



## Security and Certificates

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## Encryption

### Compliance and Policy Control for File Transfer and Screen Capture

If you send file transfers and screen captures using the Managed file transfer option on Cisco Unified Communications Manager IM and Presence 10.5(2) or later, you can send the files to a compliance server for audit and policy enforcement.

For more information about compliance, see the *Instant Messaging Compliance for IM and Presence Service on Cisco Unified Communications Manager* guide.

For more information about configuring file transfer and screen capture, see the *Cisco Unified Communications Manager IM and Presence Deployment and Installation Guide*.

### Instant Message Encryption

Cisco Jabber uses Transport Layer Security (TLS) to secure Extensible Messaging and Presence Protocol (XMPP) traffic over the network between the client and server. Cisco Jabber encrypts point to point instant messages.

## On-Premises Encryption

The following table summarizes the details for instant message encryption in on-premises deployments.

Connection	Protocol	Negotiation Certificate	Expected Encryption Algorithm
Client to server	XMPP over TLS v1.2	X.509 public key infrastructure certificate	AES 256 bit

### Server and Client Negotiation

The following servers negotiate TLS encryption with Cisco Jabber using X.509 public key infrastructure (PKI) certificates with the following:

- Cisco Unified Communications Manager IM and Presence
- Cisco Unified Communications Manager

After the server and client negotiate TLS encryption, both the client and server generate and exchange session keys to encrypt instant messaging traffic.

The following table lists the PKI certificate key lengths for Cisco Unified Communications Manager IM and Presence Service.

Version	Key Length
Cisco Unified Communications Manager IM and Presence Service versions 9.0.1 and higher	2048 bit

### XMPP Encryption

Cisco Unified Communications Manager IM and Presence Service uses 256-bit length session keys that are encrypted with the AES algorithm to secure instant message traffic between Cisco Jabber and the presence server.

If you require additional security for traffic between server nodes, you can configure XMPP security settings on Cisco Unified Communications Manager IM and Presence Service. See the following for more information about security settings:

- Cisco Unified Communications Manager IM and Presence Service—*Security configuration on IM and Presence*

### Instant Message Logging

You can log and archive instant messages for compliance with regulatory guidelines. To log instant messages, you either configure an external database or integrate with a third-party compliance server. Cisco Unified Communications Manager IM and Presence Service does not encrypt instant messages that you log in external databases or in third party compliance servers. You must configure your external database or third party compliance server as appropriate to protect the instant messages that you log.

See the following for more information about compliance:

- Cisco Unified Communications Manager IM and Presence Service—*Instant Messaging Compliance for IM and Presence Service*

For more information about encryption levels and cryptographic algorithms, including symmetric key algorithms such as AES or public key algorithms such as RSA, see *Next Generation Encryption* at this link <https://www.cisco.com/c/en/us/about/security-center/next-generation-cryptography.html>.

For more information about X.509 public key infrastructure certificates, see the *Internet X.509 Public Key Infrastructure Certificate and CRL Profile* document at this link <https://www.ietf.org/rfc/rfc2459.txt>.

## Cloud-Based Encryption

The following table summarizes the details for instant message encryption in cloud-based deployments:

Connection	Protocol	Negotiation Certificate	Expected Encryption Algorithm
Client to server	XMPP within TLS	X.509 public key infrastructure certificate	AES 128 bit
Client to client	XMPP within TLS	X.509 public key infrastructure certificate	AES 256 bit

### Server and Client Negotiation

The following servers negotiate TLS encryption with Cisco Jabber using X.509 public key infrastructure (PKI) certificates with the Webex Messenger service.

After the server and client negotiate TLS encryption, both the client and server generate and exchange session keys to encrypt instant messaging traffic.

### XMPP Encryption

The Webex Messenger service uses 128-bit session keys that are encrypted with the AES algorithm to secure instant message traffic between Cisco Jabber and the Webex Messenger service.

You can optionally enable 256-bit client-to-client AES encryption to secure the traffic between clients.

### Instant Message Logging

The Webex Messenger service can log instant messages, but it does not archive those instant messages in an encrypted format. However, the Webex Messenger service uses stringent data center security, including SAE-16 and ISO-27001 audits, to protect the instant messages that it logs.

The Webex Messenger service cannot log instant messages if you enable AES 256 bit client-to-client encryption.

