



Software Activation Configuration Guide

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CHAPTER 1

Read Me First

Important Information about Cisco IOS XE 16

Effective Cisco IOS XE Release 3.7.0E for Catalyst Switching and Cisco IOS XE Release 3.17S (for Access and Edge Routing) the two releases evolve (merge) into a single version of converged release—the Cisco IOS XE 16—providing one release covering the extensive range of access and edge products in the Switching and Routing portfolio.

Feature Information

Use [Cisco Feature Navigator](#) to find information about feature support, platform support, and Cisco software image support. An account on Cisco.com is not required.

Related References

- [Cisco IOS Command References, All Releases](#)

Obtaining Documentation and Submitting a Service Request

- To receive timely, relevant information from Cisco, sign up at [Cisco Profile Manager](#).
- To get the business impact you're looking for with the technologies that matter, visit [Cisco Services](#).
- To submit a service request, visit [Cisco Support](#).
- To discover and browse secure, validated enterprise-class apps, products, solutions and services, visit [Cisco Marketplace](#).
- To obtain general networking, training, and certification titles, visit [Cisco Press](#).
- To find warranty information for a specific product or product family, access [Cisco Warranty Finder](#).



CHAPTER 2

Cisco IOS Software Activation Conceptual Overview

The Cisco IOS Software Activation feature is an orchestrated collection of processes and components to activate Cisco software feature sets by obtaining and validating Cisco software licenses. With this feature, you can enable licensed features and register licenses in these ways:

- By using the Cisco Product License Registration portal.
- By entering Cisco EXEC commands on the device.
- By using Cisco License Manager to register, obtain, and install licenses in a bulk fashion for network-wide deployments.

This document provides an overview of the Cisco software licensing processes and describes the role of the Cisco IOS Software Activation feature in those processes.

- [Finding Feature Information, on page 3](#)
- [Information About the Cisco Software Licensing Process, on page 4](#)
- [Additional References, on page 12](#)
- [Feature Information for Cisco IOS Software Activation, on page 13](#)
- [Glossary, on page 13](#)

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <https://cfng.cisco.com/>. An account on Cisco.com is not required.

Information About the Cisco Software Licensing Process

Cisco Software Licensing Concepts

Cisco Product License Registration Portal

Use the Cisco Product License Registration portal at <http://www.cisco.com/go/license> to perform these licensing operations:

- Get a license through product authorization key (PAK) registration
- Register for a return merchandise authorization (RMA) replacement license
- Manage a license (look up a license and upload a rehost ticket)
- Migrate a license

You must have a Cisco.com account before you can access the portal.

Product Authorization Key

Interaction with the Cisco Product License Registration portals might require a PAK, which is provided when you order and purchase the right to use a feature set for a particular platform. The PAK serves as a receipt and is an important component in the process to obtain and upgrade a license.

You can also purchase a bulk PAK to fulfill multiple licenses on a device.

Unique Device Identifier

Cisco software performs license verification checks by comparing a stored unique device identifier (UDI)--a unique and unchangeable identifier assigned to all Cisco hardware devices--with the UDI of the device.

The UDI has two main components: the product ID (PID) and the serial number (SN). For most Cisco hardware devices, the UDI is printed on a label located on the back of the device and can be displayed by using the **show license udi** command.



Note When registering a license, you must use the correct UDI.

Cisco Software License Validation

Cisco software licensing uses a system of validation keys to provide a simple mechanism for deploying new feature sets that offers Cisco customers increased functionality for upgrading and maintaining their software.

Some feature sets on a Cisco device might need the license key before they can be enabled. You obtain the license key by using the Cisco licensing portal. The portal issues a license key for a specific Cisco software feature set, and the license is locked to the device UDI. (This is known as a node-locked license.)

Cisco License Manager

The Cisco License Manager, a client/server-based application that is available free to Cisco customers, can automatically discover Cisco devices on a network and can simplify the task of collecting the license key.

For more information, see the *User Guide for Cisco License Manager* at this URL:
http://www.cisco.com/en/US/products/ps7138/products_user_guide_list.html .

Software End-User License Agreement

As part of the licensing process, you must accept terms and conditions set forth in the end-user license agreement. You implicitly accept the agreement when you first use a new device. However, you must explicitly accept the agreement before a feature set can be activated for evaluation and extension temporary licenses.

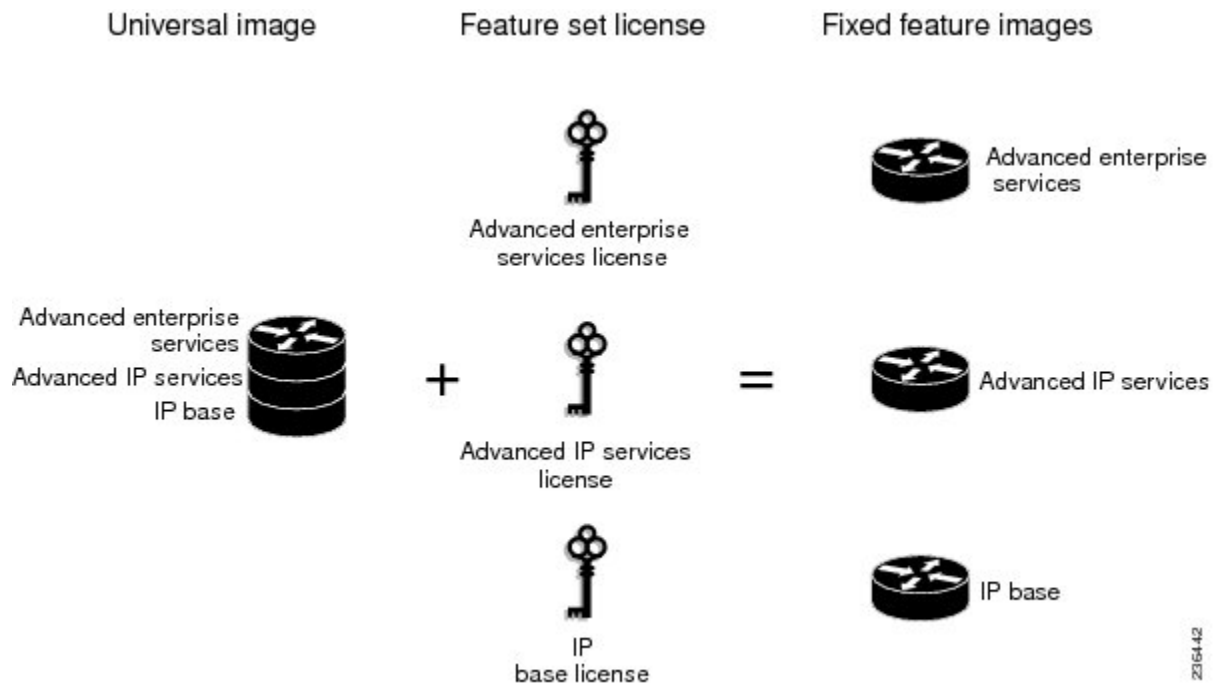
You can read the terms and conditions of the end-user license agreement at this URL:
http://www.cisco.com/en/US/docs/general/warranty/English/EU1KEN_.html .

License Models for Images and Features

Cisco IOS Universal Image-Based Licenses

The Cisco IOS universal image contains *all* fixed feature images in one image. You can access the required functionality based on the license installed on the device. A higher-level feature-set license inherits the content of the lower-level feature sets it contains. The figure below shows an example of the feature sets and fixed feature images that can make the universal image.

Figure 1: Example of Universal Image Components



A platform can have a single universal image, which is a superset of all fixed feature images. Fixed feature images are an older packaging form in which the image contains only part of a systems capabilities. The fixed

feature images supported by platform are predetermined and vary between platforms. A particular fixed feature image functionality is enabled based on license availability.

The software packaging simplifies the image selection process by consolidating the total number of packages and by using consistent package names across all hardware products.

The image-based license is used to help bring up all the subsystems that correspond to the image-level license that you purchase. Image licenses are enforced only during boot time.

The feature sets available for upgrading Cisco devices are listed on the Cisco IOS Software Packaging web page at this URL: <http://www.cisco.com/en/US/products/sw/iosswrel/ps5460/index.html>.

Feature-Based Licenses

Once the image-based license is used and the appropriate subsystems are activated, individual feature licenses are used to activate individual features.

License keys enable or disable individual features. Features check for their licenses before enabling themselves and adjust their behavior based on the following:

- Activation of a permanent license
- Expiration of a time-limited evaluation license
- Validity of a subscription license

License Types

Permanent Licenses

Permanent licenses are perpetual; that is, no usage period is associated with them. Once permanent licenses are installed, they provide all the permissions needed to access features in the software image. All permanent licenses are node locked and validated by the Cisco licensing infrastructure during software installation. Once a permanent license is installed, you do not need to upgrade for subsequent releases.

Cisco manufacturing preinstalls the appropriate permanent license on the ordered device for the purchased feature set. No customer interaction with the software activation processes is required to enable a license on new hardware.

Temporary Licenses

Temporary licenses are limited to a specific usage period (for example, 60 days). You must accept the end-user license agreement before the temporary licenses can be activated.

There are three types of temporary licenses: those embedded in Cisco images, evaluation licenses obtained from the Cisco Product License Registration portal, and extension licenses that are obtained from the Cisco Technical Assistant Center (TAC).

Although the embedded license can also be used for evaluation purposes, we recommend that you use the embedded license for emergency use only and obtain an evaluation license from the self-serve Cisco Product Licensing Registration portal.

These sections further define the types of temporary licenses:

Built-in Licenses for Emergencies

To avoid network downtime in the event of device failure and if the replaced device does not have the same licenses as the failed device, you can use a built-in license (an evaluation license) in the software image. Using it ensures that you can configure the needed features without requiring a license key. However, you must still accept an end-user license agreement and must acknowledge that there is a 60-day usage limit for this type of license.



Note You must go to the Cisco Product License Registration portal to obtain a permanent RMA replacement license.

Evaluation Licenses

Evaluation licenses are also temporary, and you use them to evaluate a feature set on new hardware.

You obtain evaluation licenses from the Cisco licensing portal: [Licensing Portal for Demo Licenses](#)



Note You must go to the Cisco Product License Registration portal prior to the expiration of the evaluation license to upgrade the license status.

Extension Licenses

When the time allowed for an evaluation licenses expires, you can work with TAC to obtain an extension license. Similar to an evaluation license, extension licenses are node locked and valid for a specific period (for example, 60 days) based on usage.



Note You must obtain approval to use an extension license.

Uncounted or Counted Licenses

Feature-based licenses are either uncounted licenses or counted licenses. Uncounted licenses do not have any count. Counted licenses have an attribute to fulfill for a certain number of counts. In other words, a count is associated with them that indicates the instances of that feature available for use in the system.

Pay as You Grow Model

The pay-as-you-grow model allows you to upgrade your hardware and software capacity by using a license key. You need not complete an RMA to add new hardware. You can purchase the upgrade, have it electronically delivered, and use the license key to enable increased capacity. The Cisco wireless controller is one example in which you can dynamically increase to 12, 25, 50, 100, or 250 access points for wireless services.

Subscription Licenses

The subscription license provides software enforcement for licensed features for a calendar period.

These node-locked license types are supported in a subscription license:

- Evaluation subscription license

- Extension subscription license
- Paid subscription license

Software Activation Processes

Software activation enables the various feature sets on a device by using license keys.

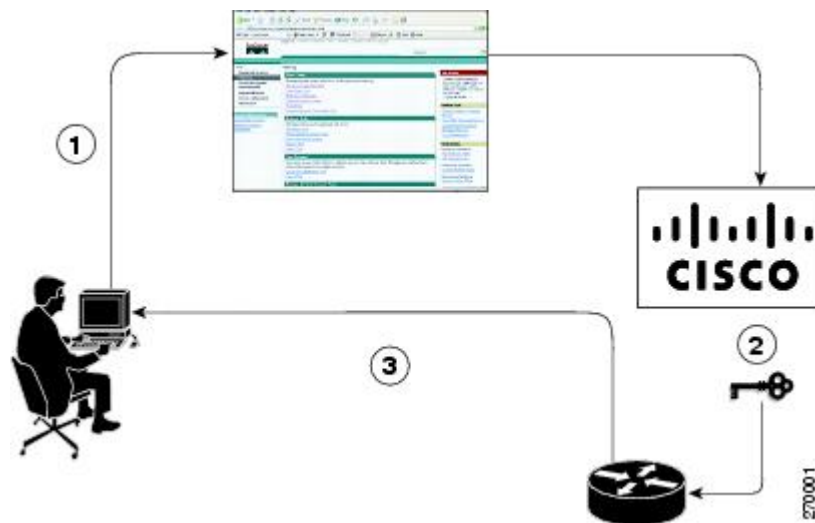


Note You can apply feature or maintenance upgrades to the software at any time. Maintenance upgrades do not require any interaction with the software activation process.

Manufacturing Preinstalled Licenses

The figure below shows the overall license work flow for manufacturing preinstalled licenses.

Figure 2: Manufacturing Preinstalled License Work Flow



The work flow for manufacturing preinstalled licensing involves these steps:

1. You place an order for a Cisco device through the Cisco sales ordering tool.
2. Manufacturing information technology systems pick up the order information and build the device. Manufacturing also retrieves a license key for the device being assembled by contacting a license server and then installing the code on the device. The device is shipped to you.
3. You install and configure the device, and place the device in production. There is no requirement to activate or register the software prior to use. A new device is ready for deployment upon receipt.

Automated Software Activation by Using Cisco License Manager

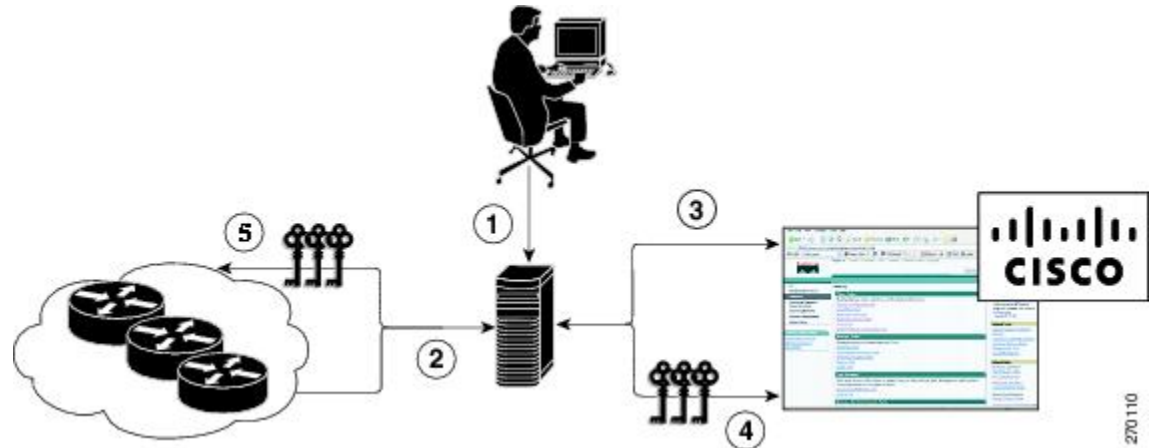
Cisco License Manager transparently interacts with the Cisco Product Licensing Registration portal for many devices. With the Cisco License Manager application deployed, you can automate many of the steps for

upgrading and registering software licenses. For example, you can enter the PAK and select the device on which to install the license.

For a network-wide deployment, the Cisco License Manager can automate all license-related work flows by securely communicating to the licensing back-end fulfillment systems at Cisco.com and by deploying the obtained licenses to managed devices on a network-wide basis. The application also keeps an inventory of deployed licenses and generates license reports.

The figure below shows the license upgrade work flow for automated upgrades through Cisco License Manager.

Figure 3: License Upgrade Work Flow for Automated Upgrades through Cisco License Manager



The workflow for license upgrades for automated license transfers involves these steps:

1. Cisco License Manager identifies the source and destination devices and stock keeping units (SKUs) to transfer.
2. Cisco License Manager automatically determines the device credentials of the source device.
3. Cisco License Manager automatically communicates with Cisco.com to obtain the permissions ticket, which is used to start the rehost process. It applies the permissions ticket to the source device to obtain the rehost ticket.
4. Cisco License Manager automatically sends the rehost ticket along with the destination device UDI to automatically obtain the license keys from the Cisco Product Licensing Registration portal.
5. Cisco License Manager automatically installs the license key on the destination device.

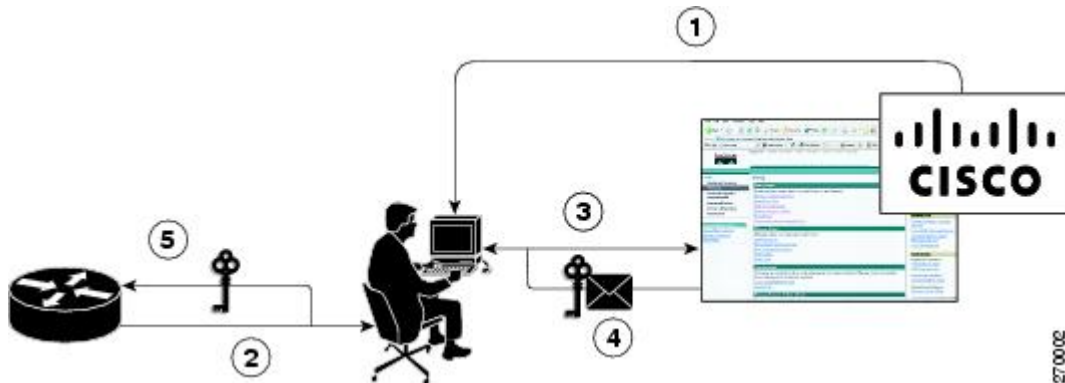
For more information, see the *User Guide for Cisco License Manager* at http://www.cisco.com/en/US/products/ps7138/products_user_guide_list.html.

License Software Activation by Using EXEC Commands

You install the license by using Cisco EXEC commands after receiving your license key electronically through e-mail or through paper and mail delivery.

The figure below shows the license upgrade process work flow for manual license fulfillment.

Figure 4: License Upgrade Work Flow for Manual License Fulfillment



The license upgrade process work flow for manual license fulfillment involves these steps:

1. You purchase the required PAKs for the desired type of license. Some licenses do not require a PAK, but they might need a contract instead.
2. You obtain the UDI from the device.
3. You enter the UDI and PAK into the Cisco Product License Registration portal. If it is a contract license, follow the links to non-PAK-based licenses and submit the UDI of the device.
4. The portal retrieves the SKUs associated with the PAK. You then select the SKU and enter the UDI, a unique and unchangeable identifier of the device where the license should be installed. A license key is then e-mailed to you, and you use that key to install the license.
5. You install the license file returned from the license portal to the device by using the CLI.

License Transfer Between Devices

Cisco supports two scenarios to transfer licenses between devices:

1. The first scenario has both the source and destination devices active and functional. In this scenario, the license is revoked on the source device, and a new permanent license is issued for the destination device.
2. The second is a failure scenario in which one of the devices is unavailable. In this scenario, the license from the failed device is transferred to the RMA or to the replaced device by using the RMA License Transfer process on the Cisco Product License Registration portal.

These scenarios are described in the following sections:

License Transfer Between Two Working Devices

Cisco supports fully automated, customer-initiated, no-questions-asked transfer of licenses. Transferring a license between two working devices is accomplished by using a process known as *rehosting*. The rehosting process transfers a license from one UDI to another by revoking the license from the source device and installing it on a new device.

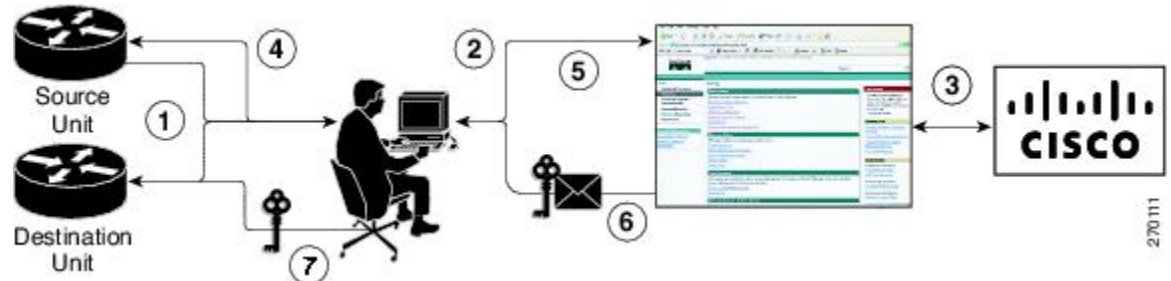
You perform a license transfer (rehosting) by using one of the following:

- Cisco Product License Registration portal
- Cisco IOS License Call Home commands

- Cisco License Manager application

The figure below shows the processes involved for rehosting (transferring) a license.

Figure 5: License Transfer Work Flow



The following summary is for a license transfer process by using the Cisco Product License Registration portal:

1. You obtain the UDI and device credentials from the source and destination devices by using the CLI.
2. You contact the Product License Registration page on Cisco.com, and you enter the source device credentials and the UDI into the license transfer portal tool.
3. The portal displays licenses that can be transferred from the source device.
4. Select the licenses that need to be transferred. A permission ticket is issued. You can use this permission ticket to start the rehost process by using the CLI.
5. You apply the permissions ticket to the source device by using the **license revoke** command. The source device then provides a rehost ticket indicating proof of revocation. A 60-day grace period license is also installed on the device to allow enough time to transfer the licenses to the destination device.
6. You enter the rehost ticket into the license transfer portal tool on Cisco.com along with the destination device UDI.
7. You receive the license key through e-mail.
8. You install the license key on the destination device.

After you execute the **license call-home resend** command, the source device contacts the Cisco Product License Registration portal and obtains a license key for the destination device after revoking it from the source device. The license key stored on the source device can then be installed on the destination device to complete the transfer.

By using Cisco License Manager, you can select the source and destination devices from a GUI wizard for automated processing.

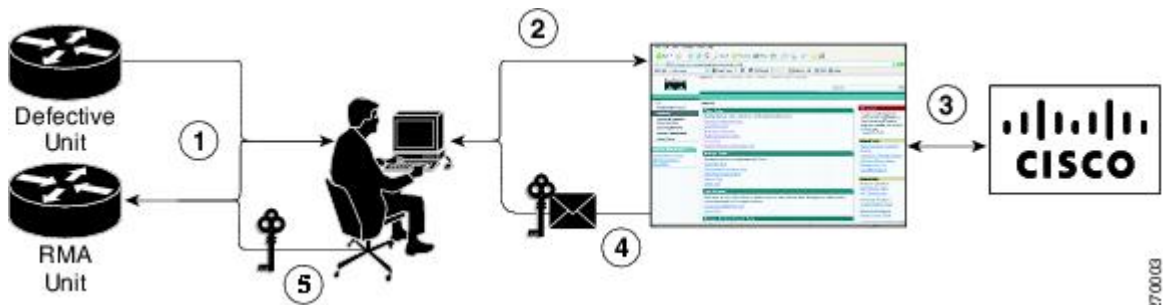
RMA License Transfer Between a Failed and a Working Device

Before you can transfer a software license from a failed device to a new device, you must enter UDI information from both devices into the Cisco Product License Registration portal. The portal issues the RMA replacement licenses (<http://www.cisco.com/go/license>).

