuffix</saml:AttributeValue>
  </saml:Attribute>
</saml:AttributeStatement>
```

Sample SOAP Message for Delegated Authentication

As part of the delegated authentication single sign-on process, a Salesforce server makes a SOAP 1.1 request to authenticate the user who is passing in the credentials. Here is an example of this type of request. Your single sign-on Web service needs to accept this request, process it, and return a true or false response.

**Sample Request**

```xml
<?xml version="1.0" encoding="UTF-8" ?>
<soapenv:Envelope
  xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:soapenv:Body="urn:authentication.soap.sforce.com">
  <Authenticate
    xmlns="urn:authentication.soap.sforce.com"
    username="sampleuser@sample.org"
    password="myPassword99"
    sourceIp="1.2.3.4"/>
</soapenv:Body>
</soapenv:Envelope>
```

**Sample Response Message**

```xml
<?xml version="1.0" encoding="UTF-8" ?>
<soapenv:Envelope
  xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:soapenv:Body="urn:authentication.soap.sforce.com">
  <AuthenticateResult
    xmlns="urn:authentication.soap.sforce.com"
    Authenticated="false"/>
</soapenv:Body>
</soapenv:Envelope>
```
Sample SAML Assertion for Just-In-Time Provisioning

The following is a sample SAML assertion for just in time provisioning.

<saml:AttributeStatement>
  <saml:Attribute Name="User.Username"
      NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
    <saml:AttributeValue xsi:type="xs:anyType">testuser@123.org</saml:AttributeValue>
  </saml:Attribute>

  <saml:Attribute Name="User.Phone"
      NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
    <saml:AttributeValue xsi:type="xs:anyType">415-123-1234</saml:AttributeValue>
  </saml:Attribute>

  <saml:Attribute Name="User.FirstName"
      NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
    <saml:AttributeValue xsi:type="xs:anyType">Testuser</saml:AttributeValue>
  </saml:Attribute>

  <saml:Attribute Name="User.LanguageLocaleKey"
      NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
    <saml:AttributeValue xsi:type="xs:anyType">en_US</saml:AttributeValue>
  </saml:Attribute>

  <saml:Attribute Name="User.CompanyName"
      NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
    <saml:AttributeValue xsi:type="xs:anyType">Salesforce.com</saml:AttributeValue>
  </saml:Attribute>

  <saml:Attribute Name="User.Alias"
      NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
    <saml:AttributeValue xsi:type="xs:anyType">tlee2</saml:AttributeValue>
  </saml:Attribute>

  <saml:Attribute Name="User.CommunityNickname"
      NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
    <saml:AttributeValue xsi:type="xs:anyType">tlee2</saml:AttributeValue>
  </saml:Attribute>
</saml:AttributeStatement>
About Single Sign-On

Example SAML Assertions

<saml:AttributeValue xsi:type="xs:anyType">0000000000000000
</saml:AttributeValue>
</saml:Attribute>

<saml:Attribute Name="User.Title"
    NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
  <saml:AttributeValue xsi:type="xs:anyType">Mr.
  </saml:AttributeValue>
</saml:Attribute>

<saml:Attribute Name="User.LocaleSidKey"
    NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
  <saml:AttributeValue xsi:type="xs:anyType">en_CA
  </saml:AttributeValue>
</saml:Attribute>

<saml:Attribute Name="User.Email"
    NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
  <saml:AttributeValue xsi:type="xs:anyType">testuser@salesforce.com
  </saml:AttributeValue>
</saml:Attribute>

<saml:Attribute Name="User.FederationIdentifier"
    NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
  <saml:AttributeValue xsi:type="xs:anyType">tlee2
  </saml:AttributeValue>
</saml:Attribute>

<saml:Attribute Name="User.TimeZoneSidKey"
    NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
  <saml:AttributeValue xsi:type="xs:anyType">America/Los_Angeles
  </saml:AttributeValue>
</saml:Attribute>

<saml:Attribute Name="User.LastName"
    NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
  <saml:AttributeValue xsi:type="xs:anyType">Lee
  </saml:AttributeValue>
</saml:Attribute>

<saml:Attribute Name="User(ProfileId"
    NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
  <saml:AttributeValue xsi:type="xs:anyType">00ex0000001pBNL
  </saml:AttributeValue>
</saml:Attribute>

<saml:Attribute Name="User.IsActive"
    NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
  <saml:AttributeValue xsi:type="xs:anyType">1
  </saml:AttributeValue>
</saml:Attribute>

<saml:Attribute Name="User.EmailEncodingKey"
    NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
  <saml:AttributeValue xsi:type="xs:anyType">
</saml:AttributeValue>
</saml:Attribute>
Identity Provider Values

Before you can configure Salesforce for SAML, you must receive information from your identity provider. This information must be used on the single sign-on page.

The following information might be useful for your identity provider.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
</table>
| SAML Version                 | The version of SAML your identity provider uses. Salesforce currently supports version 1.1 and 2.0. The SAML specifications for the various versions are linked below:  
  • SAML 1.1
  • SAML 2.0                     |
<p>| Issuer                       | The Entity ID—a URL that uniquely identifies your SAML identity provider. SAML assertions sent to Salesforce must match this value exactly in the <a href="">saml:Issuer</a> attribute of SAML assertions. |
| Entity ID                    | The issuer in SAML requests generated by Salesforce, and is also the expected audience of any inbound SAML Responses. If you don’t have domains deployed, this value is always <a href="https://saml.salesforce.com">https://saml.salesforce.com</a>. If you have domains deployed, Salesforce recommends that you use your custom domain name. You can find the value on the Single Sign-On Settings page. From Setup, click Security Controls &gt; Single Sign-On Settings. |
| Identity Provider Certificate| The authentication certificate issued by your identity provider.              |
| Request Signing Certificate  | The certificate (saved in Security Controls &gt; Certificate and Key Management) used to generate the signature on a SAML request to the identity provider when Salesforce is the service provider for a service provider-initiated SAML login. If a certificate has not been saved in Security Controls &gt; Certificate and Key Management, Salesforce uses the global proxy certificate by default. Using a saved signing certificate provides more control over events, such as certificate expiration, than using the global proxy certificate. |
| Request Signature Method     | The hashing algorithm for encrypted requests, either RSA-SHA1 or RSA-SHA256. |</p>
<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SAML Identity Type</strong></td>
<td>The element in a SAML assertion that contains the string that identifies a Salesforce user. Values are:</td>
</tr>
<tr>
<td></td>
<td><strong>Assertion contains User’s Salesforce username</strong></td>
</tr>
<tr>
<td></td>
<td>Use this option if your identity provider passes the Salesforce username in SAML assertions.</td>
</tr>
<tr>
<td></td>
<td><strong>Assertion contains the Federation ID from the User object</strong></td>
</tr>
<tr>
<td></td>
<td>Use this option if your identity provider passes an external user identifier, for example an employee ID, in the SAML assertion to identify the user.</td>
</tr>
<tr>
<td></td>
<td><strong>Assertion contains the User ID from the User object</strong></td>
</tr>
<tr>
<td></td>
<td>Use this option if your identity provider passes an internal user identifier, for example a user ID from your Salesforce organization, in the SAML assertion to identify the user.</td>
</tr>
<tr>
<td><strong>SAML Identity Location</strong></td>
<td>The location in the assertion where a user should be identified. Values are:</td>
</tr>
<tr>
<td></td>
<td><strong>Identity is in the NameIdentifier element of the Subject statement</strong></td>
</tr>
<tr>
<td></td>
<td>The Salesforce Username or FederationIdentifier is located in the <code>&lt;Subject&gt;</code> statement of the assertion.</td>
</tr>
<tr>
<td></td>
<td><strong>Identity is in an Attribute element</strong></td>
</tr>
<tr>
<td></td>
<td>The Salesforce Username or FederationIdentifier is specified in an <code>&lt;AttributeValue&gt;</code>, located in the <code>&lt;Attribute&gt;</code> of the assertion.</td>
</tr>
<tr>
<td><strong>Attribute Name</strong></td>
<td>If &quot;Identity is in an Attribute element&quot; is selected, this contains the value of the AttributeName that is specified in <code>&lt;Attribute&gt;</code> that contains the User ID.</td>
</tr>
</tbody>
</table>
| **Attribute URI**             | If SAML 1.1 is the specified SAML version and "Identity is in an Attribute element" is selected, this contains the value of the AttributeNamespace that is specified in `<Attribute>`.
