



## **Cisco IOS Software Activation Command Reference**

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# Introduction

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This document describes the commands used to configure Cisco IOS Software Activation features with Cisco IOS software.

For information about configuration, refer to the *Cisco IOS Software Activation Configuration Guide*.





# Cisco IOS Software Activation Commands

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# clear license agent

To clear license agent statistics counters or connection statistics, use the **clear license agent** command in privileged EXEC mode.

**clear license agent {counters | sessions}**

## Syntax Description

<b>counters</b>	Clears license agent statistics counters.
<b>sessions</b>	Clears license agent connection statistics.

## Command Modes

Privileged EXEC (#)

## Command History

Release	Modification
15.0(1)M	This command was introduced.

## Examples

The following example clears license agent statistics counters:

```
Router# clear license agent counters
```

## Related Commands

Command	Description
<b>show license</b>	Displays information about a Cisco IOS software license.

# debug license

To enable controlled Cisco IOS software license debugging activity on a device, use the **debug license** command in privileged EXEC mode. To disable debugging, use the no form of this command.

```
debug license {agent {all | error} | core {all | errors | events} | errors | events | ipc}
```

```
no debug license {agent {all | error} | core {all | errors | events} | errors | events | ipc}
```

## Cisco ASR 1001 Router Platforms

```
debug license {core {all | errors | events} | errors | ipc}
```

```
no debug license {core {all | errors | events} | errors | ipc}
```

### Syntax Description

<b>agent</b>	Debugs license agent information. <ul style="list-style-type: none"> <li><b>all</b>—Debugs all license agent messages.</li> <li><b>error</b>—Debugs only license agent error messages.</li> </ul>
<b>core</b>	Debugs messages from a license core module. <ul style="list-style-type: none"> <li><b>all</b>—Debugs all license core messages</li> <li><b>errors</b>—Debugs only license core error messages</li> <li><b>events</b>—Debugs only license core event messages.</li> </ul>
<b>errors</b>	Debugs license warnings and errors.
<b>events</b>	Debugs license event messages.
<b>ipc</b>	Debugs license interprocess communication (IPC) messages.

### Command Default

Debugging is disabled.

### Command Modes

Privileged EXEC (#)

### Command History

Release	Modification
12.2(35)SE2	This command was introduced.
12.4(15)XZ	This command was integrated into Cisco IOS Release 12.4(15)XZ.
12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.
Cisco IOS XE Release 3.2S	This command was implemented on the Cisco ASR 1001 router.

### Usage Guidelines

Use this command to help troubleshoot issues with licenses on a device.

On the Cisco ASR 1001 router, the output from the **debug license** command is not in standard IOS format. You must execute the **request platform software trace rotate all** privileged EXEC command to make the output in the log files in the bootflash:tracelogs directory.

## Examples

The following example shows how to enable debugging for license warnings and errors on a router:

```
Router# debug license errors
```

The following example shows how to enable debugging for all license agent information on a switch:

```
Switch# debug license agent all
```

```
license agent app https[0x43FBC7C]: urlhook function
license agent app https[0x43FBC7C]: https action function
LIC_AGENT:Processing XML message
<?xml version="1.0" encoding="UTF-8"?>
<SOAP:Envelope xmlns:SOAP="http://www.w3.org/2003/05/soap-envelope">
<SOAP:Header>
<clm:Header version="1.0" xmlns:clm="http://www.cisco.com/clm">
<clm:Time>2003-04-23T20:27:19.827Z</clm:Time>
</clm:Header>
</SOAP:Header>
<SOAP:Body>
<lica:request xmlns:lica="http://www.cisco.com/clm">
<lica:installRequest>
<lica:license encoding="BASE64">
PENJUONPX1dUX0FSVElGQUNUyB2ZXJzaW9uPSIxLjAiPjxDSVNDT19XVF9MSUNFTlNFIHl1cnNp
b249IjEuMCI+PEZFRVVRVUkVfTkFNRT5pcGJhc2U8L0ZFRVVRVUkVfTkFNRT48RkVBVfVSRV9WRVJT
SU90PjEuMdwRkVBVfVSRV9WRVJTSU90PjxvREk+PFBJRD5CVUxMU0VZRTI0PC9QSUQ+PFNOPkNB
VDEwMDZSMEU4PC9TTj48L1VEST48U09VUkNFPkNpc2NvIEhRPC9TT1VSQ0U+PENSUFURV9EQVRF
PjIwMDYtMTEtMjUJUMDA6MzMTA8L0NSRUFURV9EQVRFPPjxMSUNFTlNFX0xJTkVfSEFTSCBoYXNo
QWxnbz0iU0hBMSI+NDJiNFVWVWpOd3pJK0ZNdEV6QlNzSDRwdzFFPtwTElDRU5TRV9MSU5FX0hB
U0g+PFRZUEU+UkVHVUxBUjwvVF1QRT48TElDRU5TRV9MSU5FPjwhW0NEQVRBWzExIGlwYmFzZSZA
LjAgTE90RyB0T1JNQUwgU1RBTkRBTTE9ORSBFWENMIElORk1OSVRFX0tFWMgSU5GSU5JVEVfS0VZ
UyBORVZFUiBORVZFUiBoAUwgU0xNX0NPREUgQ0xfTkRfTENLIE5pTCAqMVZBU1Y5WlJESzREOU5U
NDAwIE5pTCBoAUwgTmlMDVfTU1OUyA8VURJPFjxQSUQ+QlVMTFNFWUyNDwvUElEPjxTTj5DQVQX
MDA2UjBFODwvU04+PC9VREk+IGUxWW8wS1U2VnJLONBJZXRib1dJVKyZlVaVGdieU1Eak1HWERR
VXc3dkx0Yw1XRzZ0dUJOMG51TXpKaHpzQ2tMN113TWFxS2paem05YW5FbVJHUUVPTH1DdmRVZksw
QmNLN0pPcnZsUkw0VjMyJDxXTEM+QVFFQk1RQUiVly9Gbs8vWDkybThNb0NOZkVMShJiVzRjWDFM
ZGNpdDNMvU5Gw1V1OWppT0phcXB5Q2N6TTFpaUlKbVE3NEd5WHJfY3F2UGlBbVdTYUVtVVQ1NnJz
dGs2Z3ZtaiteFUUtSZkQ5TbpbWUxY3pyZEt4ZklMVDBMYVhUNDE2bndtZnA5M1R5YTZ2SVE0Rm5s
QmRxsJfZTTPYZVNX0FBtVmNUVT1BNG85aGlS0XZLdXI4Tj1GODg1RD1HVkYwYkpIY21UNU09PC9X
TEM+XV0+PC9MSUNFTlNFX0xJTkU+PFVTRVJfTU9ESUZJQUJMRV9DT01NRU5UIGZpZWxkUmVzdHJp
Y3Rpb25zPSJNYXggOTkgQVNDsUkgY2hhcmFjdGVycyBpbiBsZW5ndGguIj48L1VTRVJfTU9ESUZJ
QUJMRV9DT01NRU5UPjwvQ01TQ09fV1RfTElDRU5TRT48L0NBUONPX1dUX0FSVElGQUNUyB2ZXJzaW9uPSIxLjAiPjxDSVNDT19XVF9MSUNFTlNFIHl1cnNp
</lica:license>
</lica:installRequest>
</lica:request>
</SOAP:Body>
</SOAP:Envelope>

LIC_AGENT: XML received opcode(1)
LIC_AGENT: License ipbase
%IOS_LICENSE_IMAGE_APPLICATION-6-LICENSE_LEVEL: Next reboot level = ipbase and License =
ipbase
LIC_AGENT: Notification Event type = 1 License Installed
LIC_AGENT: Notification Event type = 13 License Annotate
```

# license accept end user agreement

To accept the end-user license agreement (EULA) for all Cisco IOS software packages and features at one time, use the **license accept end user agreement** command in global configuration mode.

## license accept end user agreement

**Syntax Description** This command has no arguments or keywords.

**Command Default** EULA is not accepted.

**Command Modes** Global configuration (config)

Command History	Release	Modification
	15.0(1)M4	This command was introduced for the fixed Cisco ISR and the Cisco ISR G2 platforms.

**Usage Guidelines** The **license accept end user agreement** command is used to accept the EULA for all Cisco IOS software packages and features. After the command is issued and the EULA accepted, it is automatically applied for all Cisco IOS software packages and feature licenses.

- If this configuration command is part of the start-up configuration, it implies that the EULA is accepted. The EULA is automatically applied to any subsequent license that is activated; the EULA is not displayed and the user is not prompted to accept the EULA.
- A copy of the terms of the End User License Agreement (EULA) is available at [http://www.cisco.com/en/US/docs/general/warranty/English/EU1KEN\\_.html](http://www.cisco.com/en/US/docs/general/warranty/English/EU1KEN_.html)

**Examples** The following example shows how to configure the EULA:

```
Router(config)# license accept end user agreement
```

Related Commands	Command	Description
	<b>license install</b>	Installs a stored license file.
	<b>show license</b>	Displays information about a Cisco IOS software license.

# license agent default

To configure license agent authentication, use the **license agent default** command in global configuration mode.

**license agent default authenticate [none]**

## Syntax Description

<b>authenticate</b>	Authenticates by using the HTTP mechanism.
<b>none</b>	(Optional) Disables (bypasses) HTTP authentication.

## Command Default

The license agent is enabled, and it monitors the HTTP path /lic-agent by using plaintext.

## Command Modes

Global configuration (config)

## Command History

Release	Modification
15.0(1)M	This command was introduced.
15.0(1.1)M	This command was modified. The <b>no</b> form of the command was removed.

## Usage Guidelines

By default, the license agent starts automatically when the device boots up.

The agent responds to ConnectRequest XML messages, and depending on the configuration of the **license agent listener http** command, all other Cisco License Manager XML messages.

## Examples

The following example shows how to use the default HTTP mechanism for authentication:

```
Router(config)# license agent default authenticate
```

## Related Commands

Command	Description
<b>license agent listener</b>	Configures the path that the license agent authentication monitors.
<b>license agent max-sessions</b>	Limits the number of HTTP sessions to the license agent.
<b>license agent notify</b>	Specifies the URL to send license agent notifications.

# license agent listener

To configure the path that the license agent authentication monitors, use the **license agent listener** command in global configuration mode. To return to the default setting, use the **no** form of this command.

```
license agent listener http {encrypt | plaintext} url-path authenticate [acl access-list]
[max-message size] [none]
```

```
no license agent listener http
```

Syntax Description		
<b>http</b>		Uses the HTTP listener transport.
<b>encrypt</b>		Accepts encrypted connections.
<b>plaintext</b>		Accepts plaintext connections.
<i>url-path</i>		The HTTP servlet path to respond to (for example, http://10.1.1.1/abc).
<b>authenticate</b>		Authenticates by using the default HTTP mechanism.
<b>acl</b> <i>access-list</i>		(Optional) Uses the specified access list for trusted clients on this session. The range is 1 to 65536.
<b>max-message</b> <i>size</i>		(Optional) Defines the maximum message size that the license agent accepts. The range is 1000 to 4294967295.
<b>none</b>		(Optional) Disables (bypasses) HTTP authentication.

**Command Default** The license agent authentication monitors the HTTP path /lic-agent by using plaintext.

**Command Modes** Global configuration (config)

Command History	Release	Modification
	15.0(1)M	This command was introduced.

**Usage Guidelines** This command starts the license agent in listener mode.

If the *url-path* argument is not */lic-agent*, then */lic-agent* (for example, license agent default) accepts only the ConnectRequest message. Otherwise, if the value for the *url-path* argument is */lic-agent* (and **encrypt** is specified), then **encrypt** /*lic-agent* accepts all requests and **plaintext** /*lic-agent* accepts only the ConnectRequest message.

**Examples** The following example shows how to authenticate the license agent by using the HTTP encrypted authentication mechanism:

```
Router(config)# license agent listener http encrypt /lic-agent authenticate
```

## ■ license agent listener

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>license agent default</b>	Configures license agent authentication.
<b>license agent max-sessions</b>	Limits the number of HTTP sessions to the license agent.
<b>license agent notify</b>	Specifies the URL to send license agent notifications.

# license agent max-sessions

To limit the number of HTTP sessions to the license agent, use the **license agent max-sessions** command in global configuration mode. To return to the default setting, use the **no** form of this command.

**license agent max-sessions** *number*

**no license agent max-sessions**

Syntax Description	<i>number</i>	Maximum number of license agent sessions (4 to 25).
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Command Default	The default number of HTTP sessions is 9.
-----------------	---

Command Modes	Global configuration (config)
---------------	-------------------------------

Command History	Release	Modification
	15.0(1)M	This command was introduced.