If you need assistance to obtain a license, contact Cisco technical support at: <http://www.cisco.com/cisco/web/support/index.html>.

The figure below shows the license transfer work flow for RMA replacement licenses.

Figure 6: License Transfer Work Flow for RMA Replacement Licenses



The RMA replacement license process involves these steps:

1. You obtain the UDI of the defective and RMA devices.
2. You enter the UDI into the RMA license portal tool on Cisco.com.
3. The license portal determines licenses associated with the defective device.
4. The license portal issues replacement licenses.
5. You install the new license on the new device.

License Resend Request

If an original license is lost or misplaced, you can enter EXEC commands to request that all licenses for a specific UDI be re-sent. The command also stores the received license lines in a location that you specify.

Cisco License Manager also allows you to perform this function with an easy-to-use GUI.



Note You must have Internet access to place a license resend request.

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	Master Commands List, All Releases
Software activation commands	Software Activation Command Reference
Software activation configuration	"Configuring the Cisco IOS Software Activation Feature" module

MIBs

MIB	MIBs Link
CISCO-LICENSE-MGMT-MIB	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use the Cisco MIB Locator at this URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Cisco IOS Software Activation

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1: Feature Information for Cisco IOS Software Activation

Feature Name	Releases	Feature Information
Cisco IOS Software Activation	12.4(15)XZ 12.4(20)T 15.0(1)M	The Cisco IOS Software Activation feature supports basic licensing processes. This feature is platform-independent. This feature module provides information about Cisco Software Activation: <ul style="list-style-type: none"> "Configuring the Cisco IOS Software Activation Feature" module

Glossary

Cisco License Manager —Software tool that provides a GUI to track and manage licenses.

- license file** —File generated by Cisco licensing tools, which is used to install a license on a product. The license file contains one or more license lines.
- license key** —A unique value that enables usage and entitlement for a set of Cisco software features.
- license line** —Characters arranged in a particular format that hold the license for a single feature within it. A line has all the necessary fields and attributes that make it a valid, tamperproof, and complete license. A single line can exist independently.
- license manager** —An application used to track and manage licenses for customers.
- license server** —Software tool at the hardware manufacturing site that generates product licenses.
- license storage** —File that stores a collection of license lines. A license file exists on a licensed device. This file exists in permanent storage.
- node locked** —The explicit binding of a unique license to a unique hardware platform. Node-locked licenses are locked to one of the UDIs in the system. Non-node locked licenses are not locked to any UDI.
- PAK** —Product authorization key, which is provided to you when you order and purchase the right to use a feature set for a particular platform. The PAK serves as a receipt and is used as part of the process to obtain a license.
- permission ticket file** —File generated by Cisco licensing that is used to get a rehost ticket during a manual rehosting process. The permission ticket file contains one or more adding and removing license operations for rehosting.
- perpetual license** —License where use rights are permanent. These licenses can be used as long as required.
- persistence storage** —File that lives for the lifetime of the device that has a license and survives image changes. This file should exist in a write once storage area. The persistence file holds the license history for that device, along with certain information about license removals, expiries, rehost, and so on.
- rehost** —Process where a valid license is transferred from one platform to another. This implies the license is no longer valid on the original platform.
- removable storage** —Portable device such as compact flash or USB used to store and access data.
- RMA** —Return Merchandise Authorization, which is the process whereby you can return a defective product.
- signature server** —Generates the licenses for products and is found at Cisco manufacturing sites. Also called a permission file generator.
- SKU** —Stock keeping unit. A unique, individual part number used to track and monitor inventory. A Cisco software licensing SKU maps to one or more software features.
- stack** —A switch stack is a set of up to nine Catalyst 3750 switches connected through their StackWise ports.
- subscription-based licenses** —Time-based license that requires the subscriber to periodically renew or the license will expire after an agreed-upon time.
- SWIFT** —Software Infrastructure and Fulfillment Technology. The Cisco licensing infrastructure that is accessed through HTTPS over the Internet. The Cisco License Manager application interacts with the Cisco licensing infrastructure on behalf of many devices. You can interact directly with the Cisco licensing infrastructure service by using Cisco software commands.
- UDI** —Unique device identifier, which is a Cisco-wide schema to identify products. The UDI contains a product ID, version ID, and a serial number. The UDI does not change during deployment in the field. Note that when the term UDI is used in the context of licensing, it typically refers to only the product ID and serial number.

universal image—A single software image containing all Cisco functionality levels. These levels can be enabled by installing the appropriate license.



CHAPTER 3

Configuring the Cisco IOS Software Activation Feature

This document describes the tasks used to activate software by using the Cisco IOS Software Activation feature, license keys, and Cisco EXEC commands. When you activate software from a Cisco device, you can license software without the need for additional application software.

- [Finding Feature Information, on page 17](#)
- [Restrictions for Cisco IOS Software Activation, on page 17](#)
- [Information About the Cisco IOS Software Activation, on page 18](#)
- [How to Activate Software from a Cisco IOS Device, on page 18](#)
- [Configuring Examples for Software Licensing, on page 26](#)
- [Additional References, on page 33](#)
- [Feature Information for Cisco IOS Software Activation, on page 34](#)

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <https://cfng.cisco.com/>. An account on Cisco.com is not required.

Restrictions for Cisco IOS Software Activation

Not all Cisco hardware platforms can use the Cisco IOS Software Activation feature. Use the Cisco Feature Navigator at <http://www.cisco.com/go/cfn> and the table in the Feature Information for Cisco IOS Software Activation section to determine which platforms and images support the Cisco IOS Software Activation feature.

For the stackable switches that support the Cisco IOS Software Activation feature, one switch must act as primary and the others as secondaries. The primary switch performs management and administrative operations on itself as well as on the secondary switches.

Information About the Cisco IOS Software Activation

License Activation MIB Support

The Cisco IOS Software Activation feature introduces the CISCO-LICENSE-MGMT-MIB to allow SNMP-based license management and administrative tasks. A description of this MIB can be found by using tools at this URL: <http://tools.cisco.com/ITDIT/MIBS/servlet/index>

Use the MIB Locator tool and the Search for MIB selection box to select [CISCO-LICENSE-MGMT-MIB](#).

The unique device identifier (UDI) is also associated with the Entity Name and Product Description data elements for the management information base (MIB) system. The MIB nomenclature for Entity Name is entPhysicalName and for Product Description is entPhysicalDescr.

How to Activate Software from a Cisco IOS Device

Installing and Upgrading Licenses by Using Software Activation Commands

Before you begin

Read and understand the license activation process concepts in the in the “Cisco IOS Software Activation Conceptual Overview” module.

To install or upgrade a license by using the **license install** command, you must have already received the license file from the Cisco Product License Registration portal at <http://www.cisco.com/go/license> (or you already backed up the license by using the **license save** command).

If you use Microsoft Entourage and receive the license file from Cisco in an e-mail attachment, the license file will contain UTF-8 marking. These extra bytes in the license file cause it to be unusable during license installation. To work around this issue, you can use a text editor to remove the extra characters and then install the license file. For more information about UTF-8 encoding, go to this URL: <http://www.w3.org/International/questions/qa-utf8-bom>.



Note The installation process does not install duplicate licenses. This message appears when duplicate licenses are detected:

```
Installing...Feature:xxx-xxx-xxx...Skipped:Duplicate
```



Note A standby device reboots twice when there is a mismatch of licenses.

SUMMARY STEPS

1. Obtain the PAK.

2. **enable**
3. **show license udi**
4. Convert the PAK to a license by entering the PAK and the UDI into the Cisco Product License Registration portal: <http://www.cisco.com/go/license>.
5. **license install** *stored-location-url*
6. **configure terminal**
7. **license boot level** {metroaggrservices}
8. **write memory**
9. **reload**

DETAILED STEPS

	Command or Action	Purpose
Step 1	Obtain the PAK.	The PAK is provided to you when you order or purchase the right to use a feature set for a particular platform. <ul style="list-style-type: none"> • The PAK serves as a receipt and is used as part of the process to obtain a license.
Step 2	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 3	show license udi Example: Device# show license udi	Displays all the UDI values that can be licensed in a system. <ul style="list-style-type: none"> • You need the UDI of the device as part of the process to obtain a license.
Step 4	Convert the PAK to a license by entering the PAK and the UDI into the Cisco Product License Registration portal: http://www.cisco.com/go/license .	After entering the appropriate information, you will receive an e-mail containing the license information that you can use to install the license: <ul style="list-style-type: none"> • Copy the license file received from the Cisco Product License Registration portal to the appropriate file system on the device. <p>or</p> <ul style="list-style-type: none"> • Click the Install button on the web page.
Step 5	license install <i>stored-location-url</i> Example: Device# license install tftp://infra-sun/<user>/license/5400/38a.lic	Installs the license. <ul style="list-style-type: none"> • Accept the end-user license agreement if prompted.
Step 6	configure terminal Example:	Enters the global configuration mode.

	Command or Action	Purpose
	Device# configure terminal	
Step 7	license boot level {metroaggrservices} Example: Device(config)# license boot level metroaggrservices	Activates the metroaggrservices license on the device upon the next reload.
Step 8	write memory Example: Device# write memory	Saves the running configuration to NVRAM.
Step 9	reload Example: Device# reload	(Optional) Restarts the device to enable the new feature set. Note A reload is not required when moving from an evaluation license to a permanent license of the same license level on ASR 903 routers.

Managing Licenses by Using Software Activation Commands

Adding a Comment to a License File

SUMMARY STEPS

1. enable
2. license comment add *feature-name comment* [**switch** *switch-num*]
3. show license file [**switch** *switch-num*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	license comment add <i>feature-name comment</i> [switch <i>switch-num</i>] Example: Device# license comment add gsmamrnb-codec-pack "Use this permanent license"	Adds or deletes information about a specific license. <ul style="list-style-type: none"> • (Only on Cisco Catalyst 3750-E switch platforms) If a switch number is specified, this command is executed on the specified switch. • When the license is present in license storage and multiple license lines are stored, you are prompted to select a license line. To select the license, type the number at the Select Index to Add Comment prompt.

	Command or Action	Purpose
Step 3	show license file [switch <i>switch-num</i>] Example: <pre>Device# show license file</pre>	Displays comments added to a Cisco software license file. <ul style="list-style-type: none"> • If the device is a switch, this command obtains statistics from the specified switch.

Saving All Licenses to a Specified Storage Area

SUMMARY STEPS

1. **enable**
2. **license save** *file-sys://lic-location* [**switch** *switch-num*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: <pre>Device> enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	license save <i>file-sys://lic-location</i> [switch <i>switch-num</i>] Example: <pre>Device# license save flash:all_licenses.lic</pre>	Saves copies of all licenses in a device and stores them in a format required by the command in the specified storage location. Saved licenses are restored by using the license install command. <ul style="list-style-type: none"> • <i>lic-location</i> : The license storage location can be a directory or a URL that points to a file system. Use the ? command to see the storage locations supported by your device. • (Optional) switch <i>switch-num</i>: sends this request to a specific switch in a switch stack.

Saving License Credential Information Associated with a Device to a Specified Storage Area

Before you begin

Before you can start the rehost or resend process, a device credential is required. Cisco software licensing requires that the license files generated by the Cisco back-end licensing system for its devices be secure and tamper-resistant. Security features are in place to authenticate a license by means of encrypted license credentials. If it becomes necessary to transfer a license from one device to another (which is called rehosting), a permission ticket is required. To generate the permission ticket, the Cisco back-end licensing system requires the device credential information.

SUMMARY STEPS

1. **enable**

2. license save credential *file-sys://lic-location* [**switch** *switch-num*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	license save credential <i>file-sys://lic-location</i> [switch <i>switch-num</i>] Example: Device# license save credential flash:cred.lic	Saves credential information associated with a device to a specified URL. <ul style="list-style-type: none"> • <i>lic-location</i> : The license storage location can be a directory or a URL that points to a file system. Use the ? command to see the storage locations supported by your device. • (Optional)switch <i>switch-num</i>: sends this request to a specific switch in a switch stack.

Displaying All Licenses in a Device

SUMMARY STEPS

1. enable
2. show license all

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	show license all Example: Device# show license all	Displays information about all licenses in the device.

Displaying Detailed Information about Licensed Features

SUMMARY STEPS

1. enable
2. show license detail [*feature-name*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	show license detail [<i>feature-name</i>] Example: Device# show license detail	Displays detailed information about all licensed features or the specified licensed feature.

Displaying Licensed Feature Sets Available in an Image**SUMMARY STEPS**

1. enable
2. show license feature

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	show license feature Example: Device# show license feature	Displays a list of licensed features available in an image.

Removing Licenses by Using Software Activation Commands

Removing a License Entry from a Permanent License File



Note

- The **license clear** command lists all licenses, but some licenses, such as built-in licenses, cannot be cleared.
- Only licenses that have been added by using the **license install** command are removed. Evaluation licenses are not removed.
- If a license is not in use, the **license clear** command displays all the licenses related to this feature and prompts you to make a selection. Different prompts are displayed, depending upon whether single or multiple licenses are available in the device. The selected licenses are removed from the device.
- If a license is in use, the **license clear** command might fail. However, depending on the application policy using the license, some licenses might be cleared.
- When a switch is specified, the **license clear** command is issued on that switch. When a mixed stack platform is used, the primary switch must have installed the minimum licensing features required to support the licensing operations of the secondary switches. When this command is issued from a primary switch, the switch number is required to clear a license on that switch.

SUMMARY STEPS

1. **enable**
2. **license clear** *feature-name* [**switch** *switch-num*]
3. **show license detail**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	license clear <i>feature-name</i> [switch <i>switch-num</i>] Example: Device# license clear gsmamrnb-codec-pack	Removes a license entry from license storage once it has been verified that the license line is valid and was explicitly installed. <ul style="list-style-type: none"> • The optional switch <i>switch-num</i> keyword and argument send this request to a specific switch in a switch stack. • You must select the index number of the license to clear. Enter the number at the Select Index to Clear prompt.
Step 3	show license detail Example:	Verifies that the license has been cleared.

	Command or Action	Purpose
	Device# show license detail	

Rehosting (Revoking and Transferring) a License

Before you begin

Read and understand the license transfer between devices concepts in the “Cisco IOS Software Activation Conceptual Overview” module.

Cisco software licensing requires that the license files generated by the Cisco back-end licensing system for its devices be secure and tamper-resistant. Security features are in place to authenticate a license by means of encrypted license credentials. Rehosting requires a permission ticket. To generate the permission ticket, the Cisco back-end licensing system requires the device credential information. Use the **license save credential** command to save device credential information to a specified file system.

SUMMARY STEPS

1. **enable**
2. **license revoke revoke** *permission-file-url output-rehost-ticket-url*

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	license revoke revoke <i>permission-file-url output-rehost-ticket-url</i> Example: Device# license revoke tftp://infra-sun/ramanp/pt.lic flash:rt.lic	Revokes and transfers a license by using the permission ticket provided by the Cisco back-end licensing system. It removes the original, permanent license from the device and provides a license for the new device. <ul style="list-style-type: none"> • An end-user license agreement is displayed for all grace-period licenses in the permission ticket. • You must read and accept the agreement. If you do not accept the agreement, the rehost operation stops.

Troubleshooting License Operations by Using Software Activation Commands

SUMMARY STEPS

1. **enable**
2. **show license file** [*switch switch-num*]
3. **show license statistics**
4. **show license status** [*switch switch-num*]

5. `debug license {all | core | errors | events}`
6. `no debug license {all | core | errors | events}`

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	show license file [switch <i>switch-num</i>] Example: Device# show license file	Displays license entries and license details stored in a Cisco software license file. If the device is a switch, this command obtains statistics from the specified switch.
Step 3	show license statistics Example: Device# show license statistics	Displays license statistics information. The display includes relevant statistics for error counts and is useful for troubleshooting licensing-related problems.
Step 4	show license status [switch <i>switch-num</i>] Example: Device# show license status	Displays the status of licenses in the system. If the device is a switch, this command obtains status from the specified switch.
Step 5	debug license {all core errors events} Example: Device# debug license errors	Enables controlled software license debugging activity on a device.
Step 6	no debug license {all core errors events} Example: Device# no debug license errors	Disables license debugging activity on a device.

Configuring Examples for Software Licensing

Example: Installing and Upgrading Licenses

The following example shows how to use the `license install` command to install a license saved in TFTP on the device. The display is truncated for easier readability:

```
Device# license install tftp://infra-sun/<user>/license/5400/38a.lic
Installing licenses from "tftp://infra-sun/<user>/license/5400/38a.lic"
Loading <user>/license/5400/38a.lic from 172.19.211.47 (via GigabitEthernet0/0): !
```

```
[OK - 1192 bytes]
Extension licenses are being installed in the device with UDI "AS54XM-AC-RPS:JAE0948QXKD"
for the following features:
  Feature Name: gsmamrnb-codec-pack
PLEASE READ THE FOLLOWING TERMS CAREFULLY. . .
ACCEPT? [yes/no]: yes
Issue 'license feature gsmamrnb-codec-pack' command to enable the license
Installing...Feature:gsmamrnb-codec-pack...Successful:Supported
```

Example: Adding a Comment to a License File

The following example shows how to use the **license comment** command to add or delete information about a specific license. The command checks that a license associated with the specified feature is present in license storage. If a switch number is specified, this command is executed on the specified switch.

As the example shows, when the license is present and multiple license lines are stored, you are prompted to select a license line. This action helps to distinguish licenses. Type the number at the Select Index to Add Comment prompt to select the license.

```
Device# license comment add gsmamrnb-codec-pack "Use this permanent license"
Feature: gsmamrnb-codec-pack
  1 License Type: Evaluation
  License State: Inactive
    Evaluation total period: 20 hours 0 minute
    Evaluation period left: 20 hours 0 minute
  License Addition: Additive
  Comment:
  Store Index: 0
  Store Name: Primary License Storage
  2 License Type: Permanent
  License State: Active, Not in Use
  License Addition: Exclusive
  Comment:
  Store Index: 1
  Store Name: Primary License Storage
Select Index to Add Comment [1-2]: 2
% Success: Adding comment "Use this permanent license" succeeded
Device# show license file
License Store: Primary License Storage
  Store Index: 0
    License: 11 gsmamrnb-codec-pack 1.0 LONG TRIAL DISABLED 20 DISABLED STANDALONE ADD INFINITE_KEYS INFINITE_KEYS NEVER NEVER NiL SLM_CODE CL_ND_LCK NiL *1YCHJRBMWKZAED2400 NiL NiL NiL 5_MINS <UDI><PID>AS54XM-AC-RPS</PID><SN>JAE0948QXKD</SN></UDI> ,Jx8qaVf:iXWaH9PsXjkVnmz7gWh:cxdf9nUkzY6o8fRuQbu,7wTUz237Cz6g9VjfrCk,0a2Pdo,Ow6LWxcCREFL:x cTxwnffn9i,4,aUWv8rL50opDUDAsFnxLsvofRkcAfm$<WLC>AQEBIQAB//9NA+lmUwfs/1D0dmdF9kyX8wDrua1TZhnnAy6Mxs1dTboIcRaahKxJJdj4O1lw3wscqvPiAmWSaEmUT56rstk6gvmj+EQKRfD9A0ime1czrdKxfILTOLaXT416nwmfp92Tya6vIQ4Fn1BdqJ1sMzXeSq8PmVcTU9A4o9hil9vKur8N9F885D9GVF0bJHciT5M=</WLC>
    Comment: Use this permanent license.
    Hash: E1WjIQo4qs19g8cpnpogP/0DeY=
Device#
```

Example: Saving All Licenses to a Specified Storage Area

The following example shows how to use the **license save** command to save copies of all licenses to the flash file system:

```
Device# license save flash:all_licenses.lic
license lines saved ..... to flash:all_licenses.lic
```

Example: Removing Licenses

The following examples shows how to use the **license clear** command to remove a license entry from license storage once it has been verified that the license line is valid and was explicitly installed.

