



## **Software Activation Configuration Guide, Cisco IOS Release 15M&T**

### **Americas Headquarters**

Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
<http://www.cisco.com>  
Tel: 408 526-4000  
800 553-NETS (6387)  
Fax: 408 527-0883

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED "AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: <http://www.cisco.com/go/trademarks>. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)

© 2015 Cisco Systems, Inc. All rights reserved.



## CONTENTS

---

### CHAPTER 1

#### Cisco IOS Software Activation Conceptual Overview 1

Finding Feature Information 1

Information About the Cisco Software Licensing Process 2

Cisco Software Licensing Concepts 2

Cisco Product License Registration Portal 2

Product Authorization Key 2

Unique Device Identifier 2

Cisco Software License Validation 2

Cisco License Manager 3

Software End-User License Agreement 3

License Models for Images and Features 3

Cisco IOS Universal Image-Based Licenses 3

Feature-Based Licenses 4

License Types 5

Permanent Licenses 5

Temporary Licenses 5

Built-in Licenses for Emergencies 5

Evaluation Licenses 5

Extension Licenses 6

Uncounted or Counted Licenses 6

Pay as You Grow Model 6

Subscription Licenses 6

Software Activation Processes 6

Manufacturing Preinstalled Licenses 7

Automated Software Activation by Using Cisco License Manager 7

License Software Activation by Using EXEC Commands 8

License Software Activation by Using License Call Home 9

License Transfer Between Devices 10

License Transfer Between Two Working Devices	10
RMA License Transfer Between a Failed and a Working Device	11
License Resend Request	12
Additional References	12
Feature Information for Cisco IOS Software Activation	13
Glossary	13
<hr/>	
<b>CHAPTER 2</b>	<b>Configuring the Cisco IOS Software Activation Feature 15</b>
Finding Feature Information	15
Restrictions for Cisco IOS Software Activation	15
Information About the Cisco IOS Software Activation	16
License Activation MIB Support	16
How to Activate Software from a Cisco IOS Device	16
Installing and Upgrading Licenses by Using Software Activation Commands	16
Managing Licenses by Using Software Activation Commands	18
Adding a Comment to a License File	18
Saving All Licenses to a Specified Storage Area	19
Saving License Credential Information Associated with a Device to a Specified Storage Area	20
Displaying All Licenses in a Device	21
Displaying Detailed Information about Licensed Features	21
Displaying Licensed Feature Sets Available in an Image	22
Removing Licenses by Using Software Activation Commands	23
Removing a License Entry from a Permanent License File	23
Rehosting (Revoking and Transferring) a License	24
Troubleshooting License Operations by Using Software Activation Commands	25
Configuring Examples for Software Licensing	26
Example: Installing and Upgrading Licenses	26
Example: Adding a Comment to a License File	26
Example: Saving All Licenses to a Specified Storage Area	27
Example: Removing Licenses	27
Example: Rehosting (Revoking and Transferring) a License	28
Example: Generic Command Enhanced with Licensing Information	28
reload	28
show running-config	28

show tech-support 29

show version 30

Additional References 31

Feature Information for Cisco IOS Software Activation 32

---

**CHAPTER 3****Configuring Cisco License Call Home 33**

Finding Feature Information 33

Prerequisites for Cisco License Call Home 33

Restrictions for Cisco License Call Home 34

Information About Cisco License Call Home 34

    Cisco License Call Home Interface 34

How to Configure Cisco License Call Home 35

    Installing Licenses or Upgrading Software by Using Cisco License Call Home 35

    Rehosting a License by Using Cisco License Call Home 36

    Requesting a License Resend by Using Cisco License Call Home 37

Configuration Examples for Cisco License Call Home 38

    Example: Installing Licenses or Upgrading Software by Using Cisco License Call Home 38

    Example: Rehosting a License by Using Cisco License Call Home 39

    Example: Requesting a License Resend by Using Cisco License Call Home 40

Additional References 40

Feature Information for Cisco License Call Home 41

---

**CHAPTER 4****Configuring Call Home 43**

Finding Feature Information 43

Prerequisites for Call Home 43

Information About Call Home 44

    Benefits of Using Call Home 44

    Obtaining Smart Call Home Services 45

        Anonymous Reporting 45

How to Configure Call Home 46

    Configuring Smart Call Home (Single Command) 46

    Configuring and Enabling Smart Call Home 47

    Enabling and Disabling Call Home 48

    Configuring Contact Information 49

        Example 51

Configuring a Destination Profile	51
Creating a New Destination Profile	52
Setting Profiles to Anonymous Mode	54
Subscribing to Alert Groups	55
Periodic Notification	56
Message Severity Threshold	56
Configuring Snapshot Command List	57
Configuring General email Options	58
Configuring the Mail Server	58
Example: General email Options	60
Specifying HTTP Proxy Server	60
Enabling AAA Authorization to Run IOS Commands for Call Home Messages	61
Configuring Syslog Throttling	62
Configuring Call Home Data Privacy	63
Working With Destination Profiles	63
Activating and Deactivating a Destination Profile	64
Renaming a Destination Profile	65
Using the Predefined CiscoTAC-1 Destination Profile	65
Verifying the Call Home Profile Configuration	66
Sending Call Home Communications Manually	66
Sending a Call Home Test Message Manually	66
Sending Call Home Alert Group Messages Manually	66
Submitting Call Home Analysis and Report Requests	67
Example	69
Manually Sending Command Output Message for One Command or a Command List	69
Example	70
Configuring Call Home	70
How To Configure Call Home to Support the Smart Call Home Service	70
Prerequisites	71
Declare and Authenticate a CA Trustpoint	71
Example: Declaring and authenticating the Cisco server security certificate	73
Start Smart Call Home Registration	74

What To Do Next	74
Displaying Call Home Configuration Information	74
Configuration Examples for Call Home	76
Example: Call Home Information in Summary	76
Example: Configured Call Home Information in Detail	76
Example: Available Call Home Alert Groups	77
Example: Email Server Status Information	77
Examples: Information for All Destination Profiles	77
Example: Information for a User-Defined Destination Profile	78
Example: Call Home Statistics	78
Default Settings	79
Alert Group Trigger Events and Commands	79
Message Contents	81
Sample Syslog Alert Notification in XML Format	86
Additional References	87
Feature Information for Call Home	89

---

**CHAPTER 5**

<b>Cisco Smart Licensing Client</b>	<b>91</b>
Finding Feature Information	91
Prerequisites for Cisco Smart Licensing Client	91
Restrictions for Cisco Smart Licensing Client	92
Information About Cisco Smart Licensing Client	92
Cisco Smart Licensing - An Overview	92
Transitioning from CISL to Smart Licensing	92
Cisco One Suites	92
How to Activate Cisco Smart Licensing Client	93
Enable Smart Licensing	93
Smart License Disable	94
Device Registration	96
Troubleshooting for Cisco Smart Licensing Client	96
Configuration Examples for Cisco Smart Licensing Client	97
Example: Enabling Smart Licensing	97
Additional References for Cisco Smart Licensing Client	97
Feature Information for Cisco Smart Licensing Client	98

---

**CHAPTER 6****Configuring Licensing Storage Expansion for Cisco 2800 and Cisco 3800 Series Routers 101**Finding Feature Information **101**Information About Licensing Storage Expansion **102**License Storage and Memory Allocation **102**When to Use Licensing Storage Expansion **102**Downgrading to an Image That Does Not Support Licensing Storage Expansion **103**How to Configure Licensing Storage Expansion **103**Expanding License Storage **103**    What to Do Next **104**    Compressing the Configuration Files in NVRAM **104**Configuration Examples for Licensing Storage Expansion **105**    Example: Expanding License Storage **105**    Example: Compressing the Configuration Files in NVRAM **105**Additional References **106**Feature Information for Licensing Storage Expansion **106**





## CHAPTER

# 1

# 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, page 1](#)
- [Information About the Cisco Software Licensing Process, page 2](#)
- [Additional References, page 12](#)
- [Feature Information for Cisco IOS Software Activation, page 13](#)
- [Glossary, 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 [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). 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](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](http://www.cisco.com/en/US/docs/general/warranty/English/EU1KEN_.html).

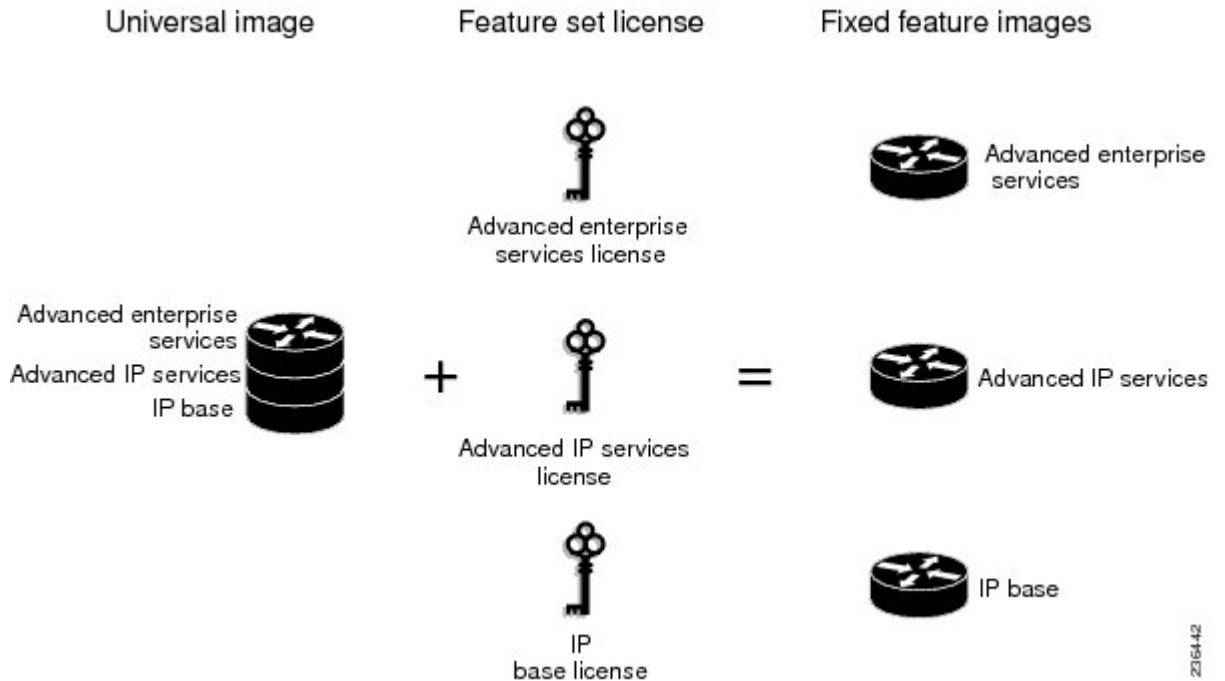
# License Models for Images and Features