**Examples** The following example shows how to limit the number of concurrent license agent sessions on a router:

```
Router(config)# license agent max-sessions 5
Router(config)# exit
Router# show license agent session
License Agent Sessions: 0 open, maximum is 5
```

Related Commands	Command	Description
	<b>license agent default</b>	Configures license agent authentication.
	<b>license agent listener</b>	Configures the path that the license agent authentication monitors.
	<b>license agent notify</b>	Specifies the URL to send license agent notifications.

# license agent notify

To specify the URL to send license agent notifications, use the **license agent notify** command in global configuration mode. To remove the configuration, use the **no** form of this command.

**license agent notify** *url-path user password version*

**no license agent notify**

## Syntax Description

<i>url-path</i>	URL to use (for example, http://10.1.1.1/abc).
<i>user</i>	HTTP-level username to use.
<i>password</i>	HTTP-level password to use.
<i>version</i>	Notification version number.

## Command Default

The URL is not configured.

## Command Modes

Global configuration (config)

## Command History

Release	Modification
15.0(1)M	This command was introduced.

## Usage Guidelines

You can also configure this command by using the Cisco License Manager message ConnectRequest.

## Examples

The following example shows how to specify the URL to send license agent notifications:

```
Router(config)# license agent notify http://10.1.1.1/abc users anonymous 1
```

## Related Commands

Command	Description
<b>license agent default</b>	Configures license agent authentication.
<b>license agent listener</b>	Configures the path that the license agent authentication monitors.
<b>license agent max-sessions</b>	Limits the number of HTTP sessions to the license agent

# license boot level

To boot a new software license on switching platforms, use the **license boot level** command in global configuration mode. To return to the previously configured license level, use the **no** form of this command.

## Cisco Catalyst 3560-E Switch Platforms

**license boot level** *license-level*

**no license boot level** *license-level*

## Cisco Catalyst 3750-E Switch and Switch Stack Platforms

**license boot level** *license-level* [**switch** *switch-num*]

**no license boot level** *license-level* [**switch** *switch-num*]

## Cisco Catalyst 3750-E Switch Mixed Stack Platforms

**license boot level** *license-level* **switch** *switch-num*

**no license boot level** *license-level* **switch** *switch-num*

## Cisco Catalyst 4500E Series Switch Platforms

**license boot level** *license-level*

Syntax Description	<i>license-level</i>	Level at which the switch is booted (for example, ipservices). The license levels available in a universal/universalk9 image are: <ul style="list-style-type: none"> <li>• entservices</li> <li>• ipbase</li> <li>• lanbase</li> </ul> The license levels available in a universal-lite/universal-litek9 image are: <ul style="list-style-type: none"> <li>• ipbase</li> <li>• lanbase</li> </ul>
	<b>switch</b> <i>switch-num</i>	Switch or slot ID in a stackable environment.

**Command Default** The switch boots the configured image.

**Command Modes** Global configuration (config)

**Command History**

Release	Modification
12.4(15)XZ	This command was introduced.
12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.
Cisco IOS XE Release 3.1.0SG	This command was integrated into Cisco IOS XE Release 3.1.0SG on Catalyst 4500E series switches.

**Usage Guidelines**

Use the **license boot level** command for these purposes:

- Downgrade or upgrade licenses
- Enable or disable an evaluation or extension license
- Clear an upgrade license

This command forces the licensing infrastructure to boot the configured license level instead of the license hierarchy maintained by the licensing infrastructure for a given module.

- When the switch reloads, the licensing infrastructure checks the configuration in the startup configuration for any licenses. If there is a license in the configuration, the switch boots with that license. If there is no license, the licensing infrastructure follows the image hierarchy to check for licenses.
- If the forced boot evaluation license expires, the licensing infrastructure follows the regular hierarchy to check for licenses.
- If the configured boot license is already expired, the licensing infrastructure follows the hierarchy to check for licenses.

This command takes effect at the next reboot of any of the supervisors (Act or stby). This configuration must be saved to the startup configuration for it to be effective. After you configure the level, the next time the standby supervisor boots up, this configuration is applied to it.

To boot the standby supervisor to a different level than active, configure that level by using this command and then bring up the standby.

If the **show license all** command displays the license as “Active, Not in Use, EULA not accepted,” you can use the **license boot level** command to enable the license and accept the end-user license agreement (EULA).

**Examples**

The following example shows how to activate the *ipbase* license on the switch upon the next reload:

```
Switch(config)# license boot level ipbase
```

**Related Commands**

Command	Description
<b>license install</b>	Installs a stored license file.
<b>license save</b>	Saves a copy of a permanent license to a specified license file.
<b>show license all</b>	Shows information about all licenses in the system.

# license boot module

To boot a new software license on routing platforms, use the **license boot module** command in global configuration mode. Use the **no** form of this command to return to the default setting.

## Cisco ASR 1001 Router Platforms

**license boot module** *module-name* **group** { **all** | **feature** } **level** *license-level*

**no license boot module**

## Cisco 860, 880, and 890 Series Routers, and Cisco 1900, 2900, and 3900 Series Integrated Services Router Platforms

**license boot module** *module-name* **level** *license-level*

**no license boot module** *module-name* **level** *license-level*

## Cisco uBR10012 Universal Broadband Routers

**license boot module** *module-name* **technology-package** *package-name* [**disable**]

**no license boot module** *module-name* **technology-package** *package-name* [**disable**]

### Syntax Description

<i>module-name</i>	Router or module to be configured (for example: c880-data or c3900).
<b>group</b>	Selects a specific group that contains the image and feature licenses for the device.
<b>all</b>	Groups by all features.
<b>feature</b>	Groups by feature.
<b>level</b> <i>license-level</i>	Boots the device or module at the specified level (for example, advipservices).
<b>technology-package</b>	Upgrades or downgrades a software license, or enables or disables an evaluation license.
<i>package-name</i>	Package or feature set the given module should boot (for example, data).
<b>disable</b>	(Optional) Disables the package or the feature set.

### Command Default

The router boots the configured image.

### Command Modes

Global configuration (config)

### Command History

Release	Modification
12.4(15)XZ	This command was introduced.
12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.

Release	Modification
15.0(1)M	This command was modified. The <b>technology-package</b> keyword was added for the Cisco 1900, 2900, and on the 3900 series integrated services router platforms.
Cisco IOS XE Release 3.2S	This command was modified. The <b>group</b> , <b>all</b> , <b>feature</b> , and <b>level</b> keywords were added for the Cisco ASR 1001 router.

### Usage Guidelines

Use the **license boot module** command for these purposes:

- Downgrade or upgrade licenses
- Enable or disable an evaluation or extension license
- Clear an upgrade license

This command forces the licensing infrastructure to boot the configured license level instead of the license hierarchy maintained by the licensing infrastructure for a given module.

- When the router reboots, the licensing infrastructure checks the configuration in the startup configuration/rommon for any licenses. If there is a license in the configuration, the router boots with that license. If there is no license, the licensing infrastructure follows the image hierarchy to check for licenses.
- If the forced boot evaluation license expires, the licensing infrastructure follows the regular hierarchy to check for licenses.
- If the configured boot license is already expired, the licensing infrastructure follows the hierarchy to check for licenses.

To make the evaluation license inactive, use the **no license boot module technology-package** command. To re-activate the evaluation license, use the **license boot module technology-package** command.

If the **show license all** command displays the license as “Active, Not in Use, EULA not accepted,” you can use the **license boot module** command to enable the license and accept the EULA. Do not confuse the **license boot module** global configuration command with a similarly named command available in privileged EXEC mode.

### Examples

The following example shows how to activate the *throughput* feature that is part of the group *all* on the ASR 1001 module at the next reboot:

```
Router(config)# license boot module asr1001 group all level throughput
```

The following example shows how to activate the *advipservices* license on the c880-data module at the next reboot:

```
Router(config)# license boot module c880-data level advipservices
```

The following example shows how to enable an evaluation license:

```
Router(config)# license boot module c3900 technology-package data
```

The following example shows how to make an evaluation license inactive:

```
Router(config)# no license boot module c3900 technology-package data
```

### Related Commands

<b>Command</b>	<b>Description</b>
<b>license install</b>	Installs a stored license file.
<b>license save</b>	Saves a copy of a permanent license to a specified license file.
<b>show license all</b>	Shows information about all licenses in the system.

# license call-home install pak

To install a license by using a product authorization key (PAK) and the Cisco License Call Home feature, use the **license call-home install pak** command in privileged EXEC mode.

**Cisco 860, 880, and 890 Series Routers, and Cisco 1900, 2900, and 3900 Series Integrated Services Router Platforms**

**license call-home install pak** *pak-id*

**Cisco Catalyst 3560-E Switch Platforms**

**license call-home install pak** *pak-id*

**Cisco Catalyst 3750-E Switch and Switch Stack Platforms**

**license call-home install pak** *pak-id* [**switch** *switch-num*]

**Cisco Catalyst 3750-E Switch Mixed Stack Platforms**

**license call-home install pak** *pak-id* **switch** *switch-num*

Syntax Description		
<i>pak-id</i>		A product authorization key sent through e-mail or through regular mail by manufacturing to authorize software upgrades.
<b>switch</b> <i>switch-num</i>		Specifies a switch in a switch stack or in a mixed switch stack. The switch number range is 1 to 9.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	12.2(35)SE2	This command was introduced.
	12.4(15)XZ	This command was integrated into Cisco IOS Release 12.4(15)XZ.
	12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.

**Usage Guidelines** The Cisco License Call Home feature allows a Cisco router to communicate with the Cisco licensing infrastructure through the Internet and retrieve licensing information. This command requires that the router be connected to the Internet.

This command requires the following:

- The router or switch 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 module in the *Network Management Configuration Guide*: [http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm\\_http\\_web.html](http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_http_web.html).
- Only certain platforms support the Cisco License Call Home feature, and those devices must be running a Cisco IOS crypto K9 image.
- You must obtain the device certificate from the Cisco licensing infrastructure.

- You must have a Cisco.com user login account.

The PAK is a unique token supplied to allow partial fulfillment of licenses. A PAK is not tied to any particular device, but rather to a product identifier (PID).

When you issue the **license call-home install pak** command, these events occur:

1. Information about the stock keeping unit (SKU) is displayed. SKUs map to one or more Cisco software features.
2. You receive prompts at the command line for required fields such as an e-mail address, username, and password to access the Cisco website and SKU quantities.
3. The user-entered data is validated and processed, and then the license is installed on the router. If data is not validated, warning messages are displayed.

## Examples

The following example shows the commands, prompts, and responses required to install a license by using a PAK and the Cisco License Call Home feature. Use the **show license feature** command to verify the installation.

```
Router# 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
```

Related Commands	Command	Description
	<b>license call-home resend</b>	Restores a lost license by using the Cisco License Call Home feature.
	<b>license call-home revoke</b>	Rehosts (revokes and transfers) a license by using the Cisco License Call Home feature.
	<b>show license call-home</b>	Displays the SKU list and features available in a PAK by using the Cisco License Call Home feature.
	<b>show license feature</b>	Shows a list of licensed features available in an image.

# license call-home resend

To request a license be re-sent by using the Cisco License Call Home feature, use the **license call-home resend** command in privileged EXEC mode.

**Cisco 860, 880, and 890 Series Routers, and Cisco 1900, 2900, and 3900 Series Integrated Services Router Platforms**

```
license call-home resend dest-lic-location
```

**Cisco Catalyst 3560-E Switch Platforms**

```
license call-home resend dest-lic-location
```

**Cisco Catalyst 3750-E Switch and Switch Stack Platforms**

```
license call-home resend dest-lic-location [switch switch-num]
```

**Cisco Catalyst 3750-E Switch Mixed Stack Platforms**

```
license call-home resend dest-lic-location switch switch-num
```

Syntax Description		
	<i>dest-lic-location</i>	<p>The location where the Cisco IOS software license is to be stored. Valid location file systems are <b>archive</b>, <b>bs</b>, <b>flash</b>, <b>flash<i>n</i></b>, <b>ftp</b>, <b>http</b>, <b>https</b>, <b>null</b>, <b>nvr</b>, <b>pram</b>, <b>rcp</b>, <b>scp</b>, <b>syslog</b>, <b>system</b>, <b>tftp</b>, <b>tmpsys</b>, <b>vb</b>. The license location can also be a directory.</p> <ul style="list-style-type: none"> <li>The <b>bs://</b>, <b>null://</b>, and <b>vb://</b> file systems do not accept filenames.</li> <li>The <b>bs</b> file system is available only on mixed Cisco 3750-E switch stacks.</li> <li>The <b>archive</b>, <b>pram</b>, <b>scp</b>, and <b>syslog</b> file systems are available only on router platforms.</li> <li>The <b>flash<i>n</i></b> file system, where <i>n</i> is an integer in the range from 1 to 9, is available only on Cisco 3750-E switches and stacks.</li> <li>The <b>https</b> file system is not available on mixed Cisco 3750-E switch stacks and the Cisco 3560-E switch.</li> </ul>
	<b>switch</b> <i>switch-num</i>	Specifies a switch in a switch stack or in a mixed switch stack. The switch number range is 1 to 9.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	12.2(35)SE2	This command was introduced.
	12.4(15)XZ	This command was integrated into Cisco IOS Release 12.4(15)XZ.
	12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.