For more information about encryption levels and cryptographic algorithms, including symmetric key algorithms such as AES or public key algorithms such as RSA, see *Next Generation Encryption* at this link <https://www.cisco.com/c/en/us/about/security-center/next-generation-cryptography.html>.

For more information about X.509 public key infrastructure certificates, see the *Internet X.509 Public Key Infrastructure Certificate and CRL Profile* document at this link <https://www.ietf.org/rfc/rfc2459.txt>.

### Client-to-Client Encryption

By default, instant messaging traffic between the client and the Cisco WebEx Messenger service is secure. You can optionally specify policies in the Cisco WebEx Administration Tool to secure instant messaging traffic between clients.

The following policies specify client-to-client encryption of instant messages:

- **Support AES Encoding For IM**—Sending clients encrypt instant messages with the AES 256-bit algorithm. Receiving clients decrypt instant messages.
- **Support No Encoding For IM**—Clients can send and receive instant messages to and from other clients that do not support encryption.

The following table describes the different combinations that you can set with these policies.

Policy Combination	Client-to-Client Encryption	When the Remote Client Supports AES Encryption	When the Remote Client Does not Support AES Encryption
<b>Support AES Encoding For IM = false</b> <b>Support No Encoding For IM = true</b>	No	Cisco Jabber sends unencrypted instant messages.  Cisco Jabber does not negotiate a key exchange. As a result, other clients do not send Cisco Jabber encrypted instant messages.	Cisco Jabber sends and receives unencrypted instant messages.
<b>Support AES Encoding For IM = true</b> <b>Support No Encoding For IM = true</b>	Yes	Cisco Jabber sends and receives encrypted instant messages.  Cisco Jabber displays an icon to indicate instant messages are encrypted.	Cisco Jabber sends encrypted instant messages.  Cisco Jabber receives unencrypted instant messages.
<b>Support AES Encoding For IM = true</b> <b>Support No Encoding For IM = false</b>	Yes	Cisco Jabber sends and receives encrypted instant messages.  Cisco Jabber displays an icon to indicate instant messages are encrypted.	Cisco Jabber does not send or receive instant messages to the remote client.  Cisco Jabber displays an error message when users attempt to send instant messages to the remote client.



**Note** Cisco Jabber does not support client-to-client encryption with group chats. Cisco Jabber uses client-to-client encryption for point-to-point chats only.

For more information about encryption and Cisco WebEx policies, see *About Encryption Levels* in the Cisco WebEx documentation.

## Encryption Icons

Review the icons that the client displays to indicate encryption levels.

### Lock Icon for Client to Server Encryption

In both on-premises and cloud-based deployments, Cisco Jabber displays the following icon to indicate client to server encryption:



### Lock Icon for Client to Client Encryption

In cloud-based deployments, Cisco Jabber displays the following icon to indicate client to client encryption:



## Local Chat History

Chat history is retained after participants close the chat window and until participants sign out. If you do not want to retain chat history after participants close the chat window, set the `Disable_IM_History` parameter to true. This parameter is available to all clients except IM-only users.

For on-premises deployment of Cisco Jabber for Mac, if you select the **Save chat archives to:** option in the **Chat Preferences** window of Cisco Jabber for Mac, chat history is stored locally in the Mac file system and can be searched using Spotlight.

Cisco Jabber does not encrypt archived instant messages when local chat history is enabled.

For desktop clients, you can restrict access to chat history by saving archives to the following directories:

- Windows, `%USERPROFILE%\AppData\Local\Cisco\Unified Communications\Jabber\CSF\History\uri.db`
- Mac: `~/Library/Application Support/Cisco/Unified Communications/Jabber/CSF/History/uri.db`.

For mobile clients, the chat history files are not accessible.

## Voice and Video Encryption

You can optionally set up secure phone capabilities for all devices. Secure phone capabilities provide secure SIP signaling, secure media streams, and encrypted device configuration files.

If you enable secure phone capabilities for users, device connections to Cisco Unified Communications Manager are secure. However, calls with other devices are secure only if both devices have a secure connection.

# Authentication Methods for Secure Media

Use SIP oAuth to enable secure media in a token-based authentication. You can set up SIP oAuth instead of CAPF enrollment for your security authentication for on-premises, cloud, and hybrid deployments of Jabber.

## SIP oAuth

Done once on your Cisco Unified Communications Manager set up. It ensures that your SIP traffic, including your RTP media, is secure.