| **Name ID Format**            | If SAML 2.0 is the specified SAML version and "Identity is in an Attribute element" is selected, this contains the value for the nameid-format. Possible values include unspecified, emailAddress or persistent. All legal values can be found in the "Name Identifier Format Identifiers" section of the Assertions and Protocols SAML 2.0 specification. |
| **Service Provider Initiated Request Binding** | If you’re using My Domain, chose the binding mechanism your identity provider requests for your SAML messages. Values are:                                                                                                                                 |
|                               | **HTTP POST**                                                                                                                                                                                                 |
|                               | HTTP POST binding sends SAML messages using base64-encoded HTML forms.                                                                                                                                 |
|                               | **HTTP Redirect**                                                                                                                                                                                           |
|                               | HTTP Redirect binding sends base64-encoded and URL-encoded SAML messages within URL parameters.                                                                                                            |
|                               | No matter what request binding is selected, the SAML Response will always use HTTP POST binding.                                                                                                         |
| **Identity Provider Login URL** | For SAML 2.0 only: The URL where Salesforce sends a SAML request to start the login sequence.                                                                                                               |
|                               | If you have domains deployed and a value specified for this field, login requests are usually sent to the address specified by this field. However, if you need to bypass this value (for example, your identity provider is down) add the `login` parameter to the query string for the login page. For example: `http://mydomain.my.salesforce.com?login`. |
### Identity Provider Values

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identity Provider Logout URL</td>
<td>For SAML 2.0 only: The URL to direct the user to when they click the <strong>Logout</strong> link in Salesforce. The default is <a href="http://www.salesforce.com">http://www.salesforce.com</a>.</td>
</tr>
<tr>
<td>Salesforce Login URL</td>
<td>The URL associated with logging in for the Web browser single sign-on flow.</td>
</tr>
<tr>
<td>OAuth 2.0 Token Endpoint</td>
<td>For SAML 2.0 only: The ACS URL used with the API when enabling Salesforce as an identity provider in the Web single sign-on OAuth assertion flow.</td>
</tr>
<tr>
<td>Custom Error URL</td>
<td>The URL of the page users should be directed to if there’s an error during SAML login. It must be a publicly accessible page, such as a public site Visualforce page. The URL can be absolute or relative.</td>
</tr>
</tbody>
</table>

### Start, Login, and Logout URL Values

In addition to the information used during the single sign-on, your identity provider can also set the start, login, and logout pages. You can also specify these pages yourself when you configure single sign-on.

The following information might be useful to your identity provider if they are setting these pages.

- The SAML specification supports an HTML form that is used to pass the SAML assertion via HTTPS POST.
- For SAML 1.1, the SAML identity provider can embed name-value pairs in the `TARGET` field to pass this additional information to Salesforce prepended with a specially formatted URL that contains URL-encoded parameters.
- The URL for SAML 1.1 to include in the `TARGET` field is as follows: https://saml.salesforce.com/?
- For SAML 2.0, instead of using the `TARGET` field, the identity providers uses the `<AttributeStatement>` in the SAML assertion to specify the additional information.
- Salesforce supports the following parameters:
  - **ssoStartPage** is the page to which the user should be redirected when trying to log in with SAML. The user is directed to this page when requesting a protected resource in Salesforce, without an active session. The `ssoStartPage` should be the SAML identity provider's login page.
  - **startURL** is the URL where you want the user to be directed when sign-on completes successfully. This URL can be absolute, such as `https://na1.salesforce.com/001/o` or it can be relative, such as `/001/o`. This parameter is only used in SAML 1.1. In SAML 2.0, the start URL is the page the user attempted to access before they were authenticated.
  - **logoutURL** is the URL where you want the user to be directed when they click the **Logout** link in Salesforce. The default is http://www.salesforce.com.

The following sample `TARGET` field is for SAML 1.1, and includes properly-encoded parameters. It passes a customized start page, as well as start and logout URLs embedded as parameter values in the query string.
The following is an example of an `<AttributeStatement>` for SAML 2.0 that contains both `ssoStartPage` and `logoutURL`:

```xml
<saml:AttributeStatement>
  <saml:Attribute Name="ssoStartPage" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
    <saml:AttributeValue xmlns:xs="http://www.w3.org/2001/XMLSchema"
                         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:anyType">
      http://www.customer.org
    </saml:AttributeValue>
  </saml:Attribute>

  <saml:Attribute Name="logoutURL" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
    <saml:AttributeValue xmlns:xs="http://www.w3.org/2001/XMLSchema"
                         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">
      https://www.salesforce.com
    </saml:AttributeValue>
  </saml:Attribute>
</saml:AttributeStatement>
```
From this page, you can configure your organization to use single sign-on. You can also set up just-in-time provisioning. Work with your identity provider to properly configure these settings. For more information about single sign-on, see About Single Sign-On. For more information about just-in-time provisioning, see About Just-In-Time Provisioning.

To configure SAML settings for single sign-on from your corporate identity provider to Salesforce:

1. Gather information from your identity provider.
2. Provide information to your identity provider.
3. Set up single sign-on.
4. Set up an identity provider to encrypt SAML assertions (optional).
5. Enable Just-in-Time user provisioning (optional).
6. Edit the SAML JIT handler if you selected Custom SAML JIT with Apex Handler for Just-in-Time provisioning.
7. Test the single sign-on connection.

Set up single sign-on

1. In Salesforce, from Setup, click Security Controls > Single Sign-On Settings, and click Edit.
2. Select SAML Enabled. You must enable SAML to view the SAML single sign-on settings.
3. Specify the SAML version used by your identity provider.
4. Click Save.
5. In SAML Single Sign-On Settings, click the appropriate button to create a new configuration, as follows.
   - **New** - Specify all settings manually.
   - **New from Metadata File** - Import SAML 2.0 settings from a XML file from your identity provider. This option reads the XML file and uses it to complete as many of the settings as possible.
     - **Note**: If your XML file contains information for more than one configuration, the first configuration that occurs in the XML file is used.