## 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**

---

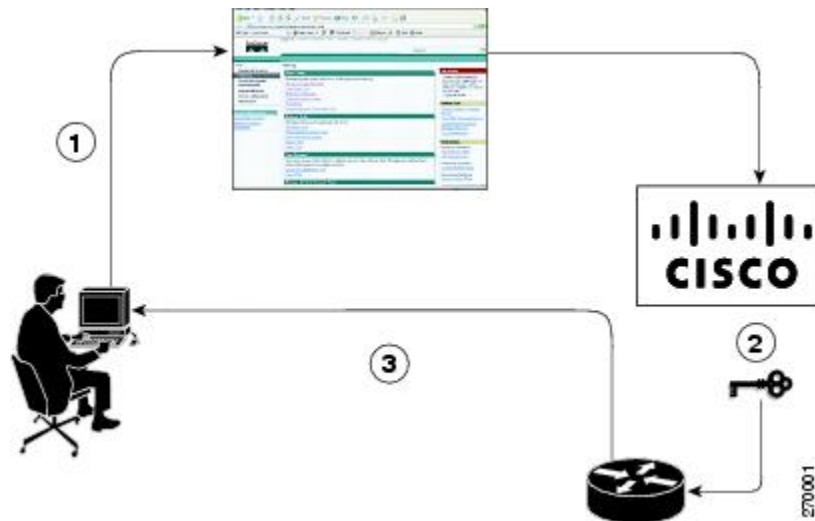
You can apply feature or maintenance upgrades to the software at any time. Maintenance upgrades do not require any interaction with the software activation process.

---

## 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.

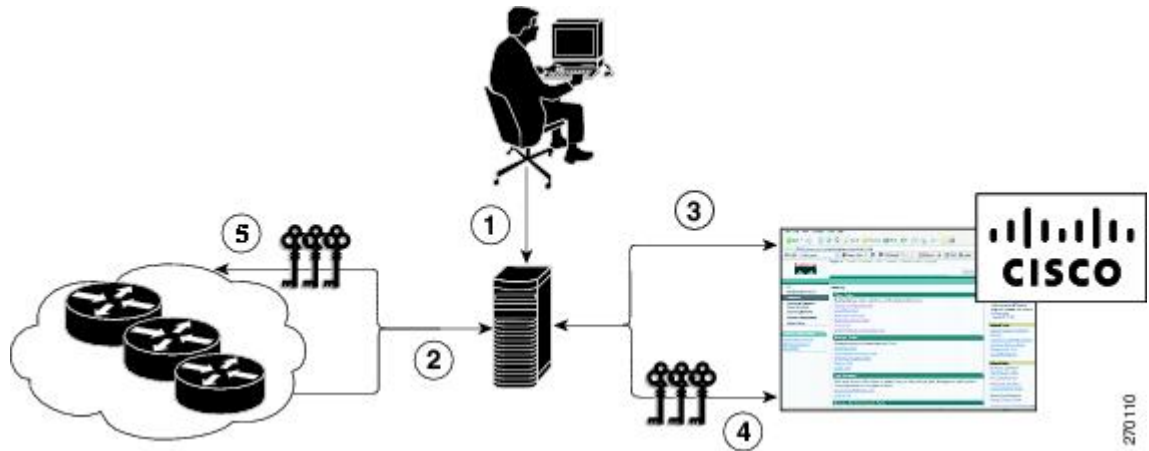
## Automated Software Activation by Using Cisco License Manager

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](http://www.cisco.com/en/US/products/ps7138/products_user_guide_list.html).

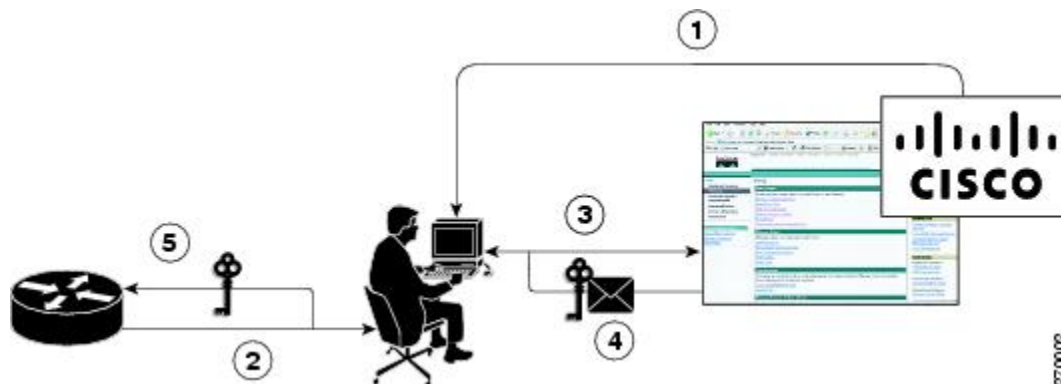
## License Software Activation by Using EXEC Commands

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 Software Activation by Using License Call Home

You can interact with the Cisco Product License Registration portal by using the Cisco License Call Home interface included with the Cisco IOS Software Activation feature.

The License Call Home feature works as a client-server model. Each transaction requires a separate connection to the Cisco licensing infrastructure. The License Call Home feature is interactive: it prompts you to obtain required information, converts that information into a defined data structure, and then connects to the Cisco licensing back-end to interact with the Cisco licensing infrastructure. A License Call Home EXEC command initiates the request, and the Cisco licensing infrastructure provides the response.

Once you purchase a PAK, you use Cisco License Call Home commands to perform these tasks:

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

## 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

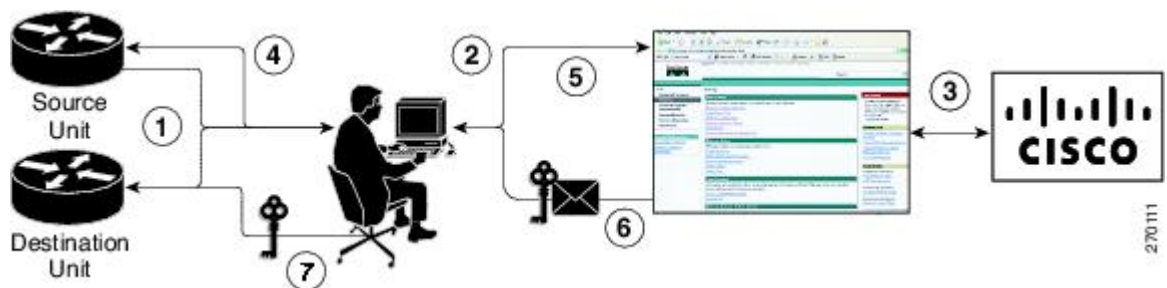
Cisco supports fully automated, customer-initiated, no-questions-asked transfer of licenses. Transferring a license between two working devices is accomplished by using a process known as *rehosting*. The rehosting process transfers a license from one UDI to another by revoking the license from the source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

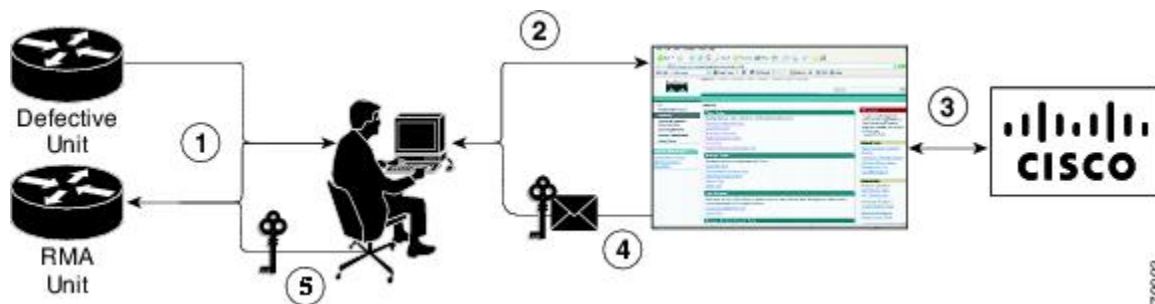
### RMA License Transfer Between a Failed and a Working Device

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	<a href="#">Master Commands List, All Releases</a>
Software activation commands	<i>Software Activation Command Reference</i>
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: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

### 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.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## 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 [http://www.cisco.com/go/featurenavigator](#). 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	<p>The Cisco IOS Software Activation feature supports basic licensing processes.</p> <p>This feature is platform-independent.</p> <p>This feature module provides information about Cisco Software Activation:</p> <ul style="list-style-type: none"> <li>"Configuring the Cisco IOS Software Activation Feature" module</li> </ul>

## 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 2

# 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, page 15](#)
- [Restrictions for Cisco IOS Software Activation, page 15](#)
- [Information About the Cisco IOS Software Activation, page 16](#)
- [How to Activate Software from a Cisco IOS Device, page 16](#)
- [Configuring Examples for Software Licensing, page 26](#)
- [Additional References, page 31](#)
- [Feature Information for Cisco IOS Software Activation, page 32](#)

## 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 [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). 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
<b>Step 1</b>	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"> <li>• The PAK serves as a receipt and is used as part of the process to obtain a license.</li> </ul>
<b>Step 2</b>	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 3</b>	<b>show license udi</b>  <b>Example:</b> Device# show license udi	Displays all the UDI values that can be licensed in a system. <ul style="list-style-type: none"> <li>• You need the UDI of the device as part of the process to obtain a license.</li> </ul>
<b>Step 4</b>	Convert the PAK to a license by entering the PAK and the UDI into the Cisco Product License Registration portal: <a href="http://www.cisco.com/go/license">http://www.cisco.com/go/license</a> .	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"> <li>• Copy the license file received from the Cisco Product License Registration portal to the appropriate file system on the device.</li> </ul> <p>or</p> <ul style="list-style-type: none"> <li>• Click the <b>Install</b> button on the web page.</li> </ul>
<b>Step 5</b>	<b>license install</b> <i>stored-location-url</i>	Installs the license.