**Usage Guidelines**

The Cisco License Call Home feature allows a Cisco router to communicate with the Cisco licensing infrastructure through the Internet and retrieve licensing information. This command requires that the router be connected to the Internet.

This command contacts the Cisco licensing back-end fulfillment system and obtains licenses that are valid for a specified unique device identifier (UDI). The **license call-home resend** command also stores the received license lines in the specified destination URL.

This command requires the following:

- The router or switch 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 module in the *IOS Network Management Configuration Guide*: [http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm\\_http\\_web.html](http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_http_web.html).
- Only certain platforms support the Cisco License Call Home feature, and those devices must be running a Cisco IOS crypto K9 image.
- You must obtain the device certificate from the Cisco licensing infrastructure before starting.
- You must have a Cisco.com user login account.

This command initiates these actions:

1. The device credential is retrieved from the device and sent to the Cisco licensing infrastructure.
2. This command invokes the Cisco licensing infrastructure to request all licenses with the device credential information be sent to the device. The Cisco licensing infrastructure provides all purchased licenses for the given UDI.
3. This command stores all licenses in the destination URL (filesystem).

**Examples**

The following example shows the commands, prompts, and responses required to request a license to be sent from the Cisco licensing infrastructure and to be stored in the requested destination file system:

```
Router# license call-home resend flash:licenseresend.xml

CCO User name: User1
CCO password : *****
Email Address: User1@cisco.com
Alternate Email Address: User1@cisco.com
Getting Licenses from SWIFT .....
Saving it to flash:licenseresend.xml.....Done
```

**Related Commands**

Command	Description
<b>license call-home install</b>	Installs a license by using the Cisco License Call Home feature.
<b>license call-home revoke</b>	Rehosts (revokes and transfers) a license by using the Cisco License Call Home feature.
<b>show license call-home</b>	Displays the SKU list and features available in a PAK by using the Cisco License Call Home feature.

# license call-home revoke

To rehost (revoke and transfer) a license by using unique device identifiers (UDIs) and the Cisco License Call Home feature, use the **license call-home revoke** command in privileged EXEC mode.

## Cisco 860, 880, and 890 Series Routers, and Cisco 1900, 2900, and 3900 Series Integrated Services Router Platforms

```
license call-home revoke [udi target-udi] output-of-rehosted-license-url [permission-ticket
permission-ticket-url] [rehost-ticket rehost-ticket-url]
```

## Cisco Catalyst 3560-E Switch Platforms

```
license call-home revoke [udi target-udi] output-of-rehosted-license-url [permission-ticket
permission-ticket-url] [rehost-ticket rehost-ticket-url]
```

## Cisco Catalyst 3750-E Switch and Switch Stack Platforms

```
license call-home revoke [udi target-udi] output-of-rehosted-license-url [permission-ticket
permission-ticket-url] [rehost-ticket rehost-ticket-url] [switch switch-num]
```

## Cisco Catalyst 3750-E Switch Mixed Stack Platforms

```
license call-home revoke [udi target-udi] output-of-rehosted-license-url [permission-ticket
permission-ticket-url] [rehost-ticket rehost-ticket-url] switch switch-num
```

### Syntax Description

<b>udi</b> <i>target-udi</i>	(Optional) Revokes license information for this target UDI.
<i>output-of-rehosted-license-url</i>	(Optional) Output received from the rehosted process, which saves the rehost ticket or the license file in the specified file system.
<b>permission-ticket</b> <i>permission-ticket-url</i>	(Optional) Revokes license information by using the permission ticket in the specified URL.
<b>rehost-ticket</b> <i>rehost-ticket-url</i>	(Optional) Revokes license information by using the rehost ticket in the specified URL.
<b>switch</b> <i>switch-num</i>	Specifies a switch in a switch stack or in a mixed switch stack. The switch number range is 1 to 9.

### Command Modes

Privileged EXEC (#)

### Command History

Release	Modification
12.4(15)XZ	This command was introduced.
12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.

### Usage Guidelines

The Cisco License Call Home feature allows a Cisco router to communicate with the Cisco licensing infrastructure through the Internet and retrieve licensing information. This command requires that the router be connected to the Internet.

If you do not specify a target UDI, the rehost ticket is stored in the specified URL. If you do specify a target UDI, this command sends the rehost ticket to the Cisco licensing infrastructure with the target UDI, converts it to a license file, and stores it in the specified URL. If one of the operations fails in the call-home revoke operations, the intermediate results are stored at the specified URL and a message explaining what to do next is displayed.

This command requires the following:

- The router or switch 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 module in the *Network Management Configuration Guide*:  
[http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm\\_http\\_web.html](http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_http_web.html).
- Only certain platforms support the Cisco License Call Home feature, and those devices must be running a Cisco IOS crypto K9 image.
- You must obtain the device certificate from the Cisco licensing infrastructure.
- You must have a Cisco.com user login account.

The **license call-home revoke EXEC** command performs this sequence of operations:

1. The Cisco licensing module establishes communication with the Cisco licensing infrastructure to start the rehost operation.
2. The Cisco licensing infrastructure sends a signed request to obtain the SKU details for this UDI from the Cisco licensing portal. The request contains the source UDI.
3. The Cisco licensing portal responds that either the target UDI is not correct or lists the stock keeping units (SKUs) available on the device for rehosting.
4. The Cisco licensing infrastructure requests the permission ticket from the licensing portal by providing the SKU and the e-mail address of the user.
5. The Cisco licensing portal provides the permission file to the Cisco licensing infrastructure.
6. The software uses this permission ticket file to generate the rehost ticket.
7. This rehost ticket is sent to the licensing back end along with the target UDI and optional e-mail address.
8. The Cisco licensing back end generates a new license file and sends it by using the e-mail address collected in the prompts.

## Examples

The following example shows how to use the **license call-home revoke** command to revoke a license on the device with the specified UDI. In the display, the user selects the SKU called SL-LWAPP= to revoke the license for the *lwapp* feature. This command sends the rehost ticket to the Cisco licensing infrastructure with the target UDI, converts it to a license file, and stores it in the specified URL (flash:REHOSTED\_LICENSE):.

```
Router# license call-home revoke udi CISCO887W:FHH1124P02Y flash:REHOSTED_LICENSE
CCO User name : xxxxxx
CCO password :
```

```
Retrieving the sku from swift .....!.....
```

```
1. SKU Name           : SA-LWAPP
   SKU Type           : Product
   Description        : For Internal purposes only
   Ordered Qty        : 1
   Available Qty      : 1
   Feature List       :
```

```

        Feature name:          lwapp Count: Uncounted
Platform Supported : N/A

```

```

2. SKU Name          : SA880-AIS
   SKU Type          : Product
   Description        : For Internal purposes only
   Ordered Qty        : 1
   Available Qty      : 1
   Feature List       :
        Feature name:      advipservices Count: Uncounted
Platform Supported : N/A

```

```

3. SKU Name          : SL-LWAPP=
   SKU Type          : Product
   Description        : For Internal purposes only
   Ordered Qty        : 1
   Available Qty      : 1
   Feature List       :
        Feature name:          lwapp Count: Uncounted
Platform Supported : N/A

```

```

4. SKU Name          : SL-AV
   SKU Type          : Product
   Description        : For Internal purposes only
   Ordered Qty        : 1
   Available Qty      : 1
   Feature List       :
        Feature name:      advsecurity Count: Uncounted
Platform Supported : N/A

```

5. All of the above

Please select the sku number you want to revoke : **3**

Retrieving the permission ticket from swift .....!... Output file saved ..... to  
flash: REHOSTED\_LICENSE

Retrieving the rehost ticket from the device .....!.

Following Permanent license(s) will be revoked from this device  
Feature Name: lwapp

Following Extension license(s) will be installed on this device  
Feature Name: lwapp

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

You hereby acknowledge and agree that the product feature license  
is terminable and that the product feature enabled by such license  
may be shut down or terminated by Cisco after expiration of the  
applicable term of the license (e.g., 30-day trial period). Cisco  
reserves the right to terminate or shut down any such product feature  
electronically or by any other means available. While alerts or such  
messages may be provided, it is your sole responsibility to monitor  
your terminable usage of any product feature enabled by the license  
and to ensure that your systems and networks are prepared for the shut  
down of the product feature. You acknowledge and agree that Cisco will  
not have any liability whatsoever for any damages, including, but not  
limited to, direct, indirect, special, or consequential damages related

## ■ license call-home revoke

to any product feature being shutdown or terminated. By clicking the "accept" button or typing "yes" you are indicating you have read and agree to be bound by all the terms provided herein.

ACCEPT? [yes/no]: **yes**

Output file saved ..... to flash: REHOSTED\_LICENSE

Retrieving the revoked license line from the swift .....Output file saved ..... to flash: REHOSTED\_LICENSE

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>license call-home install</b>	Installs a license by using the Cisco License Call Home feature.
<b>license call-home resend</b>	Restores a lost license by using the Cisco License Call Home feature.
<b>show license call-home</b>	Displays the SKU list and features available in a PAK by using the Cisco License Call Home feature.

# license call-home url

To configure a new URL for accessing the Cisco licensing infrastructure, use the **license call-home url** command in global configuration mode. To change the URL, use the **no** form of this command.

**license call-home url** *licensing-infrastructure-url*

**no license call-home url**

## Syntax Description

*licensing-infrastructure-url* The HTTP address where the Cisco licensing infrastructure can be accessed.

## Command Default

The default URL is <https://tools.cisco.com/SWIFT/licensing>.

## Command Modes

Global configuration (config)

## Command History

Release	Modification
12.4(15)XZ	This command was introduced.
12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.

## Usage Guidelines

Use this command to configure a new URL for accessing the Cisco licensing infrastructure.

This feature requires that:

- The router or switch 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 module in the *Network Management Configuration Guide*: [http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm\\_http\\_web.html](http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_http_web.html).
- Only certain platforms support the Cisco License Call Home feature, and those devices must be running a Cisco IOS crypto K9 image.
- You must obtain the device certificate from the Cisco licensing infrastructure.
- You must have a Cisco.com user login account.

## Examples

The following example shows how to change the URL to <http://cisco.com/newserver>:

```
Router(config)# license call-home url http://cisco.com/newserver
```

## Related Commands

<b>Command</b>	<b>Description</b>
<b>license call-home install</b>	Installs a license by using the Cisco License Call Home feature.
<b>license call-home resend</b>	Restores a lost license by using the Cisco License Call Home feature.
<b>license call-home revoke</b>	Rehosts (revokes and transfers) a license by using the Cisco License Call Home feature.
<b>show license call-home</b>	Displays the SKU list and features available in a PAK by using the Cisco License Call Home feature.
<b>show license status</b>	Displays license status information.

# license clear

To remove a license entry from license storage, use the **license clear** command in privileged EXEC mode.

## Cisco ASR 1001 Routers, Cisco 860, 880, and 890 Series Routers, and Cisco 1900, 2900, and 3900 Series Integrated Services Router Platforms

```
license clear feature-name
```

## Cisco Catalyst 3560-E Switch Platforms

```
license clear feature-name
```

## Cisco Catalyst 3750-E Switch and Switch Stack Platforms

```
license clear feature-name [switch switch-num]
```

## Cisco Catalyst 3750-E Switch Mixed Stack Platforms

```
license clear feature-name switch switch-num
```

### Syntax Description

<i>feature-name</i>	Name of the feature to be removed.
<b>switch</b> <i>switch-num</i>	Specifies a switch in a switch stack or in a mixed switch stack. The switch number range is 1 to 9.

### Command Default

Licenses are not removed.

### Command Modes

Privileged EXEC (#)

### Command History

Release	Modification
12.2(35)SE2	This command was introduced.
12.4(15)XZ	This command was integrated into Cisco IOS Release 12.4(15)XZ.
12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.
Cisco IOS XE Release 3.2S	This command was integrated into Cisco IOS XE Release 3.2S on the Cisco ASR 1001 router.

### Usage Guidelines

For the ASR 1001 router, the **license clear** command clears only image-level licenses that are *not* “in-use.” Once the throughput feature license is “in-use,” it cannot be cleared.

The **license clear** command clears all licenses, but some licenses, such as built-in licenses, cannot be cleared.

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 router or switch.

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.

