SAML SSO Deployment Guide for Cisco Unified Communications Applications, Release 15

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CONTENTS

Preface

Purpose

The *SAML SSO Deployment Guide for Cisco Unified Communications Applications* provides information on how to enable the Security Assertion Markup Language Single Sign-On (SAML SSO) solution, which allows administrators to access a defined set of Cisco collaboration applications seamlessly after signing into one of those applications. This document describes the various applications that can be used with the SAML-based SSO solution as well as the supported Identity Providers (IdPs) that provide the user authentication for the solution. This document provides links to product documentation for configuration of specific collaboration applications.

Audience

This document is intended for system administrators who are familiar with the SAML-based SSO solution for the various Cisco Unified Communications applications and supported IdPs. This guide also requires knowledge of Network Time Protocol (NTP) and Domain Name System (DNS) server settings.

Organization

The following table provides the organization of this guide.

Conventions

This document uses the following conventions.

Convention	Description
boldface font	Commands and keywords are in boldface.
italic font	Arguments for which you supply values are in italics.
string	A non-quoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
`screen font`	Terminal sessions and information the system displays are in screen font.
`boldface screen font`	Information you must enter is in boldface screen font.
`italic screen font`	Arguments for which you supply values are in italic screen font.
< >	Nonprinting characters, such as passwords, are in angle brackets.

Notes use the following conventions:

Note Means reader take note. Notes contain helpful suggestions or references to material not covered in the publication.

Tips use the following conventions:

Tip Means the information contains useful tips.

Additional Information

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What'sNew in CiscoProduct Documentation*, which also lists all new and revised Ciscotechnical documentation, at:

`http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html`

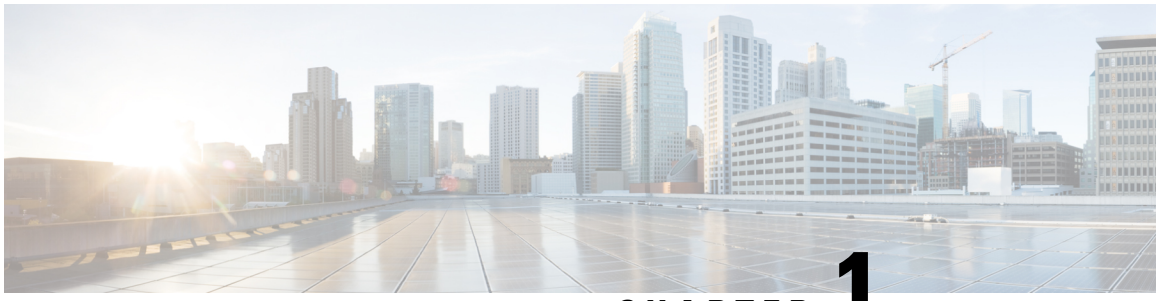
Subscribe to the *What'sNew in CiscoProduct Documentation* as a Really Simple Syndication(RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSSVersion2.0.

Cisco Product Security Overview

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for

compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

Further information regarding U.S. export regulations may be found at
`http://www.access.gpo.gov/bis/ear/ear_data.html`



CHAPTER 1

New and Changed Information

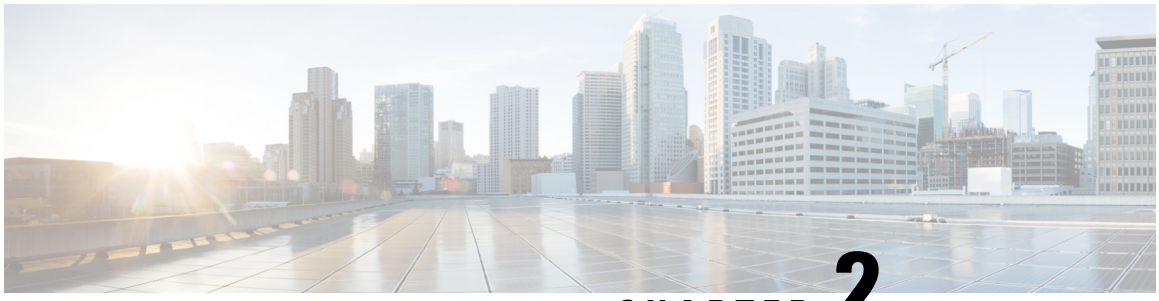
New and Changed Information

The following table provides an overview of the significant changes to the features in this guide up to this current release. The table does not provide an exhaustive list of all changes made to the guide or of the new features up to this release.

Table 1: New Features and Changed Behavior in Unified Communications Manager and IM and Presence Service

Date	Description	See
March 05, 2024	Added procedure for SAML-Based Single Logout (SLO).	Example Configuration of SAML-Based Single Logout with ADFS 2.0, on page 37
December 18, 2023	Added support for re-provisioning after network migration.	Re-Provisioning Cluster After Network Migration, on page 33

New and Changed Information



CHAPTER 2

SAML-Based SSO Solution

About SAML SSO Solution

Important When deploying Cisco Jabber with Cisco Webex meeting server, Unified Communications Manager and the Webex meeting server must be in the same domain.

SAML is an XML-based open standard data format that enables administrators to access a defined set of Cisco collaboration applications seamlessly after signing into one of those applications. SAML describes the exchange of security related information between trusted business partners. It is an authentication protocol used by service providers (for example, Unified Communications Manager) to authenticate a user. SAML enables exchange of security authentication information between an Identity Provider (IdP) and a service provider.

SAML SSO uses the SAML 2.0 protocol to offer cross-domain and cross-product single sign-on for Cisco collaboration solutions. SAML 2.0 enables SSO across Cisco applications and enables federation between Cisco applications and an IdP. SAML 2.0 allows Cisco administrative users to access secure web domains to exchange user authentication and authorization data, between an IdP and a Service Provider while maintaining high security levels. The feature provides secure mechanisms to use common credentials and relevant information across various applications.

The authorization for SAML SSO Admin access is based on Role-Based Access Control (RBAC) configured locally on Cisco collaboration applications.

SAML SSO establishes a Circle of Trust (CoT) by exchanging metadata and certificates as part of the provisioning process between the IdP and the Service Provider. The Service Provider trusts the IdP's user information to provide access to the various services or applications.

Important Service providers are no longer involved in authentication. SAML 2.0 delegates authentication away from the service providers and to the IdPs.

The client authenticates against the IdP, and the IdP grants an Assertion to the client. The client presents the Assertion to the Service Provider. Since there is a CoT established, the Service Provider trusts the Assertion and grants access to the client.

Single Sign on Single Service Provider Agreement

Single sign-on allows you to access multiple Cisco collaboration applications after logging on to one of them. In the releases earlier than Unified Communications Manager Release 11.5, when administrators enabled SSO, each cluster node generated its own service provider metadata (SP metadata) file with a URL and a certificate. Each generated file had to be uploaded separately on Identity Provider (IDP) server. As the IDP server considered each IDP and SAML exchange as a separate agreement, the number of agreements that were created was equivalent to the number of nodes in the cluster.

To improve the user experience and to reduce the total cost of the solution for large deployments, this release is enhanced. Now, it supports a single SAML agreement for a Unified Communications Manager cluster (Unified Communications Manager and Instant Messaging and Presence (IM and Presence)).

SAML-Based SSO Features

Enabling SAML SSO results in several advantages:

- It reduces password fatigue by removing the need for entering different user name and password combinations.
- It transfers the authentication from your system that hosts the applications to a third party system. Using SAML SSO, you can create a circle of trust between an IdP and a service provider. The service provider trusts and relies on the IdP to authenticate the users.
- It protects and secures authentication information. It provides encryption functions to protect authentication information passed between the IdP, service provider, and user. SAML SSO can also hide authentication messages passed between the IdP and the service provider from any external user.
- It improves productivity because you spend less time re-entering credentials for the same identity.
- It reduces costs as fewer help desk calls are made for password reset, thereby leading to more savings.

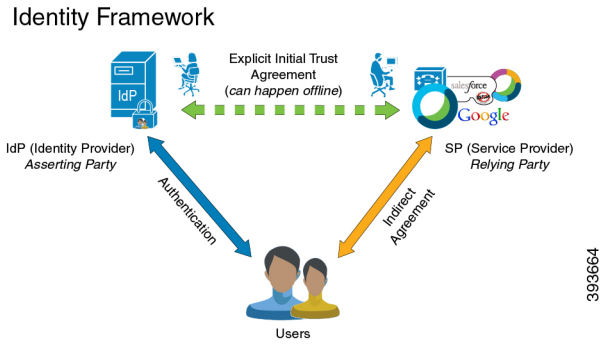
Basic Elements of a SAML SSO Solution

- Client (the user’s client): This is a browser-based client or a client that can leverage a browser instance for authentication. For example, a system administrator’s browser.
- Service provider: This is the application or service that the client is trying to access. For example, Unified Communications Manager.

- An Identity Provider (IdP) server: This is the entity that authenticates user credentials and issues SAML Assertions.
- Lightweight Directory Access Protocol (LDAP) users: These users are integrated with an LDAP directory, for example Microsoft Active Directory or OpenLDAP. Non-LDAP users reside locally on the Unified Communications server.
- SAML Assertion: It consists of pieces of security information that are transferred from IdPs to the service provider for user authentication. An assertion is an XML document that contains trusted statements about a subject including, for example, a username and privileges. SAML assertions are usually digitally signed to ensure their authenticity.
- SAML Request: This is an authentication request that is generated by a Unified Communications application. To authenticate the LDAP user, Unified Communications application delegates an authentication request to the IdP.
- Circle of Trust (CoT): It consists of the various service providers that share and authenticate against one IdP in common.
- Metadata: This is an XML file generated by an SSO-enabled Unified Communications application (for example, Unified Communications Manager, Cisco Unity Connection, and so on) as well as an IdP. The exchange of SAML metadata builds a trust relationship between the IdP and the service provider.
- Assertion Consumer Service (ACS) URL: This URL instructs the IdPs where to post assertions. The ACS URL tells the IdP to post the final SAML response to a particular URL.