	Command or Action	Purpose
	<b>Example:</b> <pre>Device# license install tftp://infra-sun/&lt;user&gt;/license/5400/38a.lic</pre>	<ul style="list-style-type: none"> <li>Accept the end-user license agreement if prompted.</li> </ul>
<b>Step 6</b>	<b>configure terminal</b>  <b>Example:</b> <pre>Device# configure terminal</pre>	Enters the global configuration mode.
<b>Step 7</b>	<b>license boot level {metroaggrservices}</b>  <b>Example:</b> <pre>Device(config)# license boot level metroaggrservices</pre>	Activates the metroaggrservices license on the device upon the next reload.
<b>Step 8</b>	<b>write memory</b>  <b>Example:</b> <pre>Device# write memory</pre>	Saves the running configuration to NVRAM.
<b>Step 9</b>	<b>reload</b>  <b>Example:</b> <pre>Device# reload</pre>	(Optional) Restarts the device to enable the new feature set.  <b>Note</b> 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

- enable
- license comment add *feature-name comment* [**switch** *switch-num*]
- show license file [**switch** *switch-num*]

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>license comment add</b> <i>feature-name comment</i> <b>[switch switch-num]</b>  <b>Example:</b> 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"> <li>• (Only on Cisco Catalyst 3750-E switch platforms) If a switch number is specified, this command is executed on the specified switch.</li> <li>• 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.</li> </ul>
Step 3	<b>show license file</b> [ <b>switch switch-num</b> ]  <b>Example:</b> Device# show license file	Displays comments added to a Cisco software license file. <ul style="list-style-type: none"> <li>• If the device is a switch, this command obtains statistics from the specified switch.</li> </ul>

## 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	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>

	Command or Action	Purpose
<b>Step 2</b>	<p><b>license save</b> <i>file-sys://lic-location</i> [<b>switch</b> <i>switch-num</i>]</p> <p><b>Example:</b></p> <pre>Device# license save flash:all_licenses.lic</pre>	<p>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 <b>license install</b> command.</p> <ul style="list-style-type: none"> <li>• <i>lic-location</i> : The license storage location can be a directory or a URL that points to a file system. Use the <b>?</b> command to see the storage locations supported by your device.</li> <li>• (Optional) <b>switch</b> <i>switch-num</i>: sends this request to a specific switch in a switch stack.</li> </ul>

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

	Command or Action	Purpose
--	-------------------	---------

## Displaying All Licenses in a Device

### SUMMARY STEPS

1. enable
2. show license all

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>show license all</b>  <b>Example:</b> 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	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>

	Command or Action	Purpose
<b>Step 2</b>	<b>show license detail</b> [ <i>feature-name</i> ]  <b>Example:</b> 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
<b>Step 1</b>	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>show license feature</b>  <b>Example:</b> 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	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>license clear</b> <i>feature-name</i> [ <b>switch</b> <i>switch-num</i> ]  <b>Example:</b> 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"> <li>• The optional <b>switch</b> <i>switch-num</i> keyword and argument send this request to a specific switch in a switch stack.</li> <li>• You must select the index number of the license to clear. Enter the number at the Select Index to Clear prompt.</li> </ul>

	Command or Action	Purpose
<b>Step 3</b>	<b>show license detail</b>  <b>Example:</b> Device# show license detail	Verifies that the license has been cleared.

## 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
<b>Step 1</b>	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>license revoke revoke <i>permission-file-url output-rehost-ticket-url</i></b>  <b>Example:</b> 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"> <li>• An end-user license agreement is displayed for all grace-period licenses in the permission ticket.</li> <li>• You must read and accept the agreement. If you do not accept the agreement, the rehost operation stops.</li> </ul>



# 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
<b>Step 1</b>	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>show license file</b> [ <b>switch</b> <i>switch-num</i> ]  <b>Example:</b> 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.
<b>Step 3</b>	<b>show license statistics</b>  <b>Example:</b> Device# show license statistics	Displays license statistics information. The display includes relevant statistics for error counts and is useful for troubleshooting licensing-related problems.
<b>Step 4</b>	<b>show license status</b> [ <b>switch</b> <i>switch-num</i> ]  <b>Example:</b> 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.
<b>Step 5</b>	<b>debug license</b> { <b>all</b>   <b>core</b>   <b>errors</b>   <b>events</b> }	Enables controlled software license debugging activity on a device.
<b>Step 6</b>	<b>no debug license</b> { <b>all</b>   <b>core</b>   <b>errors</b>   <b>events</b> }	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 STAND
LONE ADD INFINITE KEYS INFINITE KEYS NEVER NEVER NiL SLM_CODE CL
ND LCK NiL *1YCHJRBMWKZAED2400 NiL NiL NiL 5 MINS <UDI><PID>AS54X
M-AC-RPS</PID><SN>JAE0948QXKD</SN></UDI> , Jx8qaVf:iXWah9PsXjkVnmz
7gWh:cxdf9nUkzY6o8fRuQbu,7wTUz237Cz6g9VjfrCk,0a2Pdo,Ow6LWxcCRFL:x
```

```

cTxwnffn9i,4,aUWv8rL50opDUdAsFnxLsvoFRkcAfm$<WLC>AQEBIQAB//9NA+1m
Uwfs/1D0dmdF9kyX8wDrua1TZhnnAy6Mxs1dTboIcRaahKxJJdj40i1w3wscqvPiA
mWSaEmUT56rstk6gvmj+EQKRfD9A0ime1czrdKxfLLT0LaXT416nwmfp92Tya6vIQ
4Fn1BdqJ1sMzXeSq8PmVcTU9A4o9hil19vKur8N9F885D9GVF0bJHciT5M=</WLC>
Comment: Use this permanent license.
Hash: E1WjIQo4qs19g8cpnpoogP/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 : 4772 bytes
!
version 12.4
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
service internal
!
hostname csl-xfr-enhance-2951
!
...
...
license udi pid CISCO2951 sn FHH1211P037
license boot module c2951 technology-package securityk9 disable
license boot module c2951 technology-package uc
license boot module c2951 technology-package data
license call-home url https://tools-stage.cisco.com/SWIFT/Licensing
```

```
license agent listener http plaintext /lic-agent authenticate none
!
!
archive
  log config
  hidekeys
!
.
.
```

### show tech-support

The **show tech-support** command displays the output of the **show license udi**, **show license file**, **show license detail**, **show license status**, and the **show license statistics** commands.

```
Device# show tech-support
----- show license udi -----
Device#   PID                SN                UDI
-----
*0        CISCO2951             FHH1211P037      CISCO2951:FHH1211P037
-----
----- show license feature -----
Feature name      Enforcement  Evaluation  Subscription  Enabled
ipbasek9         no          no          no            no
securityk9       yes         yes         no            no
uc               yes         yes         no            yes
data             yes         yes         no            no
gatekeeper       yes         yes         no            no
LI               yes         no          no            no
SSL_VPN          yes         yes         no            no
ios-ips-update   yes         yes         yes           no
SNASw            yes         yes         no            no
-----
----- show license file -----
License Store: Primary License Storage
License Store: Evaluation License Storage
Store Index: 0
License: 11 securityk9 1.0 LONG TRIAL DISABLED 1440 DISABLED STANDALONE AD
D INFINITE_KEYS INFINITE_KEYS NEVER NEVER NiL SLM_CODE DEMO NiL N
iL Ni NiL NiL 5_MINS NiL GT5YVbrMAgt0NY50UcKGfvLTjQ17P2o3g84hE8Tq
sOfu3Xph0N:2AmMdpMNxxKXSVG$<WLC>AQEBIQAB//+FugzZgqFJn/XhIxoyelg63
YJD++i6Qx6vVp0MVqrX2EinbufbTfGzc7/GHNZaDZqRqwInXo3s+nsLU7rOtdOxoI
xYZAo3LYmUJ+MFzsqlhKoJv1PyEvQ8H21MNUjVbhoN0gyIWsyiJam8AQIkVBQFzhr
10GYo1VzdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko8XCy=</WLC>
Comment:
Hash: CLWUVZgY84BMRT03Ji1YmIqwAQA=
----- show license detail -----
Index: 1      Feature: SNASw      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
Lock type: Non Node locked
Vendor info:
License Addition: Additive
License Generation version: 0x8100000
License Count: Non-Counted
License Priority: None
Store Index: 5
Store Name: Evaluation License Storage
----- show license status -----
License Type Supported
permanent      Non-expiring node locked license
extension      Expiring node locked license
evaluation      Expiring non node locked license
paid subscription Expiring node locked subscription license
with valid end date
extension subscription Expiring node locked subscription license
evaluation subscription Expiring node locked subscription license
...
```

## Example: Generic Command Enhanced with Licensing Information

```

...
----- 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:       1
          Client statistics
Request success count:  1
Request failure count:  3
Release count:         0
Global Notify count:   4

```

**show version**

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