You must select the index number of the license to clear. Type the number at the Select Index to Clear prompt as shown in this example.

```
Device# license clear standard
Feature: standard
  1 License Type: Evaluation
  License State: Inactive
    Evaluation total period: 20 hours 0 minute
    Evaluation period left: 20 hours 0 minute
  License Addition: Additive
  Comment:
  Store Index: 0
  Store Name: Primary License Storage
  2 License Type: Permanent
  License State: Active, Not in Use
  License Addition: Exclusive
  Comment:
  Store Index: 1
  Store Name: Primary License Storage
Select Index to Clear [1-2]: 1
Are you sure you want to clear? (yes/[no]): yes
Device# show license detail
Feature: premium          Period left: 1 hour 0 minute
Index: 1      Feature: premium          Version: 1.0
  License Type: Evaluation
  License State: Active, Not in Use, EULA not accepted
    Evaluation total period: 1 hour 0 minute
    Evaluation period left: 1 hour 0 minute
  License Count: Non-Counted
  License Priority: None
  Store Index: 0
  Store Name: Evaluation License Storage
```

Example: Rehosting (Revoking and Transferring) a License

The following example shows how to use the **license revoke** command to revoke a license stored in TFTP and how to transfer it to a license stored in flash memory. You might need to read and accept the terms and conditions of the license type being transferred. The following example is truncated for readability:

```
Device# license revoke tftp://infra-sun/ramanp/pt.lic flash:rt.lic
Following Permanent license(s) will be revoked from this device
  Feature Name: gsmamrnb-codec-pack
Following Extension license(s) will be installed in this device
  Feature Name: gsmamrnb-codec-pack
PLEASE READ THE FOLLOWING TERMS CAREFULLY. . .
ACCEPT? [yes/no]: yes
Issue 'license feature gsmamrnb-codec-pack' command to enable the license
Rehost ticket saved ..... to flash:rt.lic
```

Example: Generic Command Enhanced with Licensing Information

The generic commands described in the following sections are enhanced with licensing information:

reload

The **reload** command shows the expired licenses, followed by expiring licenses sorted by the period left and end date:

```
Device# reload
The following license(s) are expiring or have expired.
Features with expired licenses may not work after Reload.
Feature: uc,Status: expiring, Period Left: 7 wks 5 days
Proceed with reload? [confirm]
```

show running-config

The **show running-config** command displays the unique device identifier (UDI) of a device. If the configuration file was copied from a different device, a warning is displayed upon reload. A UDI mismatch warning is also displayed during reload if the startup-config file has a different UDI than the platform UDI.

```
Device# show running-config
Building configuration...

Current configuration : 1764 bytes
!
! Last configuration change at 15:20:26 IST Thu Aug 1 2019
! NVRAM config last updated at 15:36:45 IST Mon Jul 22 2019
!
version 16.9
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
no platform punt-keepalive disable-kernel-core
platform bfd-debug-trace 1
platform xconnect load-balance-hash-algo mac-ip-instanceid
platform tcam-parity-error enable
platform tcam-threshold alarm-frequency 1
platform shell
!
hostname ASR920
!
boot-start-marker
boot-end-marker
!
!
vrf definition Mgmt-intf
!
address-family ipv4
exit-address-family
!
address-family ipv6
exit-address-family
!
!
no aaa new-model
clock timezone IST 5 30
!
!
!
```



```

Device status
Device Credential type: IMAGE
Device Credential Verification: PASS
Rehost Type: DC_OR_IC
    
```

----- show license status standby -----

----- show license feature -----

Feature name	Enforcement	Evaluation	Subscription	Enabled	RightToUse
advancedmetroipaccess	yes	yes	no	yes	no
metroipaccess	yes	yes	no	no	no
metroaccess	no	yes	no	no	no
1588	yes	yes	no	no	no
10GEupgradelicense	yes	no	no	no	no
2portGE-4ports10GE	yes	no	no	yes	no

----- show license feature standby -----

----- show license file -----

```

License Store: Primary License Storage
Store Index: 0
License: 11 2portGE-4ports10GE 1.0 LONG NORMAL STANDALONE EXCL INFINITE_KEYS INFINITE_KEYS NEVER NEVER NiL SLM_CODE CL_ND_LCK NiL *17FU47V3CUF3HEZ400 NiL NiL NiL 5_MINS <UDI><PID>ASR-920-4SZ-D</PID><SN>CAT2211U7WD</SN></UDI> VQogQJa91F3yuYf3g:aWf9qOXg0bRnKs25ZhhWXQ6vfaWtSiGCTcJ6UX0Wsc5SdJV:aGsY56VDTPALe9s5h7maVC7WPHrQG9hDQBB1NUiiJTLpyzm4CCG3xA8H6w8Ujj7GVA$<WLC>AQEBISAB//ePuFEFLa1WYTTBsUwysYI1wUTu4NOSAmnH54EqMR+ddrdmYvQIWIkh/Ta02F6X3ePuFEFLa1WYTTBsUwysYI1wUTu4NOSAnIcMf6vWuUuI1lxR4RgKX59uDYrlsEJot7Qno/vtY18B0vN08xyEcT152bmL3dfDsAumQ+9NeEXWOHMiXGAsjTr+jONlkzusU=</WLC>
Comment:
Hash: M6TSnLcLnXd4krgImjtXxTWRmcQ=
Store Index: 1
License: 11 advancedmetroipaccess 1.0 LONG NORMAL STANDALONE EXCL INFINITE_KEYS INFINITE_KEYS NEVER NEVER NiL SLM_CODE CL_ND_LCK NiL *17FU47V3CUF3HEZ400 NiL NiL NiL 5_MINS <UDI><PID>ASR-920-4SZ-D</PID><SN>CAT2211U7WD</SN></UDI> BfkkXOhIiIUBcTurSQLif:aZz0Kyvtju4rD7lMmvK mLytEIMPkuNEY3dSawv,OHTVUP3zh,qGeYcsPmpi3tGL2V8kxRbVvJXV,wrXJ306ous3,P7EQtt,Ho,9wCO2BwDbpfz$<WLC>AQEBISAB//ePuFEFLa1WYTTBsUwysYI1wUTu4NOSAKSLhrKyrLBd3+nroEfw8/8Av4nEYBFF/nePuFEFLa1WYTTBsUwysYI1wUTu4NOSAnIcMf6vWuUuI1lxR4RgKX59uDYrlsEJot7Qno/vtY18B0vN08xyEcT152bmL3dfDsAumQ+9NeEXWOHMiXGAsjTr+jONlkzusU=</WLC>
Comment:
Hash: cuBh2U4PcOLuolaYMZLYQ5MeBMw=
License Store: Built-In License Storage
Store Index: 0
License: 11 advancedmetroipaccess 1.0 LONG TRIAL DISABLED 1440 DISABLED STANDALONE ADD INFINITE_KEYS INFINITE_KEYS NEVER NEVER NiL SLM_CODE DEMO NiL NiL NiL 5_MINS NiL q7A1zERv7M3asfmTNiBq3AIfzXaMn771WFbW0QLSFTf8XRd,uBSGsOh5VadJXolSVH$<WLC>AQEBIf8B//+GALABZF9TUBkv9DfLeeIHuY2S2mDnoo9JUxWfflSYbGg+v4MuWi3L+D6KJGVjyyRqWInXo3s+nsLU7rOtdOxoIxYZAo3LYmUJ+MFzsqLhKoJV1PyEvQ8H21MNUjVbhoN0gyIWsyiJaM8AQIkVBQFzhr10GYolVzdzfJfEPQIX6tZ++/Vtc/q3SF/5Ko8XCy=</WLC>
Comment:
    
```

```

      Hash: 5J2d3ZfjOzgP5xlaiJQslaiGh5s=
Store Index: 1
  License: 11 metroipaccess 1.0 LONG TRIAL DISABLED 1440 DISABLED STANDALONE
          ADD INFINITE_KEYS INFINITE_KEYS NEVER NEVER NiL SLM_CODE DEMO Ni
          L NiL Ni NiL NiL 5_MINS NiL IAWD3vd7KQItmcShIC,OfF3GzO4u8QWwFBsvd
          Sb:hJ37cc9g9tgFm5xuhx8x1kEYVn$<WLC>AQEBIf8B//9ryCDjMpbNbltG4CTDc9
          WNRCMQWn9rrxz5QrHYihBHk4fxDPzR1Gd7iVy5zb+iA/+RqwInXo3s+nsLU7rOtdO
          xoIxyZAo3LYmUJ+MFzsqlhKoJv1PyEvQ8H21MNUjVbhoN0gyIWsyiJam8AQIkVBQF
          zhr10GYo1VzdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko8XCXY=</WLC>
Comment:
  Hash: CLI5/I7/N6UcLXt3j/1AejmDR6k=
Store Index: 2
  License: 11 metroaccess 1.0 LONG TRIAL DISABLED 1440 DISABLED STANDALONE A
          DD INFINITE_KEYS INFINITE_KEYS NEVER NEVER NiL SLM_CODE DEMO NiL
          NiL Ni NiL NiL 5_MINS NiL Tc5IK2dLk8:24bhasctP3uWtPe9GRDccbeQIO7f
          aqBVjFFz3A9YK6ZNPxbSE41knLI$<WLC>AQEBIf8B//+w2jF8oVWARFb7oStekvg+
          x8aEAlunD5s0KQO9r9p1tUnWCR7/QRzS8kYzXtPMYKSRqwInXo3s+nsLU7rOtdOxo
          IxyZAo3LYmUJ+MFzsqlhKoJv1PyEvQ8H21MNUjVbhoN0gyIWsyiJam8AQIkVBQFzh
          r10GYo1VzdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko8XCXY=</WLC>
Comment:
  Hash: kKMjObqq6eiTdHduukDWLPZub/k=

```

```
----- show license file standby -----
```

```
----- show license detail -----
```

```

Index: 1  Feature: 2portGE-4ports10GE                      Version: 1.0
License Type: Permanent
License State: Active, In Use
License Count: Non-Counted
License Priority: Medium
Store Index: 0
Store Name: Primary License Storage
Index: 2  Feature: advancedmetroipaccess                  Version: 1.0
License Type: Permanent
License State: Active, In Use
License Count: Non-Counted
License Priority: Medium
Store Index: 1
Store Name: Primary License Storage
Index: 3  Feature: advancedmetroipaccess                  Version: 1.0
License Type: Evaluation
License State: Inactive
  Evaluation total period: 8 weeks 4 days
  Evaluation period left: 0 minute 0 second
  Period used: 8 weeks 4 days
License Count: Non-Counted
License Priority: Low
Store Index: 0
Store Name: Built-In License Storage
Index: 4  Feature: metroaccess                            Version: 1.0
License Type: Evaluation
License State: Active, Not in Use, EULA not accepted
  Evaluation total period: 8 weeks 4 days
  Evaluation period left: 8 weeks 4 days
  Period used: 0 minute 0 second
License Count: Non-Counted
License Priority: None
Store Index: 2
Store Name: Built-In License Storage
Index: 5  Feature: metroipaccess                          Version: 1.0

```



```

License Type: Evaluation
License State: Active, Not in Use, EULA not accepted
  Evaluation total period: 8 weeks 4 days
  Evaluation period left: 8 weeks 4 days
  Period used: 0 minute 0 second
License Count: Non-Counted
License Priority: None
Store Index: 1
Store Name: Built-In License Storage

```

```
----- show license detail standby -----
```

```
% Error: No license for standby found - License feature not found
```

```
----- show license statistics -----
```

```

Administrative statistics
Install success count: 0
Install failure count: 0
Install duplicate count: 0
Comment add count: 0
Comment delete count: 0
Clear count: 0
Save count: 0
Save cred count: 0

Client statistics
Request success count: 2
Request failure count: 0
Release count: 0
Global Notify count: 1

```

```
----- show license statistics standby -----
```

show license udi

The **show license udi** command displays the license UDI information:

```

Device> show license udi
SlotID  PID                SN                UDI
-----
0        ASR-920-4SZ-D          CAT2211U7WD      ASR-920-4SZ-D:CAT2211U7WD

```

Additional References

Related Documents

Related Topic	Document Title
Cisco License Manager application	<i>User Guide for Cisco License Manager</i>
Software activation conceptual overview	“Cisco IOS Software Activation Conceptual Overview” module
Software activation commands	<i>Software Activation Command Reference</i>

Related Topic	Document Title
Cisco IOS commands	<i>Master Commands List, All Releases</i>
Integrated Services Routers licensing	<i>Software Activation on Cisco Integrated Services Routers</i>

MIBs

MIB	MIBs Link
CISCO-LICENSE-MGMT-MIB	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Cisco IOS Software Activation

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 2: Feature Information for Cisco IOS Software Activation

Feature Name	Releases	Feature Information
Cisco IOS Software Activation	12.4(15)XZ 12.4(20)T 15.0(1)M 15.4(1)S	<p>Cisco IOS Software Activation EXEC commands support basic licensing processes.</p> <p>This feature is platform-independent.</p> <p>These commands were introduced or modified by this feature: debug license, license clear, license comment, license install, license revoke, license save, license save credential, show license all, show license detail, show license feature, show license file, show license statistics, show license status, show license udi</p> <p>In Cisco IOS Release 15.4(1)S, support was added for the Cisco ASR 901S series router.</p>
CISL-SNMP support (MIB)	12.4(20)T 15.0(1)M	<p>SNMP support for the CISCO-LICENSE-MGMT-MIB was added.</p> <p>These commands were introduced or modified by this feature: snmp-server enable traps, snmp-server host</p>



CHAPTER 4

Configuring a Cisco Right-To-Use License

This guide provides an overview and guidance for configuring the Cisco® ASR 1000 Series Aggregation Services Routers with Right-To-Use License (RTU).

- [Feature Information for Cisco Right-To-Use License, on page 37](#)
- [Prerequisites for RTU, on page 37](#)
- [Information About Cisco RTU License, on page 37](#)
- [How to Activate an Evaluation License, on page 41](#)
- [Sample Output for show Commands, on page 45](#)
- [Cisco ONE Suites, on page 48](#)
- [Additional References, on page 50](#)
- [Feature Information for Call Home, on page 51](#)

Feature Information for Cisco Right-To-Use License

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Prerequisites for RTU

- You must obtain the device certificate from the Cisco licensing infrastructure before you start the installation process.
- You must have a Cisco user login account.

Information About Cisco RTU License

Overview of the Cisco Licensing Mechanism

The Cisco licensing mechanism provides flexibility to run a device at different technology package levels. This mechanism is referred to as technology package licensing and leverages the universal technology package based licensing solution. A universal image containing all levels of a software package is loaded on to the

device. During startup, the device determines the highest level of license and loads the corresponding software features or subsystems.

The Cisco ASR 1001 Router and ASR 1002-X Router support technology package-based licenses that are not node locked. Technology packages and feature licenses are activated using evaluation licenses that are built in. Evaluation licenses are limited period-metered licenses that are valid for 60 days. When the time allowed for an evaluation license expires, the license is automatically upgraded to RTU license. After all the RTU licenses are activated, there is no expiration of license and are valid for a lifetime.

To enable an evaluation license, you have to accept the global end user license agreement (EULA).

RTU Supported Software Licenses

This section describes the various RTU-supported software licenses.



Note Permanent licenses are not affected by Cisco IOS XE release upgrades.

An evaluation license is required to activate the licensed features. When a router enters the configuration mode, a check is performed to verify the license. Feature configurations are allowed only valid licenses are available. If a permanent license does not exist, Cisco IOS activates an RTU license when you accept the EULA agreement and the corresponding Cisco IOS functionalities will be available. The RTU license supports the following software features:

- Inter chassis redundancy
- Lawful intercept
- Software redundancy
- IPsec
- Throughput

Accept the EULA to activate the corresponding feature. Migration of a permanent license from previous versions of the software images are seamless. For information on accepting the EULA, see Example: Accepting the Global EULA, page 10-6.

Evaluation licenses and RTU licenses available on the Cisco ASR 1000 Series Routers

Evaluation and RTU Licenses	Evaluation and RTU Licenses	License Name	License Description Evaluation License
FLS-ASR1001-5G	FLS-ASR1001-5G	Upgrade from 2.5G to 5G license for Cisco ASR1001 Router	Yes
FLSASR1-IOSRED	Software redundancy license for Cisco ASR1000 Series Aggregation Services Routers	Yes	Yes

Evaluation and RTU Licenses	Evaluation and RTU Licenses	License Name	License Description Evaluation License
FLSASR1-IPSEC IPSEC	License for Cisco ASR1000 Series Aggregation Services Routers	Yes	Yes
FLSASR1-FW FW	License for Cisco ASR1000 Series Aggregation Services Routers	Yes	Yes
FLSASR1-FPI	Flex. Pack. Insp License for Cisco ASR1000 Series Aggregation Services Routers	Yes	Yes
FLSASR1-FWNAT-R	Firewall and NAT Stateful Inter-Chassis Redundancy License	Yes	Yes
FLSASR1-LI	Lawful Intercept License for Cisco ASR1000 Series Aggregation Services Routers	Yes	Yes
FLSASR1-BB	Broadband License for Cisco ASR1000 Series Aggregation Services Routers	Yes	Yes
FLSASR1-BB-4K	Broadband 4K Sessions for Cisco ASR1000 Series Aggregation Services Routers	Yes	Yes
FLSASR1-BB-16K	Broadband 16K Sessions for Cisco ASR1000 Series Aggregation Services Routers	Yes	Yes
FLSASR1-BB-32K	Broadband 32K Sessions for Cisco ASR1000 Series Aggregation Services Routers	Yes	Yes
FLSASR1-CS-250P	CUBE(SP) 250Session License for Cisco ASR1000 Series Aggregation Services Routers	Yes	Yes

Evaluation and RTU Licenses	Evaluation and RTU Licenses	License Name	License Description Evaluation License
FLSASR1-CS-2KP	CUBE(SP) 2K Session License for Cisco ASR1000 Series Aggregation Services Routers	Yes	Yes
FLSASR1-CS-4KP	CUBE(SP) 4K Session License for Cisco ASR1000 Series Aggregation Services Routers	Yes	Yes
FLSASR1-CS-16KP	CUBE(SP) 16K Session License for Cisco ASR1000 Series Aggregation Services Routers	Yes	Yes
FLSASR1-CS-32KP	CUBE(SP) 32K Session License for Cisco ASR1000 Series Aggregation Services Routers	Yes	Yes
FLSASR1-CS-LAB	CUBE(SP) Lab Use Only Lic for Cisco ASR1000 Series Aggregation Services Routers	Yes	Yes
FLSASR1-CS-TPEX	CUBE(SP) License for ASR1000 in Video/B2BTP Ex	Yes	Yes
SLASR1-AIS	Cisco ASR 1000 Advanced IP Services License	Yes	Yes
SLASR1-AES	Cisco ASR 1000 Advanced Enterprise Services License	Yes	Yes
SLASR1-IPB	Cisco ASR 1000 IP BASE License		
FLS-ASR1001-5G	Throughput performance upgrade from 2.5G to 5G license for ASR1001	Yes	Yes

How to Activate an Evaluation License



Note Evaluation RTU licenses automatically changes to RTU licenses after an evaluation period of 60 days.

Evaluation licenses can be activated using the license boot level {adventerprise | advipservices | ipbase} command.

SUMMARY STEPS

1. enable
2. configure terminal
3. license boot level {adventerprise | advipservices | ipbase}
4. exit
5. copy running-config startup-config
6. reload

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables the privileged EXEC mode. Enter your password if prompted.
Step 2	configure terminal Example: Router#configure terminal	Enters the global configuration mode.
Step 3	license boot level {adventerprise advipservices ipbase} Example: Router(config)#license boot level adventerprise	Enables the evaluation license. Note Use the ? command with the technology-package command to see the software packages and features supported on your router.
Step 4	exit Example: Router(config)#exit	Exits the global configuration mode.
Step 5	copy running-config startup-config Example: Router#copy running-config startup-config	Saves the configuration.
Step 6	reload Example: Router#reload	Reloads the router. A reload is required to activate the software package.

Example

The following example shows how to activate an evaluation license:

```
Router>enable
Router#configure terminal
Router(config)#license boot level advenprise
% use 'write' command to make license boot config take effect on next boot
Router(config)#exit
Router#copy running-config startup-config
Router#reload
```

Configuring Throughput

For information on configuring throughput on the Cisco ASR 1001 Router, see Cisco ASR 1001 Router Quick Start Guide. For information on configuring throughput on the Cisco ASR 1002-X Router, see Cisco ASR 1001 Router Quick Start Guide.

Example: IPsec

Configure map or tunnels to the interface to trigger the EULA. Perform the following actions when required:

```
step1:
Device#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)#crypto isakmp policy 1
Device(config-isakmp)#encryption aes
Device(config-isakmp)#hash md5
Device(config-isakmp)#group 2
Device(config-isakmp)#lifetime 86400
Device(config-isakmp)#authentication pre-share
Device(config-isakmp)#exit

step2:
Device(config)#crypto isakmp key cisco address 10.10.0.0

step3:
Device(config)#crypto ipsec transform-set trans esp-aes esp-md5-hmac
Device(cfg-crypto-trans)#mode transport
Device(cfg-crypto-trans)#exit

step4:
Device(config)#crypto map map1 10 ipsec-isakmp
% NOTE: This new crypto map will remain disabled until a peer
and a valid access list have been configured.
Device(config-crypto-map)#set transform-set trans
Device(config-crypto-map)#set peer 10.10.0.0
Device(config-crypto-map)#match address 101
Device(config-crypto-map)#exit

step5:
Device(config)#access-list 101 permit ip 192.168.2.0 0.0.0.255 192.168.1.0 0.0.0.255
Device(config)#access-list 102 permit ip 100.100.100.0 0.0.0.255 100.100.100.0 0.0.0.255
Device(config)#exit

step6:
Device#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)#int GigabitEthernet0/0/1
```

```
Device(config-if)#crypto map map1
Device(config-if)#end
```

Example: Accepting an EULA for Software Redundancy License

The following example shows the acceptance of an EULA for the software redundancy feature:

```
Router(config)#redundancy
Router(config-red)#mode
Router(config-red)#mode sso
```

```
PLEASE READ THE FOLLOWING TERMS CAREFULLY. INSTALLING THE LICENSE OR LICENSE KEY
PROVIDED FOR ANY CISCO PRODUCT FEATURE OR USING SUCH PRODUCT FEATURE CONSTITUTES
YOUR FULL ACCEPTANCE OF THE FOLLOWING TERMS. YOU MUST NOT PROCEED FURTHER IF YOU ARE NOT
WILLING TO BE BOUND BY ALL THE TERMS SET FORTH HEREIN.
```

Use of this product feature requires an additional license from Cisco, together with an additional payment. You may use this product feature on an evaluation basis, without payment to Cisco, for 60 days. Your use of the product, including during the 60 day evaluation period, is subject to the Cisco end user license agreement http://www.cisco.com/en/US/docs/general/warranty/English/EU1KEN_.html If you use the product feature beyond the 60 day evaluation period, you must submit the appropriate payment to Cisco for the license. After the 60 day evaluation period, your use of the product feature will be governed solely by the Cisco end user license agreement (link above), together with any supplements relating to such product feature. The above applies even if the evaluation license is not automatically terminated and you do not receive any notice of the expiration of the evaluation period. It is your responsibility to determine when the evaluation period is complete and you are required to make payment to Cisco for your use of the product feature beyond the evaluation period.

Your acceptance of this agreement for the software features on one product shall be deemed your acceptance with respect to all such software on all Cisco products you purchase which includes the same software. (The foregoing notwithstanding, you must purchase a license for each software feature you use past the 60 days evaluation period, so that if you enable a software feature on 1000 devices, you must purchase 1000 licenses for use past the 60 day evaluation period.)

Activation of the software command line interface will be evidence of your acceptance of this agreement.

```
ACCEPT? (yes/[no]): yes
```

```
Router(config)#
```

Example: Accepting an EULA for the Inter-Chassis Redundancy License

The following example shows the acceptance of an EULA for the application redundancy feature:

```
Router(config-red)#application redundancy
```

```
PLEASE READ THE FOLLOWING TERMS CAREFULLY. INSTALLING THE LICENSE OR LICENSE KEY
PROVIDED FOR ANY CISCO PRODUCT FEATURE OR USING SUCH PRODUCT FEATURE CONSTITUTES
YOUR FULL ACCEPTANCE OF THE FOLLOWING TERMS. YOU MUST NOT PROCEED FURTHER IF YOU ARE NOT
WILLING TO BE BOUND BY ALL THE TERMS SET FORTH HEREIN.
```

Use of this product feature requires an additional license from Cisco, together with an additional payment. You may use this product feature on an evaluation basis, without payment to Cisco, for 60 days. Your use of the product, including during the 60 day evaluation period, is subject to the Cisco end user license agreement http://www.cisco.com/en/US/docs/general/warranty/English/EU1KEN_.html If you use the product feature beyond the 60 day evaluation period, you must submit the appropriate payment to

Cisco for the license. After the 60 day evaluation period, your use of the product feature will be governed solely by the Cisco end user license agreement (link above), together with any supplements relating to such product feature. The above applies even if the evaluation license is not automatically terminated and you do not receive any notice of the expiration of the evaluation period. It is your responsibility to determine when the evaluation period is complete and you are required to make payment to Cisco for your use of the product feature beyond the evaluation period.

Your acceptance of this agreement for the software features on one product shall be deemed your acceptance with respect to all such software on all Cisco products you purchase which includes the same software. (The foregoing notwithstanding, you must purchase a license for each software feature you use past the 60 days evaluation period, so that if you enable a software feature on 1000 devices, you must purchase 1000 licenses for use past the 60 day evaluation period.)

Activation of the software command line interface will be evidence of your acceptance of this agreement.