   - **New from Metadata URL** - Import SAML 2.0 settings from a public URL. This option reads the XML file located at a public URL and uses it to complete as many of the settings as possible. The URL must be added to Remote Site Settings to access it from your Salesforce org.
6. Give this setting a **Name** for reference within your organization.
   Salesforce inserts the corresponding **API Name** value, which you can customize if necessary.
7. Enter the **Issuer**. This is often referred to as the entity ID for the identity provider.
8. If your Salesforce organization has domains deployed, specify whether you want to use the base domain (https://saml.salesforce.com) or the custom domain for the Entity ID. You must share this information with your identity provider.

   Tip: Generally, use the custom domain as the entity ID. If you already have single sign-on configured before deploying a domain, the base domain is the entity ID. If you are providing Salesforce to Salesforce services, you must specify the custom domain.

9. For the Identity Provider Certificate, use the Browse button to locate and upload the authentication certificate issued by your identity provider.

10. For the Request Signing Certificate, select the certificate you want from the ones saved in your Certificate and Key Management settings.

11. For the Request Signature Method, select the hashing algorithm for encrypted requests, either RSA-SHA1 or RSA-SHA256.

12. Optionally, if the identity provider encrypts SAML assertions, select the Assertion Decryption Certificate they’re using from the ones saved in your Certificate and Key Management settings. This field is available only if your organization supports multiple single sign-on configurations. For more information, see Set up an identity provider to encrypt SAML assertions.

13. For the SAML Identity Type, SAML Identity Location, and other fields described in Identity Provider Values, specify the values provided by your identity provider as appropriate.

14. For the Service Provider Initiated Request Binding, select the appropriate value based on the information provided by your identity provider.

15. For SAML 2.0, if your identity provider has specific login or logout pages, specify them in Identity Provider Login URL and Identity Provider Logout URL, respectively.

   Note: These fields appear in Developer Edition and sandbox organizations by default and in production organizations only if My Domain is enabled. The fields do not appear in trial organizations or sandboxes linked to trial organizations.

16. For the Custom Error URL, specify the URL of the page users should be directed to if there’s an error during SAML login. It must be a publicly accessible page, such as a public website Visualforce page. The URL can be absolute or relative.

17. Optionally, set up Just-in-Time user provisioning. For more information, see Enable Just-in-Time user provisioning and About Just-in-Time Provisioning for SAML.

18. Click Save.

If your identity provider supports metadata, and if you’ve configured SAML using version 2.0, you can click Download Metadata to download an XML configuration file to send them, which they can then upload to automatically configure their settings for connecting to your Salesforce organization or community.

---

**Set up an identity provider to encrypt SAML assertions**

When Salesforce is the service provider for inbound SAML assertions, you can pick a saved certificate to decrypt inbound assertions from third party identity providers. You need to provide a copy of this certificate to the identity provider.

1. In Security Controls > Single Sign-On Settings, add a new SAML configuration.

2. In the Assertion Decryption Certificate field, specify the certificate for encryption from the ones saved in your Certificate and Key Management settings.

   Note: If you don’t see the Assertion Decryption Certificate field, you need to enable multiple single sign-on for your organization (this applies to organizations created before the Summer ’13 release that are not using SAML 1.1).
enable multiple single sign-on configurations, select Enable Multiple Configs on the Single Sign-On Settings page. If this setting has already been enabled, the field appears, and you won’t see the Enable Multiple Configs button.

3. Set the SAML Identity Location to Identity is in the NameIdentifier element of the Subject statement.
   
   For a successful authentication, the user must be identified in the <Subject> statement of the assertion. For more information, see Identity Provider Values.

4. When you save the new SAML configuration, your organization’s SAML settings value for the Salesforce Login URL (also known as the “Salesforce ACS URL”) changes. Get the new value in Security Controls > Single Sign-On Settings, and click the name of the new SAML configuration. The value is in the Salesforce Login URL field.

5. The identity provider must use the Salesforce Login URL value.

6. You also need to provide the identity provider with a copy of the certificate selected in the Assertion Decryption Certificate field to use for encrypting assertions.

Enable Just-in-Time user provisioning

1. In SAML Single Sign-On Settings, select User Provisioning Enabled.
   
   • Standard - This option allows you to provision users automatically using attributes in the assertion.
   
   • Custom SAML JIT with Apex handler - This option provisions users based on logic in an Apex class.

2. If you selected Standard, click Save and test the single sign-on connection. If you selected Custom SAML JIT with Apex handler, proceed to the next step.

3. In the SAML JIT Handler field, select an existing Apex class as the SAML JIT handler class. This class must implement the SamlJitHandler interface. If you do not have an Apex class, you can generate one by clicking Automatically create a SAML JIT handler template. You must edit this class and modify the default content before using it. For more information, see Edit the SAML JIT handler.

4. In the Execute Handler As field, select the user that runs the Apex class. The user must have “Manage Users” permission.

5. Just-in-time provisioning requires a Federation ID in the user type. In SAML Identity Type, select Assertion contains the Federation ID from the User object. If your identity provider previously used the Salesforce username, communicate to them that they must use the Federation ID.

6. Click Save.

Edit the SAML JIT handler

1. From Setup, click Develop > Apex Classes.

2. Edit the generated Apex SAML JIT handler to map fields between SAML and Salesforce. In addition, you can modify the generated code to support the following:
   
   • Custom fields
   
   • Fuzzy profile matching
   
   • Fuzzy role matching
   
   • Contact lookup by email
   
   • Account lookup by account number
Configuring SAML Settings for Single Sign-On

- Standard user provisioning into a community
- Standard user login into a community
- Default profile ID usage for portal Just-in-Time provisioning
- Default portal role usage for portal Just-in-Time provisioning
- Username generation for portal Just-in-Time provisioning

For example, to support custom fields in the generated handler code, find the “Handle custom fields here” comment in the generated code. After that code comment, insert your custom field code. For more information and examples, see the SAMLJitHandler Interface documentation.

Note: If your identity provider sends JIT attributes for the Contact or Account object with the User object in the same assertion, the generated handler may be unable to make updates. For a list of User fields that cannot be updated at the same time as the Contact or Account fields, see SOBjects That Cannot Be Used Together in DML Operations.

Test the single sign-on connection

After you have configured and saved your SAML settings, test them by trying to access the identity provider’s application. Your identity provider directs the user’s browser to POST a form containing SAML assertions to the Salesforce login page. Each assertion is verified, and if successful, single sign-on is allowed.

If you have difficulty signing on using single sign-on after you have configured and saved your SAML settings, use the SAML Assertion Validator. You may have to obtain a SAML assertion from your identity provider first.

If your users are having problems using SAML to login, you can review the SAML login history to determine why they were not able to log in and share that information with your identity provider.

If you are using SAML version 2.0, after you’ve finished configuring SAML, the OAuth 2.0 Token Endpoint field is populated. Use this with the Web single sign-on authentication flow for OAuth 2.0.
After you have configured your Salesforce organization to use SAML, you can view the single sign-on settings. From Setup, click Security Controls > Single Sign-On Settings.