```

Device> show version
Cisco IOS Software, C2951 Software (C2951-UNIVERSALK9-M), Experimental Version
12.4(20090326:052343)
 [rifu-xformers_3_25_130]
Copyright (c) 1986-2009 by Cisco Systems, Inc.
Compiled Thu 26-Mar-09 21:49 by rifu
ROM: System Bootstrap, Version 12.4(20090303:092436)
[BLD-xformers_dev.XFR_20090303-20090303_0101-53
107], DEVELOPMENT SOFTWARE
csl-xfr-enhance-2951 uptime is 3 days, 4 hours, 28 minutes
System returned to ROM by reload at 18:48:45 PST Mon Nov 26 1956
System image file is "flash0:c2951-universalk9-mz.SSA"
Last reload reason: Reload Command
...
...
Cisco C2951 (revision 1.0) with 1005568K/43008K bytes of memory.
Processor board ID FHH1211P037
3 Gigabit Ethernet interfaces
1 terminal line
1 cisco Special Services Engine(s)
DRAM configuration is 72 bits wide with parity enabled.
255K bytes of non-volatile configuration memory.
250880K bytes of ATA System CompactFlash 0 (Read/Write)
License Info:
License UDI:
-----
Device#    PID                SN
-----
*0        CISCO2951          FHH1211P037
Technology Package License Information for Module:'c2951'
-----
Technology    Technology-package    Technology-package
              Current          Type                 Next reboot
-----
ipbase        ipbasek9             None                 ipbasek9
security     disable              None                 disable
uc           uc                   Evaluation           uc
data         None                 None                 None
Configuration register is 0x0

```

## 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	<a href="#">Master Commands List, All Releases</a>
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:  <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

### 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.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## 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 [http://www.cisco.com/go/featurenavigator](#). 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: <b>debug license</b>, <b>license clear</b>, <b>license comment</b>, <b>license install</b>, <b>license revoke</b>, <b>license save</b>, <b>license save credential</b>, <b>show license all</b>, <b>show license detail</b>, <b>show license feature</b>, <b>show license file</b>, <b>show license statistics</b>, <b>show license status</b>, <b>show license udi</b></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: <b>snmp-server enable traps</b>, <b>snmp-server host</b></p>





## 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, page 33](#)
- [Prerequisites for Cisco License Call Home, page 33](#)
- [Restrictions for Cisco License Call Home, page 34](#)
- [Information About Cisco License Call Home, page 34](#)
- [How to Configure Cisco License Call Home, page 35](#)
- [Configuration Examples for Cisco License Call Home, page 38](#)
- [Additional References, page 40](#)
- [Feature Information for Cisco License Call Home, page 41](#)

### 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 [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). 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

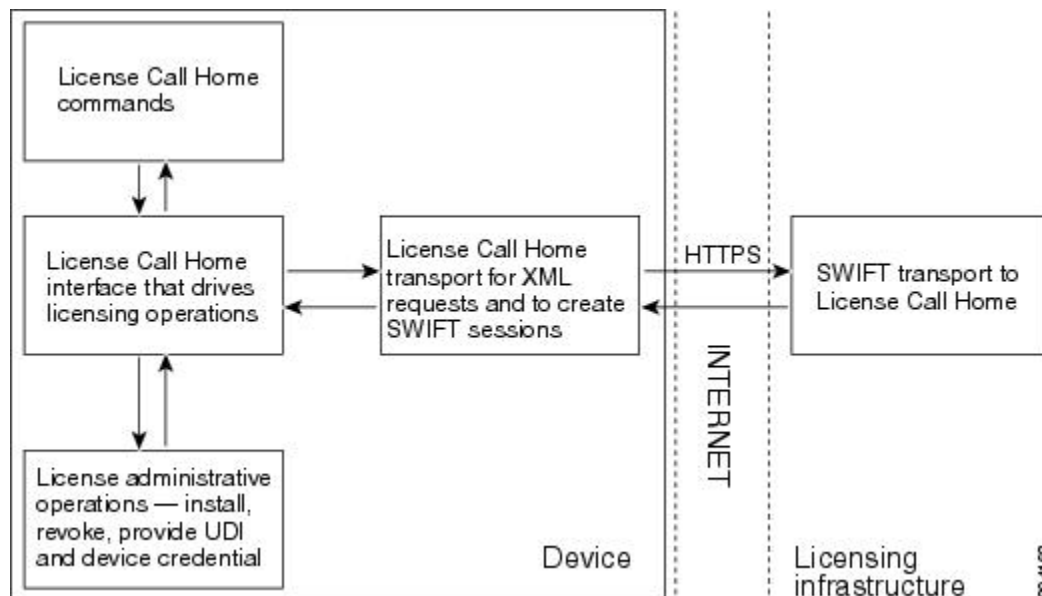
### Cisco License Call Home Interface

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 PAK serves as a receipt and is used as part of the process to obtain a license.
Step 2	<b>enable</b>  <b>Example:</b>  Device> enable	Enables privileged EXEC mode.  <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 3	<b>show license call-home pak</b> <i>pak-id</i>  <b>Example:</b>  Device# show license call-home pak 3XPXR9E7D30	Displays the stock keeping unit (SKU) list and features available for the PAK provided.
Step 4	<b>license call-home install pak</b> <i>pak-id</i>  <b>Example:</b>  Device# license call-home install pak 3XPXR9E7D30	Installs a license by using the Cisco License Call Home feature.  <ul style="list-style-type: none"> <li>• Respond to the prompts in the command display.</li> </ul>
Step 5	<b>show license feature</b>  <b>Example:</b>  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	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>license call-home revoke udi</b> <i>target-udi</i> <i>output-of-rehosted-license-url</i>  <b>Example:</b> Device# license call-home revoke udi AS54XM-AC-RPS:JAE0948QT6R flash:licensetargetudi.xml	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. <ul style="list-style-type: none"> <li>• Select from multiple SKUs for rehosting when you are prompted, and supply information when required.</li> </ul>
Step 3	<b>show license detail</b>  <b>Example:</b> Device# show license detail	Verifies that the license has been transferred.
Step 4	<b>license install</b> <i>stored-location-url</i>	(Optional) Installs the revoked license. <ul style="list-style-type: none"> <li>• For details about installing and upgrading licenses, see the “Configuring the Cisco IOS Software Activation Feature” module.</li> </ul>

## 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	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>

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

## 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	<a href="#">Master Commands List, All Releases</a>
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.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>



## 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 [http://www.cisco.com/go/featurenavigator](#). An account on Cisco.com is not required.

**Table 3: 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: <b>license call-home install</b>, <b>license call-home resend</b>, <b>license call-home revoke</b>, <b>license call-home url</b>, <b>show license call-home</b>.</p>





## 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, page 43](#)
- [Prerequisites for Call Home, page 43](#)
- [Information About Call Home, page 44](#)
- [How to Configure Call Home, page 46](#)
- [Additional References, page 87](#)
- [Feature Information for Call Home, page 89](#)

### 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 [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). 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 included with many Cisco service contracts and is designed to assist customers resolve problems more quickly. In addition, the information gained from crash messages helps Cisco understand equipment and issues occurring in the field. If you decide not to use Smart Call Home, you can still enable Anonymous Reporting to allow Cisco to securely receive minimal error and health information from the device. If you enable Anonymous Reporting, your customer identity will remain anonymous, and no identifying information is sent.



### Note

---

When you enable Anonymous Reporting, you acknowledge your consent to transfer the specified data to 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
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Device# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	<b>call-home reporting</b> { <b>anonymous</b>   <b>contact-email-addr</b> <i>email-address</i> } [ <b>http-proxy</b> { <i>ipv4-address</i>   <i>ipv6-address</i>   <b>name</b> } <b>port</b> <i>port number</i> ]  <b>Example:</b> Device (config)# <b>call-home reporting contact-email-addr email@company.com</b>	Enables all Call Home basic configurations using a single command. <ul style="list-style-type: none"> <li>• <b>anonymous</b>—Enables Call-Home TAC profile to only send crash, inventory, and test messages and send the messages in an anonymous way.</li> <li>• <b>contact-email-addr</b>—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.</li> <li>• <b>http-proxy</b> {<i>ipv4-address</i>   <i>ipv6-address</i>   <b>name</b>—An ipv4 or ipv6 address or server name. Maximum length is 64.</li> <li>• <b>port</b> <i>port number</i>—Port number. Range is 1 to 65535.</li> </ul> <p><b>Note</b> HTTP proxy option allows you to make use of your own proxy server to buffer and secure internet connections from your devices.</p> <p><b>Note</b> After successfully enabling Call Home either in anonymous or full registration mode using the <b>call-home reporting</b> 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
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Device# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	<b>call-home</b>  <b>Example:</b> Device(config)# <b>call-home</b>	Enters call home configuration mode.
<b>Step 3</b>	<b>profile CiscoTAC-1</b>  <b>Example:</b> Device(config-call-home)# <b>profile CiscoTAC-1</b>	Enters call home destination profile configuration mode for the CiscoTAC-1 destination profile.
<b>Step 4</b>	<b>destination transport-method http</b>  <b>Example:</b> Device(cfg-call-home-profile)# <b>destination transport-method http</b>	(Required only if using HTTPS) Configures the message transport method for http.

	Command or Action	Purpose
<b>Step 5</b>	<b>active</b>  <b>Example:</b> Device (cfg-call-home-profile) # <b>active</b>	Enables the destination profile.
<b>Step 6</b>	<b>exit</b>  <b>Example:</b> Device (cfg-call-home-profile) # <b>exit</b>	Exits call home destination profile configuration mode and returns to call home configuration mode.
<b>Step 7</b>	<b>contact-email-addr</b> <i>email-address</i>  <b>Example:</b> Device (cfg-call-home) # <b>contact-email-addr</b> <b>username@example.com</b>	Assigns the customer's e-mail address. Enter up to 200 characters in e-mail address format with no spaces.
<b>Step 8</b>	<b>exit</b>  <b>Example:</b> Device (cfg-call-home) # <b>exit</b>	Exits call home configuration mode and returns to global configuration mode.
<b>Step 9</b>	<b>service call-home</b>  <b>Example:</b> Device (config) # <b>service call-home</b>	Enables the Call Home feature.
<b>Step 10</b>	<b>exit</b>  <b>Example:</b> Device (config) # <b>exit</b>	Exits global configuration mode and returns to privileged EXEC mode.
<b>Step 11</b>	<b>copy running-config startup-config</b>  <b>Example:</b> Device# <b>copy running-config startup-config</b>	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**

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

## Configuring Contact Information

Each router must include a contact e-mail 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
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Router> <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	<b>call-home</b>  <b>Example:</b> Router (config)# <b>call-home</b>	Enters call home configuration mode.
<b>Step 3</b>	<b>contact-email-addr</b> <i>email-address</i>  <b>Example:</b> Router (cfg-call-home)# <b>contact-email-addr</b> <b>username@example.com</b>	Assigns the customer's e-mail address. Enter up to 200 characters in e-mail address format with no spaces.
<b>Step 4</b>	<b>phone-number</b> <i>+phone-number</i>  <b>Example:</b> Router (cfg-call-home)# <b>phone-number</b> <b>+1-222-333-4444</b>	(Optional) Assigns the customer's phone number.  <b>Note</b> The number must begin 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 (" ").
<b>Step 5</b>	<b>street-address</b> <i>street-address</i>  <b>Example:</b> Router (cfg-call-home)# <b>street-address "1234</b> <b>Any Street, Any city, Any state, 12345"</b>	(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 (" ").
<b>Step 6</b>	<b>customer-id</b> <i>text</i>  <b>Example:</b> Router (cfg-call-home)# <b>customer-id</b> <b>Customer1234</b>	(Optional) Identifies the customer ID. Enter up to 64 characters. If you include spaces, you must enclose your entry within double quotation marks (" ").
<b>Step 7</b>	<b>site-id</b> <i>text</i>  <b>Example:</b> Router (cfg-call-home)# <b>site-id</b> <b>Site1ManhattanNY</b>	(Optional) Identifies the customer site ID. Enter up to 200 characters. If you include spaces, you must enclose your entry within double quotation marks (" ").

	Command or Action	Purpose
Step 8	<b>contract-id</b> <i>text</i>  <b>Example:</b>  Router (cfg-call-home) # <b>contract-id</b> <b>Company1234</b>	(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](#).

**Note**

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
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Device# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	<b>call-home</b>  <b>Example:</b> Device(config)# <b>call-home</b>	Enters call home configuration mode.
<b>Step 3</b>	<b>profile</b> <i>name</i>  <b>Example:</b> Device(config-call-home)# <b>profile profile1</b>	Enters call home destination profile configuration mode for the specified destination profile name. If the specified destination profile does not exist, it is created.
<b>Step 4</b>	<b>destination transport-method email</b>  <b>Example:</b> Device(cfg-call-home-profile)# <b>destination transport-method email</b>	(Optional) Configures the message transport method for email. This is the default.
<b>Step 5</b>	<b>destination address email</b> <i>email-address</i>  <b>Example:</b> Device(cfg-call-home-profile)# <b>destination address email myaddress@example.com</b>	(Required) Configures the destination e-mail address to which Call Home messages are sent.

	Command or Action	Purpose
<b>Step 6</b>	<b>destination preferred-msg-format</b> { <b>long-text</b>   <b>short-text</b>   <b>xml</b> }  <b>Example:</b> Device(cfg-call-home-profile)# <b>destination preferred-msg-format xml</b>	(Optional) Configures a preferred message format. The default is XML.
<b>Step 7</b>	<b>destination message-size</b> <i>bytes</i>  <b>Example:</b> Device(cfg-call-home-profile)# <b>destination message-size 3145728</b>	(Optional) Configures a maximum destination message size (from 50 to 3145728 bytes) for the destination profile. The default is 3145728 bytes.
<b>Step 8</b>	<b>active</b>  <b>Example:</b> Device(cfg-call-home-profile)# <b>active</b>	(Optional) Enables the destination profile. By default, a user-defined profile is enabled when it is created.
<b>Step 9</b>	<b>exit</b>  <b>Example:</b> Device(cfg-call-home-profile)# <b>exit</b>	Exits call home destination profile configuration mode and returns to call home configuration mode.