ACCEPT? (yes/[no]): yes

Example: IPSec

Configure map or tunnels to the interface to trigger the EULA. Perform the following actions when required:

step1:

```
Device#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)#crypto isakmp policy 1
Device(config-isakmp)#encryption aes
Device(config-isakmp)#hash md5
Device(config-isakmp)#group 2
Device(config-isakmp)#lifetime 86400
Device(config-isakmp)#authentication pre-share
Device(config-isakmp)#exit
```

step2:

```
Device(config)#crypto isakmp key cisco address 10.10.0.0
```

step3:

```
Device(config)#crypto ipsec transform-set trans esp-aes esp-md5-hmac
Device(cfg-crypto-trans)#mode transport
Device(cfg-crypto-trans)#exit
```

step4:

```
Device(config)#crypto map map1 10 ipsec-isakmp
% NOTE: This new crypto map will remain disabled until a peer
and a valid access list have been configured.
Device(config-crypto-map)#set transform-set trans
Device(config-crypto-map)#set peer 10.10.0.0
Device(config-crypto-map)#match address 101
Device(config-crypto-map)#exit
```

step5:

```
Device(config)#access-list 101 permit ip 192.168.2.0 0.0.0.255 192.168.1.0 0.0.0.255
Device(config)#access-list 102 permit ip 100.100.100.0 0.0.0.255 100.100.100.0 0.0.0.255
Device(config)#exit
```

step6:

```
Device#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)#int GigabitEthernet0/0/1
Device(config-if)#crypto map map1
Device(config-if)#end
```

Example: Accepting an EULA for the Lawful Intercept License

The following example shows the acceptance of an EULA for the lawful intercept feature. The following MIBs are required to activate lawful intercept license:

- snmp-server view INTERCEPT_VIEW ciscoIpTapMIB
- snmp-server view INTERCEPT_VIEW cisco802TapMIB
- snmp-server view INTERCEPT_VIEW ciscoTap2MIB

```
Router(config-red)#snmp-server view INTERCEPT_VIEW ciscoIpTapMIB included
```

```
PLEASE READ THE FOLLOWING TERMS CAREFULLY. INSTALLING THE LICENSE OR LICENSE KEY
PROVIDED FOR ANY CISCO PRODUCT FEATURE OR USING SUCH PRODUCT FEATURE CONSTITUTES
YOUR FULL ACCEPTANCE OF THE FOLLOWING TERMS. YOU MUST NOT PROCEED FURTHER IF YOU ARE NOT
WILLING TO BE BOUND BY ALL THE TERMS SET FORTH HEREIN.
```

```
Use of this product feature requires an additional license from Cisco, together with an
additional payment. You may use this product feature on an evaluation basis, without
payment to Cisco, for 60 days. Your use of the product, including during the 60 day
evaluation period, is subject to the Cisco end user license agreement
http://www.cisco.com/en/US/docs/general/warranty/English/EU1KEN_.html If you use the product
feature beyond the 60 day evaluation period, you must submit the appropriate payment to
Cisco for the license. After the 60 day evaluation period, your use of the product
feature will be governed solely by the Cisco end user license agreement (link above),
together with any supplements relating to such product feature. The above applies
even if the evaluation license is not automatically terminated and you do not receive
any notice of the expiration of the evaluation period. It is your responsibility to
determine when the evaluation period is complete and you are required to make payment to
Cisco for your use of the product feature beyond the evaluation period.
```

```
Your acceptance of this agreement for the software features on one product shall be
deemed your acceptance with respect to all such software on all Cisco products you
purchase which includes the same software. (The foregoing notwithstanding, you must
purchase a license for each software feature you use past the 60 days evaluation period,
so that if you enable a software feature on 1000 devices, you must purchase 1000
licenses for use past the 60 day evaluation period.)
```

```
Activation of the software command line interface will be evidence of your acceptance of
this agreement.
ACCEPT? (yes/[no]): yes
```

Sample Output for show Commands

Sample Output for the show license EULA Command

```
Router#show license EULA
Feature name          EULA Accepted
-----
adventerprise        yes
advipservices        no
ipbase                n/a
avc                   n/a
broadband             n/a
broadband_4k         n/a
cube_250              n/a
cube_250_red         n/a
```

Sample Output for the show license all Command

```

cube_ent_100          n/a
cube_ent_100_red     n/a
cube_lab             n/a
cube_video_b2btp     n/a
cube_video_b2btp_red n/a
firewall             n/a
fpi                  n/a
fwnat_red            no
gtp_addon_aic        n/a
internal_service     n/a
ipsec                no
lawful_intr          no
lisp                  n/a
nat64_stateful_2m    n/a
otv                  n/a
sgt_fw               n/a
sw_redundancy        yes
throughput_10g       no
throughput_20g       no
throughput_36g       no
vpls                  n/a

```

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Use of this product feature requires an additional license from Cisco, together with an additional payment. You may use this product feature on an evaluation basis, without payment to Cisco, for 60 days. Your use of the product, including during the 60 day evaluation period, is subject to the Cisco end user license agreement

http://www.cisco.com/en/US/docs/general/warranty/English/EU1KEN_.html

If you use the product feature beyond the 60 day evaluation period, you must submit the appropriate payment to Cisco for the license. After the 60 day evaluation period, your use of the product feature will be governed solely by the Cisco end user license agreement (link above), together with any supplements relating to such product feature. The above applies even if the evaluation license is not automatically terminated and you do not receive any notice of the expiration of the evaluation period. It is your responsibility to determine when the evaluation period is complete and you are required to make payment to Cisco for your use of the product feature beyond the evaluation period.

Your acceptance of this agreement for the software features on one product shall be deemed your acceptance with respect to all such software on all Cisco products you purchase which includes the same software. (The foregoing notwithstanding, you must purchase a license for each software feature you use past the 60 days evaluation period, so that if you enable a software feature on 1000 devices, you must purchase 1000 licenses for use past the 60 day evaluation period.)

Activation of the software command line interface will be evidence of your acceptance of this agreement.

Sample Output for the show license all Command

```

Router#show license all
License Store: Primary License Storage
License Store: Built-In License Storage
StoreIndex: 0   Feature: adventerprise           Version: 1.0
                License Type: EvalRightToUse

```

```
License State: Active, In Use
  Evaluation total period: 8 weeks 4 days
  Evaluation period left: 6 weeks 2 days
  Period used: 2 weeks 1 day
  Transition date: Aug 24 2012 05:14:39
License Count: Non-Counted
License Priority: Low
StoreIndex: 1 Feature: advipservices Version: 1.0
License Type: EvalRightToUse
License State: Active, Not in Use, EULA not accepted
  Evaluation total period: 8 weeks 4 days
  Evaluation period left: 8 weeks 4 days
  Period used: 0 minute 0 second
License Count: Non-Counted
License Priority: None
StoreIndex: 2 Feature: fwnat_red Version: 1.0
License Type: EvalRightToUse
License State: Active, Not in Use, EULA not accepted
  Evaluation total period: 8 weeks 4 days
  Evaluation period left: 8 weeks 4 days
  Period used: 0 minute 0 second
License Count: Non-Counted
License Priority: None
StoreIndex: 3 Feature: ipsec Version: 1.0
License Type: EvalRightToUse
License State: Active, Not in Use, EULA not accepted
  Evaluation total period: 8 weeks 4 days
  Evaluation period left: 8 weeks 4 days
  Period used: 0 minute 0 second
License Count: Non-Counted
License Priority: None
StoreIndex: 4 Feature: lawful_intr Version: 1.0
License Type: EvalRightToUse
License State: Active, Not in Use, EULA not accepted
  Evaluation total period: 8 weeks 4 days
  Evaluation period left: 8 weeks 4 days
  Period used: 0 minute 0 second
License Count: Non-Counted
License Priority: None
StoreIndex: 5 Feature: sw_redundancy Version: 1.0
License Type: RightToUse
License State: Active, In Use
License Count: Non-Counted
License Priority: Low
StoreIndex: 6 Feature: throughput_10g Version: 1.0
License Type: EvalRightToUse
License State: Active, Not in Use, EULA not accepted
  Evaluation total period: 8 weeks 4 days
  Evaluation period left: 8 weeks 4 days
  Period used: 0 minute 0 second
License Count: Non-Counted
License Priority: None
StoreIndex: 7 Feature: throughput_20g Version: 1.0
License Type: EvalRightToUse
License State: Active, Not in Use, EULA not accepted
  Evaluation total period: 8 weeks 4 days
  Evaluation period left: 8 weeks 4 days
  Period used: 0 minute 0 second
License Count: Non-Counted
License Priority: None
StoreIndex: 8 Feature: throughput_36g Version: 1.0
License Type: EvalRightToUse
License State: Active, Not in Use, EULA not accepted
  Evaluation total period: 8 weeks 4 days
```

```

Evaluation period left: 8 weeks 4 days
Period used: 0 minute 0 second
License Count: Non-Counted
License Priority: None

```

Cisco ONE Suites

Cisco ONE Suites is a new way for customers to purchase infrastructure software. Cisco ONE offers a simplified purchasing model, centered on common customer scenarios in the data center, wide area network, and local access networks.

Smart Licensing supports Smart License Cisco ONE suite level licenses and image licenses, such as ipbase, Advanced IP Services (AIS), Advanced Enterprise Services (AES) and feature license and throughput performance, crypto throughput and port licensing on ASR 1000 Aggregation Series Routers.

To know more about Cisco One Suites, please refer to [Cisco ONE Suites](#).

How to Activate Cisco One Suite License

SUMMARY STEPS

1. enable
2. configure terminal
3. license boot suite suite-name
4. exit
5. reload

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables the privileged EXEC mode. Enter your password if prompted.
Step 2	configure terminal Example: Router#configure terminal	Enters the global configuration mode.
Step 3	license boot suite suite-name Example: Router(config)# license boot suite FoundationSuiteK9	Enables the suite license. Note This command is required for activating both the evaluation and permanent licenses.
Step 4	exit Example: Router(config)#exit	Exits the global configuration mode.

	Command or Action	Purpose
Step 5	<pre>reload</pre> <p>Example:</p> <pre>Router# reload</pre>	Reloads the router. A reload is required to activate the software suite.

Example

The following example shows how to activate an suite license:

```
Router>enable
Router#configure terminal
Router(config)#license boot suite FoundationSuiteK9
```

PLEASE READ THE FOLLOWING TERMS CAREFULLY. INSTALLING THE LICENSE OR LICENSE KEY PROVIDED FOR ANY CISCO PRODUCT FEATURE OR USING SUCH PRODUCT FEATURE CONSTITUTES YOUR FULL ACCEPTANCE OF THE FOLLOWING TERMS. YOU MUST NOT PROCEED FURTHER IF YOU ARE NOT WILLING TO BE BOUND BY ALL THE TERMS SET FORTH HEREIN.

Use of this product feature requires an additional license from Cisco, together with an additional payment. You may use this product feature on an evaluation basis, without payment to Cisco, for 60 days. Your use of the product, including during the 60 day evaluation period, is subject to the Cisco end user license agreement http://www.cisco.com/en/US/docs/general/warranty/English/EU1KEN_.html If you use the product feature beyond the 60 day evaluation period, you must submit the appropriate payment to Cisco for the license. After the 60 day evaluation period, your use of the product feature will be governed solely by the Cisco end user license agreement (link above), together with any supplements relating to such product feature. The above applies even if the evaluation license is not automatically terminated and you do not receive any notice of the expiration of the evaluation period. It is your responsibility to determine when the evaluation period is complete and you are required to make payment to Cisco for your use of the product feature beyond the evaluation period.

Your acceptance of this agreement for the software features on one product shall be deemed your acceptance with respect to all such software on all Cisco products you purchase which includes the same software. (The foregoing notwithstanding, you must purchase a license for each software feature you use past the 60 days evaluation period, so that if you enable a software feature on 1000 devices, you must purchase 1000 licenses for use past the 60 day evaluation period.)

Activation of the software command line interface will be evidence of your acceptance of this agreement.

```
ACCEPT? [yes/no]: yes
% use 'write' command to make license boot config take effect on next boot

Router(config)#
*Nov 6 01:48:34.023: %LICENSE-6-EULA_ACCEPTED: EULA for feature FoundationSuiteK9 1.0 has
been accepted. UDI=C3900-SPE100/K9:FOC14440KXB; StoreIndex=3:Built-In License Storage
Router(config)#exit
Router#write
Router#reload
```

Additional References

The following sections provide references related to the Call Home feature.

Related Documents

Related Topic	Title
Cisco IOS XE commands	Cisco IOS Master Commands List, All Releases
Explains how the Smart Call Home service offers web-based access to important information on select Cisco devices and offers higher network availability, and increased operational efficiency by providing real-time alerts.	Smart Call Home User Guide
Smart Call Home site page on Cisco.com for access to all related product information.	Cisco Smart Call Home site
Public Key Infrastructure (PKI) and Certificate Authority configuration in Cisco IOS XE software	Cisco IOS XE Security Configuration Guide: Secure Connectivity

Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

MIBs

MIB	MIBs Link
CISCO-CALLHOME-MIB	To locate and download MIBs for selected platforms, Cisco IOS XE software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	—

Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Call Home

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS XE software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.



Note The Feature Information table below lists only the Cisco IOS XE software release that introduced support for a given feature in a given Cisco IOS XE software release train. Unless noted otherwise, subsequent releases of that Cisco IOS XE software release train also support that feature.

Table 3: Feature Information for Call Home

Feature Name	Releases	Feature Information
Call Home	Cisco IOS XE Release 3.13S	<p>The Call Home feature provides e-mail-based and web-based notification of critical system events. A versatile range of message formats are available for optimal compatibility with pager services, standard e-mail, or XML-based automated parsing applications.</p> <p>The following commands were introduced or modified:</p>



CHAPTER 5

Configuring Call Home

The Call Home feature provides e-mail-based and web-based notification of critical system events. A versatile range of message formats are available for optimal compatibility with pager services, standard e-mail, or XML-based automated parsing applications. Common uses of this feature may include direct paging of a network support engineer, e-mail notification to a Network Operations Center, XML delivery to a support website, and utilization of Cisco Smart Call Home services for direct case generation with the Cisco Systems Technical Assistance Center (TAC).

- [Finding Feature Information, on page 53](#)
- [Prerequisites for Call Home, on page 53](#)
- [Information About Call Home, on page 54](#)
- [How to Configure Call Home, on page 55](#)
- [Additional References, on page 94](#)
- [Feature Information for Call Home, on page 95](#)

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <https://cfng.cisco.com/>. An account on Cisco.com is not required.

Prerequisites for Call Home

How you configure Call Home depends on how you intend to use the feature. Consider the following requirements before you configure Call Home:

- Obtain e-mail, phone, and street address information for the Call Home contact to be configured so that the receiver can determine the origin of messages received.
- Identify the name or IPv4 address of a primary Simple Mail Transfer Protocol (SMTP) server and any backup servers, if using e-mail message delivery.
- Verify IP connectivity from the router to the e-mail server(s) or the destination HTTP server.

- If Cisco Smart Call Home is used, an active service contract covering the device is required to provide full SCH service.

Information About Call Home

Call Home provides e-mail-based and web-based notification of critical system events. A versatile range of message formats are available for optimal compatibility with pager services, standard e-mail, or XML-based automated parsing applications. Common uses of this feature may include direct paging of a network support engineer, e-mail notification to a Network Operations Center, XML delivery to a support website, and utilization of Cisco Smart Call Home services for direct case generation with the Cisco Systems Technical Assistance Center (TAC).

The Call Home feature can deliver alert messages containing information on configuration, environmental conditions, inventory, syslog, and crash events.

The Call Home feature can deliver alerts to multiple recipients, referred to as *Call Home destination profiles*, each with configurable message formats and content categories. A predefined destination profile (CiscoTAC-1) is provided, and you also can define your own destination profiles. The CiscoTAC-1 profile is used to send alerts to the backend server of the Smart Call Home service, which can be used to create service requests to Cisco TAC, the service will depend on the Smart Call Home service support in place for your device and the severity of the alert.

Flexible message delivery and format options make it easy to integrate specific support requirements.

Benefits of Using Call Home

The Call Home feature offers the following benefits:

- Multiple message-format options:
 - Short Text—Suitable for pagers or printed reports.
 - Plain Text—Full formatted message information suitable for human reading.
 - XML—Matching readable format using Extensible Markup Language (XML) and Adaptive Markup Language (AML) document type definitions (DTDs). The XML format enables communication with the Cisco Smart Call Home server.
- Multiple concurrent message destinations.
- Multiple message categories, including configuration, environmental conditions, inventory, syslog, and crash events
- Filtering of messages by severity and pattern matching.
- Scheduling of periodic message sending.

Obtaining Smart Call Home Services

If you have a service contract directly with Cisco, you can register for the Smart Call Home service. Smart Call Home analyzes Smart Call Home messages and provides background information and recommendations. For critical issues, Automatic Service Requests are generated with the Cisco TAC.

Smart Call Home offers the following features:

- Continuous device health monitoring and real-time alerts.

- Analysis of Smart Call Home messages and, if needed, Automatic Service Request generation routed to the correct TAC team, including detailed diagnostic information to speed problem resolution.
- Secure message transport directly from your device or through an HTTP proxy server or a downloadable Transport Gateway (TG). You can use a TG aggregation point to support multiple devices or in cases where security dictates that your devices may not be connected directly to the Internet.
- Web-based access to Smart Call Home messages and recommendations, inventory, and configuration information for all Smart Call Home devices provides access to associated field notices, security advisories, and end-of-life information.

You need the following items to register for Smart Call Home:

- SMARTnet contract number for your router.
- Your e-mail address
- Your Cisco.com username

For information on how to configure and register a Cisco ASR 1000 Series Router for Smart Call Home, see the [Smart Call Home Quick Start Configuration Guide](#)

Anonymous Reporting

Smart Call Home is a service capability that is included with many Cisco service contracts and is designed to assist you help resolve problems quickly. In addition, the information gained from crash messages helps Cisco understand equipment and issues occurring in the field. You can enable Anonymous Reporting without Smart Call Home. Anonymous Reporting allows Cisco to securely receive minimal error and health information from the device. If you enable Anonymous Reporting, your identity remains anonymous, and no identifying information is sent.



Note When you enable Anonymous Reporting, you acknowledge your consent to transfer specified data. The data is shared with Cisco or to vendors operating on behalf of Cisco (including countries outside the United States). Cisco maintains the privacy of all customers. For information about how Cisco treats personal information, see the Cisco Privacy Statement at [Cisco Online Privacy Statement](#).

When Call Home is configured in an anonymous way, only crash, inventory, and test messages are sent to Cisco. No identifying information is sent.

For more information about what is sent in these messages, see the Alert Group Trigger Events and Commands section.

How to Configure Call Home

Configuring Smart Call Home (Single Command)

To enable all Call Home basic configurations using a single command, perform the following steps:

SUMMARY STEPS

1. **configure terminal**

2. **call-home reporting** {**anonymous** | **contact-email-addr** *email-address*} [**http-proxy** {*ipv4-address* | *ipv6-address* | **name**} **port** *port number*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	<p>configure terminal</p> <p>Example:</p> <pre>Device# configure terminal</pre>	Enters global configuration mode.
Step 2	<p>call-home reporting {anonymous contact-email-addr <i>email-address</i>} [http-proxy {<i>ipv4-address</i> <i>ipv6-address</i> name} port <i>port number</i>]</p> <p>Example:</p> <pre>Device(config)# call-home reporting contact-email-addr email@company.com</pre>	<p>Enables all Call Home basic configurations using a single command.</p> <ul style="list-style-type: none"> • anonymous—Enables Call-Home TAC profile to only send crash, inventory, and test messages and send the messages in an anonymous way. • contact-email-addr—Enables Smart Call Home service full reporting capability and sends a full inventory message from Call-Home TAC profile to Smart Call Home server to start full registration process. • http-proxy {<i>ipv4-address</i> <i>ipv6-address</i> name—An ipv4 or ipv6 address or server name. Maximum length is 64. • port <i>port number</i>—Port number. Range is 1 to 65535. <p>Note HTTP proxy option allows you to make use of your own proxy server to buffer and secure internet connections from your devices.</p> <p>Note After successfully enabling Call Home either in anonymous or full registration mode using the call-home reporting command, an inventory message is sent out. If Call Home is enabled in anonymous mode, an anonymous inventory message is sent out. If Call Home is enabled in full registration mode, a Full Inventory message for full registration mode is sent. For more information about what is sent in these messages, see the “Alert Group Trigger Events and Commands” section.</p>

Configuring and Enabling Smart Call Home

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **profile CiscoTAC-1**
4. **destination transport-method http**
5. **active**
6. **exit**
7. **contact-email-addr** *email-address*
8. **exit**
9. service call-home
10. **exit**
11. copy running-config startup-config

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 2	call-home Example: Device(config)# call-home	Enters call home configuration mode.
Step 3	profile CiscoTAC-1 Example: Device(config-call-home)# profile CiscoTAC-1	Enters call home destination profile configuration mode for the CiscoTAC-1 destination profile.
Step 4	destination transport-method http Example: Device(cfg-call-home-profile)# destination transport-method http	(Required only if using HTTPS) Configures the message transport method for http.
Step 5	active Example: Device(cfg-call-home-profile)# active	Enables the destination profile.

	Command or Action	Purpose
Step 6	exit Example: Device(cfg-call-home-profile)# exit	Exits call home destination profile configuration mode and returns to call home configuration mode.
Step 7	contact-email-addr <i>email-address</i> Example: Device(cfg-call-home)# contact-email-addr username@example.com	Assigns the customer's e-mail address. Enter up to 200 characters in e-mail address format with no spaces.
Step 8	exit Example: Device(cfg-call-home)# exit	Exits call home configuration mode and returns to global configuration mode.
Step 9	service call-home Example: Device(config)# service call-home	Enables the Call Home feature.
Step 10	exit Example: Device(config)# exit	Exits global configuration mode and returns to privileged EXEC mode.
Step 11	copy running-config startup-config Example: Device# copy running-config startup-config	Saves the configuration to NVRAM.

Enabling and Disabling Call Home

To enable or disable the Call Home feature, complete the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **service call-home**
3. **no service call-home**

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 2	service call-home Example: Router(config)# service call-home	Enables the Call Home feature.
Step 3	no service call-home Example: Router(config)# no service call-home	Disables the Call Home feature.

Configuring Contact Information

Each router must include a contact email address. You can optionally include a phone number, street address, contract ID, customer ID, and site ID.

To assign the contact information, complete the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **contact-email-addr** *email-address*
4. **phone-number** *+phone-number*
5. **street-address** *street-address*
6. **customer-id** *text*
7. **site-id** *text*
8. **contract-id** *text*

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure terminal Example: Router> configure terminal	Enters global configuration mode.
Step 2	call-home Example:	Enters call home configuration mode.