Note All in-scope services requiring authentication use SAML 2.0 as the SSO mechanism.

See the following figure for the identity framework of a SAML SSO solution.



Cisco Unified Communications Applications that Support SAML SSO

- Unified Communications Manager
- Unified Communications Manager IM and Presence Service

Note See the "SAML Single Sign-On" chapter in the *Features and Services Guide for Cisco Unified Communications Manager, Release 10.0(1)* for detailed information on configuring SAML SSO.

- Cisco Unity Connection

Note See the "Managing SAML SSO in Cisco Unity Connection" chapter in the *System Administration Guide for Cisco Unity Connection Release 10.x* for additional information on configuring the SAML SSO feature on the Cisco Unity Connection server.

- Cisco Prime Collaboration

Note See the "Single Sign-On for Prime Collaboration" section under "Managing Users" chapter in the *Cisco Prime Collaboration 10.0 Assurance Guide - Advanced* guide to get detailed information on the SAML SSO configuration steps on the Cisco Prime Collaboration server.

- Windows version of Cisco Unified Real-Time Monitoring Tool (RTMT).

Note See the "Configure SSO for RTMT" procedure under "Configure Initial System and Enterprise Parameters" chapter in the *System Configuration Guide for Cisco Unified Communications Manager* guide to get detailed information on how to enable SAML SSOfor RTMT.

- Cisco Expressway

Note See the *Cisco Expressway Administrator Guide* to get SAML SSO setup information for Cisco Expressway.

SAML SSO Support for Cisco Unified Communications Manager Web Interfaces

With this release, the Cisco Unified OS Administration and Disaster Recovery System are now the Security Assertion Markup Language (SAML) SSO-supported applications. If SAML SSO is enabled, you can launch these applications or other supported applications, such as Unified Communications Manager, after a single sign-in with an Identity Provider (IdP). You no longer need to sign in to these applications separately.

To support SAML SSO for Cisco Unified OS Administration and Disaster Recovery System, the Level 4 administrator creates the Level 0 and Level 1 administrators in the active directory. The Level 4 administrator adds the platform administrators in all the nodes of a cluster. With this addition, the platform administrators are synchronized between the active directory and the platform database. While configuring users in platform database, the administrator must configure the **uid** value for the user. Cisco Unified OS Administration and Disaster Recovery System applications use the **uid** value to authorize a user. The IdP server authenticates their credentials against the active directory server and sends a SAML response. After authentication, Unified Communications Manager authorizes the users from the platform database using the **uid** value. For details on **uid** value, see Configure Unique Identification Value for Platform Users, on page 7 procedure.

If SAML SSO is enabled for the existing release and you upgrade from earlier release to the new release, the SAML SSO support is available for Unified OS Administration and Disaster Recovery System applications in the new release. The SAML SSO support for these applications is also enabled when you enable SAML SSO for any Unified Communications Manager web applications. To enable the SAML SSO support for the new release, see the SAML SSO Enablement topic from the *SAML SSO Deployment Guide for Cisco Unified Communications Applications* at http://www.cisco.com/c/en/us/support/unified-communications/unified-communications-manager-callmanager/products-maintenance-guides-list.html.

Note When SAML SSO support is enabled for a Unified Communications Manager administrator, it is applicable across the cluster. However, for the Cisco Unified OS Administration and Disaster Recovery System applications, each platform administrator is specific to a node and these user details are not replicated across the cluster. So, each platform user is created in each subscriber node of a cluster.

Configure Unique Identification Value for Platform Users

The unique identification (UID) value is used to authorize a platform user to do SSO login on platform pages. The Level 4 administrator can configure this value for platform administrators in one of the following ways:

- While creating the platform users by using the **set account name** command on the CLI.
- While updating the existing **uid** value.

Note For details, see the **set account name** and **set account ssouidvalue** commands in the *Command Line Interface Reference Guide for Cisco Unified Communications Solutions*.

Recovery URL Sign-in Option for Cisco Unified OS Administration

With this release, platform administrators can access Cisco Unified OS Administration either by signing in to one of the SAML SSO-enabled applications or by using the recovery URL option. This option is available as **Recovery URL to bypass Single Sign On** link on the main page of the SSO-enabled nodes. Platform users can sign in to Cisco Unified OS Administration if they have Recovery URL access.

Note If you only enable SSO and not the Recovery URL, and an authenticating user has insufficient access privileges they will only receive a 403 Error (Access Denied Response). However, if you enable Recovery URL, the error occurrence will redirect an authenticating user to the Recovery URL page.

The Level 4 administrator configures the recovery URL sign-in option for platform users. The administrator can enable this option while the platform administrators are being created through CLI or when their details are being updated using the CLI command. For details on the CLI commands for recovery URL login for new and existing platform administrators, see the **set account ssorecoveryurlaccess** command in the *Command Line Interface Reference Guide for Cisco Unified Communications Solutions*.

Note By default, the **Recovery URL to bypass Single Sign On** link is enabled for the Level 4 administrator. This link is enabled for the platform administrators Level 0 and Level 1 in case of upgrade from earlier release to the new release.

Software Requirements

The SAML SSO feature requires the following software components:

- Cisco Unified Communications applications, release 10.0(1) or later.
- An LDAP server that is trusted by the IdP server and supported by Cisco Unified Communications applications.
- An IdP server that complies with SAML 2.0 standard.
- Login flow supported by Unified Comunications Manager is SP-initiated.

Selecting an Identity Provider (IdP)

Cisco Collaboration solutions use SAML 2.0 (Security Assertion Markup Language) to enable SSO (single sign-on) for clients consuming Unified Communications services.

SAML-based SSO is an option for authenticating UC service requests originating from inside the enterprise network, and it is now extended to clients requesting UC services from outside via Mobile and Remote Access (MRA).

If you choose SAML-based SSO for your environment, note the following:

- SAML 2.0 is not compatible with SAML 1.1 and you must select an IdP that uses the SAML 2.0 standard.
- SAML-based identity management is implemented in different ways by vendors in the computing and networking industry, and there are no widely accepted regulations for compliance to the SAML standards.
- The configuration of and policies governing your selected IdP are outside the scope of Cisco TAC (Technical Assistance Center) support. Please use your relationship and support contract with your IdP Vendor to assist in configuring the IDP properly. Cisco cannot accept responsibility for any errors, limitations, or specific configuration of the IdP.

Although Cisco Collaboration infrastructure may prove to be compatible with other IdPs claiming SAML 2.0 compliance, only the following IdPs have been tested with Cisco Collaboration solutions:

- OpenAM 10.0.1
- Microsoft® Active Directory® Federation Services 2.0, 3.0, 4.0, and 5.0
- Microsoft Azure
- PingFederate® 6.10.0.4
- F5 BIG-IP 11.6.0
- Okta 2017.38

SAML Components

A SAML SSO solution is based on a particular combination of assertions, protocols, bindings, and profiles. The various assertions are exchanged among applications and sites using the protocols and bindings, and those assertions authenticate the users among sites. The SAML components are as follows:

- SAML Assertion: It defines the structure and content of the information that is transferred from IdPs to service providers. It consists of packets of security information and contains statements that service providers use for various levels of access-control decisions.

  SAML SSO provides the following types of statements:

  - Authentication statements- These statements assert to the service provider about the method of authentication that occurs between the IdP and the browser at a particular time.
  - Attribute statements- These statements assert about certain attributes (name-value pairs) that are associated with the user. The attribute assertions contain specific information about the user. The service providers use attributes to make access-control decisions.

- SAML protocol: A SAML protocol defines how the SAML requests for and gets assertions. This protocol is responsible for the SAML request and response elements that consist of certain SAML elements or assertions. The SAML 2.0 contains the following protocols:

  - Assertion Query and Request Protocol
  - Authentication Request Protocol

- SAML binding: A SAML binding specifies the mapping of SAML assertion and/or protocol message exchanges with standard messaging formats or communication protocols like SOAP exchanges. Unified Communications 10.0 supports the following SAML 2.0 bindings:

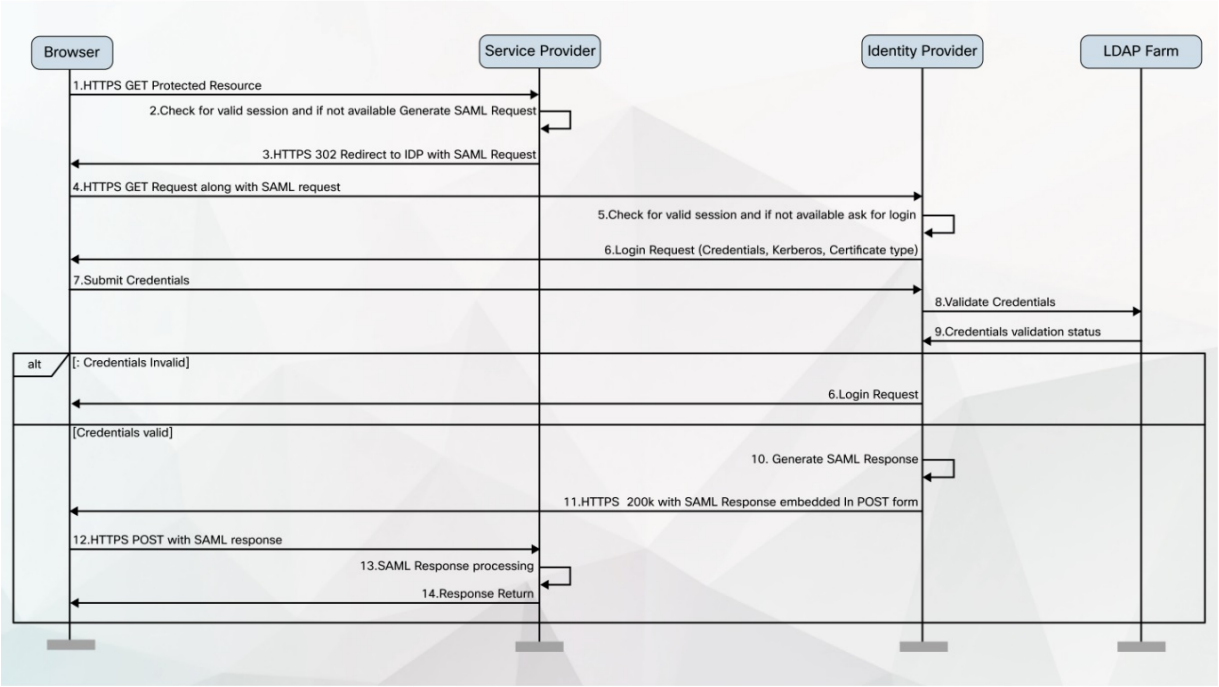
  - HTTP Redirect (GET) Binding
  - HTTP POST Binding

- SAML profile: A SAML profile provides a detailed description of the combination of SAML assertions, protocols, and bindings to support well-defined use cases. Unified Communications 10.0 supports the SAML 2.0 Web Browser SSO Profile.