This page lists the details of your SAML configuration. Most of these fields are the same as the fields on the page where you configured SAML. The following fields contain information automatically generated by completing the configuration. The available fields depend on your configuration.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salesforce Login URL</td>
<td>For SAML 2.0 only. If you select “Assertion contains User’s Salesforce username” for SAML User ID Type and “User ID is in the NameIdentifier element of the Subject statement” for SAML User ID Location, this URL is the URL associated with login for the Web single sign-on OAuth assertion flow.</td>
</tr>
<tr>
<td>Salesforce Logout URL</td>
<td>For SAML 2.0. Displays the Salesforce logout URL that the user is directed to after he or she logs off. This URL is only used if no value is specified for Identity Provider Logout URL.</td>
</tr>
<tr>
<td>OAuth 2.0 Token Endpoint</td>
<td>For SAML 2.0 only. The ACS URL used with enabling Salesforce as an identity provider in the Web single sign-on OAuth assertion flow.</td>
</tr>
</tbody>
</table>

From this page you can do any of the following:

- Click Edit to change the existing SAML configuration.
- Click SAML Assertion Validator to validate the SAML settings for your organization using a SAML assertion provided by your identity provider.
- If your identity provider supports metadata, and if you’ve configured SAML using version 2.0, you can click Download Metadata to download an XML configuration file to send them, which they can then upload to automatically configure their settings for connecting to your Salesforce organization or community.
If your users have difficulty logging into Salesforce after you configure Salesforce for single sign-on, use the SAML Assertion Validator and the login history to validate the SAML assertions sent by your identity provider.

1. Obtain a SAML assertion from your identity provider. The assertion can be either in plain XML format or base64 encoded.

   If a user tries to log in to Salesforce and fails, the invalid SAML assertion is used to automatically populate the SAML Assertion Validator if possible.

2. From Setup, click Security Controls > Single Sign-On Settings, then click SAML Assertion Validator.

3. Enter the SAML assertion into the text box, and click Validate.

4. Share the results of the validation errors with your identity provider.

EDITIONS

Federated Authentication is available in: All Editions
Delegated Authentication is available in: Professional, Enterprise, Performance, Unlimited, Developer, and Database.com Editions
Authentication Providers are available in: Professional, Enterprise, Performance, Unlimited, and Developer Editions

USER PERMISSIONS

To view the settings:
- "View Setup and Configuration"

To edit the settings:
- "Customize Application" AND "Modify All Data"
SAML Assertion Validation Errors

Salesforce imposes the following validity requirements on assertions:

**Authentication Statement**
The identity provider must include an `<AuthenticationStatement>` in the assertion.

**Conditions Statement**
If the assertion contains a `<Conditions>` statement, it must contain a valid timestamp.

**Timestamps**
The validity period specified in an assertion is honored. In addition, an assertion’s timestamp must be less than five minutes old, plus or minus three minutes, regardless of the assertion’s validity period setting. This allows for differences between machines. The NotBefore and NotOnOrAfter constraints must also be defined and valid.

**Attribute**
If your Salesforce configuration is set to Identity is in an Attribute element, the assertion from the identity provider must contain an `<AttributeStatement>`.

If you are using SAML 1.1, both `<AttributeName>` and `<AttributeNamespace>` are required as part of the `<AttributeStatement>`.

If you are using SAML 2.0, only `<AttributeName>` is required.

**Format**
The `Format` attribute of an `<Issuer>` statement must be set to "urn:oasis:names:tc:SAML:2.0:nameid-format:entity" or not set at all.

For example:

```xml
```

The following example is also valid:

```xml
<saml:Issuer>https://www.salesforce.com</saml:Issuer>
```

**Issuer**
The issuer specified in an assertion must match the issuer specified in Salesforce.

**Subject**
The subject of the assertion must be resolved to be either the Salesforce username or the Federation ID of the user.

**Audience**
The `<Audience>` value is required and must match the Entity ID from the single sign-on configuration. The default value is https://saml.salesforce.com.

**Recipient**
The recipient specified in an assertion must match either the Salesforce login URL specified in the Salesforce configuration or the OAuth 2.0 token endpoint. This is a required portion of the assertion and is always verified.
Signature
A valid signature must be included in the assertion. The signature must be created using the private key associated with the certificate that was provided in the SAML configuration.

Recipient
Verifies that the recipient and organization ID received in the assertion matches the expected recipient and organization ID, as specified in the single sign-on configuration. This is an optional portion of the assertion and is only verified if it’s present. For example:

Recipient that we found in the assertion: http://aalbert-salesforce.com:8081/
  ?saml=02HKiPoin4zeKLPYxfj3twkPaNSJF3fxsH0Jng4vVeQr3xNkIwZC_IVk3
Recipient that we expected based on the Single Sign-On Settings page: http://asmith.salesforce.com:8081/
  ?saml=EK03Almz90Cik_lg0L97.0Brme6mT4o6nzi0t_JROL6HLbdR1WVP5aQ05w
Organization Id that we expected: 00Dx0000000BQ1I
Organization Id that we found based on your assertion: 00D000000000062

Site URL Attribute
Verifies if a valid Sites URL is provided. Values are:

- Not Provided
- Checked
- Site URL is invalid
- HTTPS is required for Site URL
- The specified Site is inactive or has exceeded its page limit
REVIEWING THE SAML LOGIN HISTORY

When a user logs in to Salesforce from another application using single sign-on, SAML assertions are sent to the Salesforce login page. The assertions are checked against assertions in the authentication certificate specified under Setup, in Security Controls > Single Sign-On Settings. If a user fails to log in, a message is written to the login history log that indicates why the login failed. In addition, the SAML Assertion Validator may be automatically populated with the invalid assertion.

To view the login history, from Setup, click Users > Login History. After viewing the login history, you may want to share the information with your identity provider.

The following are the possible failures:

**Assertion Expired**
- An assertion’s timestamp is more than five minutes old.

  Note: Salesforce does make an allowance of three minutes for clock skew. This means, in practice, that an assertion can be as much as eight minutes after the timestamp time, or three minutes before it. This amount of time may be less if the assertion’s validity period is less than five minutes.

**Assertion Invalid**
- An assertion is not valid. For example, the <Subject> element of an assertion might be missing.

**Audience Invalid**

**Configuration Error/Perm Disabled**
- Something is wrong with the SAML configuration in Salesforce. For example, the uploaded certificate might be corrupted, or the organization preference might have been turned off. Check your configuration from Setup, in Security Controls > Single Sign-On Settings, get a sample SAML assertion from your identity provider, and click SAML Assertion Validator.

**Issuer Mismatched**
- The issuer or entity ID specified in an assertion does not match the issuer specified in your Salesforce configuration.

**Recipient Mismatched**
- The recipient specified in an assertion does not match the recipient specified in your Salesforce configuration.

**Replay Detected**
- The same assertion ID was used more than once. Assertion IDs must be unique within an organization.

**Signature Invalid**
- The signature in an assertion cannot be validated by the certificate in your Salesforce configuration.

**Subject Confirmation Error**
- The <Subject> specified in the assertion does not match the SAML configuration in Salesforce.