Example

	Command or Action	Purpose
	Router (config) # call-home	
Step 3	contact-email-addr <i>email-address</i> Example: Router (cfg-call-home) # contact-email-addr username@example.com	Assigns the customer's email address. Enter up to 200 characters in email address format with no spaces.
Step 4	phone-number <i>+phone-number</i> Example: Router (cfg-call-home) # phone-number +1-222-333-4444	(Optional) Assigns the customer's phone number. Note The number must start with a plus (+) prefix, and may contain only dashes (-) and numbers. Enter up to 16 characters. If you include spaces, you must enclose your entry within double quotation marks (" ").
Step 5	street-address <i>street-address</i> Example: Router (cfg-call-home) # street-address "1234 Any Street, Any city, Any state, 12345"	(Optional) Assigns the customer's street address where RMA equipment can be shipped. Enter up to 200 characters. If you include spaces, you must enclose your entry within double quotation marks (" ").
Step 6	customer-id <i>text</i> Example: Router (cfg-call-home) # customer-id Customer1234	(Optional) Identifies the customer ID. Enter up to 64 characters. If you include spaces, you must enclose your entry within double quotation marks (" ").
Step 7	site-id <i>text</i> Example: Router (cfg-call-home) # site-id Site1ManhattanNY	(Optional) Identifies the customer site ID. Enter up to 200 characters. If you include spaces, you must enclose your entry within double quotation marks (" ").
Step 8	contract-id <i>text</i> Example: Router (cfg-call-home) # contract-id Company1234	(Optional) Identifies the customer's contract ID for the router. Enter up to 64 characters. If you include spaces, you must enclose your entry within double quotation marks (" ").

Example

The following example shows the configuration of contact information:

```
Device# configure terminal
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Device(config)# call-home

Device(cfg-call-home)# contact-email-addr username@example.com

Device(cfg-call-home)# phone-number +1-222-333-4444

Device(cfg-call-home)# street-address "1234 Any Street, Any city, Any state, 12345"

Device(cfg-call-home)# customer-id Customer1234

Device(cfg-call-home)# site-id Site1ManhattanNY

Device(cfg-call-home)# contract-id Company1234

Device(cfg-call-home)# exit
```

Configuring a Destination Profile

A destination profile contains the required delivery information for an alert notification. You can configure multiple destination profiles of one or more type.

You can create and define a new destination profile or copy and use another destination profile. If you define a new destination profile, you must assign a profile name. If you define a new destination profile, you must assign a profile name.

If you use the Cisco Smart Call Home service, the destination profile must use the XML message format.



Note The Call Home feature provides a predefined profile named CiscoTAC-1 that is inactive by default. The CiscoTAC-1 profile is intended for use with the Smart Call Home service, which requires certain additional configuration steps to enable the service with the Call Home feature. For more information about this profile, see the [Using the Predefined CiscoTAC-1 Destination Profile](#).

You can configure the following attributes for a destination profile:

- Profile name—String that uniquely identifies each user-defined destination profile. The profile name is limited to 31 characters and is not case-sensitive. You cannot use **all** as a profile name.
- Transport method—The transport mechanism, either e-mail or HTTP (including HTTPS), for delivery of alerts.
 - For user-defined destination profiles, e-mail is the default, and you can enable one or both transport mechanisms. If you disable both methods, e-mail is enabled.
 - For the predefined Cisco TAC profile, you can enable either transport mechanism, but not both.
- Destination address—The actual address related to the transport method by which the alert should be sent.

In Call Home version 3, you can change the destination of the CiscoTAC-1 profile.

- **Message formatting**—The message format used for sending the alert. The format options for a user-defined destination profile are long-text, short-text, or XML. The default is XML. For the predefined Cisco TAC profile, only XML is allowed. If you use the Cisco Smart Call Home service, the destination profile must use the XML message format.
- **Message size**—The maximum destination message size. The valid range is 50 to 3,145,728 bytes and the default is 3,145,728 bytes.
- **Reporting method**—You can choose which data to report for a profile. You can report Smart Call Home data or Smart Licensing data for a profile. Only one active profile is allowed to report Smart Licensing data at a time.
- **Anonymous reporting**—You can choose for your customer identity to remain anonymous, and no identifying information is sent.
- **Subscribing to interesting alert-groups**—You can choose to subscribe to alert-groups highlighting your interests.

This section includes the following tasks:

Creating a New Destination Profile

To create and configure a new destination profile, complete the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **profile *name***
4. **destination transport-method email**
5. **destination address email *email-address***
6. **destination preferred-msg-format {long-text | short-text | xml}**
7. **destination message-size *bytes***
8. **active**
9. **exit**
10. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 2	call-home Example: Device (config)# call-home	Enters call home configuration mode.

	Command or Action	Purpose
Step 3	<p>profile <i>name</i></p> <p>Example:</p> <pre>Device(config-call-home)# profile profile1</pre>	Enters call home destination profile configuration mode for the specified destination profile name. If the specified destination profile does not exist, it is created.
Step 4	<p>destination transport-method <i>email</i></p> <p>Example:</p> <pre>Device(cfg-call-home-profile)# destination transport-method email</pre>	(Optional) Configures the message transport method for email. This is the default.
Step 5	<p>destination address email <i>email-address</i></p> <p>Example:</p> <pre>Device(cfg-call-home-profile)# destination address email myaddress@example.com</pre>	(Required) Configures the destination e-mail address to which Call Home messages are sent.
Step 6	<p>destination preferred-msg-format {<i>long-text</i> <i>short-text</i> <i>xml</i>}</p> <p>Example:</p> <pre>Device(cfg-call-home-profile)# destination preferred-msg-format xml</pre>	(Optional) Configures a preferred message format. The default is XML.
Step 7	<p>destination message-size <i>bytes</i></p> <p>Example:</p> <pre>Device(cfg-call-home-profile)# destination message-size 3145728</pre>	(Optional) Configures a maximum destination message size (from 50 to 3145728 bytes) for the destination profile. The default is 3145728 bytes.
Step 8	<p>active</p> <p>Example:</p> <pre>Device(cfg-call-home-profile)# active</pre>	(Optional) Enables the destination profile. By default, a user-defined profile is enabled when it is created.
Step 9	<p>exit</p> <p>Example:</p> <pre>Device(cfg-call-home-profile)# exit</pre>	Exits call home destination profile configuration mode and returns to call home configuration mode.
Step 10	<p>end</p> <p>Example:</p> <pre>Device(cfg-call-home)# end</pre>	Returns to privileged EXEC mode.

Setting Profiles to Anonymous Mode

To create a new destination profile by copying an existing profile, complete the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **copy profile** *source-profile target-profile*

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 2	call-home Example: Device(config)# call-home	Enters call home configuration mode.
Step 3	copy profile <i>source-profile target-profile</i> Example: Device(cfg-call-home)# copy profile profile1 profile2	Creates a new destination profile with the same configuration settings as the existing destination profile, where:

Subscribing to Alert Groups

An alert group is a predefined subset of Call Home alerts supported in all routers. Different types of Call Home alerts are grouped into different alert groups depending on their type. The following alert groups are available:

- Configuration
- Environment
- Inventory
- Syslog
- Crash

The triggering events for each alert group are listed in the [Alert Group Trigger Events and Commands](#), and the contents of the alert group messages are listed in the [Message Contents](#).

You can select one or more alert groups to be received by a destination profile.



Note A Call Home alert is only sent to destination profiles that have subscribed to the alert group containing that Call Home alert. In addition, the alert group must be enabled.

Periodic Notification

When you subscribe a destination profile to either the Configuration or the Inventory alert group, you can choose to receive the alert group messages asynchronously or periodically at a specified time. The sending period can be one of the following:

- **Daily**—Specify the time of day to send, using an hour:minute format hh:mm, with a 24-hour clock (for example, 14:30).
- **Weekly**—Specify the day of the week and time of day in the format day hh:mm, where the day of the week is spelled out (for example, monday).
- **Monthly**—Specify the numeric date, from 1 to 31, and the time of day, in the format date hh:mm.

Message Severity Threshold

When you subscribe a destination profile to the Environment or Syslog alert group, you can set a threshold for the sending of alert group messages based on the message's level of severity. Any message with a severity lower than the specified threshold of the destination profile is not sent to the destination.



Note When syslog level is changed via IOS CLI, the new value is propagated to non-IOS processes as well, with the result that these processes no longer send syslog messages of lower priority to IOS to process, thus "saving" CPU cycles for IOS.

The table below lists the keywords used to configure the severity, which range from catastrophic (level 9, highest level of urgency) to debugging (level 0, lowest level of urgency). If no severity threshold is configured, the default is debugging (level 0). However, the default is not recommended due to the number of messages that will be triggered.



Note Call Home severity levels are not the same as system message logging severity levels.

Table 4: Severity and Syslog Level Mapping

Level	Keyword	Syslog Level	Description
9	catastrophic	N/A	Network-wide catastrophic failure.
8	disaster	N/A	Significant network impact.
7	fatal	Emergency (0)	System is unusable.
6	critical	Alert (1)	Critical conditions, immediate attention needed.
5	major	Critical (2)	Major conditions.
4	minor	Error (3)	Minor conditions.
3	warning	Warning (4)	Warning conditions.
2	notification	Notice (5)	Basic notification and informational messages. Possibly independently insignificant.

Level	Keyword	Syslog Level	Description
1	normal	Information (6)	Normal event signifying return to normal state.
0	debugging	Debug (7)	Debugging messages.

Configuring Snapshot Command List

To configure the snapshot command list, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **[no | default] alert-group-config snapshot**
4. **[no | default] add-command *command string***
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 2	call-home Example: Device(config)# call-home	Enters Call Home configuration mode.
Step 3	[no default] alert-group-config snapshot Example: Device(cfg-call-home)# alert-group-config snapshot	Enters snapshot configuration mode. The no or default command removes the snapshot command.
Step 4	[no default] add-command <i>command string</i> Example: Device(cfg-call-home-snapshot)# add-command "show version"	Adds the command to the Snapshot alert group. The no or default command removes the corresponding command. • <i>command string</i> —Cisco IOS command. Maximum length is 128.
Step 5	end Example: Device(cfg-call-home-snapshot)# exit	Exits and saves the configuration.

Configuring General Email Options

Configuring the Mail Server

To use the email message transport, you must configure at least one Simple Mail Transfer Protocol (SMTP) email server address. You can specify up to four backup email servers, for a maximum of five total mail-server definitions.

Consider the following guidelines when configuring the mail server:

- Backup email servers can be defined by repeating the **mail-server** command using different priority numbers.
- The **mail-server priority number** parameter can be configured from 1 to 100. The server with the highest priority (lowest priority number) is tried first.

To configure general email options, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **mail-server** {*ipv4-address* | *name*} **priority number**
4. **sender from** *email-address*
5. **sender reply-to** *email-address*
6. **source-interface** *interface-name*
7. **source-ip-address** *ipv4/ipv6 address*
8. **vrfvrf-name**

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 2	call-home Example: Device(config)# call-home	Enters call home configuration mode.
Step 3	mail-server { <i>ipv4-address</i> <i>name</i> } priority number Example: Device(cfg-call-home)# mail-server stmp.example.com priority 1	Assigns an email server address and its relative priority among configured email servers. Provide either of the following: <ul style="list-style-type: none"> • The email server's IP address or • The email server's fully qualified domain name (FQDN) of 64 characters or less.

	Command or Action	Purpose
		Assign a priority number between 1 (highest priority) and 100 (lowest priority).
Step 4	<p>sender from <i>email-address</i></p> <p>Example:</p> <pre>Device(cfg-call-home)# sender from username@example.com</pre>	(Optional) Assigns the email address that appears in the from field in Call Home email messages. If no address is specified, the contact email address is used.
Step 5	<p>sender reply-to <i>email-address</i></p> <p>Example:</p> <pre>Device(cfg-call-home)# sender reply-to username@example.com</pre>	(Optional) Assigns the email address that appears in the reply-to field in Call Home email messages.
Step 6	<p>source-interface <i>interface-name</i></p> <p>Example:</p> <pre>Device(cfg-call-home)# source-interface loopback1</pre>	<p>Assigns the source interface name to send call-home messages.</p> <p><i>interface-name</i>—Source interface name. Maximum length is 64.</p> <p>Note For HTTP messages, use the ip http client source-interface interface-name command in global configuration mode to configure the source interface name. This command allows all HTTP clients on the device to use the same source interface.</p>
Step 7	<p>source-ip-address <i>ipv4/ipv6 address</i></p> <p>Example:</p> <pre>Device(cfg-call-home)# ip-address 209.165.200.226</pre>	<p>Assigns source IP address to send call-home messages.</p> <ul style="list-style-type: none"> <i>ipv4/ipv6 address</i>—Source IP (IPv4 or IPv6) address. Maximum length is 64.
Step 8	<p>vrf <i>vrf-name</i></p> <p>Example:</p> <pre>Device(cfg-call-home)# vrf vpn1</pre>	<p>(Optional) Specifies the VRF instance to send call-home email messages. If no vrf is specified, the global routing table is used.</p> <p>Note For HTTP messages, if the source interface is associated with a VRF, use the ip http client source-interface interface-name command in global configuration mode. This command would specify the VRF instance that is used for all HTTP clients on the device.</p>

Example: General email Options

The following example shows general email options:

```

Device# configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Device(config)# call-home

Device(cfg-call-home)# mail-server smtp.example.com priority 1

Device(cfg-call-home)# mail-server 192.168.0.1 priority 2

Device(cfg-call-home)# exit

```

Specifying HTTP Proxy Server

To specify an HTTP proxy server for sending Call Home HTTP(S) messages to a destination, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **http-proxy** *{ipv4-address | ipv6-address name} name*

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 2	call-home Example: Device(config)# call-home	Enters call home configuration mode.
Step 3	http-proxy <i>{ipv4-address ipv6-address name} name</i> Example: Device(config)# http-proxy 1.1.1.1 port 1	Specifies the proxy server for the HTTP request.

Enabling AAA Authorization to Run Cisco IOS Commands for Call Home Messages

To enable AAA authorization to run Cisco IOS commands that enable the collection of output for a Call Home message, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **aaa-authorization**
4. **aaa-authorization [username *username*]**

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 2	call-home Example: Device(config)# call-home	Enters call home configuration mode.
Step 3	aaa-authorization Example: Device(cfg-call-home)# aaa-authorization	Enables AAA authorization. Note By default, AAA authorization is disabled for Call Home.
Step 4	aaa-authorization [username <i>username</i>] Example: Device(cfg-call-home)# aaa-authorization username <i>username</i>	Specifies the username for authorization. <ul style="list-style-type: none"> • username <i>user</i>—Default username is callhome. Maximum length is 64.

Configuring Syslog Throttling

To enable or disable Call Home syslog message throttling and avoid sending repetitive Call Home syslog messages, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **[no] syslog-throttling**

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure terminal Example:	Enters global configuration mode.

	Command or Action	Purpose
	Device# configure terminal	
Step 2	call-home Example: Device(config)# call-home	Enters call home configuration mode.
Step 3	[no] syslog-throttling Example: Device(cfg-call-home)# syslog-throttling	Enables or disables Call Home syslog message throttling and avoids sending repetitive Call Home syslog messages. By default, syslog message throttling is enabled.

Configuring Call Home Data Privacy

The **data-privacy** command scrubs data, such as IP addresses, from running configuration files to protect the privacy of customers. Enabling the **data-privacy** command can affect CPU utilization when scrubbing a large amount of data. Currently, **show** command output is not being scrubbed except for configuration messages in the **show running-config all** and **show startup-config** data.

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **data-privacy {level {normal | high} | hostname}**

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 2	call-home Example: Device(config)# call-home	Enters call home configuration mode.
Step 3	data-privacy {level {normal high} hostname} Example: Device(cfg-call-home)# data-privacy level high	Scrubs data from running configuration file to protect the privacy of the user. The default data-privacy level is normal. Note Enabling the data-privacy command can affect CPU utilization when scrubbing a large amount of data. • normal —Scrubs all normal-level commands.

	Command or Action	Purpose
		<ul style="list-style-type: none"> • high—Scrubs all normal-level commands plus the IP domain name and IP address commands. • hostname—Scrubs all high-level commands plus the hostname command. <p>Note Scrubbing the hostname from configuration messages can cause Smart Call Home processing failure on some platforms.</p>

Working With Destination Profiles

This section describes some of the tasks that you can complete with destination profiles:

Activating and Deactivating a Destination Profile

Except for the predefined CiscoTAC-1 profile, all Call Home destination profiles are automatically activated once you create them. If you do not want to use a profile right way, you can deactivate the profile. The CiscoTAC-1 profile is inactive by default and must be activated to be used.

To activate or deactivate a destination profile, complete the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **profile *name***
4. **active**
5. **no active**
6. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 2	call-home Example: Router(config)# call-home	Enters call home configuration mode.
Step 3	profile <i>name</i> Example: Router(config-call-home)# profile test	Enters call home destination profile configuration mode for the specified destination profile. If the specified destination profile does not exist, it is created.

	Command or Action	Purpose
Step 4	active Example: Router(cfg-call-home-profile)# active	Enables the destination profile. By default, a new profile is enabled when it is created.
Step 5	no active Example: Router(cfg-call-home-profile)# no active	Disables the destination profile.
Step 6	end Example: Router(cfg-call-home)# end	Exits call home destination profile configuration mode and returns to privileged EXEC mode.

Renaming a Destination Profile

To change the name of an existing profile, complete the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **rename profile** *source-profile target-profile*

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 2	call-home Example: Router(config)# call-home	Enters call home configuration mode.
Step 3	rename profile <i>source-profile target-profile</i> Example: Router(cfg-call-home)# rename profile2 testprofile	Renames an existing source file, where: <ul style="list-style-type: none"> • <i>source-profile</i> —Specifies the existing name of the profile. • <i>target-profile</i> —Specifies a new name for the existing profile.

Using the Predefined CiscoTAC-1 Destination Profile

The CiscoTAC-1 profile is automatically configured in the Call Home feature for your use with the Cisco Smart Call Home service. This profile includes certain information, such as the destination e-mail address and HTTPS URL, and default alert groups for communication with the Smart Call Home service. Some of these attributes, such as the destination e-mail address, HTTPS URL, and message format cannot be modified.

You can use either email or http transport to communicate with the Smart Call Home service backend server. By default, the CiscoTAC-1 profile is inactive and uses email as the default transport method. To use email transport, you only need to enable the profile. However, to use this profile with the Cisco Smart Call Home service secure server (via HTTPS), you not only must enable the profile, but you must also change the transport method to HTTP as shown in the following example:

```
Router# configure terminal
Router(config)# call-home
Router(config-call-home)# profile CiscoTAC-1
Router(cfg-call-home-profile)# destination transport-method http
Router(cfg-call-home-profile)# active
```

For more information about additional requirements for Configuring the Smart Call Home service, see the [How To Configure Call Home to Support the Smart Call Home Service](#) section.

Verifying the Call Home Profile Configuration

To verify the profile configuration for Call Home, use the **show call-home profile** command. See [Displaying Call Home Configuration Information](#) for more information and examples.

Sending Call Home Communications Manually

You can manually send several types of Call Home communications. To send Call Home communications, complete the tasks in this section. This section contains the following subsections:

Sending a Call Home Test Message Manually

You can use the **call-home test** command to send a user-defined Call Home test message.

SUMMARY STEPS

1. **call-home test** ["*test-message*"] **profile name**

DETAILED STEPS

	Command or Action	Purpose
Step 1	call-home test [" <i>test-message</i> "] profile name Example: Router# call-home test profile profile1	Sends a test message to the specified destination profile. The user-defined test message text is optional, but must be enclosed in quotes (" ") if it contains spaces. If no user-defined message is configured, a default message is sent.

Sending Call Home Alert Group Messages Manually

You can use the **call-home send** command to manually send a specific alert group message.

Note the following guidelines when manually sending a Call Home alert group message:

- Configuration, , and inventory alert groups can be sent manually.
- When you manually trigger an alert group message and you specify a destination profile name, a message is sent to the destination profile regardless of the active status, subscription status, or severity setting of the profile.
- When you manually trigger a configuration or inventory alert group message and do not specify a destination profile name, a message is sent to all active profiles that have either a normal or periodic subscription to the specified alert group.
- When you manually trigger a diagnostic alert group message and do not specify a destination profile name, a message is sent to all active profiles that have a lower severity subscription than the severity of the diagnostic results of the specified slot.

To manually trigger Call Home alert group messages, complete the following steps:

SUMMARY STEPS

1. **call-home send alert-group configuration** [*profile name*]
2. **call-home send alert-group inventory** [*profile name*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	call-home send alert-group configuration [<i>profile name</i>] Example: <pre>Device# call-home send alert-group configuration profile CiscoTAC-1</pre>	Sends a configuration alert group message to one destination profile if specified, or to all subscribed destination profiles.
Step 2	call-home send alert-group inventory [<i>profile name</i>] Example: <pre>Device# call-home send alert-group inventory</pre>	Sends an inventory alert group message to one destination profile if specified, or to all subscribed destination profiles.

Submitting Call Home Analysis and Report Requests

The **call-home request** command allows you to submit the system information to Cisco Systems. The report provides helpful analysis and information specific to your system. You can request various reports, including security alerts, known bugs, recommendations, and the command references.

Note the following guidelines when manually sending Call Home analysis and report requests:

- If a **profile name** is specified, the request is sent to the profile. If no profile is specified, the request is sent to the Cisco TAC profile. The Call-home request can have a recipient profile that is not enabled. The recipient profile specifies the email address where the transport gateway is configured. The recipient profile allows the request message to be forwarded to the Cisco TAC and you can receive the reply from the Smart Call Home service.

Example

- The **ccoid** *user-id* is the registered identifier of the Smart Call Home user. If the *user-id* is specified, the response is sent to the email address of the registered user. If no *user-id* is specified, the response is sent to the contact email address of the device.
- Based on the keyword specifying the type of report that is requested, the following information is returned:
 - **config-sanity**—Information on the recommendations for the current running configuration.
 - **bugs-list**—Known bugs in the running version and in the currently applied features.
 - **command-reference**—Reference links to all commands in the running configuration.
 - **product-advisory**—Product Security Incident Response Team (PSIRT) notices. The PSIRT includes End of Life (EOL) or End of Sales (EOS) notices, or field notices (FN) that may affect devices in your network.

To submit a request for analysis and report information from the Cisco Output Interpreter tool, complete the following steps:

SUMMARY STEPS

1. **call-home request output-analysis** “*show-command*”
2. **call-home request** {**config-sanity** | **bugs-list** | **command-reference** | **product-advisory**}

DETAILED STEPS

	Command or Action	Purpose
Step 1	call-home request output-analysis “ <i>show-command</i> ” Example: [profile <i>name</i>] [ccoid <i>user-id</i>] Example: Device# call-home request output-analysis “ show diag ” profile TG	Sends the output of the specified show command for analysis. The show command must be contained in quotes (“”).
Step 2	call-home request { config-sanity bugs-list command-reference product-advisory } Example: [profile <i>name</i>] [ccoid <i>user-id</i>] Example: Device# call-home request config-sanity profile TG	Sends the output of a predetermined set of commands, such as the show running-config all and show version commands, for analysis. In addition, the call home request product-advisory subcommand includes all inventory alert group commands. The keyword that is specified after the call-home request command specifies the type of report requested.

Example

The following example shows a request for analysis of a user-specified **show** command:

```
Router# call-home request output-analysis "show diag" profile TG
```

Manually Sending Command Output Message for One Command or a Command List

You can use the **call-home send** command to execute a CLI command and e-mail the command output to Cisco or to an e-mail address that you specify.