SAML SSO Call Flow

This section describes how the SAML SSO feature enables single sign-on for Unified Communications applications. This section also explains the relationship between the IdP and the service provider and helps identify the importance of the various configuration settings to enable single sign-on.

Figure 1: SAML SSO Call Flow for Credential Requests from IdP



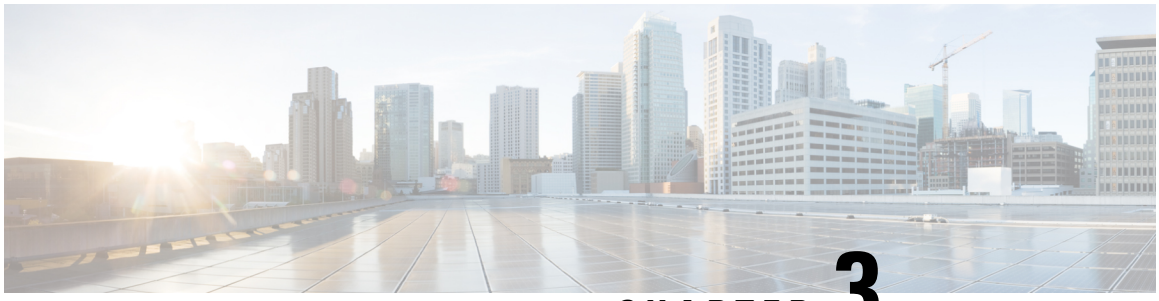
1	A browser-based client attempts to access a protected resource on a service provider. **Note** The browser does not have an existing session with the service provider.

2	Upon receipt of the request from the browser, the service provider generates a SAML authentication request. **Note** The SAML request includes information indicating which service provider generated the request. Later, this allows the IdP to know which particular service provider initiated the request. The IdP must have the Assertion Consumer Service (ACS) URL to complete SAML authentication successfully. The ACS URL tells the IdP to post the final SAML response to a particular URL. **Note** Unified Communications Manager and VOS products use the Assertion Consumer Service Index URL, which is compliant with SAML 2.0 standards. **Note** The authentication request can be sent to the IdP, and the Assertion sent to the service provider through either Redirect or POST binding. For example, Unified Communications Manager supports POST binding in either direction.
3	The service provider redirects the request to the browser. **Note** The IdP URL is preconfigured on the service provider as part of SAML metadata exchange.
4	The browser follows the redirect and issues an HTTPS GET request to the IdP. The SAML request is maintained as a query parameter in the GET request.
5	The IdP checks for a valid session with the browser.
6	In the absence of any existing cookie within the browser, the IdP generates a login request to the browser and authenticates the browser using whatever authentication mechanism is configured and enforced by the IdP. **Note** The authentication mechanism is determined by the security and authentication requirements of the customer. This could be form-based authentication using username and password, Kerberos, PKI, etc. This example assumes form-based authentication.
7	The user enters the required credentials in the login form and posts them back to the IdP. **Note** The authentication challenge for logging is between the browser and the IdP. The service provider is not involved in user authentication.
8	The IdP in turn submits the credentials to the LDAP server.
9	The LDAP server checks the directory for credentials and sends the validation status back to the IdP.
10	The IdP validates the credentials and generates a SAML response which includes a SAML Assertion. **Note** The Assertion is digitally signed by the IdP and the user is allowed access to the service provider protected resources. The IdP also sets its cookie here.
11	The IdP redirects the SAML response to the browser.
12	The browser follows the hidden form POST instruction and posts the Assertion to the ACS URL on the service provider.
13	The service provider extracts the Assertion and validates the digital signature. **Note** The service provider uses this digital signature to establish the circle of trust with the IdP.

14	The service provider then grants access to the protected resource and provides the resource content by replying 200 OK to the browser. **Note** The service provider is responsible for resource authorization. For example, users may be authenticated successfully by the IdP, but still may not be able to login to the Cisco Unified CM Administration interface unless they have administrator role permissions, as configured on Cisco Unified Communications Manager. **Note** The service provider sets its cookie here. If there is a subsequent request by the browser for an additional resource, the browser includes the service provider cookie in the request. The service provider checks whether a session already exists with the browser. If a session exists, the web browser returns with the resource content.

Java Requirements for SAML SSO Login to RTMT via Okta

If you have SAML SSO configured with Okta as the identity Provider, and you want to use SSO to log in to the Cisco Unified Real-Time Monitoring Tool, you must be running a minimum Java version of 8.221. This requirement applies to 12.5(x) releases of Cisco Unified Communications Manager and the IM and Presence Service.



CHAPTER 3

SAML SSO Requirements for Identity Providers

Requirements for Identity Providers

This section provides an outline of the requirements that Identity Providers must meet in order to deploy SAML SSO services for Cisco Collaboration applications.

Identity Providers must adhere to the following guidelines:

- Support is for SAML 2.0 only.
- Supports Service-Provider initiated SSO only.
- Set the NameID Format attribute to *urn:oasis:names:tc:SAML:2.0:nameid-format:transient*
- Configure a claim on the IdP to include the *uid* attribute name with a value that is mapped to LDAP attributes (for example SAMAccountName).
- Cisco Unified Communications Manager uses ACS url index in the Authentication Request. The IdP must be able the index to the ACS url in the Service Provider metadata. This is compliant with SAML standards.
- It's not supported to have multiple certificates in the Signing and Encryption portion of the SAML Assertion. See CSCvq78479.

When configuring SAML SSO, make sure to deploy the following in your Cisco Collaboration Deployment:

- Network Time Protocol—Deploy NTP in your environment so that the times in your Cisco Collaboration Deployment and your Identity Provider are synced. Make sure that the time difference between the IdP and the Cisco Collaboration deployment does not exceed 3 seconds.
- DNS—Your Cisco Collaboration applications and your Identity Provider must be able to resolve each other’s addresses.
- LDAP—You must have an LDAP Directory sync configured in your Cisco Collaboration deployment. However, we recommend that you disable LDAP authentication.

- Certificates—You must exchange metadata files between your Cisco Collaboration deployment and the Identity Provider. The metadata contains the certificates that are required to create a trust relationship between your Collaboration deployment and the Identity Provider. You can use either a tomcat certificate or a system-generated self-signed certificate to establish trust.

SAML Agreement Types

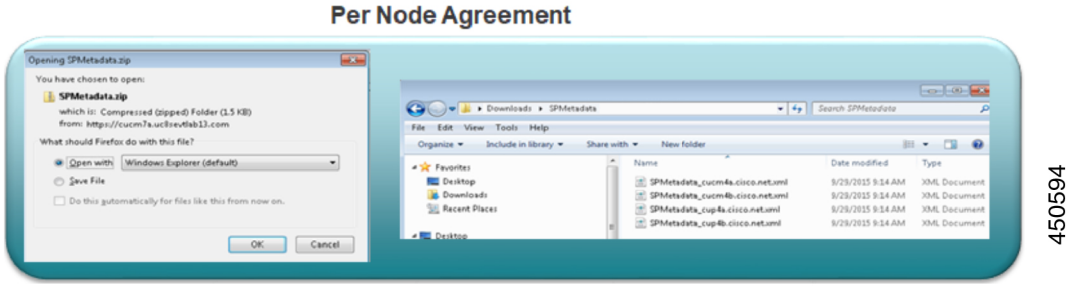
Cisco Unified Communications Manager supports two types of SAML metadata agreements:

- Cluster Wide—With this deployment, a single metadata agreement must be configured, which covers the entire cluster.
- Per Node—With this deployment, you must configure multiple metadata agreements, with a separate agreement for each cluster node. Each cluster node has a separate metadata exchange with the Identity Provider.

Figure 2: Two types of SAML metadata agreements in Cisco Unified Communications Manger

The following image illustrates the contents of a metadata zip file that was generated on Cisco Unified Communications Manager using a per node agreement. In this example, the IM and Presence Service is deployed using a Standard Deployment (non-centralized) so the zip file contains separate metadata xml files for each Unified Communications Manager and IM and Presence Service cluster node.