ABOUT JUST-IN-TIME PROVISIONING FOR SAML

With Just-in-Time provisioning, you can use a SAML assertion to create regular and portal users on the fly the first time they try to log in. This eliminates the need to create user accounts in advance. For example, if you recently added an employee to your organization, you don’t need to manually create the user in Salesforce. When they log in with single sign-on, their account is automatically created for them, eliminating the time and effort with on-boarding the account. Just-in-Time provisioning works with your SAML identity provider to pass the correct user information to Salesforce in a SAML 2.0 assertion. You can both create and modify accounts this way. Because Just-in-Time provisioning uses SAML to communicate, your organization must have SAML-based single sign-on enabled.

Benefits of Just-in-Time Provisioning

Implementing Just-in-Time provisioning can offer the following advantages to your organization.

• **Reduced Administrative Costs:** Provisioning over SAML allows customers to create accounts on-demand, as part of the single sign-on process. This greatly simplifies the integration work required in scenarios where users need to be dynamically provisioned, by combining the provisioning and single sign-on processes into a single message.

• **Increased User Adoption:** Users only need to memorize a single password to access both their main site and Salesforce. Users are more likely to use your Salesforce application on a regular basis.

• **Increased Security:** Any password policies that you have established for your corporate network are also in effect for Salesforce. In addition, sending an authentication credential that is only valid for a single use can increase security for users who have access to sensitive data.

Just-in-Time Provisioning Requirements

Just-in-Time provisioning requires the creation of a SAML assertion. Consider the following when creating your SAML assertion.

• **Provision Version** is supported as an optional attribute. If it isn’t specified, the default is 1.0. For example:

```xml
<saml:Attribute Name="ProvisionVersion" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
  <saml:AttributeValue xsi:type="xs:anyType">1.0</saml:AttributeValue>
</saml:Attribute>
```

• ProfileIDs change per organization, even for standard profiles. To make it easier to find the profile name, Salesforce allows you to do a profile name lookup by passing the **ProfileName** into the **ProfileId** field.

Field Requirements for the SAML Assertion

To correctly identify which object to create in Salesforce, you must use the **User**. prefix for all fields passed in the SAML assertion. In this example, the **User**. prefix has been added to the **Username** field name.

```xml
<saml:Attribute Name="User.Username" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified">
</saml:Attribute>
```
The following standard fields are supported.

<table>
<thead>
<tr>
<th>Fields</th>
<th>Required</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>AboutMe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alias</td>
<td></td>
<td>If not present, a default is derived from FirstName and LastName.</td>
</tr>
<tr>
<td>CallCenter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>City</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CommunityNickname</td>
<td></td>
<td>If not present, a default is derived from the UserName.</td>
</tr>
<tr>
<td>CompanyName</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DefaultCurrencyIsoCode</td>
<td></td>
<td>Derived from organization settings.</td>
</tr>
<tr>
<td>DelegatedApproverId</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Division</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td>Y</td>
<td>For example, User.Email=<a href="mailto:test2@salesforce.com">test2@salesforce.com</a></td>
</tr>
<tr>
<td>EmailEncodingKey</td>
<td></td>
<td>If not present, a default is derived from the organization settings.</td>
</tr>
<tr>
<td>EmployeeNumber</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fax</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FederationIdentifier</td>
<td>(insert only)</td>
<td>If present, it must match the SAML subject, or the SAML subject is taken instead. Can't be updated with SAML.</td>
</tr>
<tr>
<td>FirstName</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ForecastEnabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IsActive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LastName</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>LanguageLocaleKey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LocaleSidKey</td>
<td></td>
<td>If not present, a default is derived from the organization settings.</td>
</tr>
<tr>
<td>Manager</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MobilePhone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ProfileId</td>
<td>Y</td>
<td>For example, User.ProfileId=Standard User</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Just-in-Time Provisioning Errors

This table shows the error codes for Just-in-Time provisioning for SAML. Errors are returned in the URL parameter, for example:

```
http://login.salesforce.com/identity/jit/saml-error.jsp?
ErrorCode=5&ErrorDescription=Unable+to+create+user&ErrorDetails=
INVALID_OR_NULL_FOR_RESTRICTED_PICKLIST+TimeZoneSidKey
```

- **Note:** Salesforce redirects the user to a custom error URL if one is specified in your SAML configuration.

### Error Messages

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Error Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Missing Federation Identifier</td>
<td>MISSING_FEDERATION_ID</td>
</tr>
<tr>
<td>2</td>
<td>Mis-matched Federation Identifier</td>
<td>MISMATCH_FEDERATION_ID</td>
</tr>
<tr>
<td>3</td>
<td>Invalid organization ID</td>
<td>INVALID_ORG_ID</td>
</tr>
<tr>
<td>4</td>
<td>Unable to acquire lock</td>
<td>USER_CREATION_FAILED_ON_UROG</td>
</tr>
<tr>
<td>5</td>
<td>Unable to create user</td>
<td>USER_CREATION_API_ERROR</td>
</tr>
</tbody>
</table>

Other field requirements:
- Only text type custom fields are supported.
- Only the insert and update functions are supported for custom fields.
- When using the API for user creation, you can pass the new username into the `User.Username` field. You can also specify the `User.FederationIdentifier` if it is present. However, the `Username` and `FederationIdentifier` fields can't be updated with API.

### Fields

<table>
<thead>
<tr>
<th>Required</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **ReceivesAdminInfoEmails**
- **ReceivesInfoEmails**
- **State**
- **Street**
- **TimeZoneSidKey**
- **Title**
- **Username** (insert only)
- **UserRoleIds**
- **Zip**

For example, `User.Username=test2@test.com`. Can't update using SAML.

Defaults to "no role" if blank.
