Phone Security

This chapter provides information about phone security.

Phone Security Overview

At installation, Unified Communications Manager boots up in nonsecure mode. When the phones boot up after the Unified Communications Manager installation, all devices register as nonsecure with Unified Communications Manager.

After you upgrade from Unified Communications Manager 4.0(1) or a later release, the phones boot up in the device security mode that you enabled prior to the upgrade; all devices register by using the chosen security mode.

The Unified Communications Manager installation creates a self-signed certificate on the Unified Communications Manager and TFTP server. You may also choose to use a third-party, CA-signed certificate for Unified Communications Manager instead of the self-signed certificate. After you configure authentication, Unified Communications Manager uses the certificate to authenticate with supported Cisco Unified IP Phones. After a certificate exists on the Unified Communications Manager and TFTP server, Unified Communications Manager does not reissue the certificates during each Unified Communications Manager upgrade. You must create a new CTL file with the new certificate entries.

Tip For information on unsupported or nonsecure scenarios, see topics related to interactions and restrictions.

Unified Communications Manager maintains the authentication and encryption status at the device level. If all devices that are involved in the call register as secure, the call status registers as secure. If one device registers as nonsecure, the call registers as nonsecure, even if the phone of the caller or recipient registers as secure.

Unified Communications Manager retains the authentication and encryption status of the device when a user uses Cisco Extension Mobility. Unified Communications Manager also retains the authentication and encryption status of the device when shared lines are configured.

Tip When you configure a shared line for an encrypted Cisco IP Phone, configure all devices that share the lines for encryption; that is, ensure that you set the device security mode for all devices to encrypted by applying a security profile that supports encryption.

Trusted Devices

Unified Communications Manager allows Security icons to be enabled by phone model on Cisco IP Phones. The Security icon indicates whether the call is secure and the connected device is trusted.

A Trusted Device represents a Cisco device or a third-party device that has passed Cisco security criteria for trusted connections. This includes, but is not limited to, signaling/media encryption, platform hardening, and assurance. If a device is trusted, a Security icon displays and a secure tone plays on supported devices. Also, the device may provide other features or indicators that are related to secure calls.

Unified Communications Manager determines whether a device is trusted when you add it to your system. The security icon displays for information purposes only, and the administrator cannot configure it directly.

Unified Communications Manager also indicates whether a gateway is trusted by displaying an icon and a message in Unified Communications Manager Administration.

This section describes the behavior of the security icon for trusted devices on both the Cisco IP Phones and in Unified Communications Manager Administration.

Cisco Unified Communications Manager Administration

The following windows in Unified Communications Manager Administration indicate whether a device is trusted:

Gateway Configuration

For each gateway type, the Gateway Configuration window (**Device** > **Gateway**) displays either **Device is trusted** or **Device is not trusted**, along with a corresponding icon.

The system determines whether the device is trusted, based on the device type. You cannot configure whether the device is trusted.

Phone Configuration

For each phone device type, the Phone Configuration window (**Device** > **Phone**) displays either **Device is trusted** or **Device is not trusted**, along with a corresponding icon.

The system determines whether the device is trusted, based on the device type. You cannot configure whether the device is trusted.

Device Called Trust Determination Criteria

The type of device that a user calls affects the security icon that displays on the phone. The system considers the following three criteria to determine whether the call is secure:

- Are all devices on the call trusted?
- Is the signaling secure (authenticated and encrypted)?
- Is the media secure?

Before a supported Cisco Unified IP Phone displays the Lock Security icon, be aware that all three of these criteria must be met. For calls that involve a device that is not trusted, regardless of signaling and media security, the overall status of the call will stay unsecure, and the phone will not display the Lock icon. For example, if you include an untrusted device in a conference, the system considers its call leg, as well as the conference itself, to be unsecure.

Phone Model Support

There are two categories of phone models which support security in Unified Communications Manager: Secure Cisco phones and Secure Preferred Vendor phones. Secure Cisco phones are pre-installed with a Manufacture-Installed Certificate (MIC) and support automatic generation and exchange of Locally-Significant Certificates (LSC) using the Certificate Authority Proxy Function (CAPF). Secure Cisco phones are capable of registering with Cisco Unified CM using the MIC without additional certificate management. For additional security, you can create and install an LSC on the phone using CAPF. See topics related to phone security setup and settings for more information.

Secure Preferred Vendor phones do not come pre-installed with a MIC, and do not support CAPF for generating LSCs. In order for Secure Preferred Vendor phones to connect to Cisco Unified CM, a certificate must be provided with the device, or generated by the device. The phone supplier must provide the details on how to acquire or generate a certificate for the phone. Once you obtain the certificate, you must upload the certificate to the Cisco Unified CM using the OS Administration Certificate Management interface. See topics related to preferred vendor SIP phone security set up for more information.

For a list of security features that are supported on your phone, refer to the phone administration and user documentation that supports this Unified Communications Manager release or the firmware documentation that supports your firmware load.

You can also use Cisco Unified Reporting to list the phones that support a particular feature. For more information about using Cisco Unified Reporting, see the Cisco Unified Reporting Administration Guide.