## CAPF Enrollment

Workflow for enabling CAPF enrolment is as follows:

- Create and Configure Jabber Devices
- Authentication Strings
- Configure Phone Security Profile

# PIE ASLR Support

Cisco Jabber for Android, iPhone and iPad supports Position Independent Executable Address Space Layout Randomization (PIE ASLR).

# Federal Information Processing Standards

The Federal Information Processing Standard (FIPS) 140 is a U.S. and Canadian government standard that specifies security requirements for cryptographic modules. These cryptographic modules include the set of hardware, software, and firmware that implements approved security functions and is contained within the cryptographic boundary.

FIPS requires that all encryption, key exchange, digital signatures, and hash and random number generation functions used within the client are compliant with the FIPS 140.2 requirements for the security of cryptographic modules.

FIPS mode results in the client managing certificates more strictly. Users in FIPS mode may see certificate errors in the client if a certificate for a service expires and they haven't reentered their credentials. Users also see a FIPS icon in their hub window to indicate that the client is running in FIPS mode.

## Enable FIPS for Cisco Jabber for Windows

Cisco Jabber for Windows supports two methods of enabling FIPS:

- Operating system enabled—The Windows operating system is in FIPS mode.
- Cisco Jabber bootstrap setting—Configure the FIPS\_MODE installer switch. Cisco Jabber can be in FIPS mode on an operating system that is not FIPS enabled. In this scenario, only connections with non-Windows APIs are in FIPS mode.

**Table 1: Cisco Jabber for Windows Setting for FIPS**

Platform Mode	Bootstrap Setting	Cisco Jabber Client Setting
FIPS Enabled	FIPS Enabled	FIPS Enabled—Bootstrap setting.
FIPS Enabled	FIPS Disabled	FIPS Disabled—Bootstrap setting.
FIPS Enabled	No setting	FIPS Enabled—Platform setting.
FIPS Disabled	FIPS Enabled	FIPS Enabled—Bootstrap setting.
FIPS Disabled	FIPS Disabled	FIPS Disabled—Bootstrap setting.
FIPS Disabled	No setting	FIPS Disabled—Platform setting.



**Note** Jabber Voicemail service only accepts TLS Version TLS 1.2 for HTTPs request <https://164.62.224.15/vmrest/version> with **FIPS enabled** during an SSL connection.

### Enable FIPS for Cisco Jabber for Mobile Clients

To enable FIPS for Cisco Jabber for mobile clients, set the FIPS\_MODE parameter to TRUE in the Enterprise Mobility Management (EMM).



### Important

- Enabling FIPS removes the users ability to accept untrusted certificates. In this case, some services may not be available to users. Certificate Trust List (CTL) or ITL file does not apply here. The servers' certificates must be properly signed, or the client must be made to trust the servers' certificates through side-loading.
- FIPS enforces TLS1.2, so the older protocols are disabled.
- Cisco Jabber for mobile clients don't support Platform Mode.

## Common Criteria

The Common Criteria for Information Technology Security Evaluation comprise a set of international standards that are used to evaluate the security attributes of IT products. You can run Cisco Jabber in a mode that is compliant with the Common Criteria certification requirements. To do this, you must enable it for each of the clients.

To run Jabber in an environment that is enabled with Common Criteria:

- Jabber for Windows: Set the CC\_MODE installation argument to TRUE.
- For Jabber for Android and Jabber for iPhone and iPad: Set the CC\_MODE parameter to TRUE in your Enterprise Mobility Management (EMM).

- The RSA key length must be at least 2048 bits. To configure the RSA key length, read about how to *Create and Configure Cisco Jabber Devices* in the *On-Premises Deployment Guide for Cisco Jabber 12.5*.

For more information about how to set up Jabber to run in common criteria mode, read about how to *Deploy Cisco Jabber Applications* in the *On-Premises Deployment Guide for Cisco Jabber 12.5*.

## Secure LDAP

Secure LDAP communication is LDAP over SSL/TLS

LDAPS initiates an LDAP connection over a SSL/TLS connection. It opens the SSL session then begins using the LDAP protocol. This requires a separate port, 636 or Global Catalog port 3269.

## Authenticated UDS Contact Search

Enable authentication for UDS contact searches in Cisco Unified Communications Manager and Cisco Jabber provides credentials to authenticate with UDS for contact searches.