Figure 3: UC Metadata File Downloaded from Cisco Unified Communications Manger

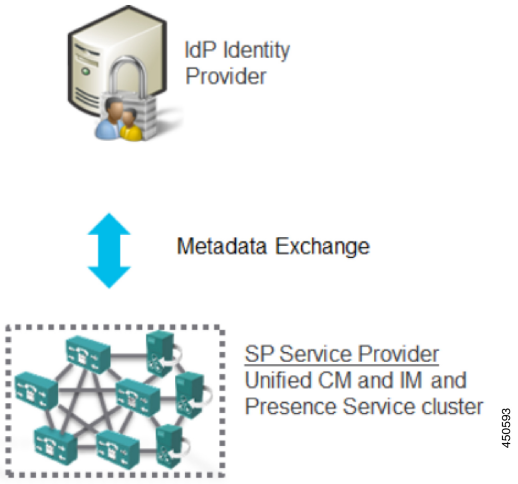


Note If you have a Centralized Deployment for the IM and Presence Service, your IM and Presence deployment is in a separate cluster from your telephony cluster. With Cluster Wide agreements, you must generate metadata separately for your telephony cluster, and for your IM and Presence cluster.

Metadata Exchange

As a part of the process for setting up SAML SSO, you must exchange metadata files between your UC deployment and the Identity Provider.

Figure 4: SAML Metadata Exchange



Following is an example of a UC metadata file that was generated from the Service Provider (Cisco Unified Communications Manager).

Metadata File from Service Provider (Cisco Unified Communications Manager)

```
<?xml version="1.0" encoding="UTF-8"?>
<!--With Single Cluster agreement the entityID is always the publisher FQDN-->
<md:EntityDescriptor xmlns:md="urn:oasis:names:tc:SAML:2.0:metadata"
ID="cucm0a.identitylab20.ciscolabs.com" entity ID="cucm0a.identitylab20.ciscolabs.com">
     <!--We don't require AuthN or signed Assertions but comply to what the IdP requests-->

     <md:SPSSODescriptor AuthnRequestsSigned="false" WantAssertionsSigned="false"
protocolSupportEnumeration="urn:oasis:names:tc:SAML:2.0:protocol">
       <md:KeyDescriptor use="signing">
   <ds:KeyInfo xmlns:ds="http://www.w3.org/2000/09/xmldsig#">
     <ds:X509Data>
       <ds:X509Certificate>MIIDzzCCA........</ds:X509Certificate>
     </ds:X509Data>
   </ds:KeyInfo>
  </md:KeyDescriptor>
   <!--Certificate for Signing and/or Encryption-->
  <md:KeyDescriptor use="encryption">
    <ds:KeyInfo xmlns:ds="http://www.w3.org/2000/09/xmldsig#">
      <ds:X509Data>
        <ds:X509Certificate>MIIDzzCCA........</ds:X509Certificate>
      </ds:X509Data>
    </ds:KeyInfo>
  </md:KeyDescriptor>
   <!--We only support name-id format transient-->
  <md:NameIDFormat>urn:oasis:names:tc:SAML:2.0:nameid-format:transient</md:NameIDFormat>
         <!--ACS URL for the Client to POST the answer from the IdP, two per node in the
cluster-->
```

```
   <md:AssertionConsumerService Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST"
Location="https://cucm0a.identitylab20.ciscolabs.com:8443/ssosp/saml/SSO/alias/cucm0a.identitylab20.ciscolabs.com"
 index="0"/>
               <md:AssertionConsumerService
Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-Redirect"
Location="https://cucm0a.identitylab20.ciscolabs.com:8443/ssosp/saml/SSO/alias/cucm0a.identitylab20.ciscolabs.com"
 index="1"/>
     </md:SPSSODescriptor>
</md:EntityDescriptor>
```

Following is an example of a metadata file that was generated from an Identity Provide (Active Directory Federation Service)

Metadata File from Identity Provider (Active Directory Federation Service)

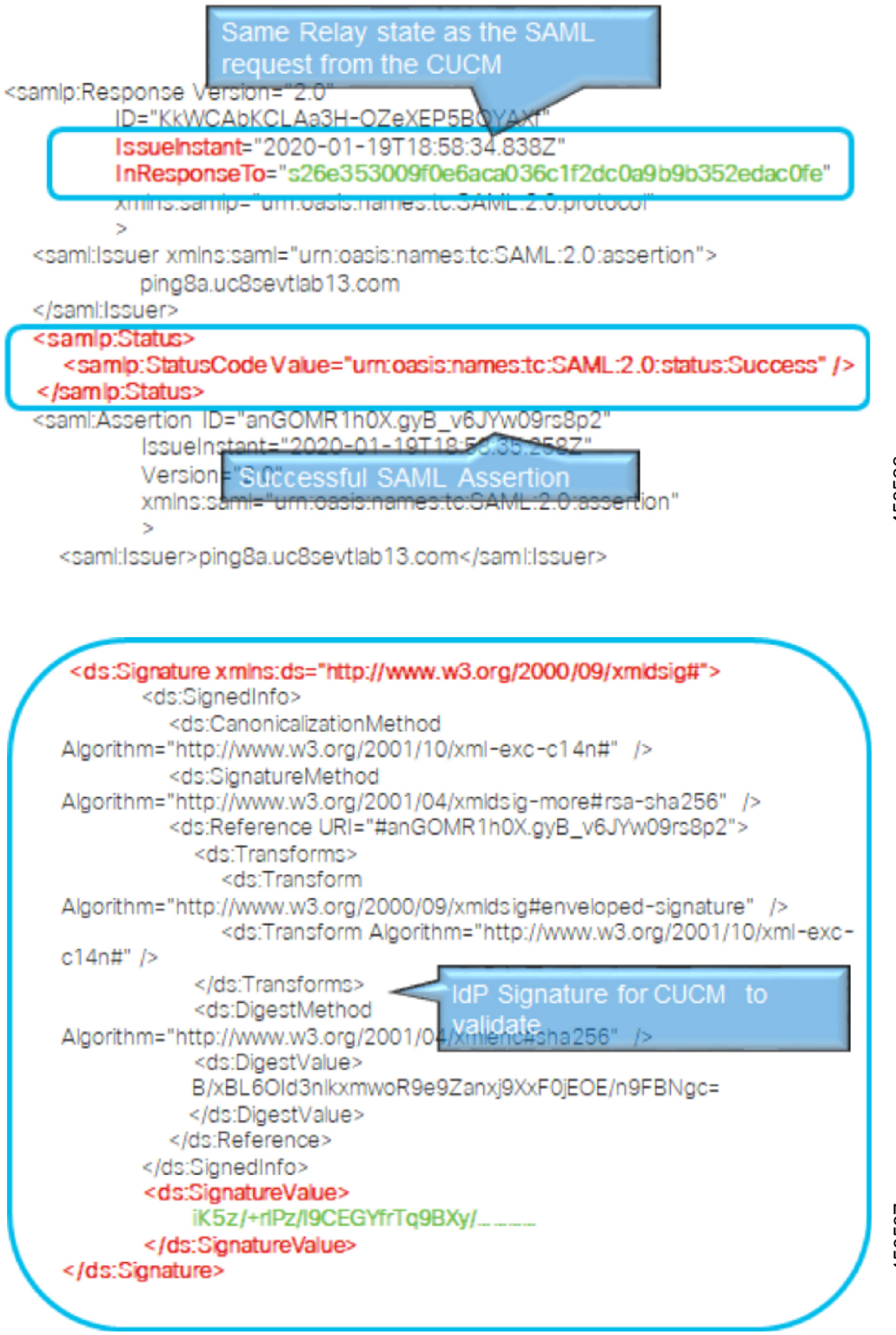
```
<?xml version="1.0"?
<!--entityID=IdP Entity ID-->
<EntityDescriptor xmlns="urn:oasis:names:tc:SAML:2.0:metadata"
ID="_b12fe1b5-6866-40cc-94be-9d9d8cb71916"
   entityID="http://WIN-2019SSO.cisco-dod.com/adfs/services/trust">
 <ds:Signature xmlns:ds="http://www.w3.org/2000/09/xmldsig#">
   <ds:SignedInfo>
     <ds:CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#"/>
       <ds:SignatureMethod Algorithm="http://www.w3.org/2001/04/xmldsig-more#rsa-sha256"/>
    <ds:Reference URI="#_b12fe1b5-6866-40cc-94be-9d9d8cb71916">
                 <ds:Transforms>
                   <ds:Transform
Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature"/>
                   <ds:Transform Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#"/>
                 </ds:Transforms>
      <!--Sign the metadata provided to the SP for extra security-->
      <ds:DigestMethod Algorithm="http://www.w3.org/2001/04/xmlenc#sha256"/>
      <ds:DigestValue>VAcIv2uw6zG8YVVWP0IDYMZ/e7CN9o4oR8XBGiysujY=</ds:DigestValue>
    </ds:Reference>
   </ds:SignedInfo>
   <ds:SignatureValue>44RAgZ17YfwLdcRodZPcZ5PH05sLVbkDx4uAYq+EC4K+ZhiTs8aUZQ/.........
   </ds:SignatureValue>
   <KeyInfo xmlns="http://www.w3.org/2000/09/xmldsig#">
  <X509Data>
   <IDPSSODescriptor
protocolSupportEnumeration="http://docs.oasis-open.org/ws-sx/ws-trust/200512
http://schemas.xmlsoap.org/ws/2005/02/trust
http://docs.oasis-open.org/wsfed/federation/200706"
ServiceDisplayName="administrator.cisco-dod.com">
 <KeyDescriptor use="encryption">
   <KeyInfo xmlns="http://www.w3.org/2000/09/xmldsig#">
     <X509Data>
  <X509Certificate>MIIGHzCCBQegAwIBAgITHAAADUerWbVHyqoM.........
  </X509Certificate>
     </X509Data>
   </KeyInfo>
 </KeyDescriptor>
 <KeyDescriptor use="signing">
   <KeyInfo xmlns="http://www.w3.org/2000/09/xmldsig#">
     <X509Data>
         <!--Cert for signing and/or encrypting the SAML Assertion-->
  <X509Certificate>MIIC7jCCAdagAwIBAgIQJH7di/.........</ds:X509Certificate>
    </KeyInfo>
 </KeyDescriptor>
   <!--Single Sign On Service details for HTTP-Redirect and HTTP-POST-->
   <SingleSignOnService Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-Redirect"
Location="https://win-2019sso.cisco-dod.com/adfs/ls/"/
   <SingleSignOnService Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST"
```

```
Location="https://win-2019sso.cisco-dod.com/adfs/ls/"/>
   <!--NameID format offer for this agreement-->
   <NameIDFormat>urn:oasis:names:tc:SAML:1.1:nameid-format:emailAddress</NameIDFormat>
   <NameIDFormat>urn:oasis:names:tc:SAML:2.0:nameid-format:persistent</NameIDFormat>
   <NameIDFormat>urn:oasis:names:tc:SAML:2.0:nameid-format:transient</NameIDFormat>
   <AssertionConsumerService Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST"
Location="https://win-2019sso.cisco-dod.com/adfs/ls/" index="0" isDefault="true"/>
   <AssertionConsumerService Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-Artifact"
Location="https://win-2019sso.cisco-dod.com/adfs/ls/" index="1"/>
   <AssertionConsumerService Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-Redirect"
Location="https://win-2019sso.cisco-dod.com/adfs/ls/" index="2"/>
   </IDPSSODescriptor>
</EntityDescriptor>
```