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Error Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Unable to establish admin context</td>
<td>ADMIN_CONTEXT_NOT_ESTABLISHED</td>
</tr>
<tr>
<td>8</td>
<td>Unrecognized custom field</td>
<td>UNRECOGNIZED_CUSTOM_FIELD</td>
</tr>
<tr>
<td>9</td>
<td>Unrecognized standard field</td>
<td>UNRECOGNIZED_STANDARD_FIELD</td>
</tr>
<tr>
<td>11</td>
<td>License limit exceeded</td>
<td>LICENSE_LIMIT_EXCEEDED</td>
</tr>
<tr>
<td>12</td>
<td>Federation ID and username do not match</td>
<td>MISMATCH_FEDERATION_ID_AND_USERNAME_ATTRS</td>
</tr>
<tr>
<td>13</td>
<td>Unsupported provision API version</td>
<td>UNSUPPORTED_VERSION</td>
</tr>
<tr>
<td>14</td>
<td>Username change isn't allowed</td>
<td>USER_NAME_CHANGE_NOT_ALLOWED</td>
</tr>
<tr>
<td>15</td>
<td>Custom field type isn't supported</td>
<td>UNSUPPORTED_CUSTOM_FIELD_TYPE</td>
</tr>
<tr>
<td>16</td>
<td>Unable to map an unique profile ID for the given profile name</td>
<td>PROFILE_NAME_LOOKUP_ERROR</td>
</tr>
<tr>
<td>17</td>
<td>Unable to map an unique role ID for the given role name</td>
<td>ROLE_NAME_LOOKUP_ERROR</td>
</tr>
<tr>
<td>18</td>
<td>Invalid account</td>
<td>INVALID_ACCOUNT_ID</td>
</tr>
<tr>
<td>19</td>
<td>Missing account name</td>
<td>MISSING_ACCOUNT_NAME</td>
</tr>
<tr>
<td>20</td>
<td>Missing account number</td>
<td>MISSING_ACCOUNT_NUMBER</td>
</tr>
<tr>
<td>22</td>
<td>Unable to create account</td>
<td>ACCOUNT_CREATION_API_ERROR</td>
</tr>
<tr>
<td>23</td>
<td>Invalid contact</td>
<td>INVALID_CONTACT</td>
</tr>
<tr>
<td>24</td>
<td>Missing contact email</td>
<td>MISSING_CONTACT_EMAIL</td>
</tr>
<tr>
<td>25</td>
<td>Missing contact last name</td>
<td>MISSING_CONTACT_LAST_NAME</td>
</tr>
<tr>
<td>26</td>
<td>Unable to create contact</td>
<td>CONTACT_CREATION_API_ERROR</td>
</tr>
<tr>
<td>27</td>
<td>Multiple matching contacts found</td>
<td>MULTIPLE_CONTACTS_FOUND</td>
</tr>
<tr>
<td>28</td>
<td>Multiple matching accounts found</td>
<td>MULTIPLE_ACCOUNTS_FOUND</td>
</tr>
<tr>
<td>30</td>
<td>Invalid account owner</td>
<td>INVALID_ACCOUNT_OWNER</td>
</tr>
<tr>
<td>31</td>
<td>Invalid portal profile</td>
<td>INVALID_PORTAL_PROFILE</td>
</tr>
<tr>
<td>32</td>
<td>Account change is not allowed</td>
<td>ACCOUNT_CHANGE_NOT_ALLOWED</td>
</tr>
<tr>
<td>33</td>
<td>Unable to update account</td>
<td>ACCOUNT_UPDATE_FAILED</td>
</tr>
<tr>
<td>34</td>
<td>Unable to update contact</td>
<td>CONTACT_UPDATE_FAILED</td>
</tr>
<tr>
<td>35</td>
<td>Invalid standard account field value</td>
<td>INVALID_STANDARD_ACCOUNT_FIELD_VALUE</td>
</tr>
<tr>
<td>36</td>
<td>Contact change not allowed</td>
<td>CONTACT_CHANGE_NOT_ALLOWED</td>
</tr>
<tr>
<td>37</td>
<td>Invalid portal role</td>
<td>INVALID_PORTAL_ROLE</td>
</tr>
</tbody>
</table>

Just-in-Time Provisioning Errors

About Just-in-Time Provisioning for SAML
Salesforce offers the following ways to use single sign-on:

- **Federated authentication** using Security Assertion Markup Language (SAML) allows you to send authentication and authorization data between affiliated but unrelated Web services. This enables you to sign on to Salesforce from a client application. Federated authentication using SAML is enabled by default for your organization.

- **Delegated authentication single sign-on** enables you to integrate Salesforce with an authentication method that you choose. This enables you to integrate authentication with your LDAP (Lightweight Directory Access Protocol) server, or perform single sign-on by authenticating using a token instead of a password. You manage delegated authentication at the permission level, allowing some users to use delegated authentication, while other users continue to use their Salesforce-managed password. Delegated authentication is set by permissions, not by organization.

The primary reasons for using delegated authentication include:

- Using a stronger type of user authentication, such as integration with a secure identity provider
- Making your login page private and accessible only behind a corporate firewall
- Differentiating your organization from all other companies that use Salesforce in order to reduce phishing attacks

You must request that this feature be enabled by Salesforce. Contact Salesforce to enable delegated authentication single sign-on for your organization.

- **Authentication providers** let your users log in to your Salesforce organization using their login credentials from an external service provider. Salesforce supports the OpenId Connect protocol that allows users to log in from any OpenID provider such as Google, Paypal, LinkedIn and other services supporting OpenID Connect. When authentication providers are enabled, Salesforce does not validate a user’s password. Instead, Salesforce uses the user’s login credentials from the external service provider to establish authentication credentials.

In addition, you can also configure SAML for use with portals as well as for Sites.

### Delegated Authentication Best Practices

Consider the following best practices when implementing delegated authentication single sign-on for your organization.

- Your organization’s implementation of the Web service must be accessible by Salesforce servers. This means you must deploy the Web service on a server in your DMZ. Remember to use your server’s external DNS name when entering the **Delegated Gateway URL** in the Delegated authentication section in Salesforce (from Setup, click **Security Controls > Single Sign-On Settings**).

- If Salesforce and your system cannot connect, or the request takes longer than 10 seconds to process, the login attempt fails. An error is reported to the user indicating that his or her corporate authentication service is down.

- Namespaces, element names, and capitalization must be exact in SOAP requests. Wherever possible, generate your server stub from the WSDL to ensure accuracy.

- For security reasons, you should make your Web service available by TLS. You must use a certificate from a trusted provider, such as Verisign or Thawte. For a full list of trusted providers, contact Salesforce.
Best Practices for Implementing Single Sign-On

- The IP address that originated the login request is `sourceIp`. Use this information to restrict access based on the user's location. Note that the Salesforce feature that validates login IP ranges continues to be in effect for single sign-on users. For more information, see “Setting Login Restrictions” in the Salesforce Help.

- You may need to map your organization’s internal usernames and Salesforce usernames. If your organization does not follow a standard mapping, you may be able to extend your user database schema (for example, Active Directory) to include the Salesforce username as an attribute of a user account. Your authentication service can then use this attribute to map back to a user account.

- We recommend that you do not enable single sign-on for system administrators. If your system administrators are single sign-on users and your single sign-on server has an outage, they have no way to log in to Salesforce. System administrators should always be able to log in to Salesforce so they can disable single sign-on in the event of a problem.

- We recommend that you use a Developer Edition account or a sandbox when developing a single sign-on solution before implementing it in your organization. To sign up for a free Developer Edition account, go to developer.salesforce.com.

- Make sure to test your implementation with Salesforce clients such as Salesforce for Outlook, Connect for Office, and Connect Offline. For more information, see Single Sign-On for Salesforce clients.

Federated Authentication using SAML Best Practices

Consider the following best practices when implementing federated single sign-on with SAML for your organization.

- Obtain the Salesforce Login URL value from the Single Sign On Settings configuration page and put it in the corresponding configuration parameter of your Identity Provider (sometimes called the “Recipient URL”).

- Salesforce allows a maximum of three minutes for clock skew with your IDP server; make sure your server’s clock is up-to-date.

- If you are unable to log in with SAML assertion, always check the login history and note the error message. Use the SAML Assertion Validator on the Single Sign On Settings configuration page to troubleshoot.

- You need to map your organization’s internal usernames and Salesforce usernames. You have two choices to do this: add a unique identifier to the `FederationIdentifier` field of each Salesforce user, or extend your user database schema (for example, Active Directory) to include the Salesforce username as an attribute of a user account. Choose the corresponding option for the SAML User ID Type field and configure your authentication service to send the identifier in SAML assertions.

- Before allowing users to log in with SAML assertions, enable the SAML organization preference and provide all the necessary configurations.

- Use the My Domain feature to prevent users from logging in to Salesforce directly, and gives administrators more control over login policies. You can use the URL parameters provided in the Salesforce Login URL value from the Single Sign-On Settings configuration page with your custom domain.