<b>Step 10</b>	<b>end</b>  <b>Example:</b> Device(cfg-call-home)# <b>end</b>	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	<b>configure terminal</b>  <b>Example:</b> Device# <b>configure terminal</b>	Enters global configuration mode.
Step 2	<b>call-home</b>  <b>Example:</b> Device (config) # <b>call-home</b>	Enters call home configuration mode.
Step 3	<b>copy profile source-profile target-profile</b>  <b>Example:</b> Device (cfg-call-home) # <b>copy profile profile1 profile2</b>	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	<b>catastrophic</b>	N/A	Network-wide catastrophic failure.
8	<b>disaster</b>	N/A	Significant network impact.
7	<b>fatal</b>	Emergency (0)	System is unusable.
6	<b>critical</b>	Alert (1)	Critical conditions, immediate attention needed.
5	<b>major</b>	Critical (2)	Major conditions.



Level	Keyword	Syslog Level	Description
4	<b>minor</b>	Error (3)	Minor conditions.
3	<b>warning</b>	Warning (4)	Warning conditions.
2	<b>notification</b>	Notice (5)	Basic notification and informational messages. Possibly independently insignificant.
1	<b>normal</b>	Information (6)	Normal event signifying return to normal state.
0	<b>debugging</b>	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
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Device# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	<b>call-home</b>  <b>Example:</b> Device (config)# <b>call-home</b>	Enters Call Home configuration mode.
<b>Step 3</b>	<b>[no   default ] alert-group-config snapshot</b>  <b>Example:</b> Device (cfg-call-home)# <b>alert-group-config snapshot</b>	Enters snapshot configuration mode.  The <b>no</b> or <b>default</b> command will remove all snapshot command.

	Command or Action	Purpose
<b>Step 4</b>	<p>[no   default ] <b>add-command</b> <i>command string</i></p> <p><b>Example:</b></p> <pre>Device (cfg-call-home-snapshot) # <b>add-command</b> "show version"</pre>	<p>Adds the command to the Snapshot alert group. The <b>no</b> or <b>default</b> command will remove the corresponding command.</p> <ul style="list-style-type: none"> <li>• <i>command string</i>—IOS command. Maximum length is 128.</li> </ul>
<b>Step 5</b>	<p><b>end</b></p> <p><b>Example:</b></p> <pre>Device (cfg-call-home-snapshot) # <b>exit</b></pre>	<p>Exits and saves the configuration.</p>

## Configuring General email Options

### Configuring the Mail Server

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

Consider the following guidelines when configuring the mail server:

- Backup e-mail 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	<b>configure terminal</b>  <b>Example:</b> Device# <b>configure terminal</b>	Enters global configuration mode.
Step 2	<b>call-home</b>  <b>Example:</b> Device (config)# <b>call-home</b>	Enters call home configuration mode.
Step 3	<b>mail-server</b> <i>{ipv4-address   name}</i> <b>priority number</b>  <b>Example:</b> Device (cfg-call-home)# <b>mail-server stmp.example.com priority 1</b>	Assigns an email server address and its relative priority among configured email servers.  Provide either of these: <ul style="list-style-type: none"> <li>• The email server's IP address or</li> <li>• The email server's fully qualified domain name (FQDN) of 64 characters or less.</li> </ul> Assign a priority number between 1 (highest priority) and 100 (lowest priority).
Step 4	<b>sender from</b> <i>email-address</i>  <b>Example:</b> Device (cfg-call-home)# <b>sender from username@example.com</b>	(Optional) Assigns the e-mail address that will appear in the from field in Call Home e-mail messages. If no address is specified, the contact e-mail address is used.
Step 5	<b>sender reply-to</b> <i>email-address</i>  <b>Example:</b> Device (cfg-call-home)# <b>sender reply-to username@example.com</b>	(Optional) Assigns the e-mail address that will appear in the reply-to field in Call Home e-mail messages.
Step 6	<b>source-interface</b> <i>interface-name</i>  <b>Example:</b> Device (cfg-call-home)# <b>source-interface loopback1</b>	Assigns the source interface name to send call-home messages.  <i>interface-name</i> —Source interface name. Maximum length is 64.  <b>Note</b> For HTTP messages, use the <b>ip http client source-interface interface-name</b> command in global configuration mode to configure the source interface name. This allows all HTTP clients on the device to use the same source interface.
Step 7	<b>source-ip-address</b> <i>ipv4/ipv6 address</i>	Assigns source IP address to send call-home messages.

	Command or Action	Purpose
	<p><b>Example:</b></p> <pre>Device(cfg-call-home) # ip-address 209.165.200.226</pre>	<ul style="list-style-type: none"> <li><i>ipv4/ipv6 address</i>—Source IP (ipv4 or ipv6) address. Maximum length is 64.</li> </ul>
<b>Step 8</b>	<p><i>vrfvrf-name</i></p> <p><b>Example:</b></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><b>Note</b> For HTTP messages, if the source interface is associated with a VRF, use the <b>ip http client source-interface interface-name</b> command in global configuration mode to specify the VRF instance that will be 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	<b>configure terminal</b>  <b>Example:</b> Device# <b>configure terminal</b>	Enters global configuration mode.
Step 2	<b>call-home</b>  <b>Example:</b> Device(config)# <b>call-home</b>	Enters call home configuration mode.
Step 3	<b>http-proxy {ipv4-address   ipv6-address name} name</b>  <b>Example:</b> Device(config)# <b>http-proxy 1.1.1.1 port 1</b>	Specifies the proxy server for the HTTP request.

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

To enable AAA authorization to run 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	<b>configure terminal</b>  <b>Example:</b> Device# <b>configure terminal</b>	Enters global configuration mode.
Step 2	<b>call-home</b>  <b>Example:</b> Device(config)# <b>call-home</b>	Enters call home configuration mode.

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

### 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
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Device# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	<b>call-home</b>  <b>Example:</b> Device (config) # <b>call-home</b>	Enters call home configuration mode.
<b>Step 3</b>	<b>[no] syslog-throttling</b>  <b>Example:</b> Device (cfg-call-home) # <b>syslog-throttling</b>	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
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Device# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	<b>call-home</b>  <b>Example:</b> Device(config)# <b>call-home</b>	Enters call home configuration mode.
<b>Step 3</b>	<b>data-privacy {level {normal   high}   hostname}</b>  <b>Example:</b> Device(cfg-call-home)# <b>data-privacy level high</b>	Scrubs data from running configuration file to protect the privacy of the user. The default data-privacy level is normal.  <b>Note</b> Enabling the data-privacy command can affect CPU utilization when scrubbing a large amount of data. <ul style="list-style-type: none"> <li>• <b>normal</b>—Scrubs all normal-level commands.</li> <li>• <b>high</b>—Scrubs all normal-level commands plus the IP domain name and IP address commands.</li> <li>• <b>hostname</b>—Scrubs all high-level commands plus the hostname command.</li> </ul> <b>Note</b> Scrubbing the hostname from configuration messages can cause Smart Call Home processing failure on some platforms.

## 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
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Router# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	<b>call-home</b>  <b>Example:</b> Router(config)# <b>call-home</b>	Enters call home configuration mode.
<b>Step 3</b>	<b>profile <i>name</i></b>  <b>Example:</b> Router(config-call-home)# <b>profile test</b>	Enters call home destination profile configuration mode for the specified destination profile. If the specified destination profile does not exist, it is created.
<b>Step 4</b>	<b>active</b>  <b>Example:</b> Router(cfg-call-home-profile)# <b>active</b>	Enables the destination profile. By default, a new profile is enabled when it is created.
<b>Step 5</b>	<b>no active</b>  <b>Example:</b> Router(cfg-call-home-profile)# <b>no active</b>	Disables the destination profile.



	Command or Action	Purpose
<b>Step 6</b>	<b>end</b>  <b>Example:</b> Router(cfg-call-home) # <b>end</b>	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
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Router# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	<b>call-home</b>  <b>Example:</b> Router(config) # <b>call-home</b>	Enters call home configuration mode.
<b>Step 3</b>	<b>rename profile</b> <i>source-profile target-profile</i>  <b>Example:</b> Router(cfg-call-home) # <b>rename profile2 testprofile</b>	Renames an existing source file, where: <ul style="list-style-type: none"> <li>• <i>source-profile</i> —Specifies the existing name of the profile.</li> <li>• <i>target-profile</i> —Specifies a new name for the existing profile.</li> </ul>

### 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	<b>call-home test</b> [ <i>test-message</i> ] <b>profile name</b>  <b>Example:</b> Router# <b>call-home test profile profile1</b>	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	<b>call-home send alert-group configuration [profile name]</b>  <b>Example:</b> Device# <b>call-home send alert-group configuration profile CiscoTAC-1</b>	Sends a configuration alert group message to one destination profile if specified, or to all subscribed destination profiles.
Step 2	<b>call-home send alert-group inventory [profile name]</b>  <b>Example:</b> Device# <b>call-home send alert-group inventory</b>	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

You can use the **call-home request** command to submit information about your system to Cisco Systems to receive helpful analysis and report information specific to your system. You can request a variety of reports, including security alerts, known bugs, best practices, and 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 recipient profile does not need to be enabled for the call-home request. The profile should specify the e-mail address where the transport gateway is configured so that the

request message can be forwarded to the Cisco TAC and the user can receive the reply from the Smart Call Home service.

- 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 e-mail address of the registered user. If no *user-id* is specified, the response is sent to the contact e-mail address of the device.
- Based on the keyword specifying the type of report requested, the following information is returned:
  - **config-sanity**—Information on best practices as related to 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, 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
<b>Step 1</b>	<b>call-home request output-analysis</b> <i>“show-command”</i>  <b>Example:</b> [profile <i>name</i> ] [ccoid <i>user-id</i> ]  <b>Example:</b> Device# <b>call-home request output-analysis “show diag” profile TG</b>	Sends the output of the specified <b>show</b> command for analysis. The <b>show</b> command must be contained in quotes (“”).
<b>Step 2</b>	<b>call-home request</b> { <b>config-sanity</b>   <b>bugs-list</b>   <b>command-reference</b>   <b>product-advisory</b> }  <b>Example:</b> [profile <i>name</i> ] [ccoid <i>user-id</i> ]  <b>Example:</b> Device# <b>call-home request config-sanity profile TG</b>	Sends the output of a predetermined set of commands, such as the <b>show running-config all</b> and <b>show version</b> commands, for analysis. In addition, the <b>call home request product-advisory</b> subcommand includes all inventory alert group commands. The keyword specified after the <b>call-home request</b> 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	<b>call-home send</b> <i>{cli command   cli list}</i> [ <b>email</b> <i>email</i> <b>msg-format</b> <i>{long-text   xml}</i> ]   <b>http</b> <i>{destination-email-addressemail}</i> ][ <b>tac-service-request</b> <i>SR#</i> ]  <b>Example:</b>  Router# <b>call-home send</b> “show version;show running-config show inventory” emailsupport@example.com <b>msg-format</b> xml	Executes the CLI or CLI list and sends output via email or HTTP. <ul style="list-style-type: none"> <li>• <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 (“”).</li> <li>• <b>email</b> <i>email</i> <b>msg-format</b> <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</li> </ul>

Command or Action	Purpose
	<p>is <code>attach@cisco.com</code> for long-text format and <code>callhome@cisco.com</code> for XML format).</p> <ul style="list-style-type: none"> <li>• <b>http {destination-email-addressemail}</b>—If the <code>http</code> option is selected, the command output will be sent to Smart Call Home backend server (URL specified in TAC profile) in XML format. <b>destination-email-addressemail</b> 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.</li> <li>• <b>tac-service-request SR#</b>—Specifies the service request number. The service request number is required if the email address is not specified.</li> </ul>

### 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/gfPqB63EHln+6eJNMYwdQYJKoZIHvcNAQEFBQAawgcExCzAJ
BgNVBAYTA1VTMRcwFQYDVQQKEw5WZXJpU2lnbiwgSW5jLjE8MDoGA1UECxMzQ2xh
c3MgMyBQdWJsaWMgUHJpbWVyeSBDZXJ0aWZpY2F0aW9uIEFlbGhvcml0eSAtIEcy
MTowOAYDVQQLEzEoYykgMTk5OCBWXJpU2lnbiwgSW5jLiAtIEZvciBhdXRob3Jp
emVkiHVzZSBvbm5MR8wHQYDVQQLExZWZXJpU2lnbiBUcnVzdCBOZXR3b3JrMB4X
DTk4MDUxODAwMDAwMFoXDTI4MDgwMTIzNTk1OVowgcExCzAJBgNVBAYTA1VTMRcw
FQYDVQQKEw5WZXJpU2lnbiwgSW5jLjE8MDoGA1UECxMzQ2xhc3MgMyBQdWJsaWMg
UHJpbWVyeSBDZXJ0aWZpY2F0aW9uIEFlbGhvcml0eSAtIEcyMTowOAYDVQQLEzEo
YykgMTk5OCBWXJpU2lnbiwgSW5jLiAtIEZvciBhdXRob3JpemVkiHVzZSBvbm5M
R8wHQYDVQQLExZWZXJpU2lnbiBUcnVzdCBOZXR3b3JrMIGfMA0GCSqGSIb3DQEB
AQUAA4GNADCBiQKBgQDMXtERXVxp0KvTuWpMmR9ZmDCOFoUgRm1HP9SFIIThbbP4
p0OM8RcPO/mn+SXXwc+EY/J8Y8+iR/LGWzOOZEAEaMGAuWQcRXfH2G711Sk8UoG0
13gfgLptQ5GVj0VXXn7F+8qkBOvq1zdUMG+7AUcyM83cV5tkaWH4mx0ciU9cZwID
AQABMA0GCSqGSIb3DQEBBQUAA4GBAFNzb5cy5gZnBWYAT14Lk0PZ3BwmcYQWpSk
U01UbSuVdV1A12TT1+7eVmGSX6bEHRBhNtMsJzZoKQm5EWR0zLVznxxIqbxhAe7i
F6YM40AIOW7n60RzKprxaZLvcRTDOaxxp5EJb+RxBrO6WVcmeQD2+A2iMzAo1KpY
oJ2daZH9
```