Note the following guidelines when sending the output of a command:

- The specified IOS command or list of IOS commands can be any run command, including commands for all modules. The command must be contained in quotes (“”).
- If the email option is selected using the “email” keyword and an email address is specified, the command output is sent to that address. If neither the email nor the HTTP option is specified, the output is sent in long-text format with the specified service request number to the Cisco TAC (attach@cisco.com).
- If neither the “email” nor the “http” keyword is specified, the service request number is required for both long-text and XML message formats and is provided in the subject line of the email.
- If the HTTP option is specified, the CiscoTac-1 profile destination HTTP or HTTPS URL is used as the destination. The destination email address can be specified so that Smart Call Home can forward the message to the email address. The user must specify either the destination email address or an SR number but they can also specify both.

To execute a command and send the command output, complete the following step:

SUMMARY STEPS

1. **call-home send** *{cli command | cli list}* [**email** *email* **msg-format** *{long-text | xml}*] | **http** *{destination-email-addressemail}*][**tac-service-request** **SR#**]

DETAILED STEPS

	Command or Action	Purpose
Step 1	<p>call-home send <i>{cli command cli list}</i> [email <i>email</i> msg-format <i>{long-text xml}</i>] http <i>{destination-email-addressemail}</i>][tac-service-request SR#]</p> <p>Example:</p> <pre>Router# call-home send "show version;show running-config show inventory" emailsupport@example.com msg-format xml</pre>	<p>Executes the CLI or CLI list and sends output via email or HTTP.</p> <ul style="list-style-type: none"> • <i>{cli command cli list}</i>—Specifies the IOS command or list of IOS commands (separated by ‘;’). It can be any run command, including commands for all modules. The commands must be contained in quotes (“”). • email <i>email</i> msg-format <i>{long-text xml}</i>—If the email option is selected, the command output will be sent to the specified email address in long-text or XML format with the service request number in the subject. The email address, the service request number, or both must be specified. The service request number is required if the email address is not specified (default is attach@cisco.com for long-text format and callhome@cisco.com for XML format). • http <i>{destination-email-addressemail}</i>—If the http option is selected, the command output will be sent to

Example

	Command or Action	Purpose
		<p>Smart Call Home backend server (URL specified in TAC profile) in XML format.</p> <p>destination-email-address<i>email</i> can be specified so that the backend server can forward the message to the email address. The email address, the service request number, or both must be specified.</p> <ul style="list-style-type: none"> • tac-service-request SR#—Specifies the service request number. The service request number is required if the email address is not specified.

Example

The following example shows how to send the output of a CLI command to a user-specified email address:

```
Device# call-home send "show diag" email support@example.com
```

The following example shows the command output sent in long-text format to attach@cisco.com, with the SR number specified:

```
Device# call-home send "show version"; "show run tac-service-request 123456
```

The following example shows the command output sent in XML message format to callhome@cisco.com:

```
Device# call-home send "show diag" email callhome@example.com msg-format xml
```

Configuring Call Home

The Call Home feature provides e-mail-based and web-based notification of critical system events. A versatile range of message formats are available for optimal compatibility with pager services, standard e-mail, or XML-based automated parsing applications. Common uses of this feature may include direct paging of a network support engineer, e-mail notification to a Network Operations Center, XML delivery to a support website, and utilization of Cisco Smart Call Home services for direct case generation with the Cisco Systems Technical Assistance Center (TAC).

How To Configure Call Home to Support the Smart Call Home Service

This section provides an overview of the minimum steps required to configure the Call Home feature on a Cisco device, and other required supporting configuration to communicate securely with the Smart Call Home service using HTTPS:

Prerequisites

Before you configure and use the Smart Call Home Service, be sure that you have completed the following prerequisites:

- Verify that you have an active Cisco Systems service contract for the device being configured.
- Verify that you have IP connectivity to the Cisco HTTPS server.
- Obtain the latest Cisco Systems server security certificate. In Cisco IOS XE Release 2.6.0, the following shows the latest text for the Cisco Systems server security certificate:

```
MIIDAjCCAmSCEH3Z/gfPqB63EH1n+6eJNMYwDQYJKoZIhvcNAQEFBQAwwgcExCzAJ
```

```
BgNVBAYTA1VTMRcwFQYDVQKKEw5WZXXJpU2lnbiwgSW5jLjE8MDoGA1UECzMzQ2xhc3MgMyBQdWJsaWMgUHJpbWVyeSBDZXJ0aWZpY2F0aW9uIEF1dGhvcm10eSAtIEcyMTowOAYDVQQLZezEoYykgMTk5OCBWXJpU2lnbiwgSW5jLiAtIEZvciBhdXRob3JpemVkiHVzZSBvbm5MR8wHQYDVQLEExZWZXXJpU2lnbiBUcnVzdCBOZXR3b3JrMB4XDk4MDUxODAwMDAwMFoXDTE4MDgwMTIzNTk1OVowgcExCzAJBgNVBAYTA1VTMRcwFQYDVQKKEw5WZXXJpU2lnbiwgSW5jLjE8MDoGA1UECzMzQ2xhc3MgMyBQdWJsaWMgUHJpbWVyeSBDZXJ0aWZpY2F0aW9uIEF1dGhvcm10eSAtIEcyMTowOAYDVQQLZezEoYykgMTk5OCBWXJpU2lnbiwgSW5jLiAtIEZvciBhdXRob3JpemVkiHVzZSBvbm5MR8wHQYDVQLEExZWZXXJpU2lnbiBUcnVzdCBOZXR3b3JrMIGfMA0GCSqGSIb3DQEB AQUAA4GNADCBiQKBgQDMXtERXVxp0KvTuWpMmR9ZmDCOFoUgRm1HP9SFIIThbbP4pO0M8RcPO/mn+SXXwc+EY/J8Y8+iR/LGWzOOZEAEaMGAuWQcRXfH2G711Sk8UOg013gfqLptQ5GVj0VXXn7F+8qkBOvq1zdUMG+7AUcyM83cV5tkaWH4mx0ciU9cZwIDAQABMA0GCSqGSIb3DQEBBQUAA4GBAFFNzb5cy5gZnBWyAT14Lk0PZ3BwmcYQWpSkU01UbsuvDV1Ai2TT1+7eVmGSX6bEHRBhNtMsJzZoKQm5EWR0zLVznxxIqbxhAe7iF6YM40AIOW7n60RzKprxaZLvcRTDOaxxp5EJb+RxBrO6WVcmeQD2+A2iMzAo1KpYoj2dazH9
```

Declare and Authenticate a CA Trustpoint

To establish communication with the Cisco HTTPS server for Smart Call Home service, you must declare and authenticate the Cisco server security certificate.

SUMMARY STEPS

1. **configure terminal**
2. **crypto pki trustpoint *name***
3. **enrollment terminal**
4. **exit**
5. **crypto pki authenticate *name***
6. At the prompt, paste the security certificate text.
7. **quit**
8. **yes**
9. **end**
10. copy running-config startup-config

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 2	crypto pki trustpoint <i>name</i> Example: Router(config)# crypto pki trustpoint cisco	Declares a CA trustpoint on your router and enters CA trustpoint configuration mode.
Step 3	enrollment terminal Example: Router(ca-trustpoint)# enrollment terminal	Specifies a manual cut-and-paste method of certificate enrollment.

	Command or Action	Purpose
Step 4	exit Example: Router(ca-trustpoint)# exit	Exits CA trustpoint configuration mode and returns to global configuration mode.
Step 5	crypto pki authenticate name Example: Router(config)# crypto pki authenticate cisco	Authenticates the named CA. Note The CA name should match the <i>name</i> specified in the crypto pki trustpoint command.
Step 6	At the prompt, paste the security certificate text. Example: Enter the base 64 encoded CA certificate. Example: End with a blank line or the word "quit" on a line by itself Example: <Paste certificate text here>	Specifies the security certificate text.
Step 7	quit Example: quit	Specifies the end of the security certificate text.
Step 8	yes Example: % Do you accept this certificate? [yes/no]: yes	Confirms acceptance of the entered security certificate.
Step 9	end Example: Router# end	Exits global configuration mode and returns to privileged EXEC mode.
Step 10	copy running-config startup-config Example: Router# copy running-config startup-config	Saves the configuration to NVRAM.

Example: Declaring and authenticating the Cisco server security certificate

The following example shows the configuration for declaring and authenticating the Cisco server security certificate:

```

Router# configure terminal
Router(config)# crypto pki trustpoint cisco
Router(ca-trustpoint)# enrollment terminal
Router(ca-trustpoint)# exit
Router(config)# crypto pki authenticate cisco
Enter the base 64 encoded CA certificate.
End with a blank line or the word "quit" on a line by itself
MIIDAjCCAmCEH3Z/gfPqB63Ehln+6eJNMYwDQYJKoZIhvcNAQEFBQAwgCExCzAJ
BgNVBAYTAlVTMRcwFQYDVQQKEw5WZXJpU2lnbiwgSW5jLjE8MDoGA1UECzMzQ2xh
c3MgMyBQdWJsaWMMgUHJpbWVyeSBkZXJ0aWZpY2F0aW9uIEFlbGhvcml0eSAtIEcy
MTowOAYDVQQLEzEoYykgMTk5OCBWXJpU2lnbiwgSW5jLiAtIEZvciBhdXRob3Jp
emVkJHVzZSBvbm5MR8wHQYDVQQLEExZWZlJpU2lnbiBUCnVzdCB0ZXR3b3JrMB4X
DTk4MDUxODAwMDAwMFoXDTE4MDgwMTIzNTk1OVowgCExCzAJBgNVBAYTAlVTMRcw
FQYDVQQKEw5WZXJpU2lnbiwgSW5jLjE8MDoGA1UECzMzQ2xhc3MgMyBQdWJsaWMMg
UHJpbWVyeSBkZXJ0aWZpY2F0aW9uIEFlbGhvcml0eSAtIEcyMTowOAYDVQQLEzEo
YykgMTk5OCBWXJpU2lnbiwgSW5jLiAtIEZvciBhdXRob3JpemVkJHVzZSBvbm5MR8
wHQYDVQQLEExZWZlJpU2lnbiBUCnVzdCB0ZXR3b3JrMIGfMA0GCSqGSIb3DQEB
AQUAA4GNADCBiQKBgQDMXtERXVxp0KvTuWpMmR9ZmDcoFoUgRm1HP9SFIIThbbP4
pOOM8RcPO/mn+SXXwc+EY/J8Y8+iR/LGWzOOZEAEaMGAuWQcRXfH2G711Sk8UOg0
13gfqLptQ5GVj0VXXn7F+8qkBOvqlzdUMG+7AUcyM83cV5tkaWH4mx0ciU9cZwID
AQABMA0GCSqGSIb3DQEBBQUAA4GBAFFNzb5cy5gZnBWyAT14Lk0PZ3BwmcYQWpSk
U01UbSuvDV1Ai2Tt1+7eVmGSX6bEHRBhNtMsJzZoKQm5EWR0zLVznxxIqbxhAe7i
F6YM40AIow7n60RzKprxaZLvcRTDOaxxp5EJb+RxBrO6WVcmeQD2+A2iMzAo1KpY
oJ2daZH9
quit
Certificate has the following attributes:
    Fingerprint MD5: A2339B4C 747873D4 6CE7C1F3 8DCB5CE9
    Fingerprint SHA1: 85371CA6 E550143D CE280347 1BDE3A09 E8F8770F
% Do you accept this certificate? [yes/no]: yes
Trustpoint CA certificate accepted.
% Certificate successfully imported
Router(config)# end
Router# copy running-config startup-config
    
```

Start Smart Call Home Registration

To start the Smart Call Home registration process, manually send an inventory alert-group message to the CiscoTAC-1 profile.

SUMMARY STEPS

1. call-home send alert-group inventory profile CiscoTAC-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	<p>call-home send alert-group inventory profile CiscoTAC-1</p> <p>Example:</p> <pre>Device# call-home send alert-group inventory profile CiscoTAC-1</pre>	Sends an inventory alert group message to the CiscoTAC-1 destination profile.

What To Do Next

To receive an email from Cisco Systems and follow the instructions to complete the device registration in the Smart Call Home web application:

- Launch the Smart Call Home web application at the following URL:

<https://tools.cisco.com/sch/>

- Accept the Legal Agreement.
- Confirm device registration for Call Home devices with pending registration.

For more information about using the Smart Call Home web application, see *Smart Call Home User Guide*. This user guide also includes configuration examples for sending Smart Call Home messages directly from your device or through a transport gateway (TG) aggregation point. You can use a TG aggregation point in cases requiring support for multiple devices or in cases where security requirements mandate that your devices must not be connected directly to the Internet.

Displaying Call Home Configuration Information

You can use variations of the **show call-home** command to display Call Home configuration information.

To display the configured Call Home information, use one or more of the following commands:

SUMMARY STEPS

1. **show call-home**
2. **show call-home detail**
3. **show call-home alert-group**
4. **show call-home mail-server status**
5. **show call-home profile {all | name}**
6. **show call-home statistics**

DETAILED STEPS

	Command or Action	Purpose
Step 1	show call-home Example: Device# show call-home	Displays the Call Home configuration in summary.
Step 2	show call-home detail Example: Device# show call-home detail	Displays the Call Home configuration in detail.
Step 3	show call-home alert-group Example: Device# show call-home alert-group	Displays the available alert groups and their status.

	Command or Action	Purpose
Step 4	show call-home mail-server status Example: Device# show call-home mail-server status	Checks and displays the availability of the configured e-mail server(s).
Step 5	show call-home profile {all name} Example: Device# show call-home profile all	Displays the configuration of the specified destination profile. Use the all keyword to display the configuration of all destination profiles.
Step 6	show call-home statistics Example: Device# show call-home statistics	Displays the statistics of Call Home events.

Configuration Examples for Call Home

The following examples show the sample output when using different options of the **show call-home** command.

Example: Call Home Information in Summary

```

Device# show call-home
Current call home settings:
  call home feature : disable
  call home message's from address: username@example.com
  call home message's reply-to address: username@example.com
  vrf for call-home messages: Mgmt-intf
  contact person's email address: username@example.com
  contact person's phone number: +14085551234
  street address: 1234 Any Street Any city Any state 12345
  customer ID: customer@example.com
  contract ID: 123456789
  site ID: example.com
  Mail-server[1]: Address: smtp.example.com Priority: 1
  Mail-server[2]: Address: 192.168.0.1 Priority: 2
  Rate-limit: 20 message(s) per minute
Available alert groups:
  Keyword                State   Description
  -----
  configuration           Enable  configuration info
  diagnostic              Enable  diagnostic info
  environment             Enable  environmental info
  inventory               Enable  inventory info
  syslog                  Enable  syslog info
Profiles:
  Profile Name: campus-noc
  Profile Name: CiscoTAC-1

```

Example: Configured Call Home Information in Detail

```

Device# show call-home detail

```

Example: Configured Call Home Information in Detail

```

Current call home settings:
  call home feature: enable
  call home message's from address: router@example.com
  call home message's reply-to address: support@example.com
  vrf for call-home messages: Not yet set up
  contact person's email address: technical@example.com
  contact person's phone number: +1-408-555-1234
  street address: 1234 Picaboo Street, Any city, Any state, 12345
  customer ID: ExampleCorp
  contract ID: X123456789
  site ID: SantaClara
  source ip address: Not yet set up
  source interface: GigabitEthernet1
  Mail-server[1]: Address: 192.168.2.1 Priority: 1
  Mail-server[2]: Address: 223.255.254.254 Priority: 2
  http proxy: 192.168.1.1:80
  aaa-authorization: disable
  aaa-authorization username: callhome (default)
  data-privacy: normal
  syslog throttling: enable
  Rate-limit: 20 message(s) per minute
  Snapshot command[0]: show version
  Snapshot command[1]: show clock
Available alert groups:
  Keyword State Description
  -----
  configuration Enable configuration info
  crash Enable crash and traceback info
  inventory Enable inventory info
  snapshot Enable snapshot info
  syslog Enable syslog info
Profiles:
  Profile Name: campus-noc
  Profile status: ACTIVE
  Preferred Message Format: xml
  Message Size Limit: 3145728 Bytes
Transport Method: email
  Email address(es): noc@example.com
  HTTP address(es): Not yet set up
  Alert-group Severity
  -----
  configuration          normal
  crash                  normal
  inventory              normal
  Syslog-Pattern        Severity
  -----
  .*CALL_LOOP.* debug
Profile Name: CiscoTAC-1
  Profile status: INACTIVE
  Profile mode: Full Reporting
  Preferred Message Format: xml
  Message Size Limit: 3145728 Bytes
  Transport Method: email
  Email address(es): callhome@cisco.com
  HTTP address(es): https://tools.cisco.com/its/service/oddce/services/DDCEService
  Periodic configuration info message is scheduled every 14 day of the month at 11:12
  Periodic inventory info message is scheduled every 14 day of the month at 10:57
  Alert-group Severity
  -----
  crash                  normal
  Syslog-Pattern        Severity
  -----
  .*CALL_LOOP.*        debug

```

Example: Available Call Home Alert Groups

```

Device# show call-home alert-group
Available alert groups:
  Keyword State Description
-----
configuration Enable configuration info
crash Enable crash and traceback info
inventory Enable inventory info
snapshot Enable snapshot info
syslog Enable syslog info

```

Example: Email Server Status Information

```

Device# show call-home mail-server status
Please wait. Checking for mail server status ...
Mail-server[1]: Address: 192.168.2.1 Priority: 1 [Not Available]
Mail-server[2]: Address: 223.255.254.254 Priority: 2 [Available]

```

Examples: Information for All Destination Profiles

```

Device# show call-home profile all
Profile Name: campus-noc
Profile status: ACTIVE
Preferred Message Format: xml
Message Size Limit: 3145728 Bytes
Transport Method: email
Email address(es): noc@example.com
HTTP address(es): Not yet set up
Alert-group Severity
-----
configuration          normal
crash                   normal
inventory                normal
Syslog-Pattern          Severity
-----
.*CALL_LOOP.* debug
Profile Name: CiscoTAC-1
Profile status: INACTIVE
Profile mode: Full Reporting
Preferred Message Format: xml
Message Size Limit: 3145728 Bytes
Transport Method: email
Email address(es): callhome@cisco.com
HTTP address(es): https://tools.cisco.com/its/service/oddce/services/DDCEService

Periodic configuration info message is scheduled every 14 day of the month at 11:12

Periodic inventory info message is scheduled every 14 day of the month at 10:57
Alert-group          Severity
-----
crash                 normal
Syslog-Pattern        Severity
-----
.*CALL_LOOP.*        debug

```

Example: Information for a User-Defined Destination Profile

```

Device# show call-home profile campus-noc
Profile Name: campus-noc
Profile status: ACTIVE
Preferred Message Format: xml
Message Size Limit: 3145728 Bytes
Transport Method: email
Email address(es): noc@example.com
HTTP address(es): Not yet set up
Alert-group          Severity
-----
configuration        normal
crash                 normal
inventory             normal
Syslog-Pattern       Severity
-----
.*CALL_LOOP.*        debug

```

Example: Call Home Statistics

```

Device# show call-home statistics
Message Types      Total          Email          HTTP
-----
Total Success      3              3              0
  Config           3              3              0
  Diagnostic        0              0              0
  Environment       0              0              0
  Inventory         2              2              0
  SysLog            0              0              0
  Test              0              0              0
  Request           0              0              0
  Send-CLI         0              0              0
Total In-Queue     0              0              0
  Config           0              0              0
  Diagnostic        0              0              0
  Environment       0              0              0
  Inventory         0              0              0
  SysLog            0              0              0
  Test              0              0              0
  Request           0              0              0
  Send-CLI         0              0              0
Total Failed       0              0              0
  Config           0              0              0
  Diagnostic        0              0              0
  Environment       0              0              0
  Inventory         0              0              0
  SysLog            0              0              0
  Test              0              0              0
  Request           0              0              0
  Send-CLI         0              0              0
Total Ratelimit
  -dropped         0              0              0
  Config           0              0              0
  Diagnostic        0              0              0
  Environment       0              0              0
  Inventory         0              0              0
  SysLog            0              0              0
  Test              0              0              0
  Request           0              0              0

```

```

Send-CLI      0
Last call-home message sent time: 2010-01-11 18:32:32 GMT+00:00

```

Default Settings

Lists of default Call Home settings.

Parameters	Default
Call Home feature status	Disabled
User-defined profile status	Active
Predefined Cisco TAC profile status	Inactive
Transport method	E-mail
Message format type	XML
Destination message size for a message sent in long text, short text, or XML format	3,145,728
Alert group status	Enabled
Call Home message severity threshold	0 (debugging)
Message rate limit for messages per minute	20
AAA Authorization	Disabled
Call Home syslog message throttling	Enabled
Data privacy level	Normal

Alert Group Trigger Events and Commands

Call Home trigger events are grouped into alert groups, with each alert group assigned CLI commands to execute when an event occurs. The CLI command output is included in the transmitted message. [Table 5: Call Home Alert Groups, Events, and Actions](#), on page 87 lists the trigger events included in each alert group, including the severity level of each event and the executed CLI commands for the alert group.

Table 5: Call Home Alert Groups, Events, and Actions

Alert Group	Call Home Trigger Event	Syslog Event	Severity	Description and CLI Commands Executed
Crash	SYSTEM_CRASH	—	—	Events related to system crash. Commands executed: show version show logging show region show stack
—	TRACEBACK	—	—	Detects software traceback events. Commands executed: show version show logging show region show stack

Alert Group	Call Home Trigger Event	Syslog Event	Severity	Description and CLI Commands Executed
Configuration	—	—	—	User-generated request for configuration. (Sent to TAC.) CLI commands executed: show platform show inventory show running-config all show startup-config show version
Environmental	—	—	—	Events related to power, fan, and environment sensing elements, such as temperature alarms. (Sent to TAC.) CLI commands executed: show platform show environment show inventory show logging
Inventory	—	—	—	Inventory status should be provided whenever a unit is cold-booted, or when FRUs are inserted or removed. This is considered a noncritical event, and the information is used for status and entitlement. (Sent to TAC.) CLI commands executed: show diag all eeprom detail include MAC show license all show platform show platform hardware qfp active infrastructure chipset 0 capabilities show platform software vnic-if interface-mapping show version
Syslog	—	—	—	Event logged to syslog. CLI commands executed: show logging

Message Contents

The following tables display the content formats of alert group messages:

- The **Format for a Short Text Message** table describes the content fields of a short text message.
- The **Common Fields for All Long Text and XML Messages** table describes the content fields that are common to all long text and XML messages. The fields specific to a particular alert group message are inserted at a point between the common fields. The insertion point is identified in the table.
- The **Inserted Fields for a Reactive or Proactive Event Message** table describes the inserted content fields for reactive messages (system failures that require a TAC case) and proactive messages (issues that might result in degraded system performance).
- The **Inserted Fields for an Inventory Event Message** table describes the inserted content fields for an inventory message.