Preferred Vendor SIP Phone Security Set Up

Secure Preferred Vendor phones are phone types that are manufactured by third-party vendors but are installed in the Cisco Unified database via a COP file. Unified Communications Manager provides security for a preferred vendor SIP phone. In order to support security, you must enable Security Encryption or Security Authentication for the preferred vendor SIP phone in the COP file. These phone types appear in the drop-down list in the Add a New Phone window. While all preferred vendor phones support Digest Authorization, not all preferred vendor phones support TLS security. Security capabilities is based on the phone model. If the Phone Security Profile includes a “Device Security Mode” field, then it supports TLS security.

If the preferred vendor phone supports TLS security, there are two modes that are possible: per-device certificate and shared certificate. The phone supplier must specify which mode is applicable for the phone as well as instructions on generating or acquiring a certificate for the phone.

Set Up Preferred Vendor SIP Phone Security Profile Per-Device Certificates

To configure the preferred vendor SIP phone security profile with per-device certificates, perform the following procedure:

Procedure

Step 1 Upload the certificate for each phone using the OS Administration Certificate Management interface.

Step 2 In the Cisco Unified Administration, choose **System** > **Security** > **Phone Security Profile**.

Step 3 Configure a new Phone Security Profile for the device type of this phone and in the **Device Security Mode** drop-down list, choose **Encrypted** or **Authenticated**.

Step 4 To configure the new SIP phone in the CCMAdmin interface, choose **Device** > **Phone** > **Add New**.

Step 5 Select Phone type.

Step 6 Fill in the required fields.

Step 7 In the **Device Security Profile** drop-down list, select the profile you just created.

Set Up Preferred Vendor SIP Phone Security Profile Shared Certificates

To configure the preferred vendor SIP phone security profile with shared certificates, perform the following procedure:

Procedure

Step 1 Using instructions from the phone vendor, generate a certificate with a Subject Alternate Name (SAN) string. The SAN must be of type DNS. Make a note of the SAN specified in this step. For example, X509v3 extensions:

- X509v3 Subject Alternative Name
- DNS:AscomGroup01.acme.com

Note The SAN must be of type DNS or security will not be enabled.

Step 2 Upload the shared certificate using the OS Administration Certificate Management interface.

Step 3 In the Cisco Unified Administration, choose **System** > **Security** > **Phone Security Profile**.

Step 4 In the **Name** field, enter the name of the Subject Alt Name (SAN), which is the name on the certificate provided by the preferred vendor, or if there is no SAN enter the Certificate Name.

Note The name of the security profile must match the SAN in the certificate exactly or security will not be enabled.

Step 5 In the **Device Security Mode** drop-down list, choose **Encrypted** or **Authenticated**.

Step 6 In the Transport type drop-down list, choose **TLS**.

Step 7 To configure the new SIP phone in the CCMAdmin interface, choose **Device** > **Phone** > **Add New**.

Step 8 Select Phone type.

Step 9 Fill in the required fields

Step 10 In the **Device Security Profile** drop-down list, select the profile you just created.

View Phone Security Settings

You can configure and view certain security-related settings on phones that support security; for example, you can view whether a phone has a locally significant certificate or manufacture-installed certificate installed. For additional information on the security menu and icons, refer to the *Cisco IP Phone Administration Guide* and *Cisco IP Phone User Guide* that supports your phone model.

When Unified Communications Manager classifies a call as authenticated or encrypted, an icon is displayed on the phone and indicates the call state. It also determines when Unified Communications Manager classifies the call as authenticated or encrypted.

Set Up Phone Security

The following procedure describes the tasks to configure security for supported phones.

Procedure

Step 1 If you have not already done so, configure the Cisco CTL Client and ensure that the Unified Communications Manager security mode equals Mixed Mode.

Step 2 If the phone does not contain a locally significant certificate (LSC) or manufacture-installed certificate (MIC), install a LSC by using the Certificate Authority Proxy Function (CAPF).

Step 3 Configure phone security profiles.

Step 4 Apply a phone security profile to the phone.

Step 5 After you configure digest credentials, choose the Digest User from the Phone Configuration window.

Step 6 On Cisco Unified IP Phone 7962 or 7942 (SIP only), enter the digest authentication username and password (digest credentials) that you configured in the End User Configuration window.

Note This document does not provide procedures on how to enter the digest authentication credentials on the phone. For information on how to perform this task, see Administration Guide for Cisco Unified Communications Manager that supports your phone model and this version of Unified Communications Manager.

Step 7 Encrypt the phone configuration file, if the phone supports this functionality.

Step 8 To harden the phone, disable phone settings.

Phone Security Interactions and Restrictions

This section provides the interaction and restriction on Phone Security.

Table 1: Phone Security Interactions and Restrictions

Feature	Interaction and Restriction
Certificate Encryption	Beginning from Unified Communications Manager Release 11.5(1) SU1, all the LSC certificates issued by CAPF service are signed with SHA-256 algorithm. Therefore, Cisco Unified IP Phone 7900 Series, 8900 Series, and 9900 Series supports SHA-256 signed LSC certificates and external SHA2 identity certificates (Tomcat, CallManager, CAPF, TVS, and so on). For any other cryptographic operation that require validation of signature, only SHA-1 is supported. **Note** If you use phone models which are in End of Software Maintenance or End of Life, we strongly recommend using the Unified Communications Manager before 11.5(1)SU1 release.

Where to Find More Information About Phone Security

Related Cisco Documentation

- *Administration Guide for Cisco Unified Communications Manager*
- *Troubleshooting Guide for Cisco Unified Communications Manager*