## 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
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Router# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	<b>crypto pki trustpoint <i>name</i></b>  <b>Example:</b> Router(config)# <b>crypto pki trustpoint cisco</b>	Declares a CA trustpoint on your router and enters CA trustpoint configuration mode.
<b>Step 3</b>	<b>enrollment terminal</b>  <b>Example:</b> Router(ca-trustpoint)# <b>enrollment terminal</b>	Specifies a manual cut-and-paste method of certificate enrollment.
<b>Step 4</b>	<b>exit</b>  <b>Example:</b> Router(ca-trustpoint)# <b>exit</b>	Exits CA trustpoint configuration mode and returns to global configuration mode.
<b>Step 5</b>	<b>crypto pki authenticate <i>name</i></b>  <b>Example:</b> Router(config)# <b>crypto pki authenticate cisco</b>	Authenticates the named CA.  <b>Note</b> The CA name should match the <i>name</i> specified in the <b>crypto pki trustpoint</b> command.
<b>Step 6</b>	At the prompt, paste the security certificate text.  <b>Example:</b> Enter the base 64 encoded CA certificate.  <b>Example:</b> End with a blank line or the word "quit" on a line by itself  <b>Example:</b> <Paste certificate text here>	Specifies the security certificate text.
<b>Step 7</b>	<b>quit</b>  <b>Example:</b> <b>quit</b>	Specifies the end of the security certificate text.