SAML Assertions

Following is an example of the SAML Assertion that is sent from the Identity Provider to Cisco Unified Communications Manager:

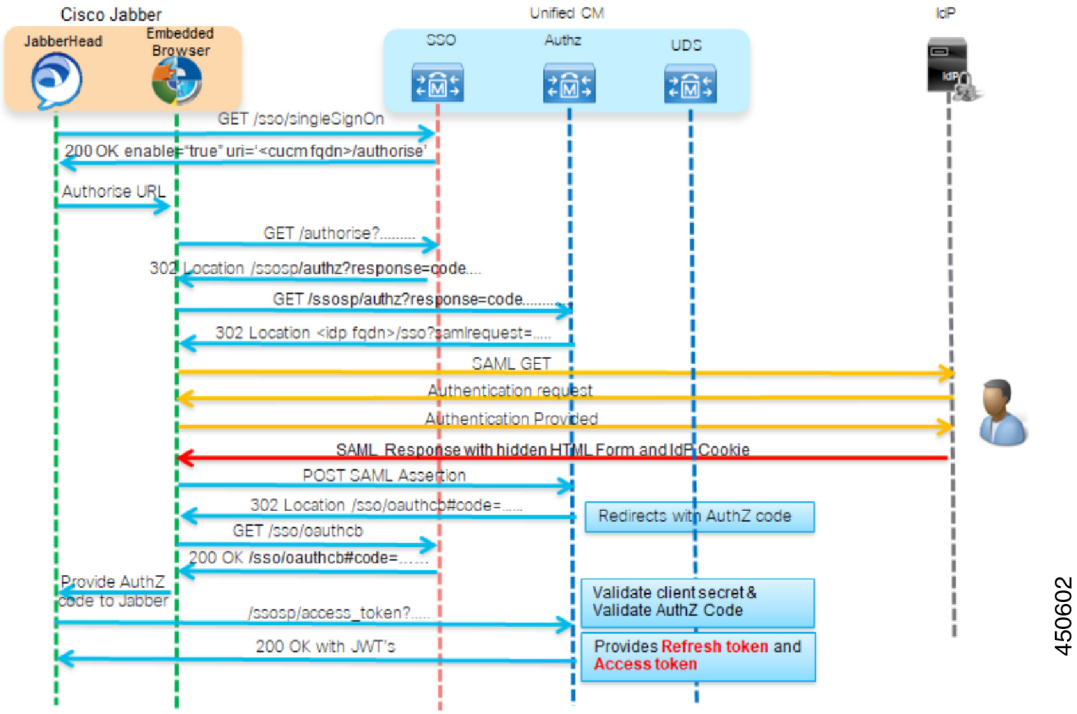
Figure 5: SAML Assertion Example

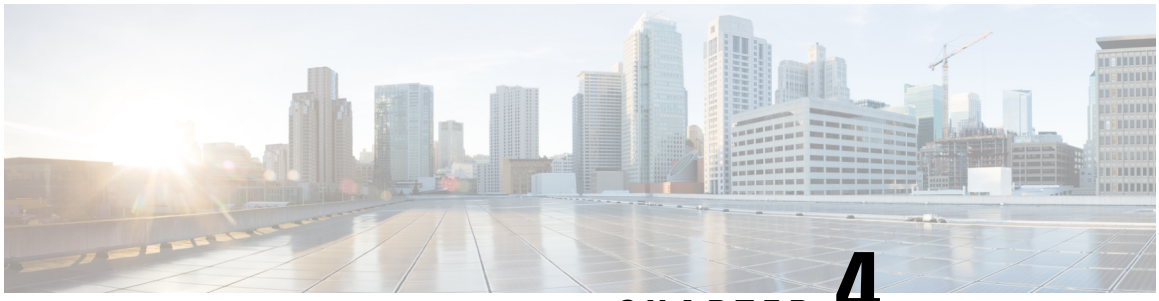


SAML OAuth Authentication Flow

Following is an example of the authentication flow for an OAuth authentication request with the Identity Provider.

Figure 6: OAuth Authentication Flow





CHAPTER 4

SAML SSO Configuration

SAML-Based SSO Prerequisites

The following system setup is required for SAML-Based SSO configuration:

- NTP Setup
- DNS Setup
- Directory Setup

NTP Setup

In SAML SSO, Network Time Protocol (NTP) enables clock synchronization between the Unified Communications applications and IdP. SAML is a time sensitive protocol and the IdP determines the time-based validity of a SAML assertion. If the IdP and the Unified Communications applications clocks are not synchronized, the assertion becomes invalid and stops the SAML SSO feature. The maximum allowed time difference between the IdP and the Unified Communications applications is 3 seconds.

Note For SAML SSO to work, you must install the correct NTP setup and make sure that the time difference between the IdP and the Unified Communications applications does not exceed 3 seconds.

For information on adding an NTP server in order to synchronize clocks, see the "Core Settings for Device Pools" chapter of the *System Configuration Guide for Cisco Unified Communications Manager.*

DNS Setup

Domain Name System (DNS) enables the mapping of host names and network services to IP addresses within a network or networks. DNS server(s) deployed within a network provide a database that maps network services to hostnames and, in turn, hostnames to IP addresses. Devices on the network can query the DNS

server and receive IP addresses for other devices in the network, thereby facilitating communication between network devices.

Unified Communications applications can use DNS to resolve fully qualified domain names to IP addresses. The service providers and the IdP must be resolvable by the browser. For example, when the administrator enters the service provider hostname (`http://www.cucm.com/ccmadmin`) in the browser, the browser must resolve the hostname. When the service provider redirects the browser to IdP (`http://www.idp.com/saml`) for SAML SSO, the browser must also resolve the IdP hostname. Moreover, when the IdP redirects back to the service provider ACS URL, the browser must resolve that as well.

Directory Setup

LDAP directory synchronization is a prerequisite and a mandatory step to enable SAML SSO across various Unified Communications applications. Synchronization of Unified Communications applications with an LDAP directory allows the administrator to provision users easily by mapping Unified Communications applications data fields to directory attributes.

Note To enable SAML SSO, the LDAP server must be trusted by the IdP server and supported by Unified Communications applications.

For more information, see the "Directory Integration and Identity Management" chapter of the *Cisco Collaboration System Solution Reference Network Designs* at:

https://www.cisco.com/c/en/us/support/unified-communications/unified-communications-system/products-implementation-design-guides-list.html

Certificate Management and Validation

Important Cisco strongly recommends that server certificates are signed for SAML SSO and that multiserver certificates are used where product support is available.

Note

- Common Names (CN) and Subject Alternative Names (SAN) are references to the IP address or Fully Qualified Domain Name (FQDN) of the address that is requested. For instance, if you enter https://www.cisco.com, then the CN or SAN must have “www.cisco.com” in the header.
- If the Unified Communications Manager is already in Mixed/Secure Mode and there are changes made to the certificates, then the CTL certificate must be updated using the secure USB token. Otherwise the Cisco Jabber client will not be able to acquire telephony capability. The CTL token update requires a Unified Communications Manager restart.

In SAML SSO, each entity participating in the SAML message exchange, including the user's web browser, must establish a seamless secure HTTPS connections to the required entities. Cisco strongly recommends that signed certificates issued by a trusted Certificate Authority be configured on each UC product participating in the SAML SSO deployment.

Unified Communications applications use certificate validation to establish secure connections with servers. Certificates are used between end points to build a trust/authentication and encryption of data. This confirms that the endpoints communicate with the intended device and have the option to encrypt the data between the two endpoints.

When attempting to establish secure connections, servers present Unified Communications clients with certificates. If the client cannot validate a certificate, it prompts the user to confirm if they want to accept the certificate.

Certificates Signed by a Certificate Authority

Cisco recommends using server certificates that are signed by one of the following types of Certificate Authority (CA):

- **Public CA** - A third-party company verifies the server identity and issues a trusted certificate.
- **Private CA** - You create and manage a local CA and issue trusted certificates.

The signing process varies for each product and can vary between server versions. It is beyond the scope of this document to provide detailed steps for every version of each server. Refer the appropriate server documentation for detailed instructions on how to get certificates signed by a CA.

However, the following steps provide a high-level overview of the procedure:

Step 1 Generate a Certificate Signing Request (CSR) on each product that can present a certificate to the client.

Step 2 Submit each CSR to the CA.

Step 3 Upload the certificates that the CA issues to each server.

Every server certificate should have an associated root certificate present in the trust store on client computers. Cisco UC applications validate the certificates that servers present against the root certificates in the trust store.

If you get server certificates signed by a public CA, the public CA should already have a root certificate present in the trust store on the client computer. In this case, you do not need to import root certificates on the client computers.