  For example, if the Salesforce Login URL is `https://login.salesforce.com/?saml=02HKiP...`

  you can use `https://<my_domain_name>.my.salesforce.com/?saml=02HKiP...`

- We recommend that you use Developer Edition account or a sandbox when testing a SAML single sign-on solution. To sign up for a free Developer Edition account, go to developer.salesforce.com.

- Sandbox copies are made with federated authentication with SAML disabled. Any configuration information is preserved, except the value for Salesforce Login URL. The Salesforce Login URL is updated to match your sandbox URL, for example `http://cs1.salesforce.com`, after you re-enable SAML. To enable SAML in the sandbox, from Setup, click Security Controls > Single Sign-On Settings, then click Edit, and select SAML Enabled.

- Your identity provider must allow you to set the service provider's audience URL. The value must match the Entity ID value in the single sign-on configuration. The default value is `https://saml.salesforce.com`.

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Single Sign-On for Portals Best Practices

Customer Portals and partner portals are not available for new organizations in the Summer '13 release or later. Use Communities instead. For more information about single sign-on and SAML for Communities, see “Configuring SAML for Communities” in Getting Started With Communities. If you continue to use portals, note the following information.

- Only SAML version 2.0 can be used with portals.
- Only Customer Portals and partner portals are supported.
- Service provider initiated login is not supported.
- Both the portal_id and organization_id attributes are required for single sign-on for portals. If only one is specified, the user receives an error.
- If both the portal_id and organization_id attributes are populated in the SAML assertion, the user is directed to that portal login. If neither is populated, the user is directed to the regular SAML Salesforce login.
- More than one portal can be used with a single organization.

Single Sign-On for Sites Best Practices

- Only SAML version 2.0 can be used with Sites.
- Only Customer Portals and partner portals are supported.
- Service provider initiated login is not supported.
- The portal_id, organization_id and siteUrl attributes are required for single sign-on for Sites. If only one is specified, the user receives an error.
- If all three of the portal_id, organization_id and siteUrl attributes are populated in the SAML assertion, the user is directed to that Sites login. If the siteUrl isn't populated and the other two are, the user is directed to that portal login.
- More than one portal can be used with a single organization.
Single sign-on is a process that allows network users to access all authorized network resources without having to log in separately to each resource. Single sign-on allows you to validate usernames and passwords against your corporate user database or other client application rather than having separate user passwords managed by Salesforce.

You can set up Customer Portals and partner portals to use SAML single sign-on, so that a customer only has to login once.

Note: Single sign-on with portals is only supported for SAML 2.0.

To enable single sign-on for portals:

1. In addition to the SAML sign-on information that must be gathered and shared with your identity provider, you must supply your information provider with the Organization ID and the Portal ID. In the SAML assertion that is sent from your identity provider, the portal_id and organization_id must be added as attributes.

   Note: You can leave these attributes blank to differentiate between portal and platform users. For example, when blank, the user is a regular platform user and when populated, the user is a portal user.

   a. From Setup, click Company Profile > Company Information and copy the ID located in the Salesforce Organization ID.

   b. For Customer Portals, from Setup, click Customize > Customer Portal > Settings, click the name of the Customer Portal, and copy the ID located in the Portal ID.

   c. For partner portals, from Setup, click Customize > Partners > Settings, click the name of the partner portal, and copy the ID located in the Salesforce Portal ID.
Salesforce uses the following process for authenticating users using delegated authentication single sign-on:

1. When a user tries to log in—either online or using the API—Salesforce validates the username and checks the user’s permissions and access settings.

2. If the user has the “Is Single Sign-On Enabled” user permission, then Salesforce does not validate the username and password. Instead, a Web services call is made to the user’s organization, asking it to validate the username and password.
   
   Note: Salesforce doesn’t store, log, or view the password in any way. It is disposed of immediately once the process is complete.

3. The Web services call passes the username, password, and sourceIp to your Web service. (sourceIp is the IP address that originated the login request. You must create and deploy an implementation of the Web service that can be accessed by Salesforce servers.)

4. Your implementation of the Web service validates the passed information and returns either true or false.

5. If the response is true, then the login process continues, a new session is generated, and the user proceeds to the application. If false is returned, then the user is informed that his or her username and password combination is invalid.

Note: There may be a momentary delay before a user can log in after being given delegated authentication due to the time required for the user account to become available in the organization.
Configuring Salesforce for Delegated Authentication

To enable delegated authentication single sign-on (SSO) for your organization:

1. Contact Salesforce to enable delegated authentication single sign-on for your organization.

2. Build your single sign-on Web service:
   a. In Salesforce, download the Web Services Description Language (WSDL) file AuthenticationService.wsdl from Setup by clicking Develop > API > Download Delegated Authentication WSDL. The WSDL describes the delegated authentication single sign-on service and can be used to automatically generate a server-side stub to which you can add your specific implementation. For example, in the WSDL2Java tool from Apache Axis, you can use the --server-side switch. In the wsdl.exe tool from .NET, you can use the /server switch.

   For a sample request and response, see Sample SOAP Message for Delegated Authentication on page 12.
   b. Add a link to your corporate intranet or other internally-accessible site that takes the authenticated user’s credentials and passes them through an HTTP POST to the Salesforce login page.

   Because Salesforce does not use the password field other than to pass it back to you, you do not need to send a password in this field. Instead, you could pass another authentication token, such as a Kerberos Ticket so that your actual corporate passwords are not passed to or from Salesforce.

   You can configure the Salesforce delegated authentication authority to allow only tokens or to accept either tokens or passwords. If the authority only accepts tokens, a Salesforce user cannot log in to Salesforce directly, because they cannot create a valid token. However, many companies choose to allow both tokens and passwords. In this environment, a user could still log in to Salesforce through the login page.

   When the Salesforce server passes these credentials back to you in the Authenticate message, verify them, and the user will gain access to the application.

3. In Salesforce, specify your organization’s single sign-on gateway URL from Setup by clicking Security Controls > Single Sign-On Settings > Edit. Enter the URL in the Delegated Gateway URL text box.

   For security reasons, Salesforce restricts the outbound ports you may specify to one of the following:
   - 80: This port only accepts HTTP connections.
   - 443: This port only accepts HTTPS connections.
   - 1024–66535 (inclusive): These ports accept HTTP or HTTPS connections.

4. Optionally, check the Force Delegated Authentication Callout box.

   ! Note: When this box is unchecked, a call is not made to the SSO endpoint if the login attempt first fails because of login restrictions within the Salesforce organization. If you must record every login attempt, then check this box to force a callout to the SSO endpoint regardless of login restriction failures.

5. Enable the “Is Single Sign-On Enabled” permission.

! Important: If single sign-on is enabled for your organization, API and desktop client users can log in to Salesforce unless their profile has IP address restrictions set, and they try to log in from outside of the range defined for that profile. Furthermore, the single sign-on authority usually handles login lockout policies for users with the “Is Single Sign-On Enabled” permission. However,
if the security token is enabled for your organization, then your organization’s login lockout settings determine the number of times a user can attempt to log in with an invalid security token before being locked out of Salesforce. For more information, see “Setting Login Restrictions” in the Salesforce Help. For information on how to view login errors, see “Viewing Single Sign-On Login Errors” in the Salesforce Help.