	Command or Action	Purpose
Step 8	<p>yes</p> <p><b>Example:</b> % Do you accept this certificate? [yes/no]: yes</p>	Confirms acceptance of the entered security certificate.
Step 9	<p>end</p> <p><b>Example:</b> Router# end</p>	Exits global configuration mode and returns to privileged EXEC mode.
Step 10	<p>copy running-config startup-config</p> <p><b>Example:</b> Router# copy running-config startup-config</p>	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
MIIDAjCCAmSCEH3Z/gfPqB63EHln+6eJNMYwdQYJKoZIHvcNAQEFBQAwgcExCzAJ
BgNVBAYTALVTMRcwFQYDVQQKEw5WZXJpU2lnbiwgSW5jLjE8MDoGA1UECxMzQ2xh
c3MgMyBQdWJsaWMgUHJpbWVyeSBDZXJ0aWZpY2F0aW9uIEF1dGhvcml0eSAtIEcy
MTowOAYDVQQLEzEoYykgMTk5OCBWXzJpU2lnbiwgSW5jLiAtIEZvciBhdXRob3Jp
emVkIHVzZSBvbm55MR8wHQYDVQQLExZWZlZjU2lnbiBUCnVzdCBOZXR3b3JrMB4X
DTk4MDUxODAwMDAwMFoXDTE4MDgwMTIzNTk1OVowgcExCzAJBgNVBAYTALVTMRcw
FQYDVQQKEw5WZXJpU2lnbiwgSW5jLjE8MDoGA1UECxMzQ2xhc3MgMyBQdWJsaWMg
UHJpbWVyeSBDZXJ0aWZpY2F0aW9uIEF1dGhvcml0eSAtIEcyMTowOAYDVQQLEzEo
YykgMTk5OCBWXzJpU2lnbiwgSW5jLiAtIEZvciBhdXRob3JpemVkIHVzZSBvbm55
MR8wHQYDVQQLExZWZlZjU2lnbiBUCnVzdCBOZXR3b3JrMIGfMA0GCSqGSIb3DQEB
AQUAAAGNADCBiQKBgQDMXtERXVxp0KvTuWpMmR9ZmDCOFoUgRm1HP9SFIIThbbP4
pO0M8RcPO/mn+SXXwc+EY/J8Y8+iR/LGwzOOZEAEaMGauWQcRXfh2G711Sk8UoG0
13gfgLptQ5GVj0VXXn7F+8qkBOvqlzdUMG+7AUcyM83cV5tkaWH4mx0ciU9cZwID
AQABMA0GCSqGSIb3DQEBBQUAA4GBAFFNzb5cy5gZnBWyAt14Lk0PZ3BwmcYQWpSk
U0IUbsuvDV1A12Tt1+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	<b>call-home send alert-group inventory profile CiscoTAC-1</b>  <b>Example:</b>  Device# <b>call-home send alert-group inventory profile CiscoTAC-1</b>	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
<b>Step 1</b>	<b>show call-home</b>  <b>Example:</b> Device# <b>show call-home</b>	Displays the Call Home configuration in summary.
<b>Step 2</b>	<b>show call-home detail</b>  <b>Example:</b> Device# <b>show call-home detail</b>	Displays the Call Home configuration in detail.
<b>Step 3</b>	<b>show call-home alert-group</b>  <b>Example:</b> Device# <b>show call-home alert-group</b>	Displays the available alert groups and their status.
<b>Step 4</b>	<b>show call-home mail-server status</b>  <b>Example:</b> Device# <b>show call-home mail-server status</b>	Checks and displays the availability of the configured e-mail server(s).
<b>Step 5</b>	<b>show call-home profile {all   name}</b>  <b>Example:</b> Device# <b>show call-home profile all</b>	Displays the configuration of the specified destination profile. Use the <b>all</b> keyword to display the configuration of all destination profiles.
<b>Step 6</b>	<b>show call-home statistics</b>  <b>Example:</b> Device# <b>show call-home statistics</b>	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
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/odcse/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          0          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 80 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: <b>show version show logging show region show stack</b>
—	TRACEBACK	—	—	Detects software traceback events. Commands executed: <b>show version show logging show region show stack</b>
Configuration	—	—	—	User-generated request for configuration. (Sent to TAC.) CLI commands executed: <b>show platform show inventory show running-config all show startup-config show version</b>
Environmental	—	—	—	Events related to power, fan, and environment sensing elements, such as temperature alarms. (Sent to TAC.) CLI commands executed: <b>show platform show environment show inventory show logging</b>



Alert Group	Call Home Trigger Event	Syslog Event	Severity	Description and CLI Commands Executed
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: <b>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</b>
Syslog	—	—	—	Event logged to syslog.  CLI commands executed: <b>show logging</b>

## 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
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 GMT+HH:MM.</i>	CallHome/EventTime
Message name	Name of message. Specific event names are listed in the <b>Alert Group Trigger Events and Commands</b> 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

Data Item (Plain Text and XML)	Description (Plain Text and XML)	MML Tag (XML 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"> <li>• <i>type</i> is the product model number from backplane IDPROM.</li> <li>• <i>@</i> is a separator character.</li> <li>• <i>Sid</i> is C, identifying the serial ID as a chassis serial number.</li> <li>• <i>serial</i> is the number identified by the Sid field.</li> </ul> <p>Example: ASR1006@C@FOX105101DH</p>	CallHome/CustomerData/ ContractData/DeviceId
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"> <li>• <i>type</i> is the product model number from backplane IDPROM.</li> <li>• <i>@</i> is a separator character.</li> <li>• <i>Sid</i> is C, identifying the serial ID as a chassis serial number.</li> <li>• <i>serial</i> is the number identified by the Sid field.</li> </ul> <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

Data Item (Plain Text and XML)	Description (Plain Text and XML)	MML Tag (XML Only)	
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/ContactPhoneNumber	
Street address	Optional field containing street address for RMA part shipments associated with this unit.	CallHome/CustomerData/SystemInfo/StreetAddress	
Model name	Model name of the router. This is the “specific model as part of a product family name.	CallHome/DeviceCisco_Chassis/Model	
Serial number	Chassis serial number of the unit.	CallHome/DeviceCisco_Chassis/SerialNumber	
Chassis part number	Top assembly number of the chassis.	CallHome/DeviceCisco_Chassis/AdditionalInformation/AD@name=“PartNumber”	
System object ID	System Object ID that uniquely identifies the system.	CallHome/DeviceCisco_Chassis/AdditionalInformation/AD@name=“sysObjectID”	
System description	System description for the managed element.	CallHome/DeviceCisco_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/AttachmentName
	Attachment type	Attachment type. Usually “inline”.	/aml/Attachments/AttachmentType
	MIME type	Normally “text” or “plain” or encoding type.	/aml/Attachments/AttachmentData@encoding
	Command output text	Output of command automatically executed.	/aml/Attachments/AttachmentData

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

<b>Data Item (Plain Text and XML)</b>	<b>Description (Plain Text and XML)</b>	<b>MML Tag (XML Only)</b>
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
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**

<b>Data Item (Plain Text and XML)</b>	<b>Description (Plain Text and XML)</b>	<b>MML Tag (XML Only)</b>
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

Data Item (Plain Text and XML)	Description (Plain Text and XML)	MML Tag (XML Only)
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-qiazhou-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	<a href="#">Cisco IOS Master Commands List, All Releases</a>
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.	<a href="#">Smart Call Home User Guide</a>

Related Topic	Title
Smart Call Home site page on Cisco.com for access to all related product information.	<a href="#">Cisco Smart Call Home site</a>
Public Key Infrastructure (PKI) and Certificate Authority configuration in Cisco IOS XE software	<a href="#">Cisco IOS XE Security Configuration Guide: Secure Connectivity</a>

### 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: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

### 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>	<p><a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a></p>

## 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>





## 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](#), page 91
- [Prerequisites for Cisco Smart Licensing Client](#), page 91
- [Restrictions for Cisco Smart Licensing Client](#), page 92
- [Information About Cisco Smart Licensing Client](#), page 92
- [How to Activate Cisco Smart Licensing Client](#), page 93
- [Troubleshooting for Cisco Smart Licensing Client](#), page 96
- [Configuration Examples for Cisco Smart Licensing Client](#), page 97
- [Additional References for Cisco Smart Licensing Client](#), page 97
- [Feature Information for Cisco Smart Licensing Client](#), page 98

### 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 [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

### Prerequisites for Cisco Smart Licensing Client

- Ensure that Call Home is not disabled before using the Smart Licensing Client feature.

## Restrictions for Cisco Smart Licensing Client

- Only Cisco One Suites is supported in Cisco Smart Licensing for the current release.
- Only one licensing mode, either the Classical Licensing (CISL) or the Smart Licensing mode is supported at one point in time.

**Note**

---

Cisco Smart Licensing Client is not supported on Cisco's Integrated Services Routers Generation 2 (ISR G2) platform.

---

## Information About Cisco Smart Licensing Client

### Cisco Smart Licensing - An Overview

A new licensing model, based on a single technology, has been designed for Cisco called Smart Licensing that is intended to provide Enterprise Level Agreement-like capabilities for all of Cisco's products.

Smart Licensing is software based licensing end-to-end platform that consists of several tools and processes to authorize customers the usage and reporting of the Cisco products. The feature has the capability to capture the customers order and communicates with Cisco Cloud License Service through Smart Call Home transport media to complete the products registration and authorization on desired performance and technology level.

The Smart Licensing feature is aimed at giving users an experience of a single, standardized licensing solution for all Cisco products.

To know more about Smart Call Home, please refer to [Smart Call Home](#).

### Transitioning from CISL 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. The 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 a removal of the configuration or command.

Once either of these actions has been taken, the change in license state is noted by the Smart Software Manager upon next synchronization and an appropriate action is then 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. To know more about Cisco One Suites, please refer to [Cisco ONE Suites](#).

# How to Activate Cisco Smart Licensing Client

## Enable Smart Licensing

### Before You Begin

Before you enable Smart Licensing, ensure that Cisco One Suites is already enabled on your device. To know how to enable Cisco One Suites, please refer to [Activating Cisco One Suite License](#).