This section also includes the following subsections that provide sample messages:

Table 6: Format for a Short Text Message

Data Item	Description
Device identification	Configured device name

Data Item	Description
Date/time stamp	Time stamp of the triggering event
Error isolation message	Plain English description of triggering event
Alarm urgency level	Error level such as that applied to a system message

Table 7: Common Fields for All Long Text and XML Messages

Data Item (Plain Text and XML)	Description (Plain Text and XML)	MML Tag (XML Only)
Time stamp	Date and time stamp of event in ISO time notation: <i>YYYY-MM-DD HH:MM:SS</i> <i>GMT+HH:MM.</i>	CallHome/EventTime
Message name	Name of message. Specific event names are listed in the Alert Group Trigger Events and Commands section.	For short text message only
Message type	Specifically “Call Home”.	CallHome/Event/Type
Message subtype	Specific type of message: full, delta, test	CallHome/Event/SubType
Message group	Specifically “reactive”. Optional, because default is “reactive”.	Not applicable. For long-text message only
Severity level	Severity level of message.	Body/Block/Severity
Source ID	Product type for routing through the workflow engine. This is typically the product family name.	For long-text message only
Device ID	<p>Unique device identifier (UDI) for end device generating message. This field should be empty if the message is nonspecific to a fabric switch. The format is <i>type@Sid@serial</i>.</p> <ul style="list-style-type: none"> • <i>type</i> is the product model number from backplane IDPROM. • <i>@</i> is a separator character. • <i>Sid</i> is C, identifying the serial ID as a chassis serial number. • <i>serial</i> is the number identified by the Sid field. <p>Example: ASR1006@C@FOX105101DH</p>	CallHome/CustomData/ ContractData/DeviceId

Data Item (Plain Text and XML)	Description (Plain Text and XML)	MML Tag (XML Only)
Customer ID	Optional user-configurable field used for contract information or other ID by any support service.	CallHome/CustomerData/ ContractData/CustomerId
Contract ID	Optional user-configurable field used for contract information or other ID by any support service.	CallHome/CustomerData/ ContractData/ContractId
Site ID	Optional user-configurable field used for site IDs supplied by Cisco Systems or other data meaningful to alternate support services.	CallHome/CustomerData/ ContractData/SiteId
Server ID	<p>If the message is generated from the fabric switch, this is the unique device identifier (UDI) of the switch.</p> <p>The format is <i>type@Sid@serial</i>.</p> <ul style="list-style-type: none"> • <i>type</i> is the product model number from backplane IDPROM. • @ is a separator character. • <i>Sid</i> is C, identifying the serial ID as a chassis serial number. • <i>serial</i> is the number identified by the Sid field. <p>Example: ASR1006@C@FOX105101DH</p>	For long text message only
Message description	Short text describing the error.	CallHome/MessageDescription
Device name	Node that experienced the event. This is the host name of the device.	CallHome/CustomerData/ SystemInfo/NameName
Contact name	Name of person to contact for issues associated with the node experiencing the event.	CallHome/CustomerData/ SystemInfo/Contact
Contact e-mail	E-mail address of person identified as contact for this unit.	CallHome/CustomerData/ SystemInfo/ContactEmail
Contact phone number	Phone number of the person identified as the contact for this unit.	CallHome/CustomerData/ SystemInfo/ContactPhoneNbr
Street address	Optional field containing street address for RMA part shipments associated with this unit.	CallHome/CustomerData/ SystemInfo/StreetAddress

Data Item (Plain Text and XML)	Description (Plain Text and XML)	MML Tag (XML Only)	
Model name	Model name of the router. This is the “specific model as part of a product family name.	CallHome/Device/Cisco_Chassis/Model	
Serial number	Chassis serial number of the unit.	CallHome/Device/Cisco_Chassis/SerialNumber	
Chassis part number	Top assembly number of the chassis.	CallHome/Device/Cisco_Chassis/AdditionalInformation/AD@name=“PartNumber”	
System object ID	System Object ID that uniquely identifies the system.	CallHome/Device/Cisco_Chassis/AdditionalInformation/AD@name=“sysObjectID”	
System description	System description for the managed element.	CallHome/Device/Cisco_Chassis/AdditionalInformation/AD@name=“sysDescr”	
Fields specific to a particular alert group message are inserted here.	The following fields may be repeated if multiple CLI commands are executed for this alert group.		
	Command output name	The exact name of the issued CLI command.	/aml/Attachments/Attachment/Name
	Attachment type	Attachment type. Usually “inline”.	/aml/Attachments/Attachment@type
	MIME type	Normally “text” or “plain” or encoding type.	/aml/Attachments/Attachment/Data@encoding
	Command output text	Output of command automatically executed.	/mml/attachments/attachment/atdata

Table 8: Inserted Fields for a Reactive or Proactive Event Message

Data Item (Plain Text and XML)	Description (Plain Text and XML)	MML Tag (XML Only)
Chassis hardware version	Hardware version of chassis.	CallHome/Device/Cisco_Chassis/ HardwareVersion
Supervisor module software version	Top-level software version.	CallHome/Device/Cisco_Chassis/AdditionalInformation/AD@name=“SoftwareVersion”
Affected FRU name	Name of the affected FRU generating the event message.	CallHome/Device/Cisco_Chassis/ Cisco_Card/Model

Data Item (Plain Text and XML)	Description (Plain Text and XML)	MML Tag (XML Only)
Affected FRU serial number	Serial number of affected FRU.	CallHome/Device/Cisco_Chassis/ Cisco_Card/SerialNumber
Affected FRU part number	Part number of affected FRU.	CallHome/Device/Cisco_Chassis/ Cisco_Card/PartNumber
FRU slot	Slot number of FRU generating the event message.	CallHome/Device/Cisco_Chassis/ Cisco_Card/LocationWithinContainer
FRU hardware version	Hardware version of affected FRU.	CallHome/Device/Cisco_Chassis/ Cisco_Card/HardwareVersion
FRU software version	Software version(s) running on affected FRU.	CallHome/Device/Cisco_Chassis/ Cisco_Card/SoftwareIdentity/ VersionString

Table 9: Inserted Fields for an Inventory Event Message

Data Item (Plain Text and XML)	Description (Plain Text and XML)	MML Tag (XML Only)
Chassis hardware version	Hardware version of chassis.	CallHome/Device/Cisco_Chassis/ HardwareVersion
Supervisor module software version	Top-level software version.	CallHome/Device/Cisco_Chassis/ AdditionalInformation/AD@name= "SoftwareVersion"
FRU name	Name of the affected FRU generating the event message.	CallHome/Device/Cisco_Chassis/ Cisco_Card/Model
FRU s/n	Serial number of FRU.	CallHome/Device/Cisco_Chassis/ Cisco_Card/SerialNumber
FRU part number	Part number of FRU.	CallHome/Device/Cisco_Chassis/ Cisco_Card/PartNumber
FRU slot	Slot number of FRU.	CallHome/Device/Cisco_Chassis/ Cisco_Card/LocationWithinContainer
FRU hardware version	Hardware version of FRU.	CallHome/Device/Cisco_Chassis/ CiscoCard/HardwareVersion
FRU software version	Software version(s) running on FRU.	CallHome/Device/Cisco_Chassis/ Cisco_Card/SoftwareIdentity/ VersionString

Sample Syslog Alert Notification in XML Format

The following example shows a sample syslog alert notification in XML format:

```
<?xml version="1.0" encoding="UTF-8"?>
<soap-env:Envelope xmlns:soap-env="http://www.w3.org/2003/05/soap-envelope">
<soap-env:Header>
<aml-session:Session xmlns:aml-session="http://www.cisco.com/2004/01/aml-session"
soap-env:mustUnderstand="true"
```

```

soap-env:role="http://www.w3.org/2003/05/soap-envelope/role/next">
<aml-session:To>http://tools.cisco.com/neddce/services/DDCEService</aml-session:To>
<aml-session:Path>
<aml-session:Via>http://www.cisco.com/appliance/uri</aml-session:Via>
</aml-session:Path>
<aml-session:From>http://www.cisco.com/appliance/uri</aml-session:From>
<aml-session:MessageId>M8:9S1NMSF22DW:51AEAC68</aml-session:MessageId>
</aml-session:Session>
</soap-env:Header>
<soap-env:Body>
<aml-block:Block xmlns:aml-block="http://www.cisco.com/2004/01/aml-block">
<aml-block:Header>
<aml-block:Type>http://www.cisco.com/2005/05/callhome/syslog</aml-block:Type>
<aml-block:CreationDate>2013-06-05 03:11:36 GMT+00:00</aml-block:CreationDate>
<aml-block:Builder>
<aml-block:Name>CSR1000v</aml-block:Name>
<aml-block:Version>2.0</aml-block:Version>
</aml-block:Builder>
<aml-block:BlockGroup>
<aml-block:GroupId>G9:9S1NMSF22DW:51AEAC68</aml-block:GroupId>
<aml-block:Number>0</aml-block:Number>
<aml-block:IsLast>true</aml-block:IsLast>
<aml-block:IsPrimary>true</aml-block:IsPrimary>
<aml-block:WaitForPrimary>>false</aml-block:WaitForPrimary>
</aml-block:BlockGroup>
<aml-block:Severity>2</aml-block:Severity>
</aml-block:Header>
<aml-block:Content>
<ch:CallHome xmlns:ch="http://www.cisco.com/2005/05/callhome" version="1.0">
<ch:EventTime>2013-06-05 03:11:36 GMT+00:00</ch:EventTime> <ch:MessageDescription>*Jun 5
03:11:36.041: %CLEAR-5-COUNTERS: Clear counter on all interfaces by
console</ch:MessageDescription> <ch:Event> <ch:Type>syslog</ch:Type>
<ch:SubType></ch:SubType> <ch:Brand>Cisco Systems</ch:Brand> <ch:Series>CSR1000v Cloud
Services Router</ch:Series> </ch:Event> <ch:CustomerData> <ch:UserData>
<ch:Email>weijuhua@cisco.com</ch:Email>
</ch:UserData>
<ch:ContractData>
<ch:CustomerId></ch:CustomerId>
<ch:SiteId></ch:SiteId>
<ch:ContractId></ch:ContractId>
<ch:DeviceId>CSR1000V@C@9S1NMSF22DW</ch:DeviceId>
</ch:ContractData>
<ch:SystemInfo>
<ch:Name>qiang-vm</ch:Name>
<ch>Contact></ch>Contact>
<ch>ContactEmail>weijuhua@cisco.com</ch>ContactEmail>
<ch>ContactPhoneNumber></ch>ContactPhoneNumber>
<ch:StreetAddress></ch:StreetAddress>
</ch:SystemInfo>
<ch:CCOID></ch:CCOID>
<ch:IdToken></ch:IdToken>
</ch:CustomerData>
<ch:Device>
<rme:Chassis xmlns:rme="http://www.cisco.com/rme/4.0">
<rme:Model>CSR1000V</rme:Model>
<rme:HardwareVersion></rme:HardwareVersion>
<rme:SerialNumber>9S1NMSF22DW</rme:SerialNumber>
<rme:AdditionalInformation>
<rme:AD name="PartNumber" value="" />
<rme:AD name="SoftwareVersion" value="15.4(20130604:093915)" /> <rme:AD
name="SystemObjectId" value="1.3.6.1.4.1.9.1.1537" /> <rme:AD name="SystemDescription"
value="Cisco IOS Software, CSR1000V Software (X86_64_LINUX_IOSD-ADVENTERPRISEK9-M),
Experimental Version 15.4(20130604:093915) [mcp_dev-qiashou-ultra_ut 100] Copyright (c)
1986-2013 by Cisco Systems, Inc.

```

```

Compiled Tue 04-Jun-13 02:39 by jsmith" /> <rme:AD name="ServiceNumber" value="" />
<rme:AD name="ForwardAddress" value="" /> </rme:AdditionalInformation> </rme:Chassis>
</ch:Device> </ch:CallHome> </aml-block:Content> <aml-block:Attachments>
<aml-block:Attachment type="inline"> <aml-block:Name>show logging</aml-block:Name>
<aml-block:Data encoding="plain"> <![CDATA[show logging Syslog logging: enabled (0
messages dropped, 1 messages rate-limited, 0 flushes, 0 overruns, xml disabled, filtering
disabled)
No Active Message Discriminator.
No Inactive Message Discriminator.
Console logging: level debugging, 391 messages logged, xml disabled,
filtering disabled
Monitor logging: level debugging, 0 messages logged, xml disabled,
filtering disabled
Buffer logging: level debugging, 391 messages logged, xml disabled,
filtering disabled
Exception Logging: size (4096 bytes)
Count and timestamp logging messages: disabled
Persistent logging: disabled
No active filter modules.
Trap logging: level informational, 56 message lines logged
Logging Source-Interface: VRF Name:
Log Buffer (4096 bytes):
*Jun 5 03:11:18.295: %SYS-5-CONFIG_I: Configured from console by console
qiang-vm#]]></aml-block:Data> </aml-block:Attachment> </aml-block:Attachments>
</aml-block:Block> </soap-env:Body> </soap-env:Envelope>

```

Additional References

The following sections provide references related to the Call Home feature.

Related Documents

Related Topic	Title
Cisco IOS XE commands	Cisco IOS Master Commands List, All Releases
Explains how the Smart Call Home service offers web-based access to important information on select Cisco devices and offers higher network availability, and increased operational efficiency by providing real-time alerts.	Smart Call Home User Guide
Smart Call Home site page on Cisco.com for access to all related product information.	Cisco Smart Call Home site
Public Key Infrastructure (PKI) and Certificate Authority configuration in Cisco IOS XE software	Cisco IOS XE Security Configuration Guide: Secure Connectivity

Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

MIBs

MIB	MIBs Link
CISCO-CALLHOME-MIB	To locate and download MIBs for selected platforms, Cisco IOS XE software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	—

Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Call Home

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS XE software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.



Note The Feature Information table below lists only the Cisco IOS XE software release that introduced support for a given feature in a given Cisco IOS XE software release train. Unless noted otherwise, subsequent releases of that Cisco IOS XE software release train also support that feature.

Table 10: Feature Information for Call Home

Feature Name	Releases	Feature Information
Call Home	Cisco IOS XE Release 3.13S	<p>The Call Home feature provides e-mail-based and web-based notification of critical system events. A versatile range of message formats are available for optimal compatibility with pager services, standard e-mail, or XML-based automated parsing applications.</p> <p>The following commands were introduced or modified:</p>



CHAPTER 6

Configuring Cisco License Call Home

The Cisco License Call Home feature provides a robust set of commands that communicate with the Cisco licensing infrastructure, makes connections and data transfers, and provides interactive prompts to help you install and maintain software licenses. This module describes the tasks and the commands used to activate software by using the Cisco License Call Home feature, license keys, and Cisco EXEC commands. When you activate software from a Cisco device, you can license software without the need for additional application software.

- [Finding Feature Information, on page 97](#)
- [Prerequisites for Cisco License Call Home, on page 97](#)
- [Restrictions for Cisco License Call Home, on page 98](#)
- [Information About Cisco License Call Home, on page 98](#)
- [How to Configure Cisco License Call Home, on page 99](#)
- [Configuration Examples for Cisco License Call Home, on page 102](#)
- [Additional References, on page 104](#)
- [Feature Information for Cisco License Call Home, on page 104](#)

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <https://cfng.cisco.com/>. An account on Cisco.com is not required.

Prerequisites for Cisco License Call Home

- You must obtain the device certificate from the Cisco licensing infrastructure before starting.
- You must have a CCO user login account.

Restrictions for Cisco License Call Home

- The device must have an Internet connection and use HTTPS to connect to the Cisco licensing infrastructure. To set up a secure HTTP connection, see the HTTP 1.1 Web Server and Client chapter in the *Cisco IOS Network Management Configuration Guide*.
- Only certain platforms support the Cisco License Call Home feature, and these devices must be running a Cisco IOS crypto K9 image. For information about platform support, see the “Feature Information for Cisco License Call Home” section.

Information About Cisco License Call Home

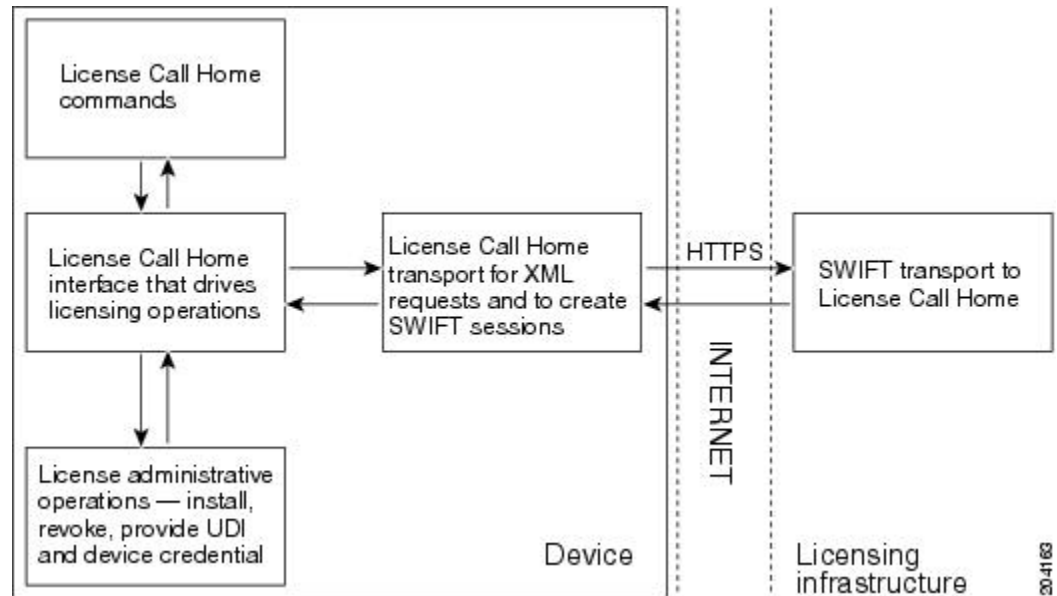
Cisco License Call Home Interface

The Cisco License Call Home feature allows a Cisco device to communicate with the Cisco licensing infrastructure that provides license generation, fulfillment, and support. The Cisco License Call Home feature uses a secured Internet connection to retrieve licensing information. This feature provides a robust set of commands that makes connections, transfers data, and provides interactive prompts to help you install and maintain software licenses. Once you purchase a product authorization key (PAK), Cisco License Call Home commands enable you to easily perform these tasks:

- Install or upgrade a license.
- Transfer a license.
- Request that a license be resent.

The figure below shows how the Cisco License Call Home feature interfaces to the Cisco licensing back-end system. The architecture shown in the figure below allows the use of the License Call Home EXEC commands to communicate with the Cisco licensing infrastructure and to perform administrative license operations.

Figure 7: Cisco License Call Home Interface



The Cisco License Call Home feature works as a client-server model with each transaction completed as a separate connection to the Cisco licensing infrastructure. The Cisco License Call Home feature displays prompts to obtain required information and then connects to the Cisco licensing back end to interact with the Cisco licensing infrastructure. A Cisco License Call Home EXEC command initiates a request, and the Cisco licensing infrastructure provides the response. The processes designed into the Cisco License Call Home architecture manage the transport of information that provides the URL required to connect to the Cisco licensing infrastructure over the Internet and to create a session.

How to Configure Cisco License Call Home

Installing Licenses or Upgrading Software by Using Cisco License Call Home

SUMMARY STEPS

1. Obtain the PAK.
2. **enable**
3. **show license call-home pak *pak-id***
4. **license call-home install pak *pak-id***
5. **show license feature**

DETAILED STEPS

	Command or Action	Purpose
Step 1	Obtain the PAK.	The PAK is provided to you when you order or purchase the right to use a feature set for a particular platform. The

	Command or Action	Purpose
		PAK serves as a receipt and is used as part of the process to obtain a license.
Step 2	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 3	show license call-home pak <i>pak-id</i> Example: Device# show license call-home pak 3XPXR9E7D30	Displays the stock keeping unit (SKU) list and features available for the PAK provided.
Step 4	license call-home install pak <i>pak-id</i> Example: Device# license call-home install pak 3XPXR9E7D30	Installs a license by using the Cisco License Call Home feature. <ul style="list-style-type: none"> • Respond to the prompts in the command display.
Step 5	show license feature Example: Device# show license feature	Displays the list of licensed features.

Rehosting a License by Using Cisco License Call Home

SUMMARY STEPS

1. **enable**
2. **license call-home revoke udi *target-udi output-of-rehosted-license-url***
3. **show license detail**
4. **license install *stored-location-url***

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	license call-home revoke udi <i>target-udi output-of-rehosted-license-url</i> Example: Device# license call-home revoke udi	Revokes and transfers a license by using source and target UDIs. Sends the rehost ticket to the Cisco licensing infrastructure with the target unique device identifier (UDI), converts it to a license file, and stores it in the URL specified.

	Command or Action	Purpose
	AS54XM-AC-RPS:JAE0948QT6R flash:licensetargetudi.xml	<ul style="list-style-type: none"> Select from multiple SKUs for rehosting when you are prompted, and supply information when required.
Step 3	show license detail Example: Device# show license detail	Verifies that the license has been transferred.
Step 4	license install <i>stored-location-url</i>	(Optional) Installs the revoked license. <ul style="list-style-type: none"> For details about installing and upgrading licenses, see the “Configuring the Cisco IOS Software Activation Feature” module.

Requesting a License Resend by Using Cisco License Call Home

SUMMARY STEPS

1. **enable**
2. **license call-home resend** *dest-lic-location*
3. **license install** *stored-location-url*

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> Enter your password if prompted.
Step 2	license call-home resend <i>dest-lic-location</i> Example: Device# license call-home resend flash:licensereresend.lic	Obtains all licenses this device owns and stores them in the specified location.
Step 3	license install <i>stored-location-url</i>	(Optional) Installs the revoked license. <ul style="list-style-type: none"> For details about installing and upgrading licenses, see the “Configuring the Cisco IOS Software Activation Feature” module.