For some devices, the **license clear** command verifies that the license line is valid and explicitly installed. Only licenses that have been added using the **license install** command are removed. Evaluation licenses are not removed.

When a switch is specified, the **license clear** command is executed only on that switch. When a mixed stack platform is used, the primary switch has installed the minimum licensing feature required to support the licensing operations of the secondary switches. The **license clear** command clears a license from license storage, which a primary switch does not have. When the command is issued from the primary switch, the switch number is required to clear a license on a specific switch.

## Examples

The following example shows how to display the installed licenses on an ASR 1001 router and how to clear the throughput license. Note that active, in-use licenses cannot be cleared:

```
Router# show license all

License Store: Primary License Storage
StoreIndex: 0 Feature: throughput Version: 1.0
License Type: Evaluation
License State: Active, Not in Use, EULA accepted
Evaluation total period: 4 weeks 2 days
Evaluation period left: 0 minute 0 second
License Count: Non-Counted
License Priority: Low

Router# license clear throughput
Feature: throughput
 1 License Type: Evaluation
License State: Active, Not in Use, EULA accepted
Evaluation total period: 4 weeks 2 days
Evaluation period left: 0 minute 0 second
License Addition: Additive
License Count: Non-Counted
Comment:
Store Name: Primary License Storage

Are you sure you want to clear? (yes/[no]): yes
Router#
```

The following example shows how to clear a license associated with the advsecurity feature:

```
Router# license clear advsecurity
Feature: advsecurity
 1 License Type: Permanent
License State: Active, In Use
License Addition: Exclusive
Comment: Permanent License
Store Index: 0
Store Name: Primary License Storage

 2 License Type: Evaluation
License State: Inactive
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 4 days
```

```
License Addition: Additive
Comment:
Store Index: 1
Store Name: Primary License Storage
```

```
Select Index to Clear [1-2]: 2
Are you sure you want to clear? (yes/[no]): yes
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>license install</b>	Installs a stored license file.
<b>license save</b>	Saves a copy of a permanent license to a specified license file.
<b>show license file</b>	Displays information in a Cisco IOS software license file.

# license comment

To add or remove a comment about a feature license, use the **license comment** command in privileged EXEC mode.

## Cisco ASR 1001 Router Platforms

**license comment** {**add feature** *feature-name* *comment* | **delete feature** *feature-name*}

## Cisco 860, 880, and 890 Series Routers, and Cisco 1900, 2900, and 3900 Series Integrated Services Router Platforms

**license comment** {**add** *feature-name* *comment* | **delete** *feature-name*}

## Cisco Catalyst 3560-E Switch Platforms

**license comment** {**add** *feature-name* *comment* | **delete** *feature-name*}

## Cisco Catalyst 3750-E Switch Platforms

**license comment** {**add** *feature-name* *comment* | **delete** *feature-name*} [**switch** *switch-num*]

## Cisco Catalyst 3750-E Switch Mixed Stack Platforms

**license comment** {**add** *feature-name* *comment* | **delete** *feature-name*} **switch** *switch-num*

### Syntax Description

<b>add</b>	Adds a comment about a feature license.
<b>feature</b>	Specifies the feature name.
<i>feature-name</i>	Name of the licensed feature.
<i>comment</i>	String of a maximum of 99 characters, including special characters.
<b>delete</b>	Deletes a comment about a licensed feature.
<b>switch</b> <i>switch-num</i>	Specifies a switch in a switch stack or in a mixed switch stack. The switch number range is 1 to 9.

### Command Modes

Privileged EXEC (#)

### Command History

Release	Modification
12.2(35)SE2	This command was introduced.
12.4(15)XZ	This command was integrated into Cisco IOS Release 12.4(15)XZ.
12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.
Cisco IOS XE Release 3.2S	This command was modified. The <b>feature</b> keyword was added for the Cisco ASR 1001 router.

**Usage Guidelines**

This command is useful for tracking a license when multiple licenses are stored on a device, and for adding or deleting information about a specific license. You can also use the **license comment** command to verify that a license associated with the specified feature is present in license storage.

Use the **show license file** command to display comments added to the license file.

The **license comment** command performs these operations:

- Verifies that the license associated with the specified feature is present in the license storage.
- If there are multiple license lines, the command prompts for license line selection.
- If a comment exists in the license line, the command displays the comment first before prompting for a new comment. Up to 99 characters are stored in license storage.
- If a switch number is specified, this command is executed on the specified switch.

**Examples**

The following example shows how to add a comment to a license file on the Cisco ASR 1001 router by using the **license comment** command and by verifying it with the **show license file** command:

```
Router# license comment add feature throughput newest
Feature: throughput
  1 License Type: Permanent
    License State: Active, In Use
    License Addition: Exclusive
    License Count: Non-Counted
    Comment: --
    Store Name: Primary License Storage

% Success: Updating comment "--" with "newest" succeeded

Router# show license file

License Store: Primary License Storage
Store Index: 0
License: 11 throughput 1.0 LONG NORMAL STANDALONE EXCL INFINITE_KEYS INFIN
ITE_KEYS NEVER NEVER NiL SLM_CODE CL_ND_LCK NiL *12MDFXFBE6TEQR54
00 NiL NiL NiL 5_MINS <UDI><PID>ASR1001</PID><SN>JAE14020AT5</SN>
</UDI> :0oy5aopCvhfLBBk3:10fBb4Kr3EwMLaYAHDV93ClpLXhJGOUE1ZuBusC,
0B2QIQlVvo6eUrKn27faF3zOYTtyjLRCGA8UMkemMyqmvjcg0Jhfm$<WLC>AQEBIQA
B//8szae77QGOnFBXBoP02Obx6Fq2XtGPUJnh5pGplTkDzw9J5aqkkUjTNku04sv4
FYORqWInXo3s+nsLU7rOtdOxoIxyZAo3LYmUJ+MFzsqlhKoJV1PyEvQ8H21MNUjVb
hoN0gyIWsyiJam8AQIkVBQFzhr10GYo1VzdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko8XC
Y=</WLC>
Comment: newest
Hash: ZJJz5MveEOPePQA3ATs6+OxF4bw=
```

The following example shows how to add a comment to a license file. You are prompted to select the index number of the license to add the comment to.

```
Router# license comment add advsecurity "Permanent License"
Feature: advsecurity
  1 License Type: Permanent
    License State: Active, In Use
    License Addition: Exclusive
    Comment:
    Store Index: 0
    Store Name: Primary License Storage

  2 License Type: Evaluation
    License State: Inactive
      Evaluation total period: 8 weeks 4 days
```

```

    Evaluation period left: 8 weeks 4 days
License Addition: Additive
Comment:
Store Index: 1
Store Name: Primary License Storage

```

```

Select Index to Add Comment [1-2]: 1
% Success: Adding comment "Permanent License" succeeded

```

The following example shows the output from **show license file** command for verification purposes:

```
Router# show license file
```

```

License Store: Primary License Storage
Store Index: 0
License: 11 advsecurity 1.0 LONG NORMAL STANDALONE EXCL INFINITE_KEYS INFI
NITE_KEYS NEVER NEVER NiL SLM_CODE CL_ND_LCK NiL *1F8CTTRHMU8DBMZ
400 NiL NiL NiL 5_MINS <UDI><PID>CISCO861W</PID><SN>FHH112400KA</
SN></UDI> DjRM8tEsBrR7ayv1U6CWL7JIe1Nmu60biRNQuFWM8sV2dUQhQSS, iB4
WgUgos4KILZJ, 4xrseQQCwOqeASii:SVNCL1Cdffc, Oph8TQkzxbX3q$<WLC>AQEB
IQAB//9fp/DSeV2xPKc+d4T/DiUhG8UQwBA786dE+HuT2GMU3uDvMbIOdbpmBQ00Q
tQTGTRKqwInXo3s+nsLU7rOtdOxoIxYZAo3LYmUJ+MFzsq1hKoJV1PyEvQ8H21MNU
jVbhoN0gyIWsyiJam8AQIkVBQFzhr10GYolVzdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko
8XCY=</WLC>
Comment: Permanent License
Hash: Mx0Sy+VmbfaB7uRctuPLsblzpbU=

```

## Related Commands

Command	Description
<b>license clear</b>	Removes a license entry from a permanent license file.
<b>license install</b>	Installs a stored license file.
<b>license save</b>	Saves a copy of a permanent license to a specified license file.
<b>show license file</b>	Displays information in a Cisco IOS software license file.

# license expand nvram

To expand the memory allocation for license storage in NVRAM for Cisco 2800 and Cisco 3800 series integrated services router platforms, use the **license expand nvram** command in privileged EXEC mode.

## license expand nvram

**Syntax Description** This command has no arguments or keywords.

**Command Default** No license storage expansion is configured.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	12.4(20)T	This command was introduced for the Cisco 2800 and Cisco 3800 series integrated services router platforms

**Usage Guidelines** License storage expansion reduces the amount of NVRAM available for configuration file storage. If the configuration files are too large to fit into the reduced NVRAM, you must run file compression on the configuration files by using the **service compress-config** command.

**Examples** The following example shows how to expand the allocation for license storage in NVRAM:

```
Router# 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]
Router# y
```

The following response indicates that the operation was successful:

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

The following response shows that the existing configuration files need compression before the licensing file system can be expanded:

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

The following response shows that a configuration file is still too large for the resized NVRAM:

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

## ■ license expand nvram

The following response shows that expansion cannot take place because the size of the block files is too large:

```
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".
```

The following response indicates that this command is being issued on an already expanded NVRAM:

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

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>service compress-config</b>	Compresses startup configuration files.

---

# license feature

To activate the memory license feature, use the **license feature** command in global configuration mode. To deactivate the memory license feature, use the **no** form of this command.

**license feature** *feature-name*

**no license feature** *feature-name*

Syntax Description	<i>feature-name</i>	Software feature name.
--------------------	---------------------	------------------------

Command Default	The memory license feature is not activated.
-----------------	--

Command Modes	Global configuration (config)
---------------	-------------------------------

Command History	Release	Modification
	15.0(1)M	This command was introduced for the Cisco 1905 integrated services router platform.

Usage Guidelines	Use the <b>license feature</b> command to activate the memory license feature.
------------------	--

Examples	The following example shows how to activate the memory license feature:
----------	---

```
Router(config)# license feature MEM-1900-256U512MB
Feature Name:MEM-1900-256U512MB
```

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

```
You hereby acknowledge and agree that the product feature license
is terminable and that the product feature enabled by such license
may be shut down or terminated by Cisco after expiration of the
applicable term of the license (e.g., 30-day trial period). Cisco
reserves the right to terminate or shut down any such product feature
electronically or by any other means available. While alerts or such
messages may be provided, it is your sole responsibility to monitor
your terminable usage of any product feature enabled by the license
and to ensure that your systems and networks are prepared for the shut
down of the product feature. You acknowledge and agree that Cisco will
not have any liability whatsoever for any damages, including, but not
limited to, direct, indirect, special, or consequential damages related
to any product feature being shutdown or terminated. By clicking the
"accept" button or typing "yes" you are indicating you have read and
agree to be bound by all the terms provided herein.
```

```

ACCEPT? [yes/no]: yes
Router(config)#
*Nov 17 23:48:18.891: %XFR_EXT_MEMORY_LICENSING-6-LICENSE_NOT_ACTIVATED: License
MEM-1900-256U512MB will take effect af reboot.

*Nov 17 23:48:19.779: %LICENSE-6-EULA_ACCEPTED: EULA for feature MEM-1900-256U512MB 1.0
has been accepted. UDI=CISCO1920B; StoreIndex=3:Evaluation License Storage

Router# license install tftp://223.255.254.254/FCW1345000B_20091118190946245.lic
Installing licenses from "tftp://223.255.254.254/FCW1345000B_20091118190946245.lic"

Loading colbywen/FCW1345000B_20091118190946245.lic from 223.255.254.254 (via
GigabitEthernet0/0): !
[OK - 1171 bytes]
Installing...Feature:MEM-1900-256U512MB...Successful:Supported
1/1 licenses were successfully installed
0/1 licenses were existing licenses
0/1 licenses were failed to install

Router#
*Nov 19 00:14:48.603: %XFR_EXT_MEMORY_LICENSING-6-LICENSE_NOT_ACTIVATED: License
MEM-1900-256U512MB will take effect after the system reboot.