### 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	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b>  <b>Example:</b> Device# configure terminal	Enters global configuration mode.
Step 3	<b>license smart enable</b>  <b>Example:</b> Device# license smart enable	Activates Smart Licensing on the device.  <b>Note</b> 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
<b>Step 4</b>	<b>exit</b>  <b>Example:</b> Device# exit	Exits the global configuration mode.
<b>Step 5</b>	<b>write memory</b>  <b>Example:</b> Device# write memory	Saves the running configuration to NVRAM.
<b>Step 6</b>	<b>show license all</b>  <b>Example:</b> 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. license accept end user agreement
5. exit
6. write memory
7. reload
8. show license all

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>

	Command or Action	Purpose
<b>Step 2</b>	<b>configure terminal</b>  <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>no license smart enable</b>  <b>Example:</b> Device(config)# no license smart enable	Deactivates Smart Licensing on the device.  <b>Note</b> When you disable 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.
<b>Step 4</b>	<b>license accept end user agreement</b>  <b>Example:</b> Device(config)# license accept end user agreement	Uses the <b>license accept end user agreement</b> command to configure a one-time acceptance of the EULA for all Cisco IOS software packages and features.  <b>Note</b> After the <b>license accept end user agreement</b> command is issued and the EULA accepted, the EULA is automatically applied to all Cisco IOS software licenses.
<b>Step 5</b>	<b>exit</b>  <b>Example:</b> Device(config)# exit	Exits the global configuration mode.
<b>Step 6</b>	<b>write memory</b>  <b>Example:</b> Device# write memory	Saves the running configuration to NVRAM.
<b>Step 7</b>	<b>reload</b>  <b>Example:</b> Device# reload	(Optional) Restarts the device to enable the new feature set.  <b>Note</b> Reload the device if you have not reloaded the device after configuring the Cisco One Suites.
<b>Step 8</b>	<b>show license all</b>  <b>Example:</b> 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
<b>Step 1</b>	<p><code>enable</code></p> <p><b>Example:</b></p> <pre>Device&gt; enable</pre>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<p><code>license smart register idtoken <i>idtoken</i> [force]</code></p> <p><b>Example:</b></p> <pre>Device# license smart register idtoken 123</pre>	<p>Registers the device with the back-end server. Token id can be obtained from your virtual a/c in the Smart Licensing server.</p> <ul style="list-style-type: none"> <li>• <b>force:</b> To forcefully register your device irrespective of either the device is registered or not.</li> </ul> <p><b>Note</b> The device supplies the token ID to the Cisco server, which sends back a “Device Certificate” that is valid for 365 days.</p>
<b>Step 3</b>	<p><code>license smart deregister</code></p> <p><b>Example:</b></p> <pre>Device# license smart deregister</pre>	<p>Deregisters the device from the backend server.</p>
<b>Step 4</b>	<p><code>license smart renew [ID   auth]</code></p> <p><b>Example:</b></p> <pre>Device# license smart renew ID</pre>	<p>(Optional) Manually renews the ID certification or authorization.</p>

## 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 mode.
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	<a href="#">Cisco IOS Master Commands List, All Releases</a>
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: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

**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>	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## 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 [http://www.cisco.com/go/featurenavigator](#). An account on Cisco.com is not required.

**Table 11: Feature Information for Cisco Smart Licensing**

Feature Name	Releases	Feature Information
Cisco Smart Licensing Client	15.5(1)T	<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: <b>license smart enable</b>, <b>show license all</b></p>





## Configuring Licensing Storage Expansion for Cisco 2800 and Cisco 3800 Series Routers

---

At present, the Cisco 2800 and Cisco 3800 series platforms are running out of licensing storage to support current and potential Cisco Software Licensing projects on Cisco 2800 and Cisco 3800 series platforms, Cisco software licenses are stored in a section of NVRAM. The Licensing Storage Expansion feature reconfigures the NVRAM to provide additional license storage when the default license storage allocation is used up.

- [Finding Feature Information, page 101](#)
- [Information About Licensing Storage Expansion, page 102](#)
- [How to Configure Licensing Storage Expansion, page 103](#)
- [Configuration Examples for Licensing Storage Expansion, page 105](#)
- [Additional References, page 106](#)
- [Feature Information for Licensing Storage Expansion, page 106](#)

### 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 [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

# Information About Licensing Storage Expansion

## License Storage and Memory Allocation

Software licenses for Cisco 2800 and Cisco 3800 series routers are stored in NVRAM. The Cisco 2800 series routers have 16 KB of NVRAM allocated for license storage, and the Cisco 3800 series routers have 32 KB allocated. With the introduction of more licensed Cisco software products, the amount of space allocated for license storage will not be adequate. The License Storage Expansion feature reconfigures NVRAM to provide 64 KB of space for license storage in both the Cisco 2800 and Cisco 3800 series routers.

NVRAM stores two types of files that are not licenses: configuration files (startup-config and user-specific configuration files), and block files (non-configuration files that you can store in NVRAM). The reconfiguration of NVRAM reduces the amount of space available for configuration and block files. In Cisco 2800 series routers, this space is reduced from 240 KB to 192 KB. In Cisco 3800 series routers, this space is reduced from 480 KB to 448 KB.

The table below gives the NVRAM allocations for license and configuration storage before and after license storage expansion.

**Table 12: Memory Allocation in NVRAM**

Router Series	Default License Storage	Default Configuration Storage	Expanded License Storage	Resized Configuration Storage
2800	16 KB	240 KB	64 KB	192 KB
3800	32 KB	480 KB	64 KB	448 KB

If the configuration files in NVRAM are larger than the allocation for resized storage, you receive a message telling you to compress the files. To compress the files, use the **service compress-config** command described in [Compressing the Configuration Files in NVRAM](#), on page 104.

When the License Storage Expansion feature is run, configuration files are retained in the resized NVRAM. Block files are also retained, if possible. However, it might be necessary to store block files outside NVRAM, in other memory. If the configuration files are too big for the resized NVRAM, they will be compressed and rewritten into NVRAM. Block files will not be compressed.

When NVRAM is successfully resized, a message is sent to the console to indicate that you must reboot the router for the change to take effect.

## When to Use Licensing Storage Expansion

When you try to install a license, but there is not enough room for it in license storage, you receive an error message *License store is full*. The following example illustrates this condition:

```
Device# license install flash:gk7.lic
Installing licenses from "flash:gk7.lic"
Installing...Feature gatekeeper...Failed
```

```
%Error: Error[137]: License store is full.
0/1 licenses were successfully installed
0/1 licenses were existing licenses
1/1 licenses failed to install
```

When you receive this error message, you must expand the license storage..

## Downgrading to an Image That Does Not Support Licensing Storage Expansion

If you downgrade to a Cisco IOS image that does not support the **license expand nvram** command, all licenses stored in NVRAM are lost. This happens even if the image stores licenses in NVRAM. We recommend that you to save all your licenses before downgrading.

# How to Configure Licensing Storage Expansion

## Expanding License Storage

### Before You Begin

Back up your Cisco software configuration before performing this procedure.

If NVRAM holds block files (files used for things other than configuration), some of these files will be lost when NVRAM is reconfigured when there is insufficient space for them in resized storage. To avoid the loss of block files, you must back them up by manually removing them and storing them elsewhere. Block files are not compressed.

### SUMMARY STEPS

1. **enable**
2. **license expand nvram**

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. Enter your password if prompted.
<b>Step 2</b>	<b>license expand nvram</b>  <b>Example:</b> Device# license expand nvram	Initiates reconfiguration of NVRAM to expand license storage to 64 KB. As a result, the memory allocated for configuration files is reduced.

## What to Do Next

If NVRAM does not have sufficient space to expand license storage, continue with [Compressing the Configuration Files in NVRAM](#), on page 104.

If License Storage Expansion is successful, reboot the device so that the change can take effect.

## Compressing the Configuration Files in NVRAM

### SUMMARY STEPS

1. **configure terminal**
2. **service compress-config**
3. **end**
4. **copy system:running-config nvram:startup-config**

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 2</b>	<b>service compress-config</b>  <b>Example:</b> Device(config)# service compress-config	Activates compression of configuration files whenever the configuration is saved to startup configuration in NVRAM.
<b>Step 3</b>	<b>end</b>  <b>Example:</b> Device(config)# end	Exits global configuration mode.
<b>Step 4</b>	<b>copy system:running-config nvram:startup-config</b>  <b>Example:</b> Device# copy system:running-config nvram:startup-config	Saves the running configuration to the startup configuration in NVRAM. <ul style="list-style-type: none"> <li>• The running configuration is compressed during the copy operation because <b>service compress-config</b> (Step 2) is activated.</li> </ul>



# Configuration Examples for Licensing Storage Expansion

## Example: Expanding License Storage

The following example shows how to expand the allocation for license storage in NVRAM.

```
Device> enable
Password:
Device# license expand nvram
Caution: IOS configuration space will be re-partitioned in NVRAM.
You must back up your IOS configuration before running this command.
Do you wish to continue NVRAM re-partition?[confirm]
Device# y
```

When you enter `y`, NVRAM is checked to make sure that it has enough space for your files and the expanded licensing storage. If there is enough space for your files in the resized NVRAM, this message is sent to the console:

```
License storage expanded successfully.
IOS must be restarted for changes to take effect.
```

If there is not enough space for your configuration files, this message is sent to the console:

```
Error: startup-config is too large. Compress the config with "service compress-config"
followed by "copy system:running-config nvram:startup-config" and rerun "license expand
nvram".
```

If, after compression, the startup configuration file is still too large for the resized NVRAM, this message is sent:

```
Error: cannot expand the license storage. Insufficient NVRAM to store compressed
configuration.
```

If expansion cannot take place because the block files are too large, this message is sent to the console:

```
Error: cannot expand the license storage. Existing block files are too large. Back up
existing block files, delete them from nvram and reissue "license expand nvram".
```

If the `license expand nvram` command is issued on an already expanded NVRAM, this message is sent to the console:

```
Error: license storage already expanded to maximum size.
```

## Example: Compressing the Configuration Files in NVRAM

The following example shows how to compress configuration files for a Cisco 2800 series router that are larger than 192 KB.

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# service compress-config
Device(config)# end
Device#
%SYS-5-CONFIG_I: Configured from console by console
Device# copy system:running-config nvram:startup-config
Building configuration...
Compressing configuration from 201179 bytes to 152674 bytes
[OK]
```

## Additional References

### Related Documents

Related Topic	Document Title
Software activation concepts and configuration	“Cisco IOS Software Activation Conceptual Overview” module “Configuring the Cisco IOS Software Activation Feature” module
Software activation commands	<i>Software Activation Command Reference</i>
Cisco IOS commands	<a href="#">Master Commands List, All Releases</a>

### 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.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## Feature Information for Licensing Storage Expansion

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 [http://www.cisco.com/cisco/featurenavigator](#). An account on Cisco.com is not required.

**Table 13: Feature Information for Licensing Storage Expansion**

Feature Name	Releases	Feature Information
Licensing Storage Expansion	12.4(20)T, 15.0(1)M	Reconfigures NVRAM in Cisco 2800 and Cisco 3800 series routers to expand storage for software licenses to 64 KB.  The following command was introduced: <b>license expand nvram</b>





## INDEX

### C

- call home destination profiles [76](#)
  - displaying [76](#)

### D

- device IDs [81](#)
  - call home format [81](#)

### E

- e-mail notifications [89](#)
  - Call Home [89](#)

### I

- IDs [81](#)
  - serial IDsserial IDs [81](#)
    - description [81](#)

### S

- server IDs [81](#)
  - description [81](#)
- source IDs [81](#)
  - call home event format [81](#)