You should import root certificates if the certificates are signed by a CA that does not already exist in the trust store, such as a private CA.

In SAML SSO, the IdP and service providers must have CA signed certificates with the correct domains in the CN or SAN. If the correct CA certificates are not validated, the browser issues a pop up warning.

For example, when the administrator points the browser to `https://www.cucm.com/ccmadmin`; the Unified Communications Manager portal presents a CA certificate to the browser. When the browser is redirected to `https://www.idp.com/saml` , the IdP presents a CA certificate. The browser will check that the certificate presented by the servers contains CN or SAN fields for that domain, and that the certificate is signed by a trusted CA.

Alternatively, if the customer has their own private CA, then that CA must be installed as a root trust anchor on the computers that the administrator is launching their browser from.

Configure Multiserver SAN Certificates

Each Cisco product has its own process for generating multiserver SAN certificates. For information about the Cisco products that support multiserver SAN certificates see the relevant guide.

Related Topics

Release Notes for Cisco Unified Communications Manager, Release 10.5(1)
Cisco Unified Communications Operating System Administration Guide for Cisco Unity Connection Release 10.x
Cisco Prime Collaboration

Deploy Certificate Issuer for Microsoft Edge Interoperability

An interoperability issue exists within SAML SSO deployments where the Microsoft Edge Browser is deployed. If the Edge Browser is deployed on an SSO-enabled machine, the Edge browser does not recognize the certificate issuer of the Unified Communications Manager certificate and does not provide access.

Use this procedure to fix this issue via the Group Policy Object (GPO) and Active Directory whereby you can push the certificate issuer of the Unified Communications Manager certificate to the Trusted Root Certification of local machines that use the Edge browser.

Note The "certificate issuer" depends on how your certificates are set up. For example, for third-party CA certificates, You may need to push the CA certificate only if the CA itself signs the Unified Communications Manager certificate. However, if an intermediate CA signs the Unified Communications Manager certificate, you may need to push the complete certificate chain, which will include the root certificate, intermediate certificate, and any leaf certificates.

Before you begin

Membership in the local **Administrators** group, or equivalent, of the local machine is the minimum required to complete this procedure

Step 1 In Active Directory, Open Group Policy Management Console.

Step 2 Find an existing GPO or create a new GPO to contain the certificate settings. The GPO must be associated with the domain, site, or organizational unit whose users you want affected by the policy.

Step 3 Right-click the GPO, and select **Edit**.
The **Group Policy Management Editor** opens, and displays the current contents of the policy object.

Step 4 In the navigation pane, open **Computer Configuration** > **Windows Settings** > **Security Settings** > **Public Key Policies** > **Trusted Publishers**.

Step 5 Click the **Action** menu, and click **Import**.

Step 6 Follow the instructions in the **Certificate Import Wizard** to find and import the certificate.

Step 7 If the certificate is self-signed, and cannot be traced back to a certificate that is in the **Trusted Root Certification Authorities** certificate store, then you must also copy the certificate to that store. In the navigation pane, click **Trusted Root Certification Authorities**, and then repeat steps 5 and 6 to install a copy of the certificate to that store.

Note For additional information on Managing Trusted Root Certificates in Active Directory, see https://technet.microsoft.com/en-us/library/cc754841(v=ws.11).aspx.

SAML SSO Configuration Task Flow

Complete these tasks to configure SAML SSO in your Cisco Collaboration environment. This process includes procedures for the following applications:

- Cisco Unified Communications Manager
- IM and Presence Service
- Cisco Unity Connection
- Cisco Expressway (with MRA Deployments)

Procedure

	Command or Action	Purpose
Step 1	Initiate SSO Configuration on Collaboration Applications, on page 25	In your Cisco Collaboration environment, initiate the SSO configuration and export UC metadata.
Step 2	Configure SAML SSO on Identity Provider, on page 27	On your Identity Provider: • Upload the UC metadata • Configure SAML SSO agreements • Export an IdP metadata file
Step 3	Enable SAML SSO for Cisco Collaboration Applications, on page 28	Import IdP metadata into your Cisco Collaboration environment and complete the configuration.

Initiate SSO Configuration on Collaboration Applications

In your Cisco Collaboration environment, begin the SAML SSO configuration and export UC metadata for upload into your Identity Provider. Depending on the applications for which you are configuring SAML SSO, and the options chosen, you may have multiple download files.

Before you begin

Make sure that you plan beforehand what type of SAML SSO agreement you want (cluster wide or per node), along with the certificate type.

Step 1 On Cisco Unified Communications Manager, export a UC metadata file:

a) From Cisco Unified CM Administration, choose **System** > **SAML Single Sign On**.
b) Select an **SSO Mode** option: **Cluster wide** or **Per Node**.

c) Select a **Certificate** option: **System generated self-signed certificate** or a **Cisco Tomcat** certificate.
d) Click **Export All Metadata** and save the metadata file to a secure location.
With cluster wide agreements, you will receive a single metadata file. With per node agreements, the zip file download contains a separate XML files for each cluster node. If you have IM and Presence Service deployed in a Standard deployment,

Step 2 IM and Presence Service—If you have a Centralized Deployment for the IM and Presence Service, repeat step 1 on the standalone Unified CM publisher node that is a part of your IM and Presence central cluster.

Note With IM and Presence Service Standard Deployments you can skip this task because the the metadata file that you downloaded from Unified Communications Manager in the previous step includes metadata for the IM and Presence Service cluster.

Step 3 On Cisco Unity Connection, export a metadata file:

a) From Cisco Unity Connection Administration, choose **System Settings** > **SAML Single Sign On**.
b) Select the **SSO Mode** option: **Cluster wide** or **Per node**.
c) Click **Export All Metadata**.

Step 4 On Cisco Expressway-C, export a metadata file:

a) On the Expressway-C primary peer, go to **Configuration** > **Unified Communications** > **Configuration**
b) In the **MRA Access Control** section, choose either of the following options for the **Authentication path**:

- **SAML SSO authentication**
- **SAML SSO and UCM/LDAP**—Allows either method.

c) Choose a **SAML Metadata** option: Cluster or Peer

- **Cluster**—Single metadata file for cluster
- **Peer**—Separate metadata files per node.

d) Click **Export SAML data**.

- For Cluster agreements, click **Generate Certificate** and then **Download** the certificate.
- For Peer agreements, **Download All**.

e) Save in a secure location.

At the completion of this procedure, you will have metadata files for each of your Collaboration applications. The number of metadata files depends on your configuration and deployment type.

Metadata Download Example

Refer to the following for an example of the number of file downloads you can expect from your Cisco Collaboration deployment. Assume that you are configuring SSO for the following applications:

- A five-node Cisco Unified Communications Manager cluster
- A three-node IM and Presence Service cluster
- A two-node Cisco Unity Connection cluster
- A three-node Expressway-C cluster accompanied with a 3-node Expressway-E cluster (MRA deployment)

The following table provides a breakdown of the total download files that you can expect depending on whether you are uisng cluster-wide agreements, and whether the IM and Presence Service is in a Standard Deployment or Centralized Deployment.

Table 2: Expected Metadata Downloads

Agreement Type	Total Files Downloaded when IM and Presence is in Standard Deployment	Total Files Downloaded when IM and Presence is in Centralized Deployment*
Cluster wide	Three metadata XML files representing following clusters: • Unfiied Communications Manager and IM and Presence Service cluster • Unity Connection cluster • Expressway-C cluster	Four metadata XML files representing following clusters: • Unfiied Communications Manager cluster • IM and Presence Service cluster • Unity Connection cluster • Expressway-C cluster
Per node	Three zip files containing 13 metadata XML files: • One zip file with eight XML files for Unified CM and IM and Presence nodes • One zip file with two XML files for Unity Connection nodes • One zip file with three XML files for Expressway-C nodes	Four zip files containing 14 metadata XML files: • One zip file with five XML files for Unified CM nodes • One zip file with three XML files for IM and Presence nodes and an extra XML file for the standalone Unified CM publisher node that is in the IM and Presence central cluster • One zip file with two XML files for Unity Connection nodes • One zip file with three XML files for Expressway-C nodes

Note With Standard Deployments, the IM and Presence Service is in the same cluster as Cisco Unified Communications Manager. Metadata for the IM and Presence Service is included in the metadata download from Cisco Unified Communications Manager.

With Centralized Deployments, the IM and Presence Service is in a different cluster from the Cisco Unified Communications Manager telephony cluster and metadata for the IM and Presence Service must be exported separately using the standalone, non-telephony Unified CM publisher node that is within the IM and Presence central cluster.

Configure SAML SSO on Identity Provider

On the Identity Provider, you need to:

- Import the UC metadata files that you downloaded from your Cisco Collaboration environment
- Configure SAML SSO agreements to your Cisco Collaboration applications
- Export an Identity Provider metadata file that you will later import into your Cisco Collaboration applications

Cisco provides the following Idp-specific configuration examples as a guide for you to use:

- Microsoft Active Directory Federation Services 2.0
- Microsoft Active Directory Federation Services 3.0
- Microsoft Active Directory Federation Services 4.0
- Microsoft Azure
- Okta
- Open AM
- PingFederate

Note The above links are examples only. Refer to your IdP documentation for official documentation.

Enable SAML SSO for Cisco Collaboration Applications

Before you begin

Import the Identity Provider metadata into your Cisco Collaboration applications and complete the SAML SSO configuration.

Important This Note is applicable from Release 14SU2 onwards.

Note While configuring the domain, we recommend you to see the section “Configuration” in the Change CUCM Server Definition from IP Address or Hostname to FQDN Format to avoid connection failures and metadata mismatch warning messages, which appears post SAML SSO enabling. This was introduced during BCFIPS feature.