*Nov 19 00:14:48.607: %LICENSE-6-INSTALL: Feature MEM-1900-256U512MB 1.0 was installed in
this device. UDI=CISCO1921/K9:FCW1345000B; StoreIndex=0:Primary License Storage

```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>license install</b>	Installs a stored license file.
<b>license revoke</b>	Revokes a software license from one device and transfers it to another.

# license feature snasw

To activate the SNA Switching (SNASw) feature license, use the **license feature snasw** command in global configuration mode. To deactivate the SNASw feature license, use the **no** form of this command.

**license feature snasw**

**no license feature snasw**

---

**Syntax Description** This command has no arguments or keywords.

---

**Command Default** The SNASw feature license is not activated.

---

**Command Modes** Global configuration (config)

---

Command History	Release	Modification
	15.0(1)M	This command was introduced for the Cisco 3900, 2900, and the 1900 series integrated services router platforms.

---

---

**Usage Guidelines** The **license feature snasw** command is used to activate the SNASw feature license.

---

**Examples** The following example shows how to enable the SNASw feature license:

```
Router(config)# license feature snasw
```

---

Related Commands	Command	Description
	<b>license install</b>	Installs a stored license file.

---

# license install

To install a stored license file, use the **license install** command in privileged EXEC mode.

**license install** *stored-location-url*

## ASR 1001 Router Platforms

**license install file** *stored-location-url*

## Cisco Catalyst 4500E Series Switch Platforms

**license install** *stored-location-url* [**standby**]

Syntax Description		
<i>stored-location-url</i>		he location within a device where Cisco IOS software licenses are stored. Depending on the hardware platform, valid URL location file systems might be: <b>archive</b> , <b>bootflash</b> , <b>bs</b> , <b>flash</b> , <b>flashn</b> , <b>ftp</b> , <b>http</b> , <b>https</b> , <b>null</b> , <b>nvr</b> , <b>pram</b> , <b>rcp</b> , <b>scp</b> , <b>syslog</b> , <b>system</b> , <b>tftp</b> , <b>tmpsys</b> , <b>usb0</b> , <b>vb</b> . <ul style="list-style-type: none"> <li>The <b>bs://</b>, <b>null://</b>, and <b>vb://</b> file systems do not accept filenames.</li> <li>The <b>bs</b> file system is available only on mixed Cisco 3750-E switch stacks.</li> <li>The <b>archive</b>, <b>pram</b>, <b>scp</b>, and <b>syslog</b> file systems are available only on router platforms.</li> <li>The <b>flashn</b> file system, where <i>n</i> is an integer in the range from 1 to 9, is available only on Cisco 3750-E switches and stacks.</li> <li>The <b>https</b> file system is not available on mixed Cisco 3750-E switch stacks and the Cisco 3560-E switch.</li> </ul>
<b>file</b>		Installs a license file.
<b>standby</b>		(Optional) Specifies that the installation occurs on the standby device only.

**Command Default** A license is not installed.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	12.2(35)SE2	This command was introduced.
	12.4(15)XZ	This command was integrated into Cisco IOS Release 12.4(15)XZ.
	12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.
	Cisco IOS XE Release 3.1.0.SG	This command was modified. The <b>standby</b> keyword was added for the Catalyst 4500E series switches.
	Cisco IOS XE Release 3.2S	This command was modified. The <b>file</b> keyword was added for the Cisco ASR 1001 router.

**Usage Guidelines**

You must have already purchased the license and obtained the license file from either the Cisco licensing portal or by using the **license save EXEC** command.

When the **license install** command is issued, these actions are initiated:

- The license module parses the license file and retrieves the universal device identifier (UDI), license line, and license comments.
- If the UDI in the license file is not local, this command passes the license line and user comments to the specified switch where the information is provided to the license security application.
- If the license is a trial license, this command initiates an end-user license agreement prompting you to accept it. If you do not accept the end-user license agreement, the license line installation is stopped.
- Upon successful completion, the application notifies you about the installation of the license.
- The command displays an information message stating that the license installation is successful and whether the licensed feature is present in the current image.

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

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

On some hardware platforms, you must reload (or reboot) the device to make a newly installed license active.

When the **standby** keyword is specified, the license is available only on the standby device. The active supervisor is not able to use it.

**Examples**

The following example shows how to install a license from the bootflash system on the Cisco ASR 1001 router. The license is a duplicate and is not installed as shown in the display:

```
Router# license install file bootflash:1ru_bu2-throughput-license
Installing...Feature:throughput...Skipped:Duplicate
0/1 licenses were successfully installed
1/1 licenses were existing licenses
0/1 licenses failed to install
```

The following example shows how to install a license saved in TFTP. You might need to read and accept an end-user license agreement during the installation. The following output has been truncated for easier readability.

```
Router# license install tftp://infra-sun/rifu/2800/normal_better_2.lic00

Installing licenses from "tftp://infra-sun/rifu/2800/normal_better_2.lic00"

Loading rifu/2800/normal_better_2.lic00 from 172.19.211.47 (via GigabitEthernet0/0): !
[OK - 2361 bytes]
```

```
Expiring licenses are being installed in the device with
UDI "CISCO2851:FTX1018A21R" for the following features:
```

```
Feature Name: ios-ips-update
Start Date:          N/A, End Date: Oct 01 2009
```

```
Feature Name: ios-ips-update
Start Date:          N/A, End Date: Oct 01 2008
```

```
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```

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ACCEPT? [yes/no]: **yes**

Installing...Feature:ios-ips-update...Successful:Supported

Installing...Feature:ios-ips-update...Failed:

% Error: Better license exists

1/2 licenses were successfully installed

0/2 licenses were existing licenses

1/2 licenses were failed to install

Router#

Apr 22 23:24:45.727: %LICENSE-6-EULA\_ACCEPTED: EULA for feature ios-ips-update 1.0 has been accepted. UDI=CISCO2851:FTX1018A21R; StoreIndex=2:Primary License Storage

Apr 22 23:24:46.263: %LICENSE-6-EULA\_ACCEPTED: EULA for feature ios-ips-update 1.0 has been accepted. UDI=CISCO2851:FTX1018A21R; StoreIndex=-1:UNKNOWN License Store

Apr 22 23:24:46.267: %LICENSE-6-INSTALL: Feature ios-ips-update 1.0 was installed in this device. UDI=CISCO2851:FTX1018A21R; StoreIndex=2:Primary License Storage

The following example shows how to initiate license installation from a flash file system on a Cisco switch:

```
Switch# license install flash:flash//test.lic
```

## Related Commands

Command	Description
<b>license clear</b>	Removes a license entry from a permanent license file.
<b>license comment</b>	Adds or removes a comment about a feature license.
<b>license save</b>	Saves a copy of a permanent license to a specified license file.
<b>license save credential</b>	Saves license identity information associated with a device to a specified URL.
<b>show license</b>	Displays information about a Cisco IOS software license.

# license modify priority

To modify a license priority, use the **license modify priority** command in privileged EXEC mode.

**license modify priority** *feature-name* {**high** | **low**}

Syntax Description	<i>feature-name</i>	Name of the feature whose priority you want to modify.
	<b>high</b>	Changes priority to high.
	<b>low</b>	Changes priority to low.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	12.4(24)T	This command was introduced.
	Cisco IOS XE Release 3.2S	This command was integrated into Cisco IOS XE Release 3.2S for the Cisco ASR 1001 router.

**Usage Guidelines** This command adjusts the priority of a license. This command generates a list of metered licenses available for a feature and prompts you to select one from the list. If only one license is present, it is automatically selected. If the selected license is an evaluation license and the feature has not been activated, the end-user license agreement (EULA) is shown, and you are prompted to accept or reject the agreement. If you accept the EULA, the priority of the selected license to the permanent license increases or decreases, and the selected license becomes the active license.

**Examples** The following example shows how the **license modify priority** command is used to modify the priority of a license:

```
Router# license modify priority lcabcv10 high

Feature: lcabcv10
Index: 1      License type   : Evaluation
        Lock type         : Locked
        License Count      : 10
        License Priority: None

Index: 2      License type   : Evaluation
        Lock type         : Locked
        License Count      : 5
        License Priority: None

Select Index to Adjust [1-2]2

Are you sure you want to modify priority? (yes/[no]): yes

Increase Precedence of Evaluation License
```

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ACCEPT? [y/n]: **y**

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>show license</b>	Displays information about a Cisco IOS software license.

# license purge

To purge unneeded licenses (licenses that are not associated with the current chassis unique device identifier [UDI]), use the **license purge** command in privileged EXEC mode.

## license purge

**Syntax Description** This command has no arguments or keywords.

**Command Default** Licenses are retained.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	Cisco IOS XE Release 3.1.0SG	This command was introduced for the Cisco Catalyst 4500E series switches.

**Usage Guidelines** Use this command to remove licenses that are not associated with the current chassis UDI. Removing these licenses frees up additional space.

When supervisors are moved from one chassis to another, the licenses that were installed on the supervisor might be tied to the old chassis. These license are not usable when the supervisor is present on the new chassis. This command removes licenses from storage that do not belong to the current chassis.

**Examples** The following example shows how to purge unneeded licenses:

```
Switch# license purge
Are you sure you want to purge licenses? [y] y
```

Related Commands	Command	Description
	<b>license install</b>	Installs a stored license file.
	<b>license save credential</b>	Saves the identity information associated with a license to a specified URL.

# license revoke

To revoke a software license from one device and transfer it to another, use the **license revoke** command in privileged EXEC mode.

**license revoke** *permission-file-url* *output-rehost-ticket-url*

## Syntax Description

<i>permission-file-url</i>	URL of the location to get to the permission ticket.
<i>output-rehost-ticket-url</i>	URL of the location to save the rehost ticket.

## Command Modes

Privileged EXEC (#)

## Command History

Release	Modification
12.4(15)XZ	This command was introduced.
12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.
Cisco IOS XE Release 3.2S	This command was integrated into Cisco IOS XE Release 3.2S for the Cisco ASR 1001 router.

## Usage Guidelines

The **license revoke** command removes the original, permanent license from the device and provides a license for the new device by accomplishing these operations:

- Obtains a permission ticket from the Cisco licensing infrastructure portal that allows the license to be moved.
- Parses the permission ticket file to extract data related to generating the rehosting ticket.
- Uploads the rehost ticket to the Cisco licensing infrastructure portal so you can obtain the final license.
- The license security application processes the data and offers a grace-period license.
- Once you accept the end-user license agreement, the licensing infrastructure processes the permission ticket and generates the rehost ticket.



### Note

Cisco IOS licensing requires that the license files generated by the Cisco licensing back end 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 licensing back end requires the device credential information. Use the **license save credential** command to save device credential information to a specified file system.

## Examples

The following example shows how 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:

```
Router# 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 on 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
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>license install</b>	Installs a stored license file.
<b>license save</b>	Saves a copy of a permanent license to a specified license file.

# license save

To save a copy of a permanent license in a Cisco IOS device to a specified license file, use the **license save** command in privileged EXEC mode.

## Cisco ASR 1001 Router Platforms

**license save file** *file-sys:filename*

## Cisco 860, 880, and 890 Series Routers, and Cisco 1900, 2900, and 3900 Series Integrated Services Router Platforms

**license save** *file-sys://lic-location*

## Cisco Catalyst 3560-E Switch Platforms

**license save** *file-sys://lic-location*

## Cisco Catalyst 3750-E Switch and Switch Stack Platforms

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

## Cisco Catalyst 3750-E Switch Mixed Stack Platforms

**license save** *file-sys://lic-location* **switch** *switch-num*

Syntax Description	file	Saves a license file.
	<i>file-sys:filename</i>	The location and filename within a device where Cisco IOS software licenses are stored. For Cisco ASR 1001 routers, valid file systems are <b>bootflash</b> and <b>usb0</b> .
	<i>file-sys://lic-location</i>	The location within a device where Cisco IOS software licenses are stored. Depending on the hardware platform, valid file system values might be: <b>archive</b> , <b>bootflash</b> , <b>bs</b> , <b>flash</b> , <b>flash<math>n</math></b> , <b>http</b> , <b>https</b> , <b>null</b> , <b>nvr</b> , <b>pram</b> , <b>rcp</b> , <b>scp</b> , <b>syslog</b> , <b>system</b> , <b>tftp</b> , <b>tmpsys</b> , <b>vb</b> .  The license location can also be a directory with these restrictions: <ul style="list-style-type: none"> <li>• The <b>bs://</b>, <b>null://</b>, and <b>vb://</b> URLs do not accept filenames.</li> <li>• The <b>bs</b> file system is available only on mixed Cisco 3750-E switch stacks.</li> <li>• The <b>archive</b>, <b>pram</b>, <b>scp</b>, and <b>syslog</b> file systems are available only on router platforms.</li> <li>• The <b>flash<math>n</math></b> file system, where <math>n</math> is an integer in the range of 1 to 9, is available only on Cisco 3750-E switches and stacks.</li> <li>• The <b>https</b> file system is not available on Cisco 3750-E switch mixed stacks or on the Cisco 3560-E switch.</li> </ul>
	<b>switch</b> <i>switch-num</i>	Specifies a switch in a switch stack or in a mixed switch stack. The switch number range is 1 to 9.

**Command Default** Licenses are not saved.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	12.2(35)SE2	This command was introduced.
	12.4(15)XZ	This command was integrated into Cisco IOS Release 12.4(15)XZ.
	12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.
	Cisco IOS XE Release 3.2S	This command was modified. The <b>file</b> <i>file-sys:filename</i> keyword and argument were added for the Cisco ASR 1001 router.

**Usage Guidelines** Issuing this command stores the license line and comment in XML format as required by the command. Issuing this command saves copies of all permanent licenses. Saved licenses can be restored by using the **license install** command.

**Examples** The following example shows how to save a license named throughput-license to the bootflash on the Cisco ASR 1001 router:

```
Router# license save file bootflash:throughput-license
license lines saved ..... to bootflash/throughput-license
```

The following example shows how to save a license named feat1.lic in the FTP file system:

```
Router# license save ftp:feat1.lic
license lines saved ..... to ftp:feat1.lic
```

Related Commands	Command	Description
	<b>license install</b>	Installs a stored license file.
	<b>license save credential</b>	Saves the identity information associated with a license to a specified URL.

# license save credential

To save the identity information associated with a device to a specified URL, use the **license save credential** command in privileged EXEC mode.

## Cisco ASR 1001 Routers

**license save credential file** *file-sys:filename*

## Cisco 860, 880, and 890 Series Routers, and Cisco 1900, 2900, and 3900 Series Integrated Services Router Platforms

**license save credential** *file-sys://lic-location*

## Cisco Catalyst 3560-E Switch Platforms

**license save credential** *file-sys://lic-location*

## Cisco Catalyst 3750-E Switch and Switch Stack Platforms

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

## Cisco Catalyst 3750-E Switch Mixed Stack Platforms

**license save credential** *file-sys://lic-location* **switch** *switch-num*

Syntax Description	file	Saves a license credential file.
	<i>file-sys:filename</i>	The location and filename within a device where Cisco IOS software licenses are stored. For Cisco ASR 1001 routers, valid file systems are <b>bootflash</b> and <b>usb0</b> .
	<i>file-sys://lic-location</i>	The location within a device where Cisco IOS software license credentials are stored. Depending on the hardware platform, valid file system values might be: <b>archive</b> , <b>bootflash</b> , <b>bs</b> , <b>flash</b> , <b>flashn</b> , <b>ftp</b> , <b>http</b> , <b>https</b> , <b>null</b> , <b>nvr</b> , <b>pram</b> , <b>rcp</b> , <b>sep</b> , <b>syslog</b> , <b>system</b> , <b>tftp</b> , <b>tmpsys</b> , <b>vb</b> . <ul style="list-style-type: none"> <li>• The <b>bs://</b>, <b>null://</b>, and <b>vb://</b> URLs do not accept filenames.</li> <li>• The <b>bs</b> file system is available only on mixed Cisco 3750-E switch stacks.</li> <li>• The <b>archive</b>, <b>pram</b>, <b>scp</b>, and <b>syslog</b> file systems are available only on router platforms.</li> <li>• The <b>flashn</b> file system, where <i>n</i> is an integer in the range of 1 to 9, is available only on Cisco 3750-E switches and stacks.</li> <li>• The <b>https</b> file system is not available on Cisco 3750-E switch mixed stacks or on the Cisco 3560-E switch.</li> </ul>
	<b>switch</b> <i>switch-num</i>	Specifies a switch in a switch stack or in a mixed switch stack. The switch number range is 1 to 9.

## Command Default

License credentials are not saved.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	12.2(35)SE2	This command was introduced.
	12.4(15)XZ	This command was integrated into Cisco IOS Release 12.4(15)XZ.
	12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.
	Cisco IOS XE Release 3.2S	This command was modified. The <b>file</b> <i>file-sys:filename</i> keyword and argument were added for the Cisco ASR 1001 router.

**Usage Guidelines** Use this command to save credential information about a device.

### Examples

The following example shows how to save identity information about a license named tput-license to the bootflash system on the Cisco ASR 1001 router:

```
Router# license save credential file bootflash:tput-license

Device credential saved ..... to /bootflash/tput-license
```

The following example shows how to save identity information about a license named feat1.lic in the http file system:

```
Switch# license save credential http:feat1.lic

Device credential saved ..... to http:feat1.lic
```

The following example shows how to save identity information about a license named feat2.lic in the scp file system:

```
Router# license save credential scp:feat2.lic

Device credential saved ..... to scp:feat2.lic
```

Related Commands	Command	Description
	<b>license install</b>	Installs a stored license file.
	<b>license save</b>	Saves a copy of a permanent license to a specified license file.

# show license

To display information about a Cisco IOS software license, use the **show license** command in privileged EXEC mode.

## Cisco ASR 1001 Routers

```
show license [all | detail [feature-name] | expiring | feature | file | image-levels | in-use |
  permanent | status | udi]
```

## Cisco 860, 880, and 890 Series Routers, and Cisco 1900, 2900, and 3900 Series Integrated Services Router Platforms

```
show license [agent {counters | session}] | [all | detail [feature-name] | feature | file | statistics |
  status | udi [modules]]
```

## Cisco Catalyst 3560-E and Cisco Catalyst 3750-E Switch and Switch Stack Platforms

```
show license [agent {counters | session}] | [all | detail [feature-name] | feature | file | image levels
  | statistics | status | udi [modules]] switch switch-num
```

## Cisco Catalyst 3750-E Mixed Switch Stacks

```
show license [agent {counters | session}] | detail {feature-name switch switch-num | switch
  switch-num} | [all | feature | file | status | udi [modules]] switch switch-num
```

## Cisco uBR10012 Universal Broadband Routers

```
show license [agent {counters | session}] | detail {feature-name subslot slot/subslot | subslot
  slot/subslot} | udi [subslot slot/subslot] | [all | feature | file | status] subslot slot/subslot
```

## Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Routers

```
show license [agent {counters | session}] | detail {feature-name slot slot | slot slot} | udi [slot slot]
  | [all | feature | file | status] {slot slot}
```

### Syntax Description

<b>agent</b>	(Optional) Shows information about a license agent.
<b>counters</b>	Shows statistics counters for the license agent.
<b>session</b>	Shows session information related to a license agent.
<b>all</b>	(Optional) Shows information about all licenses in the system.
<b>detail</b> <i>feature-name</i>	(Optional) Shows detailed information about a specified licensed feature.
<b>expiring</b>	(Optional) Shows all available expiring licenses.
<b>feature</b>	(Optional) Shows a list of licensed features available in an image.
<b>file</b>	(Optional) Shows license entries stored in the license file.
<b>image levels</b>	(Optional) Shows license image levels.
<b>image-levels</b>	(Optional) Shows license image levels.
<b>in-use</b>	(Optional) Show all available in-use licenses.
<b>permanent</b>	(Optional) Show all available permanent licenses.
<b>statistics</b>	(Optional) Shows license statistics information.

<b>status</b>	(Optional) Shows information about supported license types and license operations, and provides device status.
<b>udi</b>	(Optional) Shows all the unique device identifier (UDI) values that can be licensed in a system.
<b>modules</b>	(Optional) Shows the hierarchical relationship between the UDI modules.
<b>switch</b> <i>switch-num</i>	Specifies a switch in a switch stack or in a mixed switch stack. The range is 1 to 9.
<b>subslot</b>	Shows the slot and subslot information of a line card.
<b>slot</b>	Shows the slot information of a line card.
<i>slot/</i>	Slot where the line card resides: <ul style="list-style-type: none"> <li>• Cisco uBR7246VXR router—The range is 3 to 6.</li> <li>• Cisco uBR7225VXR router—The range is 1 to 2.</li> <li>• Cisco uBR10012 router—The range is 5 to 8.</li> </ul>
<i>subslot</i>	The subslot number is 0 or 1.

**Command Modes**

Privileged EXEC (#)

**Command History**

Release	Modification
12.2(35)SE2	This command was introduced.
12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.
12.2(33)SCC	This command was integrated into Cisco IOS Release 12.2(33)SCC on the Cisco UBR-10 MC20X20V line card.
15.0(1)M	This command was modified. The <b>modules</b> keyword was added.
12.2(33)SCD	This command was modified. The <b>subslot</b> <i>slot/subslot</i> keyword and arguments were added for the Cisco uBR7225VXR and Cisco uBR7246VXR routers.
Cisco IOS XE Release 3.2S	This command was modified. The <b>expiring</b> , <b>image-levels</b> , <b>in-use</b> , and <b>permanent</b> keywords were added for the Cisco ASR 1001 router.

**Usage Guidelines**

Use this command to display license information and to help with troubleshooting issues related to Cisco IOS software licenses. This command displays all the licenses in the system.

This command also displays the features that are available but not licensed to execute. Output is grouped according to how the features are stored in license storage.

If a switch number is specified, information from that switch is displayed. If a switch number is not specified, details of the local switch are displayed.

If the **show license all** command displays the license as “Active, Not in Use, EULA not accepted,” you can use the **license boot module** global configuration command to enable the license and accept the end-user license agreement (EULA). Do not confuse the **license boot module** global configuration command with a similarly named command available in privileged EXEC mode.

### Cisco uBR10012 Universal Broadband Router Usage Guidelines

In a Cisco uBR10012 router, the line card is identified with a slot ID, which is a combination of the *slot/subslot*. Use the **subslot** keyword as an extension to the **show license** command syntax, when appropriate.

The **show license udi** command shows the UDI values for all cable interface line cards. When the command is used with the **subslot** keyword, the UDI value for the specified line card is displayed.

Keywords such as **all**, **detail**, **feature**, **file**, and **status** require the **subslot slot/subslot** keyword and arguments to execute the **show license** command.

To enable evaluation license on the Cisco uBR10012 router, use the **license modify** command.

### Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Routers Usage Guidelines

To enable evaluation license on the Cisco uBR7225VXR and Cisco uBR7246VXR routers, use the **license modify** command.



#### Note

The **agent** keyword is not supported in Cisco IOS Release 12.2(33)SCD on the Cisco uBR7225VXR and on the Cisco uBR7246VXR routers.

### Examples

The following is sample output from the **show license agent counters** command:

```
Router# show license agent counters

License Agent Counters
Request Messages Received:0: Messages with Errors:0
Request Operations Received:0: Operations with Errors:0
Notification Messages Sent:0: Transmission Errors:0: Soap Errors:0
```

The following is sample output from the **show license all** command on the Cisco ASR 1001 router:

```
Router# show license all

License Store: Primary License Storage
StoreIndex: 0 Feature: throughput Version: 1.0
License Type: Permanent
License State: Active, In Use
License Count: Non-Counted
License Priority: Medium
License Store: Primary License Storage
StoreIndex: 4 Feature: adventerprisek9 Version: 1.0
License Type: Permanent
License State: Active, In Use
License Count: Non-Counted
License Priority: Medium
```

[Table 1](#) describes the significant fields shown in the display.

**Table 1** show license Field Descriptions

Field	Description
License Store	Name of the license line in the license storage.
StoreIndex	Index of the license line in the license storage.
Feature	Name of the feature.
License Type	Type of license; for example, Permanent or Trial.

**Table 1** *show license Field Descriptions (continued)*

Field	Description
License State	Status of the license; for example, Active or In Use.
Lock type	Association of a license to a specific device; for example, Node locked.
Vendor info	Information about the vendor associated with the device UDI.
License Addition	Additive or exclusive status of the license; for example, Additive.
License Generation version	Version of license generated.
License Count	Number of available count and in use.
License Priority	Priority of the license; for example, high or low.

The following is sample output from the **show license detail** command:

```
Router# 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
Index: 2          Feature: SSL_VPN                    Version: 1.0
  License Type: Evaluation
  License State: Active, Not in Use, EULA accepted
    Evaluation total period: 8 weeks 4 days
    Evaluation period left: 0 minute 0 second
  Lock type: Non Node locked
  Vendor info:
  License Addition: Additive
  License Generation version: 0x8100000
  License Count: 200/0/0 (Active/In-use/Violation)
  License Priority: Low
  Store Index: 4
  Store Name: Evaluation License Storage
Index: 3          Feature: datak9                     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: 2
  Store Name: Evaluation License Storage
Index: 4          Feature: gatekeeper                 Version: 1.0
  License Type: Evaluation

```

## show license