## Certificates

### Certificate Validation

#### The Certificate Validation Process

The operating system Cisco Jabber runs on validates server certificates when authenticating to services. When attempting to establish secure connections, the service presents Cisco Jabber with a certificate. The operating system validates the presented certificate against what is in the client device's local certificate store. If the certificate is not in the certificate store, the certificate is deemed untrusted and Cisco Jabber prompts the user to accept or decline the certificate.

If the user accepts the certificate, Cisco Jabber connects to the service and saves the certificate in the certificate store or keychain of the device. If the user declines the certificate, Cisco Jabber does not connect to the service and the certificate is not saved to the certificate store or keychain of the device.

If the certificate is in the local certificate store of the device, Cisco Jabber trusts the certificate. Cisco Jabber connects to the service without prompting the user to accept or decline the certificate.

Cisco Jabber can authenticate to several services, depending on what is deployed in the organization. A certificate signing request (CSR) must be generated for each service. Some public certificate authorities do not accept more than one CSR per fully qualified domain name (FQDN). Which means that the CSR for each service may need to be sent to separate public certificate authorities.

Ensure that you specify FQDN in the service profile for each service, instead of the IP address or hostname.

#### Signed Certificates

Certificates can be signed by the certificate authority (CA) or self-signed.



- CA-signed certificates (Recommended)—Users are not prompted because you are installing the certificate on the devices yourself. CA-signed certificates can be signed by a Private CA or a Public CA. Many certificates that are signed by a Public CA are stored in the certificate store or keychain of the device. Devices using Android 7.0 or later recognize only CA-signed certificates.
- Self-signed certificates—Certificates are signed by the services that are presenting the certificates, and users are always prompted to accept or decline the certificate.

### Certificate Validation Options

Before setting up certificate validation, you must decide how you want the certificates to be validated:

- Whether you are deploying certificates for on-premises or cloud-based deployments.
- What method you are using to sign the certificates.
- If are you deploying CA-signed certificates, whether you are going to use public CA or private CA.
- Which services you need to get certificates for.

## Required Certificates for On-Premises Servers

On-premises servers present the following certificates to establish a secure connection with Cisco Jabber:

Server	Certificate
Cisco Unified Communications Manager IM and Presence Service	HTTP (Tomcat) XMPP
Cisco Unified Communications Manager	HTTP (Tomcat) and CallManager certificate (secure SIP call signaling for secure phone)
Cisco Unity Connection	HTTP (Tomcat)
Webex Meetings Server	HTTP (Tomcat)
Cisco VCS Expressway Cisco Expressway-E	Server certificate (used for HTTP, XMPP, and SIP call signaling)

### Important Notes

- Security Assertion Markup Language (SAML) single sign-on (SSO) and the Identity Provider (IdP) require an X.509 certificate.
- You should apply the most recent Service Update (SU) for Cisco Unified Communications Manager IM and Presence Service before you begin the certificate signing process.
- The required certificates apply to all server versions.
- Each cluster node, subscriber, and publisher, runs a Tomcat service and can present the client with an HTTP certificate.

You should plan to sign the certificates for each node in the cluster.

- To secure SIP signaling between the client and Cisco Unified Communications Manager, you should use Certification Authority Proxy Function (CAPF) enrollment.

## Certificate Signing Request Formats and Requirements

A public certificate authority (CA) typically requires a certificate signing request (CSR) to conform to specific formats. For example, a public CA might only accept CSRs that have the following requirements:

- Are Base64-encoded.
- Do not contain certain characters, such as @&! , in the **Organization**, **OU**, or other fields.
- Use specific bit lengths in the server's public key.

If you submit CSRs from multiple nodes, public CAs might require that the information is consistent in all CSRs.

To prevent issues with your CSRs, you should review the format requirements from the public CA to which you plan to submit the CSRs. You should then ensure that the information you enter when configuring your server conforms to the format that the public CA requires.

**One Certificate Per FQDN**—Some public CAs sign only one certificate per fully qualified domain name (FQDN).

For example, to sign the HTTP and XMPP certificates for a single Cisco Unified Communications Manager IM and Presence Service node, you might need to submit each CSR to different public CAs.

## Revocation Servers

Cisco Jabber cannot connect to the Cisco Unified Communications Manager servers if the revocation server is not reachable. Also, if a certificate authority (CA) revokes a certificate, Cisco Jabber does not allow users to connect to that server.