Step 1 On Cisco Unified Communications Manager, complete the SSO configuration:

a) Restart the Cisco Tomcat server before enabling SAML SSO.
b) From Cisco Unified CM Administration, choose **System** > **SAML Single Sign On**.
c) Click **Enable SAML SSO**.
d) Click **Continue** and follow the prompts.
e) Cluster wide agreements only. Click **Test for Multi-server tomcat certificates.**

f) Click **Next**
g) **Browse** to select your IdP metadata file. After you have opened the file, click **Import IdP Metadata.**
h) Click **Next**.
i) Select an LDAP-synchronized whom has Standard CCM Super User permissions and **Run SSO test**.
j) Sign in with the user's credentials.
k) Click **Finish** to complete the SAML SSO setup.
l) Restart the Cisco Tomcat server.
m) Per node agreements only. Repeat this process on each Unified Communications Manager node.

Note If FIPS or ESM is enabled on the Unified Communications Manager, you need to set the SSO signing algorithm to sha256.

Run this command on admin CLI on all the nodes of Cisco Unified CM.

```
utils sso set signing-algorithm sha256
```

Step 2 IM and Presence Service—If you have a Centralized Deployment of the IM and Presence Service, repeat the previous step on the standalone Unified CM publisher node that is a part of the IM and Presence central cluster.

Step 3 On Cisco Unity Connection, complete the SAML SSO configuration:

a) Restart the Cisco Tomcat server before enabling SAML SSO.
b) In Cisco Unity Connection Administration, go to **System Settings** > **SAML Single Sign On**.
c) Click **Enable SAML Single Sign On**.
d) Click **Continue** and follow the prompts
e) Import the IdP metadata file into Cisco Unity Connection.
f) Test the SSO Connection.
g) Restart the Cisco Tomcat server.
h) Per node agreements only. Repeat this process for each cluster node.

Step 4 On the Expressway-C primary peer, complete the SAML SSO configuration:

a) Go to **Configuration** > **Unified Communications** > **Identity providers**.
b) Click **Import new IdP from SAML**.
c) Use **Import SAML file** control to locate the IdP metadata file.
d) Set the **Digest** to the required SHA hash algorithm.
e) Click **Upload**.

Note You can change the signing algorithm after you have imported the metadata, by going to **Configuration** > **Unified Communications** > **Identity Providers (IdP)** locating your IdP row then, in the Actions column, clicking **Configure Digest)**.

f) Verify that the IdP appears in the list of Identity Providers.
g) Click **Associate Domains** in the IdP row.
h) Check the domains that you want to assign to this Identity Provider.
i) Click **Save**.

Note If you are deploying Cisco Expressway with Active Directory Federation Services (ADFS) for SAML SSO, refer to Additional Expressway Configuration for ADFS, on page 30 for additional Expressway settings.

SAML SSO Additional Tasks

You can perform the following additional tasks to enable SAML SSO setup as per the requirement.

Restart Cisco Tomcat Service

Before and after enabling or disabling SAML Single Sign-On, restart the Cisco Tomcat service on all Unified CM and IM and Presence Service cluster nodes where Single Sign-On is running.

Step 1 Log in to the Command Line Interface.

Step 2 Run the `utils service restart Cisco Tomcat` CLI command.

Step 3 Repeat this procedure on all cluster nodes where Single Sign-On is enabled.

Additional Expressway Configuration for ADFS

If you are deploying SAML SSO for Expressway with Active Directory Federation Services, complete these additional Expressway configurations:

Step 1 In Windows PowerShell®, run the following command for each Expressway-E's <EntityName> once per Relying Party Trust created on ADFS:

`Set-ADFSRelyingPartyTrust -TargetName "<EntityName>" -SAMLResponseSignatureMessageAndAssertion` where `<EntityName>` must be a display name for the Relying Party Trust of Expressway-E as set in ADFS.

Step 2 In ADFS, add a Claim Rule for Each Relying Party :

a) Open the **Edit Claims Rule** dialog, and create a new claim rule that sends AD attributes as claims.
b) Select the AD attribute to match the one that identifies OAuth users to the internal systems, typically email or SAMAccountName.
c) Enter **uid** as the Outgoing Claim Type.

Configure SSO Login Behavior for Cisco Jabber on iOS

Step 1 From Cisco Unified CM Administration, choose **System** > **Enterprise Parameters**.

Step 2 To configure the opt-in control, in the SSO Configuration section, choose the **Use Native Browser** option for the **SSO Login Behavior for iOS** parameter:

Note The **SSO Login Behavior for iOS** parameter includes the following options:

- **Use Embedded Browser**—If you enable this option, Cisco Jabber uses the embedded browser for SSO authentication. Use this option to allow iOS devices prior to version 9 to use SSO without cross-launching into the native Apple Safari browser. This option is enabled by default.
- **Use Native Browser**—If you enable this option, Cisco Jabber uses the Apple Safari framework on an iOS device to perform certificate-based authentication with an Identity Provider (IdP) in the MDM deployment.

  Note We don't recommend to configure this option, except in a controlled MDM deployment, because using a native browser is not as secure as the using the embedded browser.

Step 3 Click **Save**.

Access the Recovery URL

Use the recovery URL to bypass SAML Single Sign-On and log in to the Cisco Unified Communications Manager Administration and Cisco Unified CM IM and Presence Service interfaces for troubleshooting. For example, enable the recovery URL before you change the domain or hostname of a server. Logging in to the recovery URL facilitates an update of the server metadata.

Before you begin

- Only application users with administrative privileges can access the recovery URL.
- If SAML SSO is enabled, the recovery URL is enabled by default. You can enable and disable the recovery URL from the CLI. For more information about the CLI commands to enable and disable the recovery URL, see *Command Line Interface Guide for Cisco Unified Communications Solutions*.

In your browser, enter `https://hostname:8443/ssosp/local/login`.

Update Server Metadata After a Domain or Hostname Change

After a domain or hostname change, SAML Single Sign-On is not functional until you perform this procedure.

Note If you are unable to log in to the **SAML Single Sign-On** window even after performing this procedure, clear the browser cache and try logging in again.

Before you begin

If the recovery URL is disabled, it does not appear for you to bypass the Single Sign-On link. To enable the recovery URL, log in to the CLI and execute the following command: **utils sso recovery-url enable**.

Step 1 In the address bar of your web browser, enter the following URL:

`https://<Unified CM-server-name>`

where `<Unified CM-server-name>` is the hostname or IP address of the server.

Step 2 Click **Recovery URL to bypass Single Sign-On (SSO)**.

Step 3 Enter the credentials of an application user with an administrator role and click **Login**.

Step 4 From Cisco Unified CM Administration, choose **System** > **SAML Single Sign-On**.

Step 5 Click **Export Metadata** to download the server metadata.

Step 6 Upload the server metadata file to the IdP.

Step 7 Click **Run Test**.

Step 8 Enter a valid User ID and password.

Step 9 After you see the success message, close the browser window.

Update IdP Metadata

Use this procedure to update the IdP Metadata Trust file on all the servers in the cluster.

Before you begin

If the recovery URL is disabled, it doesn't appear for you to bypass the Single Sign-On link. To enable the recovery URL, log in to the CLI and execute the following command: `utils sso recovery-url enable`.

Step 1 In the address bar of your web browser, enter the following URL:

https://<Unified CM-server-name>

Where <Unified CM-server-name> is the hostname or IP address of the server.

Step 2 Click **Recovery URL to bypass Single Sign-On (SSO)**.

Step 3 Enter the credentials of an application user with an administrator role and click **Login**.

Step 4 From Cisco Unified CM Administration, choose **System** > **SAML Single Sign-On**.

Step 5 Click **Update IdP Metadata File** to import the IdP Metadata trust file.

Step 6 Click **Browse** to select the IdP Metadata trust file and click **Import IdP Metadata** to import the file to collaboration servers.

Step 7 Click **Next**.

Step 8 Select an LDAP-synchronized who has Standard CCM Super User permissions to verify whether the metadata file is configured appropriately and **Run SSO Test**.

Step 9 Sign in with the valid user's credentials.

Step 10 Click **Finish** to enable the SAML SSO setup on all the servers in the cluster.

Note When the applications are updated, there will be a short delay. The "Cisco Tomcat", "Cisco SSOSP Tomcat" and "Cisco UDS Tomcat" services restart on all nodes in the cluster if the SSO mode is "cluster-wide". Otherwise, the services restart on the particular node where IDP metadata is updated.

Manually Provision Server Metadata

To provision a single connection in your Identity Provider for multiple UC applications, you must manually provision the server metadata while configuring the Circle of Trust between the Identity Provider and the Service Provider. For more information about configuring the Circle of Trust, see the IdP product documentation.

The general URL syntax is as follows:

```
https://<SP FQDN>:8443/ssosp/saml/SSO/alias/<SP FQDN>
```

To provision the server metadata manually, use the Assertion Customer Service (ACS) URL.

Example:

Sample ACS URL: `<md:AssertionConsumerService Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST" Location="https://cucm.ucsso.cisco.com:8443/ssosp/saml/SSO/alias/cucm.ucsso.cisco.com" index="0"/>`

Reconfigure OpenAM SSO to SAML SSO Following an Upgrade

As of Release 11.0(1), Unified Communications Manager no longer offers the OpenAM SSO solution. If you have upgraded from an earlier release with the Open AM SSO solution configured, you must reconfigure your system to use the SAML SSO solution using one of the supported IdPs. Use the configurations that are documented in this guide to reconfigure your system to use SAML SSO.

Note Do not confuse the OpenAM SSO solution with a SAML SSO solution that uses OpenAM for the identity provider as they are different solutions. When you reconfigure your system to use SAML SSO, you can use any of the IdPs that are listed in this document.

Re-Provisioning Cluster After Network Migration

For SSO login to work properly, ensure that you re-provision the cluster post network migration.