```

License State: Active, Not in Use, EULA accepted
  Evaluation total period: 8 weeks 4 days
  Evaluation period left: 0 minute 0 second
Lock type: Non Node locked
Vendor info:
License Addition: Additive
License Generation version: 0x8100000
License Count: Non-Counted
License Priority: Low
Store Index: 3
Store Name: Evaluation License Storage
Index: 5      Feature: ios-ips-update      Version: 1.0
License Type: Paid Subscription
Start Date:      N/A, End Date: Jun 16 2010
License State: Active, Not in Use
Lock type: Node locked
Vendor info: <UDI><PID>CISCO3900-MPE140</PID><SN>FHH123000G9</SN></UDI><T>PAS</T>
License Addition: Exclusive
License Generation version: 0x8200000
License Count: Non-Counted
License Priority: Medium
Store Index: 0
Store Name: Primary License Storage

```

The following is sample output from the **show license feature** command on the Cisco ASR 1001 router:

```
Router# show license feature
```

Feature name	Enforcement	Evaluation	Clear Allowed	Enabled
adventerprisek9	yes	no	yes	yes
advipservicesk9	yes	no	yes	no
ipbasek9	no	no	yes	no
throughput	yes	no	yes	yes

The following is sample output from the **show license file** command:

```
Router# show license file
```

```

License Store: Primary License Storage
Store Index: 0
  License: 11 throughput 1.0 LONG NORMAL STANDALONE EXCL INFINITE_KEYS INFIN
ITE_KEYS NEVER NEVER NiL SLM_CODE CL_ND_LCK NiL *12MDFXFBE6TEQR54
00 NiL NiL NiL 5_MINS <UDI><PID>ASR1001</PID><SN>JAE14020AT5</SN>
</UDI> :0oy5aopCvhfLBBk3:10fBb4Kr3EwMLaYAHdV93ClpLXhJGOUElZuBusC,
0B2QIQLv06eUrKn27faF3zOYTtyjLRCGA8UMkemMyqmvjcg0Jhfm$<WLC>AQEBIQA
B//8szae77QGOnFBXBoP020bx6Fq2XtGPUJnh5pGplTkDzw9J5aqkkUjTNku04sv4
FYORqwInXo3s+nsLU7rOtdOxoIXYZAo3LYmUJ+MFzsqLhKojVlPyEvQ8H21MNUjVb
hoN0gyIWsyiJaM8AQIkVBQFzhr10GYolVzdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko8XC
Y=</WLC>
  Comment: --
  Hash: ZJJz5MveEOPePQA3ATs6+OxF4bw=
Store Index: 1
  License: 11 adventerprisek9 1.0 LONG NORMAL STANDALONE EXCL INFINITE_KEYS
INFINITE_KEYS NEVER NEVER NiL SLM_CODE CL_ND_LCK NiL *12MDFXFBE6T
EQR5400 NiL NiL NiL 5_MINS <UDI><PID>ASR1001</PID><SN>JAE14020AT5
</SN></UDI> dFCG4MGqCj5nRQGYuTNELNjulmgkdTIXsGBaysKmB1f8it6t76IbU
1nDky:q5h843EeHBw9JMwZWcmfbveX8j93UWZckXYU8gSab1S79TVo5Vg$<WLC>AQ
EBIQAB///Y5fwUA9AySxZ1dkpw8MgMeMEbPYi4rEAcDnsmUIwbp0xMUblmtUwhaC
QMg/pCaGRqwInXo3s+nsLU7rOtdOxoIXYZAo3LYmUJ+MFzsqLhKojVlPyEvQ8H21M
NUjVbhoN0gyIWsyiJaM8AQIkVBQFzhr10GYolVzdzfJfEPQIx6tZ++/Vtc/q3SF/5
Ko8XCY=</WLC>
  Comment:
  Hash: 7A1Bc9W0+DqIdv/3EGOMsXW19Xs=

```

The following is sample output from the **show license image levels** command on the Catalyst 3750E switch:

```
Switch# show license image levels

Module name  Image level(s)  Priority  Configure  Valid license(s)
c3750e       ipservices      2        YES        ipservices;advipservices
              ipbase          3        NO         ipbase
```

The following is sample output from the **show license image-levels** command on the Cisco ASR 1001 router:

```
Router# show license image-levels

Module name  Image level      Priority  Configured  Valid license
asr1001k9   adventerprisek9  1        NO          adventerprisek9
              advipservicesk9  2        NO          advipservicesk9
              ipbasek9         3        NO          ipbasek9
```

The following is sample output from the **show license in-use** command on the Cisco ASR 1001 router:

```
Router# show license in-use

StoreIndex: 0 Feature: throughput          Version: 1.0
License Type: Permanent
License State: Active, In Use
License Count: Non-Counted
License Priority: Medium
StoreIndex: 1 Feature: adventerprisek9     Version: 1.0
License Type: Permanent
License State: Active, In Use
License Count: Non-Counted
License Priority: Medium
```

The following is sample output from the **show license permanent** command on the Cisco ASR 1001 router:

```
Router# show license permanent

StoreIndex: 0 Feature: throughput          Version: 1.0
License Type: Permanent
License State: Active, In Use
License Count: Non-Counted
License Priority: Medium
StoreIndex: 1 Feature: adventerprisek9     Version: 1.0
License Type: Permanent
License State: Active, In Use
License Count: Non-Counted
License Priority: Medium
```

The following is sample output from the **show license status** command:

```
Switch# show license status

License Type Supported
permanent Non-expiring node locked license
extension Expiring node locked license
evaluation Expiring non node locked license

License Operation Supported
install   Install license
clear     Clear license
annotate  Comment license
save      Save license
```

```

revoke      Revoke license
call-home   License call-home

          Call-home Operation Supported
show pak    Display license pak via call-home
install     Install license via call-home
revoke      Revoke license via call-home
resend      Fetch license via call-home

          Device status
Device Credential type: DEVICE
Device Credential Verification: PASS
Rehost Type: DC_OR_IC

```

```

SWIFT url status
Swift URL set to default value : https://tools.cisco.com/SWIFT/Licensing

```

The following is sample output from the **show license udi modules** command:

```
Router# show license udi modules
```

Location	PID	SN	UDI
Slot0	WS-C3750E-24TD-E	CAT1146R04N	WS-C3750E-24TD-E:CAT1146R04N
Slot0/1	WS-C3750E-24TD-E	CAT1146R04X	WS-C3750E-24TD-E:CAT1146R04X
Slot0/1/1	WS-C3750E-24TD-E	CAT1146R04Y	WS-C3750E-24TD-E:CAT1146R04Y

### Cisco uBR10012 Universal Broadband Routers

The following is sample output from the **show license all** command, where “subslot 8/1” denotes the line card for which all license information is requested. [Table 1](#) describes the fields shown in the command output:

```
Router# show license all subslot 8/1
```

```

License Store: Primary License Storage
StoreIndex: 0  Feature: DS_License                               Version: 1.0
License Type: Permanent
License State: Inactive
License Count: 10/0/0 (Active/In-use/Violation)
License Priority: Medium
StoreIndex: 1  Feature: DS_License                               Version: 1.0
License Type: Evaluation
License State: Active, In Use
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 3 days
Expiry date: Nov 24 2009 14:13:34
License Count: 20/20/0 (Active/In-use/Violation)
License Priority: High
License Store: Evaluation License Storage
StoreIndex: 0  Feature: US_License                               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
License Count: 20/0/0 (Active/In-use/Violation)
License Priority: None
StoreIndex: 1  Feature: DS_License                               Version: 1.0
License Type: Evaluation
License State: Inactive
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 4 days
License Count: 20/0/0 (Active/In-use/Violation)

```

License Priority: Low

The following is sample output from the **show license detail** command, where “subslot 8/1” specifies the line card for which detailed feature information is requested:

```
Router# show license detail subslot 8/1

Index: 1      Feature: DS_License      Version: 1.0
License Type: Evaluation
License State: Active, In Use
    Evaluation total period: 8 weeks 4 days
    Evaluation period left: 8 weeks 3 days
    Expiry date: Nov 24 2009 14:13:35
License Count: 20/20/0 (Active/In-use/Violation)
License Priority: High
Store Index: 1
Store Name: Primary License Storage
Index: 2      Feature: DS_License      Version: 1.0
License Type: Permanent
License State: Inactive
License Count: 10/0/0 (Active/In-use/Violation)
License Priority: Medium
Store Index: 0
Store Name: Primary License Storage
Index: 3      Feature: DS_License      Version: 1.0
License Type: Evaluation
License State: Inactive
    Evaluation total period: 8 weeks 4 days
    Evaluation period left: 8 weeks 4 days
License Count: 20/0/0 (Active/In-use/Violation)
License Priority: Low
Store Index: 1
Store Name: Evaluation License Storage
Index: 4      Feature: US_License      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
License Count: 20/0/0 (Active/In-use/Violation)
License Priority: None
Store Index: 0
Store Name: Evaluation License Storage
```

The following is sample output from the **show license status** command, where “subslot 8/1” denotes the line card for which license information is requested:

```
Router# show license status subslot 8/1

License Type Supported
permanent      Non-expiring node locked license
extension      Expiring node locked license
evaluation      Expiring non node locked license

License Operation Supported
install      Install license
clear        Clear license
annotate      Comment license
save         Save license
Modify       Modify license
revoke       Revoke license
call-home    License call-home

Call-home Operation Supported
```

## show license

```

show pak    Display license pak via call-home
install    Install license via call-home
revoke     Revoke license via call-home
resend     Fetch license via call-home

```

```

Device status
Device Credential type: DEVICE
Device Credential Verification: PASS
Rehost Type: DC_OR_IC

```

```

SWIFT url status
Swift URL set to default value : https://tools.cisco.com/SWIFT/Licensing

```

The following is sample output from the **show license feature** command, for the Upstream (US) and Downstream (DS) feature:

```

Router# show license feature subslot 8/1

Feature name      Enforcement  Evaluation  Subscription  Enabled
US_License        yes         yes         no            no
DS_License        yes         yes         no            yes

```

[Table 2](#) describes the fields as shown in the display.

**Table 2** show license feature Field Descriptions

Field	Description
Feature name	Shows the feature name; for example, Downstream (DS) license.
Enforcement	Shows whether license enforcement exists or not.
Evaluation	Shows whether the license is under evaluation or not.
Subscription	Shows whether the license is coming up for subscription.
Enabled	Shows whether the license feature is enabled on the line card.

The following is sample output from the **show license udi** command, where “subslot 8/1” specifies the line card for which UDI information is requested:

```

Router# show license udi subslot 8/1

SlotID  PID                      SN                      UDI
-----
*8/1    UBR10-MC20X20H-D        CSJ12179004            UBR10-MC20X20H-D:CSJ12179004
Router#

```

The following is sample output from the **show license udi** command, when the **subslot** keyword is not specified:

```

Router# show license udi

SlotID  PID                      SN                      UDI
-----
6/1     UBR10-MC20X20H-D        CSJ12339112            UBR10-MC20X20H-D:CSJ12339112
8/1     UBR10-MC20X20H-D        CSJ12179004            UBR10-MC20X20H-D:CSJ12179004

```

Table 3 describes the significant fields shown in the display.

**Table 3** *show license udi Field Descriptions*

Field	Description
SlotID	The slot/subslot number of the line card on the uBR10012 router.
PID	Product identification number. The name by which the product can be ordered.
SN	Serial number. Used to identify an individual, specific instance of a product.
UDI	Unique device identifier. This information is printed on the device as well as stored electronically on the device to facilitate remote retrieval.

The following is sample output from the **show license file** command:

```
Router# show license file subslot 8/1

License Store: Primary License Storage
Store Index: 0
License: 11 DS_License 1.0 LONG NORMAL STANDALONE EXCL 12_KEYS INFINITE_KEYS NEVER NEVER NiL SLM_CODE CL_ND_LCK NiL *12C6WKA8862SGEW400 NiL NiL NiL 5_MINS <UDI><PID>UBR10-MC20X20H-D</PID><SN>CSJ12179004</SN></UDI> UXmw4uz2YY6zajf9MeCq3YIL9zQ296cJcD5WpvEgweLLqi9T, LvwVOB941QGpyUE3AGrpBxRqY5svo26jDlkD6VVcXLnwFgTftbn4k0ZGZCC3li, C9Hs2fHbGaj9HBc0fefj$<WLC>AQEBIQAB//n5p8RRMcZgKmNabY6jLElFSa5DRh/dkqBQ29j/MCMiUoRgwGb4XkhtQwyPXzQOaKRqwInXo3s+nsLU7rOtdOxoIxYZAo3LYmUJ+MFzsqlhKoJVlPyEvQ8H21MNUjVbhoN0gyIWsyiJam8AQIkVBQFzhr10GYo1VzdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko8XCY=</WLC>

Comment:
Hash: aYPyovZMfUzVD7Mj809eh6HyMP0=
```

### Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Routers

The following is sample output from the **show license all** command, where “slot 5” denotes the line card for which the license information is requested. Table 1 describes the fields shown in the command output.