Users are not notified of the following outcomes:

- The certificates do not contain revocation information.
- The revocation server cannot be reached.

To validate certificates, the certificate must contain an HTTP URL in the **CDP** or **AIA** fields for a reachable server that can provide revocation information.

To ensure that your certificates are validated when you get a certificate issued by a CA, you must meet one of the following requirements:

- Ensure that the **CRL Distribution Point (CDP)** field contains an HTTP URL to a certificate revocation list (CRL) on a revocation server.
- Ensure that the **Authority Information Access (AIA)** field contains an HTTP URL for an Online Certificate Status Protocol (OCSP) server.

## Server Identity in Certificates

As part of the signing process, the CA specifies the server identity in the certificate. When the client validates that certificate, it checks that:

- A trusted authority has issued the certificate.

- The identity of the server that presents the certificate matches the identity of the server specified in the certificate.



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**Note** Public CAs generally require a fully qualified domain name (FQDN) as the server identity, not an IP address.

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### Identifier Fields

The client checks the following identifier fields in server certificates for an identity match:

- XMPP certificates
  - `SubjectAltName\OtherName\xmppAddr`
  - `SubjectAltName\OtherName\srvName`
  - `SubjectAltName\dnsNames`
  - `Subject CN`
- HTTP certificates
  - `SubjectAltName\dnsNames`
  - `Subject CN`



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**Tip** The `Subject CN` field can contain a wildcard (\*) as the leftmost character, for example, `*.cisco.com`.

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### Prevent Identity Mismatch

If users attempt to connect to a server with an IP address or hostname, and the server certificate identifies the server with an FQDN, the client cannot identify the server as trusted and prompts the user.

If your server certificates identify the servers with FQDNs, you should plan to specify each server name as FQDN in many places on your servers. For more information, see *Prevent Identity Mismatch* section in [Troubleshooting TechNotes](#).

## Certificates for Multiserver SANs

If you use a multiserver SAN, you only need to upload a certificate to the service once per cluster per tomcat certificate and once per cluster per XMPP certificate. If you do not use a multiserver SAN, then you must upload the certificate to the service for every Cisco Unified Communications Manager node.

## Certificate Validation for Cloud Deployments

Webex Messenger and Webex Meetings Center present the following certificates to the client by default:

- CAS
- WAPI



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**Note** Webex certificates are signed by a public Certificate Authority (CA). Cisco Jabber validates these certificates to establish secure connections with cloud-based services.

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Cisco Jabber validates the following XMPP certificates received from Webex Messenger. If these certificates are not included in your operating system, you must provide them.

- VeriSign Class 3 Public Primary Certification Authority - G5 — This certificate is stored in the Trusted Root Certificate Authority
- VeriSign Class 3 Secure Server CA - G3 — This certificate validates the Webex Messenger server identity and is stored in the Intermediate Certificate Authority.
- AddTrust External CA Root
- GoDaddy Class 2 Certification Authority Root Certificate

For more information about root certificates for Cisco Jabber for Windows, see <https://www.identrust.co.uk/certificates/trustid/install-nes36.html>.

For more information about root certificates for Cisco Jabber for Mac, see <https://support.apple.com>.

## Server Name Indication Support for Multitenant Hosted Collaboration Solution

Cisco Jabber supports Server Name Indication (SNI) in a Mobile and Remote Access (MRA) deployment with a multitenant Hosted Collaboration Solution.

Cisco Jabber sends the domain information using SNI to Expressway. Expressway looks up the certificate storage to find the certificate that contains the domain information and returns the certificate to Cisco Jabber for validation.

For more information on multitenant deployment, see the sections *Endpoint Service Discovery with Domain Certificates* and *Jabber Service Discovery without Domain Certificates* from the relevant *Cisco Hosted Collaboration Solution Multitenant Expressway Configuration Guide*, located here: <https://www.cisco.com/c/en/us/support/unified-communications/expressway-series/products-installation-and-configuration-guides-list.html>.

## Antivirus Exclusions

If you deploy antivirus software, include the following folder locations in the antivirus exclusion list:

- C:\Users\\AppData\Local\Cisco\Unified Communications\Jabber
- C:\Users\\AppData\Roaming\Cisco\Unified Communications\Jabber
- C:\ProgramData\Cisco Systems\Cisco Jabber