Note This procedure is applicable only for Network migration clusters with SSO enabled. This procedure is not applicable for Simple migration.

Before you begin

- Only application users with administrative privileges can access the recovery URL.
- If SAML SSO is enabled, the recovery URL is enabled by default. You can enable and disable the recovery URL from the CLI. For more information about the CLI commands to enable and disable the recovery URL, see the *Command Line Interface Guide for Cisco Unified Communications Solutions*.

Step 1 In the address bar of your web browser, enter the following URL: https://<*Unified CM-server-name*>, where <*Unified CM-server-name*> is the hostname or IP address of the server.

Step 2 Click **Recovery URL to bypass Single Sign-On (SSO)**.

Step 3 Enter the credentials of an application user with an administrator role and click **Login**.

Step 4 From Cisco Unified CM Administration, choose **System > SAML Single Sign-On**.

Step 5 Click **Export All Metadata** to download the server metadata for upload into your Identity Provider.

Step 6 Click **Update IdP Metadata File** to import the IdP Metadata trust file.

Step 7 Click **Browse** to select the IdP Metadata trust file and click **Import IdP Metadata** to import the file to collaboration servers. Click **Next**.

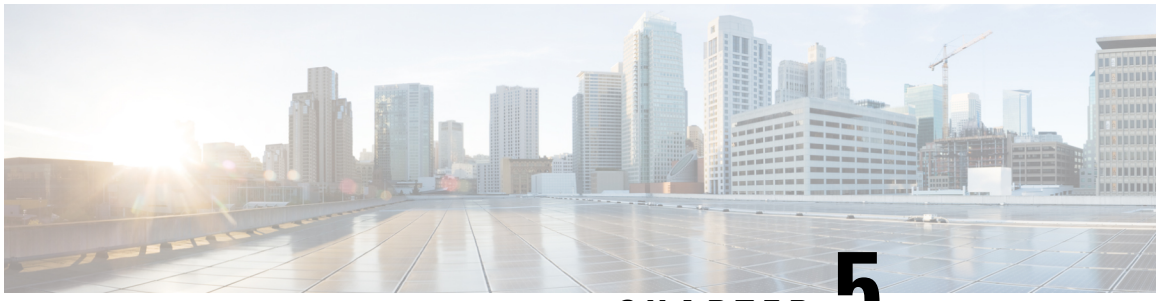
Step 8 Select an LDAP-synchronized who has Standard CCM Super User permissions to verify whether the metadata file is configured appropriately and click **Run Test**.

Step 9 Click **Finish** to enable the SAML SSO setup on all the servers in the cluster.

When the applications are updated, there will be a short delay. The "Cisco SSOSP Tomcat" and "Cisco UDS Tomcat" services restart on all nodes in the cluster if the SSO mode is 'cluster-wide'.

SAML SSO Deployment Interactions and Restrictions

Feature	Feature Interaction
Tomcat Certificate Regeneration	If you regenerate the Tomcat Certificates, generate a new metadata file on the Service Provider and upload that metadata file to the IdP.
Metadata Regeneration	The metadata file regenerates if you perform one of the following: • Change Self-Signed Certificates to Tomcat Certificates and vice-versa. • Regenerate Tomcat Certificates to ITL Recovery Certificates. Cisco Unified Communications Manager downloads the regenerated metadata file and uploads to the IdP.



CHAPTER 5

End User SAML SSO

End User SAML SSO Configuration

End user or federated SSO is a standard that allows products to meet customer compliance requirements, reduce the total cost of ownership, and improve end user experience. The foundation for this support in the collaboration products has been introduced in the 10.0 and 10.5 releases. This allows administrators to configure the infrastructure in preparation for end user clients such as Cisco Unity Connection and Cisco Jabber, which is rolling out support for users with release 10.5 in the second half of 2014.

Once an Administrator enables this feature for users it will allow users in a Cisco collaboration application to log in to supported applications with their corporate username and password. If the Cisco application is accessed by way of a browser the user can use the same corporate username and password to log in. If the user has already logged in to another corporate application in that same browser they should be able to access the application without having to provide a username and password. All of these features are available within the customer network or accessible by way of a VPN.

The supported products are:

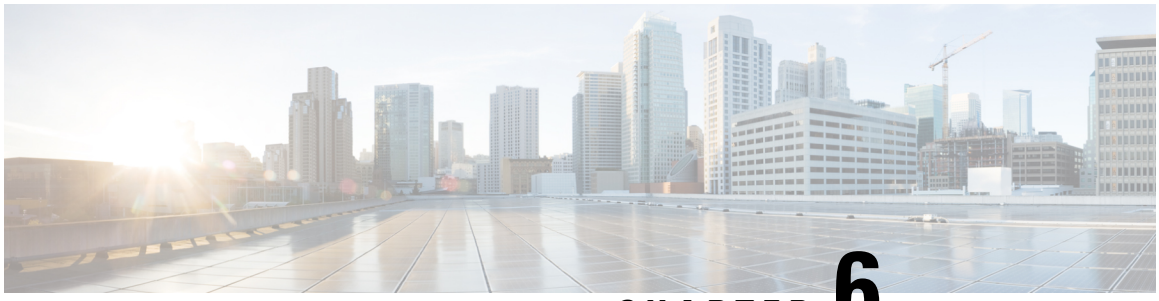
Product	Supports End User SAML SSO from Release...	More Information
Cisco Unified Communications Manager	10.5	Click here
IM and Presence Service	10.5	Click here
Cisco Unity Connection	10.5	Click here
WebEx Meeting Center	Cloud	Click here
WebEx Connect and Messenger	Cloud	Click here
Cisco WebEx Meetings Server	1.5 and 2.0	Click here

The supported end user clients are:

Product	Release	More Information
WebEx IOS	Available with all releases	Click here
WebEx Android	Available with all releases	Click here
WebEx Connect	Available with all releases	Click here
WebEx Messenger	Available with all releases	Click here
Jabber for Windows	10.5	Available in the second half of 2014
Jabber IOS	10.5	Available in the second half of 2014
Jabber for Android	10.5	Available in the second half of 2014
Jabber for Mac	10.5	Available in the second half of 2014

Note

- When deploying Cisco Jabber with Cisco WebEx Meeting Server, Unified Communications Manager and the WebEx Meeting Server must be in the same domain.
- When Cisco Jabber is running with SSO on a Mac, Jabber cannot automatically set a cookie once authorized for Jabber services. Mac behavior, by default, only allows cookies for sites the user navigates to. Each time Jabber needs to check for authentication it has to go to the IdP.
- The SAML Assertion must include the email address for WebEx; the SAML Schemas should be aligned to cover that.
- To trigger OAuth timer expiration correctly, ensure that the OAuthTokenExpiry value on Unified Communications Manager is greater than the WebsessionApp expiry value on Tomcat.



CHAPTER 6

SAML-Based SLO

Support for SAML-Based Single Logout (SLO)

Unified CM supports SAML-based Single Logout (SLO). The SLO allows you to log out simultaneously from all sessions of a browser that you have signed in using Single Sign-on (SSO).

Cisco Tomcat and Cisco SSOSP Tomcat services must be restarted if you are altering the IdP metadata and using root access to replace the idp.xml on the server. You need not restart any services if you are configuring SLO while enabling SSO. Also, if you are altering the IdP metadata and using update IdP metadata option on SAML SSO page to replace the idp.xml on server.

SLO does not close all the running sessions at the same time. For example, if there are four sessions running in two different browsers, the sessions associated with the browser that initiates the log out is closed. The sessions that are associated with the other browser are still open.

The following IdPs (Identity Providers) support Single Logout:

- OpenAM 10.0.1
- F5 BIG-IP 11.6.0
- Okta 2017.38
- Microsoft Active Directory Federation Services idPs 2.0 (AD FS 2.0). To Log out using Microsoft Active Directory Federation Services idPs 2.0, configure the logout URL in the idp.xml file.

Note The PingFederate 6.10.0.4 IdP does not support Single Logout.

For more information on sample IdPs configuration on SLO, see Configuration Examples and TechNotes.

Example Configuration of SAML-Based Single Logout with ADFS 2.0

Unified Communications Manager supports SAML-based Single Logout (SLO). The SLO allows you to log out simultaneously from all sessions of a browser that you have signed in using Single Sign-on (SSO). SLO does not close all the running sessions at the same time.

Attention This procedure is only an example configuration using Microsoft ADFS 2.0. We strongly recommend that you refer to your IdP documentation for official documentation in case they are any new IdP configuration changes or enhancements.

If SAML SSO mode is enabled with Microsoft ADFS 2.0 configuration on your system, then after a successful upgrade to Unified CM Release 14 or above, ensure that you perform the following procedure:

Step 1 For configuration at the Microsoft ADFS 2.0 side, ensure the following points:

a) Select **Relying Party Trust**. From the **Properties**, select **Endpoints**.
b) Select **Add SAML**.
c) Choose SAML Logout as **Endpoint** and Binding as **Post**.
d) Configure the URL `<url>/adfs/ls/?wa=wsignout1.0`.
e) Select **Save** and **Restart** ADFS 2.0 service.

Step 2 To log out using Microsoft ADFS 2.0, configure the logout URL in the *idp.xml* file. Follow the mentioned steps on your product server:

a) Search for **Location** in <SingleLogoutService> tag of *idp.xml* file.
b) Update the URL as `<url>/adfs/ls/?wa=wsignout1.0`.

Step 3 From the SAML Single Sign-On page, click **Update IdP Metadata File** to reimport the updated IdP metadata on Unified Communications Manager server.

Step 4 Click **Run SSO Test**.

After successful authentication, the following message is displayed:

```
SSO Metadata Test Succeesful
```

Step 5 Click **Finish** to complete the SAML SSO setup.

This step completes enabling SSO on all the servers in this cluster and all the web applications participating in SAML SSO are restarted. It may take one to two minutes for the web applications to restart.