Configuration Examples for Cisco License Call Home

Example: Installing Licenses or Upgrading Software by Using Cisco License Call Home

The following example shows how to use the **license license call-home install pak** command to install a license by using the Cisco License Call Home feature. The command also displays prompts for mandatory information. The **show license feature** command is used to verify the installation.

```

Device# license call-home install pak 3XPXR9E7D30
CCO User name: User1
CCO password : *****
Pak Number      : 3XPXR9E7D30
Pak Fulfillment type: SINGLE
  1. SKU Name      : Gatekeeper
     SKU Type      : Product
     Description   : Gatekeeper
     Ordered Qty   : 1
     Available Qty : 1
     Feature List  :
           Feature name:      gatekeeper Count: Uncounted
     Platform Supported : N/A
                        5400
                        5350
                        2800
                        3800
Do you want to install the above listed SKU(s)? [yes/no]: yes
Please enter the user's detail:
First Name : First-name
Last Name  : Last-name
Title     : Software Engineer
Company Name : Cisco Systems
Address1  : 510 McCarthy Blvd.
Address2  [Optional]:
City     : Milpitas
State    : CA
Province [Optional]:
Zipcode  : 95134
Country  : USA
Phone    : 408 526-4000
Fax      [Optional]:
Email    : User1@cisco.com
Installing...Feature:gatekeeper...Successful

Device# show license feature
Feature name      Enforcement  Evaluation  Subscription  Enabled
gsmamrnb-codec-pack  yes         yes         no             no
Device#

```

Example: Rehosting a License by Using Cisco License Call Home

The following example shows how to use the **license call-home revoke udi** command to revoke and transfer a license by using source and target UDIs. The command also displays prompts for mandatory information. The **show license detail** command is used to verify that the license has been transferred.

```

Device# license call-home revoke udi AS54XM-AC-RPS:JAE0948QT6R flash:licensetargetudi.xml
CCO User name: User1
CCO password : *****
Retrieving the sku from swift .....
  1. SKU Name           : Gatekeeper
     SKU Type           : Product
     Description        :
     Ordered Qty        : 1
     Available Qty      : 1
     Feature List       :
           Feature name: gatekeeper Count: Uncounted
     Platform Supported : N/A
                           5400
                           5350
                           2800
                           3800
  3. SKU Name           : Gatekeeper
     SKU Type           : Product
     Description        :
     Ordered Qty        : 1
     Available Qty      : 1
     Feature List       :
           Feature name: gatekeeper Count: Uncounted
     Platform Supported : N/A
                           5400
                           5350
                           2800
                           3800
  4. SKU Name           : GSMAMRNB
     SKU Type           : Product
     Description        : Transfer this feature set
     Ordered Qty        : 1
     Available Qty      : 1
     Feature List       :
           Feature name: gsmamrnb-codec-pac Count: Uncounted
     Platform Supported : 5400
                           5350
  5. All of the above
Please select the sku number you want to revoke : 4
Retrieving the permission ticket from swift .....
Installing permission ticket and retrieving rehost ticket.....Done

```

```

Device# show license detail
Index: 1 Feature: gsmamrnb-codec-pack Version: 1.0
License Type: Evaluation
License State: Active, Not in Use, EULA accepted
  Evaluation total period: 8 weeks 4 days
  Evaluation period left: 8 weeks 4 days
Lock type: Non Node locked
Vendor info
License Addition: Additive
License Generation version 135266304
License Priority: Low
Store Index: 0
Store Name: Evaluation License Storage

```

Example: Requesting a License Resend by Using Cisco License Call Home

The following examples shows how to use the **license call-home resend** command to obtain all licenses this device owns and store them in the specified location:

```
Device# license call-home resend flash:licenseresend.lic
CCO User name: User1
CCO password : *****
Email Address: User1@cisco.com
Getting Licenses from SWIFT .....
Saving it to flash:licenseresend.lic....Done
```

Additional References

Related Documents

Related Topic	Document Title
Cisco License Manager application	<i>User Guide for Cisco License Manager</i>
Software activation conceptual overview	“Cisco IOS Software Activation Conceptual Overview” module
Software activation commands	<i>Software Activation Command Reference</i>
Cisco IOS commands	<i>Master Commands List, All Releases</i>
Integrated Services Routers licensing	<i>Software Activation on Cisco Integrated Services Routers</i>

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Cisco License Call Home

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 11: Feature Information for Cisco License Call Home

Feature Name	Releases	Feature Information
Cisco License Call Home	12.4(15)XZ 12.4(20)T 15.1(1)SG Cisco IOS XE Release 3.3SG	<p>The Cisco License Call Home feature provides a robust set of commands that communicate with the Cisco licensing infrastructure, makes connections and data transfers, and provides interactive prompts to help you install and maintain software licenses.</p> <p>In 12.4(15)XZ, this feature was introduced on the Cisco AS5300, AS5350, AS5350XM, AS5400, AS5400HPX, AS5400XM, 2800, 2851, 2821, 2811, 3800, 3825, and 3845 platforms.</p> <p>The following commands were introduced or modified by this feature: license call-home install, license call-home resend, license call-home revoke, license call-home url, show license call-home.</p>



CHAPTER 7

Cisco Smart Licensing Client

Smart Licensing Client feature is a standardized licensing platform that simplifies the Cisco software experience and helps you to understand how Cisco software is used across your network. Smart Licensing is the next generation licensing platform for all Cisco software products.

This document provides an overview of the Cisco Smart Licensing Client feature and describes the several tools and processes required to complete the products' registration and authorization.

- [Finding Feature Information, on page 107](#)
- [Prerequisites for Cisco Smart Licensing Client, on page 107](#)
- [Restrictions for Cisco Smart Licensing Client, on page 108](#)
- [Information About Cisco Smart Licensing Client, on page 108](#)
- [How to Activate Cisco Smart Licensing Client, on page 109](#)
- [Troubleshooting for Cisco Smart Licensing Client, on page 112](#)
- [Configuration Examples for Cisco Smart Licensing Client, on page 112](#)
- [Additional References for Cisco Smart Licensing Client, on page 113](#)
- [Feature Information for Cisco Smart Licensing Client, on page 114](#)

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <https://cfng.cisco.com/>. An account on Cisco.com is not required.

Prerequisites for Cisco Smart Licensing Client

- Ensure that Call Home is enabled before using the Smart Licensing Client feature.
- Ensure that the device is running the Cisco IOS XE Everest 16.6.1 version that supports the Smart Licensing mode.

Restrictions for Cisco Smart Licensing Client

- Only one licensing mode, either the Cisco IOS Software License (CISL) and Cisco ONE or the Smart Licensing mode is supported at one point in time.

Information About Cisco Smart Licensing Client

Cisco Smart Licensing - An Overview

A licensing model, based on a single technology, Smart Licensing has been designed for Cisco, which is intended to provide Enterprise-level Agreements for all Cisco products. Smart Licensing provides a software inventory management system that provides Customers, Cisco, and selected Partners with information about Software Ownership and Software Utilization.

Smart Licensing is software based end-to-end license platform that comprises several tools and processes that authorizes customers to use and to report Cisco products. Smart licensing has the capability to capture a customer's order and to communicate with Cisco Cloud License Service through the Smart Call Home Transport Gateway. Additionally, the Smart Call Home Transport Gateway helps to complete product registration and authorization based on the desired performance and technology levels of Cisco products. To know more about Call Home, refer to [Call Home](#).

Benefits of Smart Licensing are the following:

- The Smart Licensing feature is aimed at giving users an experience of a single, standardized licensing solution for all Cisco products. Adding support for CiscoONE suites in the Cisco IOS Software License (CISL) and Smart Licensing mode, including the Foundation Suite and Active Directory Users and Computers (ADUC) Suite.
- Smart Licensing feature provides the ability to switch between traditional licensing (CSL) and Smart Licensing mode
- The Smart Licensing feature supports four software universal images NPE, NO-LI, NPE-NO-LI, and Non-NPE images.

Transitioning from CSL to Smart Licensing

In the Smart Licensing Model, customers can activate licensed objects without the use of a special software key or upgrade license file. Customers simply activate the new functionality using the appropriate product commands and configurations and the functionality is activated. A software reboot may or may not be required depending on the product capabilities and requirements.

Similarly, downgrading or removing an advanced feature, performance, or functionality would require removal of the configuration or command.

After either of the above actions has been taken, the change in license state is noted by the Smart Software Manager upon next synchronization and an appropriate action is taken.

Cisco ONE Suites

Cisco ONE Suites is a new way for customers to purchase infrastructure software. Cisco ONE offers a simplified purchasing model, centered on common customer scenarios in the data center, wide area network, and local access networks.

Smart Licensing supports Smart License Cisco ONE suite level licenses and image licenses, such as ipbase, Advanced IP Services (AIS), Advanced Enterprise Services (AES) and feature license and throughput performance, crypto throughput and port licensing on ASR 1000 Aggregation Series Routers.

To know more about Cisco One Suites, please refer to [Cisco ONE Suites](#).

How to Activate Cisco Smart Licensing Client

Enable Smart Licensing

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **license smart enable**
4. **exit**
5. **write memory**
6. **show license all**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	license smart enable Example: Device# license smart enable	Activates Smart Licensing on the device. Note When you enable Smart Licensing, the Cisco Software License (CSL) and all licensing calls pass through the Smart Agent. For the 'no' case, if Smart Licensing is already registered, the Smart Agent performs the "license smart deregister" operation that deactivates Smart Licensing. Reload the device to activate the CSL on the device.

	Command or Action	Purpose
Step 4	exit Example: Device# exit	Exits the global configuration mode.
Step 5	write memory Example: Device# write memory	Saves the running configuration to NVRAM.
Step 6	show license all Example: Device# show license all	(Optional) Displays summary information about all licenses.

Smart License Disable

SUMMARY STEPS

1. enable
2. configure terminal
3. no license smart enable
4. exit
5. write memory
6. reload
7. show license all

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	no license smart enable Example:	Deactivates Smart Licensing on the device.

	Command or Action	Purpose
	Device(config)# no license smart enable	Note When you enable Smart Licensing, the Cisco Software License (CSL) and all licensing calls pass through the Smart Agent. For the 'no' case, if Smart Licensing is already registered, the Smart Agent performs the "license smart deregister" operation that deactivates Smart Licensing. Reload the device to activate the CSL on the device.
Step 4	exit Example: Device(config)# exit	Exits the global configuration mode.
Step 5	write memory Example: Device# write memory	Saves the running configuration to NVRAM.
Step 6	reload Example: Device# reload	(Optional) Restarts the device to enable the new feature set. Note Reload the device if you have not reloaded the device after configuring the Cisco One Suites.
Step 7	show license all Example: Device# show license all	(Optional) Displays summary information about all licenses.

Device Registration

SUMMARY STEPS

1. enable
2. license smart register idtoken *idtoken* [force]
3. license smart deregister
4. license smart renew [ID | auth]

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	Purpose
Step 2	license smart register idtoken <i>idtoken</i> [force] Example: <pre>Device# license smart register idtoken 123</pre>	Registers the device with the back-end server. Token id can be obtained from your virtual a/c in the Smart Licensing server. <ul style="list-style-type: none"> • force: To forcefully register your device irrespective of either the device is registered or not. Note The device supplies the token ID to the Cisco server, which sends back a “Device Certificate” that is valid for 365 days.
Step 3	license smart deregister Example: <pre>Device# license smart deregister</pre>	Deregisters the device from the backend server.
Step 4	license smart renew [ID auth] Example: <pre>Device# license smart renew ID</pre>	(Optional) Manually renews the ID certification or authorization.

Troubleshooting for Cisco Smart Licensing Client

You can troubleshoot Smart Licensing enabling issues using the following commands on the device:

- **show version**
- **show running-config**
- **show license tech support**
- **show license entitlement**
- **show license feature**
- **show license certificate**
- **debug smart_lic error**
- **debug smart_lic trace**

Configuration Examples for Cisco Smart Licensing Client

Example: Enabling Smart Licensing

The following example shows how to use the **license smart enable** command to confirm if the Cisco ONE Suite is enabled.


```

Device# license smart enable
Currently only Cisco ONE license suites are supported by Smart Licensing.
Please make sure your Cisco ONE suites are enabled before turning on Smart Licensing. Any
other licenses outside of Cisco ONE suites would be disabled and made unusable in Smart
Licensing. If you have any questions, please get in touch with your Cisco representative
before using this mmode.
Please confirm Cisco ONE suites are enabled? [yes/no]: yes

```

Additional References for Cisco Smart Licensing Client

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
Cisco License Manager Application	<i>User Guide for Cisco License Manager</i>
Software Activation Conceptual Overview	“Cisco IOS Software Activation Conceptual Overview” module
Software Activation Commands	<i>Software Activation Command Reference</i>
Integrated Services Routers Licensing	<i>Software Activation on Cisco Integrated Services Routers</i>

Standards and RFCs

MIBs

MIB	MIBs Link
CISCO-LICENSE-MGMT-MIB	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	<p>http://www.cisco.com/cisco/web/support/index.html</p>

Feature Information for Cisco Smart Licensing Client

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 12: Feature Information for Cisco Smart Licensing

Feature Name	Releases	Feature Information
Cisco Smart Licensing Client	Cisco IOS XE Polaris 16.5.1	<p>The Smart Licensing feature is a standardized licensing platform that simplifies the Cisco software experience and helps you understand how Cisco software is used across your network. Smart Licensing is the next generation licensing platform for all Cisco software products.</p> <p>This feature is platform-independent.</p> <p>The following commands were introduced or modified by this feature: license smart enable, show license all</p>



CHAPTER 8

Software License Solution

This document describes the software restructuring that the Cisco ASR 1000 Series Aggregation Services Routers has undergone to achieve consistency in software solution packaging across Enterprise Routing platforms.

The software license solution for Cisco ASR 1000 Series Aggregation Services Routers provides the following features:

- Creates consistent enterprise WAN routing structure by aligning software license packaging across ASR1000, ISR and CSR1000v product lines for deployment models.
- Simplifies the licensing structure for Smart Licensing.
- Creates consistency between Cisco ASR 1000 fixed and modular systems by providing multiple licenses instead of individual feature licenses.
- [Finding Feature Information, on page 115](#)
- [Prerequisites for Software License Solution, on page 116](#)
- [Restrictions for Software License Solution, on page 116](#)
- [Information About Software License Solution, on page 116](#)
- [How to Configure Software License Solution, on page 118](#)
- [Configuration Examples for Software License Solution, on page 119](#)
- [Additional References for Software License Solution, on page 123](#)
- [Feature Information for Software License Solution, on page 123](#)

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <https://cfnnng.cisco.com/>. An account on Cisco.com is not required.

Prerequisites for Software License Solution

- A Cisco user login account is mandatory.
- Advanced IP Services (AIS) is a prerequisite license before the Software License Solution can be enabled on an ASR1000 device.
- Before installing the Software License Solution, obtain the device certificate from Cisco licensing infrastructure.
- Universalk9.xml and features.xml files changes are required to support the Right-To-Use and the bundling requirements.

Restrictions for Software License Solution

Cisco ONE Suite has an overlap of features with the Software License Solution. For example, the Cisco Application Visibility and Control (AVC) feature is a part of both the Foundation Suite and the AppX Solution License Package. Although, you can simultaneously configure both the Cisco ONE Suite and the Software License Solution on a device, the Cisco ONE Suite would always have a precedence over the Software License Solution.

```
Device# show version output in CSL mode

show version output in CSL mode
-----
License Type: EvalRightToUse
License Suite: FoundationSuiteK9
Next reload License Suite: FoundationSuiteK9
show run output for solution bundle
-----

Device#sh lic run | sec license solution

license solution level appxk9
license solution level securityk9
show license output
-----
Index 27 Feature: FoundationSuiteK9
Period left: 8 weeks 4 days
Period Used: 0 minute 0 second
License Type: EvalRightToUse
License State: Active, In Use
License Count: Non-Counted
```

Information About Software License Solution

Overview of Software License Solution

The Software License Solution feature for Cisco ASR 1000 Series Aggregation Services Routers (ASR1K) helps to align with technology-based license model (a non Cisco-ONE suite), which is similar to a model used in Integrated Services Routers (ISR) and CSR 1000v Series Cloud Services Routers (CSR).

The following table shows the Solution Licenses Product Identifiers (PIDs) and their functional features:

Table 13: Solution Licenses PIDs and Functional Features

Software License Solution	Licenses	Customized Licenses
SL-ASR1K-SEC	FLSASR1K-FW, FLSASR1K-IPSEC	FLASR1K-NAT64 FLASR1K-CGN
SL-ASR1K-SED-HX	FLSASR1K-FW, FLSA1-2HXIPS8G	FLSASR1K-FW-GTP FLSASR1-FPI
SL-ASR1K-APP	FLSASR1K-AVC	FLSASR1K-IOSRED FLSASR1-LI FLSASR1-FWNAT-R Performance Upgrade Licenses



Note Software license structure ensures backward compatibility of the existing licenses for smooth installed-base customer migration while aligning with ISR/CSR.

Platforms	Solution Level Licenses (Bundle)	Existing Boot-level Licenses
ASR1001-X ASR1002-X RP2 Universal RP3 Universal ASR1001-HX ASR1002-HX	AppX and SEC(100 Sessions) AppX and SEC-8G (100 Sessions)	IPB, AIS

Software License Solution is a bundle of licenses where all licenses within a bundle are active, but are not individually used when the license solution is enabled. For example, for the ASR1001-HX and ASR1002-HX routers, due to the introduction of performance-based crypto-license model, a specific HX-specific SEC license needs to be created to include the 8G crypto performance level. As a result of standardization, the following could be a customer's shopping experience when they choose the right technology solution license between an ISR and ASR:

The table below shows a software license solution on a Cisco ASR1K:

Platforms	New Solution Level Licenses (Bundle)	Existing Boot-level Licenses
Technology Solution Package	IPB	AIS
Software License Solution Additional customized licences	• AppX	• AppX • Security



Note SEC-8G license is for HX platforms. Includes 8G Crypto throughput license and FW license.

For the solution level license bundles, there is no impact on the boot-level licenses, such as Advanced IP Services (AISK9) or IP Base (IPBK9).

How to Configure Software License Solution

Configuring Software License Solution

Similar to the Cisco ONE suite license, the **license solution level** command triggers a request for the license solution to the licensing component or Smart License Agent. Additionally, all licenses within the software license solution are active; however, the licenses cannot be used individually when the license solution is enabled.



Note The **show license detail** command shows the details of the software license solution, which are similar to Cisco ONE suite licenses. The **license solution level** command is not a boot-level license, hence no sub-module repackaging or ROMMON changes are required.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **license solution level appxk9 | securityk9**
4. **exit**
5. **show license detail**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Info <ul style="list-style-type: none"> • Enables the privileged EXEC mode. • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters the global configuration mode.
Step 3	license solution level appxk9 securityk9 Example: Device(config)# license solution level appxk9	Enables the software license solution. Note Use the ? command with the license solution package command to see the software packages and features supported on your router.

	Command or Action	Purpose
Step 4	exit Example: Device(config)# exit	Exits the global configuration mode.
Step 5	show license detail Example: Device# Show license detail	Displays the details of the license that is configured.

Configuration Examples for Software License Solution

Example: Software License Solution is not configured

The following is a sample output when software license is not configured:

Device#**show version**

```

Cisco IOS XE Software, Version
BLD_V165_THROTTLE_LATEST_20170206_193029_V16_5_0_192_2 Cisco IOS Software [Everest], ASR1000
  Software (X86_64_LINUX_IOSDUNIVERSALK9-
M), Experimental Version 16.5.20170206:195244
[v165_throttle-BLD-BLD_V165_THROTTLE_LATEST_20170206_193029 152]
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Mon 06-Feb-17 16:35 by mcpre
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details, see the documentation or "License Notice" file accompanying
the IOS-XE software, or the applicable URL provided on the flyer
accompanying the IOS-XE software.
ROM: IOS-XE ROMMON
Device uptime is 7 hours, 12 minutes
Uptime for this control processor is 7 hours, 13 minutes
System returned to ROM by reload at 05:08:45 IST Wed Feb 22 2017
System image file is "bootflash:asr1000
universalk9.BLD_V165_THROTTLE_LATEST_20170206_193029_V16_5_0_192_2.SS
A.bin"
Last reload reason: Reload Command
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 thirdparty
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.
A summary of U.S. laws governing Cisco cryptographic products may be
found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html
If you require further assistance please contact us by sending email

```



```

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modify such GPL code under the terms of GPL Version 2.0. For more
details, see the documentation or "License Notice" file accompanying
the IOS-XE software, or the applicable URL provided on the flyer
accompanying the IOS-XE software.
ROM: IOS-XE ROMMON
Device uptime is 7 hours, 13 minutes
Uptime for this control processor is 7 hours, 15 minutes
System returned to ROM by reload at 05:08:45 IST Wed Feb 22 2017
System image file is "bootflash:asr1000-
universalk9.BLD_V165_THROTTLE_LATEST_20170206_193029_V16_5_0_192_2.SS
A.bin"
Last reload reason: Reload Command
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 thirdparty
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.
A summary of U.S. laws governing Cisco cryptographic products may be
found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html
If you require further assistance please contact us by sending email
to export@cisco.com.
License Type: EvalRightToUse
License Level: advipservices
Next reload license Level: advipservices
-----
License Solution Level Features
-----
appxk9 avc
<<<<<<<<<<<<<<<<<<< solution package information is present when it is
configured
securityk9 1HXIPS8G, firewall
-----
cisco ASR1001-HX (1SR) processor (revision 1SR) with 3763929K/6147K
bytes of memory.
Processor board ID FXS2002Q1RC
Crypto Hardware Module present
8 Gigabit Ethernet interfaces
8 Ten Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
8388608K bytes of physical memory.
29401087K bytes of eUSB flash at bootflash:.
0K bytes of SATA hard disk at hardsdisk:.
0K bytes of WebUI ODM Files at webui:.
Configuration register is 0x2102

```

Example: Show running configuration when software license solution is configured

The following is a sample configuration of the Software License Solution feature:

```
Device# show run | sec license solution
```

```
license solution level appxk9
license solution level securityk9
-----
```

Example: Show running configuration when software license solution is configured

The following is a sample configuration of the Software License Solution feature:

```
Device# show run | sec license solution

license solution level appxk9
license solution level securityk9
-----
```

Example: Show an active evaluation license

The following example shows when an evaluation license is activated:

```
Device# show running

license udi pid MCP4RU sn NWG10490493
license accept end user agreement
license boot level advipservices
license solution level AppX
license solution level Sec
license solution level UC
Device#show license
Index 29 Feature: CUBE-Standard
Index 30 Feature: CUBE-Redundant
Index 31 Feature: cgnat
Index 32 Feature: appxk9
Period left: 8 weeks 3 days
Period Used: 21 hours 27 minutes
License Type: EvalRightToUse
License State: Active, In Use
License Count: Non-Counted
License Priority: Low
Index 33 Feature: securityk9
Period left: 8 weeks 3 days
Period Used: 21 hours 22 minutes
License Type: EvalRightToUse
License State: Active, In Use
License Count: Non-Counted
License Priority: Low
Index 34 Feature: uck9
Period left: 8 weeks 3 days
Period Used: 21 hours 26 minutes
License Type: EvalRightToUse
License State: Active, In Use
License Count: Non-Counted
License Priority: Low
Index 3 Feature: avc
Period left: Not Activated
Period Used: 0 minute 0 second
License Type: EvalRightToUse
License State: Active, Not in Use, EULA not accepted
```

License Solution: appxk9
License Count: Non-Counted
License Priority: None

Additional References for Software License Solution

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
Cisco Software Activation Configuration Guide	Cisco Software Activation Guide

Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Software License Solution

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 14: Feature Information for Software License Solution

Feature Name	Releases	Feature Information
Software License Solution for Cisco ASR 1000 Series Aggregation Services Routers	Cisco IOS XE Everest 16.5.1	<p>This document describes the software licensing restructuring that the Cisco ASR 1000 Series Aggregation Services Routers has undergone to achieve harmonisation in software packaging across Enterprise Routing platforms.</p> <p>The following commands were introduced by this feature: license solution level, show license detail</p>