SAMPLE DELEGATED AUTHENTICATION IMPLEMENTATIONS

Samples are available by downloading the sample code for .NET from the Salesforce Developers website.

The samples are written in C# and authenticate users against Active Directory. The first sample is a simple implementation of delegated authentication. The second is a more complex sample that demonstrates a single sign-on solution in conjunction with an authentication token. Both samples use Microsoft .NET v1.1 and were deployed using IIS6 on a Windows 2003 server. Use the included makefile to build the samples.

Sample 1

This is implemented in simple.asmx.cs. This file declares a new class, SimpleAdAuth, that is a Web service with one method: Authenticate. There are a number of attributes declared on the method. These control the formatting of the expected request and the generated response, and set up the service to match the message definition in the WSDL. The implementation uses the passed credentials to try to connect to Active Directory via the LDAP provider. If it connects successfully, the credentials are good; otherwise the credentials are not valid.

Sample 2

This is a more complex example that generates and verifies an authentication token rather than a password. The bulk of the implementation is in the sso.asmx.cs file, which defines a class SingleSignOn that can generate an authentication token and implements the authentication service to later verify that token. The generated token consists of a token number, expiry timestamp, and username. All the data is then encrypted and signed.

The verification process verifies the signature, decrypts the token, checks that it has not expired, and checks that the token number has not been previously used. (The token number and expiration timestamp are used to prevent replay attacks.) The file gotosfdc.aspx is an ASPX page designed to be deployed and/or linked to from an intranet site. This forces the user’s authentication, generates a new authentication token for the user, and finally POSTs that token to the Salesforce login page along with a username that is mapped from the local NT username. The Salesforce login process sends the authentication token back to the service, which verifies the token and lets the user into Salesforce. intranet.aspx is a simple page that links to gotosfdc.aspx so you can see this in action.
FREQUENTLY ASKED QUESTIONS

How do I enable single sign-on?
Salesforce offers the following ways to use single sign-on:

- Federated authentication using Security Assertion Markup Language (SAML) allows you to send authentication and authorization data between affiliated but unrelated Web services. This enables you to sign on to Salesforce from a client application. Federated authentication using SAML is enabled by default for your organization.

- Delegated authentication single sign-on enables you to integrate Salesforce with an authentication method that you choose. This enables you to integrate authentication with your LDAP (Lightweight Directory Access Protocol) server, or perform single sign-on by authenticating using a token instead of a password. You manage delegated authentication at the permission level, allowing some users to use delegated authentication, while other users continue to use their Salesforce-managed password. Delegated authentication is set by permissions, not by organization.

The primary reasons for using delegated authentication include:
- Using a stronger type of user authentication, such as integration with a secure identity provider
- Making your login page private and accessible only behind a corporate firewall
- Differentiating your organization from all other companies that use Salesforce in order to reduce phishing attacks

You must request that this feature be enabled by Salesforce. Contact Salesforce to enable delegated authentication single sign-on for your organization.

- Authentication providers let your users log in to your Salesforce organization using their login credentials from an external service provider. Salesforce supports the OpenId Connect protocol that allows users to log in from any OpenID provider such as Google, Paypal, LinkedIn and other services supporting OpenID Connect. When authentication providers are enabled, Salesforce does not validate a user’s password. Instead, Salesforce uses the user’s login credentials from the external service provider to establish authentication credentials.

Where in Salesforce do I configure single sign-on?

For delegated authentication single sign-on:

- The WSDL is available by clicking, from Setup, Develop > API > Download Delegated Authentication WSDL.
- You can specify your organization’s single sign-on gateway URL from Setup by clicking Security Controls > Single Sign-On Settings > Edit.
- To enable the “Is Single Sign-On Enabled” user permission for your single sign-on users, from Setup, click Manage Users > Permission Sets, or if permission sets aren’t available, Manage Users > Profiles.

For federated authentication using SAML:

- From Setup, click Security Controls > Single Sign-On Settings > Edit.

How are passwords reset when single sign-on has been implemented?
Password reset is disabled for single sign-on users who use delegated authentication because Salesforce no longer manages their passwords. Users who try to reset their passwords in Salesforce will be directed to their Salesforce administrator.

Where can I view single sign-on login errors?

For delegated authentication, administrators with the “Modify All Data” permission can view the twenty-one most recent single sign-on login errors for your organization from Setup by clicking Manage Users > Delegated Authentication Error History. For each failed login, you can view the user’s username, login time, and the error. For federated authentication, administrators can view login errors from Setup by clicking Manage Users > Login History.
Frequently Asked Questions

Where can I find entries about login history for a failed SAML login attempt?
When Salesforce cannot find the user in your assertion or cannot associate the provided user ID with a user in Salesforce, an entry is inserted in the login history that you can see from Setup at Manage Users > Login History.

Does single sign-on work outside my corporate firewall?
Yes, single sign-on can work outside your corporate firewall. When users are outside the corporate firewall, they can use their network passwords to log in to Salesforce. Alternately, you can require that users must first be connected to your corporate network in order to log in.

Can I validate the SAML response sent by my identity provider?
Yes. After you have configured single sign-on, you can access the SAML Validation page from Setup, by clicking the SAML Validation button at Security Controls > Single Sign-On Settings. If a user tries to log in to Salesforce and fails, the invalid SAML assertion is used to automatically populate the SAML Assertion Validator if possible. On the SAML Validation page, if the SAML assertion is not automatically populated, you can enter either an XML- or base64-encoded SAML response that you’ve received from your service provider. Salesforce validates the response against the values provided during single sign-on setup, and provides detailed information about the response.

Can I configure a start page and logout page that are specific to my company?
Yes.

You can customize the start, error, login, and logout pages for single sign-on users using SAML 1.1 or 2.0. As part of your configuration, decide the following:

- The URL to direct the user to when they click the Logout link in Salesforce (known as the logout page). The default is https://login.salesforce.com, unless MyDomain is enabled. If My Domain is enabled, the default is https://customdomain.my.salesforce.com.
- If your identity provider uses SAML 1.1, the URL to direct the user to when single sign-on successfully completes (known as the start page). This URL can be absolute, such as https://na1.salesforce.com/001/o or it can be relative, such as /001/o. This URL must be an endpoint that accepts SAML authentication requests.

In SAML 2.0, the start page is the page the user attempted to access before they were authenticated. The SAML 2.0 start page must support Sp-init single sign-on.

If you are using SAML 2.0, you can also use the RelayState parameter to control where users get redirected after a successful login.

- The single sign-on start page where Salesforce sends a SAML request to start the login sequence.

We recommend that if you specify a single sign-on start page that you also specify a logout page. When you specify a logout page, when a user clicks logout or if a user’s session expires, the user is redirected to that page. If you don’t specify a logout page, the user is redirected to the general Salesforce login page.

See Customize SAML Start, Error, Login, and Logout Pages on page 4.

Does Salesforce delegated authentication support SAML tokens?
Yes, SAML tokens can be used with the sample delegated authentication implementations using the listener validating the token.

Can delegated authentication single sign-on work with Connect Offline?
Yes, delegated authentication can work with Connect Offline if it is set up to work with both tokens and passwords. In this case, users should use their network password to access Connect Offline.