```
Router# show license all slot 5

License Store: Primary License Storage
StoreIndex: 0 Feature: DS_License Version: 1.0
License Type: Permanent
License State: Active, In Use
License Count: 8/8/0 (Active/In-use/Violation)
License Priority: Medium
StoreIndex: 1 Feature: US_License Version: 1.0
License Type: Permanent
License State: Active, In Use
License Count: 8/8/0 (Active/In-use/Violation)
License Priority: Medium
License Store: Evaluation License Storage
StoreIndex: 0 Feature: US_License Version: 1.0
License Type: Evaluation
License State: Inactive
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 4 days
License Count: 8/0/0 (Active/In-use/Violation)
License Priority: None
StoreIndex: 1 Feature: DS_License Version: 1.0
```

```

License Type: Evaluation
License State: Inactive
  Evaluation total period: 8 weeks 4 days
  Evaluation period left: 8 weeks 4 days
License Count: 8/0/0 (Active/In-use/Violation)
License Priority: None

```

The following is sample output from the **show license detail** command, where “slot 5” specifies the line card for which detailed feature information is requested:

```

Router# show license detail slot 5

Index: 1      Feature: DS_License                      Version: 1.0
License Type: Permanent
License State: Active, In Use
License Count: 8/8/0 (Active/In-use/Violation)
License Priority: Medium
Store Index: 0
Store Name: Primary License Storage
Index: 2      Feature: DS_License                      Version: 1.0
License Type: Evaluation
License State: Inactive
  Evaluation total period: 8 weeks 4 days
  Evaluation period left: 8 weeks 4 days
License Count: 8/0/0 (Active/In-use/Violation)
License Priority: None
Store Index: 1
Store Name: Evaluation License Storage
Index: 3      Feature: US_License                      Version: 1.0
License Type: Permanent
License State: Active, In Use
License Count: 8/8/0 (Active/In-use/Violation)
License Priority: Medium
Store Index: 1
Store Name: Primary License Storage
Index: 4      Feature: US_License                      Version: 1.0
License Type: Evaluation
License State: Inactive
  Evaluation total period: 8 weeks 4 days
  Evaluation period left: 8 weeks 4 days
License Count: 8/0/0 (Active/In-use/Violation)
License Priority: None
Store Index: 0
Store Name: Evaluation License Storage

```

The following is sample output from the **show license status** command, where “slot 5” denotes the line card for which license information is requested:

```

Router# show license status slot 5

License Type Supported
permanent          Non-expiring node locked license
extension          Expiring node locked license
evaluation         Expiring non node locked license

License Operation Supported
install           Install license
clear            Clear license
annotate         Comment license
save             Save license
Modify           Modify license
revoke           Revoke license
call-home        License call-home

```

```

Call-home Operation Supported
show pak   Display license pak via call-home
install   Install license via call-home
revoke    Revoke license via call-home
resend    Fetch license via call-home

```

```

Device status
Device Credential type: DEVICE
Device Credential Verification: PASS
Rehost Type: DC_OR_IC

```

```

SWIFT url status
Swift URL set to default value : https://tools.cisco.com/SWIFT/Licensing

```

The following is sample output from the **show license feature** command, for the Upstream (US) and Downstream (DS) feature:

```

Router# show license feature slot 5

Feature name           Enforcement  Evaluation  Subscription  Enabled
US_License             yes         yes         no            yes
DS_License             yes         yes         no            yes

```

The following is sample output from the **show license udi** command, where “slot 5” specifies the line card for which UDI information is requested:

```

Router# show license udi slot 5

SlotID  PID                SN                UDI
-----
*5      UBR-MC88U          CSJ12514210      UBR-MC88U:CSJ12514210

```

The following is sample output from the **show license udi** command, when the **slot** keyword is not specified:

```

Router# show license udi

SlotID  PID                SN                UDI
-----
5       UBR-MC88U          CSJ12514210      UBR-MC88U:CSJ12514210

```

[Table 4](#) describes the significant fields shown in the display.

**Table 4** *show license udi* Field Descriptions

Field	Description
SlotID	The slot number of the line card on the Cisco uBR7225VXR or Cisco uBR7246VXR router.
PID	Product identification number. The name by which the product can be ordered.
SN	Serial number. Used to identify an individual, specific instance of a product.
UDI	Unique device identifier. This information is printed on the device and stored electronically on the device to facilitate remote retrieval.

The following is sample output from the **show license file** command:

```
Router# show license file slot 5

License Store: Primary License Storage
Store Index: 0
  License: 11 DS_License 1.0 LONG NORMAL STANDALONE EXCL 8_KEYS INFINITE_KEY
S NEVER NEVER NiL SLM_CODE CL_ND_LCK NiL *1VDWSEZNBXMDUF6400 NiL
NiL NiL 5_MINS <UDI><PID>UBR-MC88U</PID><SN>CSJ12514210</SN></UDI
> dai:f7mhotuFuD:1f1GnfTcbjqqZNSj4w2ZOJKr1VM3riaI6MhGUsnGkIbk83bi
U3SpE1bzN4X1TQ8x9HRC93fVHK9eTcFaMsLX6I,G4p4wWfimLew3H0SUSfdspJvyz
ikLZ$<WLC>AQEBIQAB///Z8GMgzMS3HccHkeioc4KXGR28VwY2ckacKin9G6PtV18
N/XB0WkMA+Mj6R0tJ+RmRqWInXo3s+nsLU7rOtdOxoIxyZAo3LYmUJ+MFzsqlhKoJ
VlPyEvQ8H21MNUjVbhoN0gyIWsyiJam8AQIkVBQFzhr10GYo1VzdzfJfEPQIx6tZ+
+/Vtc/q3SF/5Ko8XCY=</WLC>
  Comment:
  Hash: rYH1S/Q7961pN+kZpf3LQ9UR+dY=
Store Index: 1
  License: 11 US_License 1.0 LONG NORMAL STANDALONE EXCL 8_KEYS INFINITE_KEY
S NEVER NEVER NiL SLM_CODE CL_ND_LCK NiL *1VDWSEZNBXMDUF6400 NiL
NiL NiL 5_MINS <UDI><PID>UBR-MC88U</PID><SN>CSJ12514210</SN></UDI
> yxU,2eYAsVZXLX1Uh0:zfDWS4rE7OZr5g:cYy:rCOcVBi97MjRUZUzWb6Vi8MB2
3VVvaQBN4tni,0BsTsfqgJjXaryA,NexvAPyp09AJRh3soHjqW,COT2V6fbgzPt
5u35$<WLC>AQEBIQAB//9uV7Zp1YcBuFy6gMM/gAYOXR7dm/+006pGceLT3qUNUug
14skFZoucJkLd0ojdk+mRqWInXo3s+nsLU7rOtdOxoIxyZAo3LYmUJ+MFzsqlhKoJ
VlPyEvQ8H21MNUjVbhoN0gyIWsyiJam8AQIkVBQFzhr10GYo1VzdzfJfEPQIx6tZ+
+/Vtc/q3SF/5Ko8XCY=</WLC>
  Comment:
  Hash: Hg6bxVO8ZZITGbFg7NoAQU/QGhs=
License Store: Evaluation License Storage
Store Index: 0
  License: 11 US_License 1.0 LONG TRIAL DISABLED 1440 DISABLED STANDALONE AD
D 8_KEYS INFINITE_KEYS NEVER NEVER NiL SLM_CODE DEMO NiL NiL Ni N
iL NiL 5_MINS NiL V7kIRj,EZLjQ4gpW6nQYL40zCTx,wvk1k9buST3EOhLRys9
slYKaMRsXbMSuz3ihfA$<WLC>AQEBIQAB///QgcWxs1rLFOkfnLaMbSpr5sFnSmYb
dL0ZcysI1rlNaK9yrCLEw3aidzf+WNvFg86RqWInXo3s+nsLU7rOtdOxoIxyZAo3L
YmUJ+MFzsqlhKoJv1PyEvQ8H21MNUjVbhoN0gyIWsyiJam8AQIkVBQFzhr10GYo1V
zdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko8XCY=</WLC>
  Comment:
  Hash: Rox9tmRbNJOygotZlWYmr00OvY4=
Store Index: 1
  License: 11 DS_License 1.0 LONG TRIAL DISABLED 1440 DISABLED STANDALONE AD
D 8_KEYS INFINITE_KEYS NEVER NEVER NiL SLM_CODE DEMO NiL NiL Ni N
iL NiL 5_MINS NiL Hp5gBr76OsVcoCNVW8Hi33rQs2xMyd5YU6sDI6oQsdVTrxI
vaLwepwAB4GXyk1zvLP$<WLC>AQEBIQAB//8c0JDyC40fqQGUTy1DKqaN/AyL43ZV
PdJH0Ho1JAgOF5mjctCLuw5RaXRSPAJO9LaRqWInXo3s+nsLU7rOtdOxoIxyZAo3L
YmUJ+MFzsqlhKoJv1PyEvQ8H21MNUjVbhoN0gyIWsyiJam8AQIkVBQFzhr10GYo1V
zdzfJfEPQIx6tZ++/Vtc/q3SF/5Ko8XCY=</WLC>
  Comment:
  Hash: 3bm6gofelR14J0rO/J44poj+dEY=
```

## Related Commands

Command	Description
<b>license boot module</b>	Boots a new software license.
<b>license call-home install</b>	Installs a license using the Cisco License Call Home feature.
<b>license call-home resend</b>	Restores a lost license by using the Cisco License Call Home feature.
<b>license call-home revoke</b>	Revokes and transfers a license by using the Cisco License Call Home feature.
<b>license clear</b>	Removes a license entry from license storage.

<b>Command</b>	<b>Description</b>
<b>license comment</b>	Add or removes a comment about a feature license.
<b>license modify priority</b>	Modifies a license priority.
<b>license save</b>	Saves a copy of a permanent license to a specified license file.

# show license call-home

To display the stock keeping unit (SKU) list and features available in a product authorization key (PAK), use the **show license call-home** command in privileged EXEC mode.

**Cisco 860, 880, and 890 Series Routers, and Cisco 1900, 2900, and 3900 Series Integrated Services Router Platforms**

```
show license call-home pak pak-id
```

**Cisco uBR10012 Universal Broadband Router**

```
show license [call-home pak pak-id]
```

**Cisco Catalyst 3560-E and Cisco Catalyst 3750-E Switch Platforms**

```
show license call-home pak pak-id
```

## Syntax Description

<b>pak</b>	Shows the product authorization key.
<i>pak-id</i>	The product authorization key sent through e-mail or through regular mail by manufacturing to authorize software upgrades.

## Command Modes

Privileged EXEC (#)

## Command History

Release	Modification
12.4(15)XZ	This command was introduced.
12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.
12.2(33)SCC	This command was integrated into Cisco IOS Release 12.2(33)SCC on the Cisco uBR10012 universal broadband router.

## Usage Guidelines

The Cisco License Call Home feature allows a Cisco router to communicate with the Cisco licensing infrastructure through the Internet and retrieve licensing information. This command requires that the router be connected to the Internet.

This command requires the following:

- The router or switch 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 module in the *Network Management Configuration Guide*: [http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm\\_http\\_web.html](http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_http_web.html).
- Only certain platforms support the Cisco License Call Home feature, and those devices must be running a Cisco IOS crypto K9 image.
- You must obtain the device certificate from the Cisco licensing infrastructure.
- You need a Cisco.com user login account.

Issuing the **show license call-home** command causes these actions to occur:

- The Cisco licensing infrastructure returns parsed XML content to the command line. The parsed content contains information about SKUs and feature names. The content might also contain warning messages.
- The SKU information and any warning messages are displayed as formatted output on the router command line.

### Cisco uBR10012 Universal Broadband Router

In the Cisco uBR10012 universal broadband router, the **call-home** keyword is optional in the **show license** command syntax.

## Examples

The following example shows the PAKs and SKUs associated with a software license:

```
Router# show license call-home 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 : 5400
                        5350
                        2800
                        3800
```

[Table 5](#) describes the significant fields shown in the display.

**Table 5** *show license call-home Field Descriptions*

Field	Description
Pak Number	Product authorization key number, 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.
SKU Name	Stock keeping unit name, which maps to one or more Cisco software features.
Description	Description provided for the SKU.
Ordered Qty	Quantity ordered.
Feature List	List of features.
Platform Supported	List of Cisco device platforms supported.

## Related Commands

Command	Description
<b>license call-home install</b>	Installs a license by using the Cisco License Call Home feature.

<b>Command</b>	<b>Description</b>
<b>license call-home resend</b>	Restores a lost license by using the Cisco License Call Home feature.
<b>license call-home revoke</b>	Rehosts (revokes and transfers) a license by using the Cisco License Call Home feature.

# show license statistics

To display license statistics information, use the **show license statistics** command in privileged EXEC mode.

## Cisco 860, 880, and 890 Series Routers, and Cisco 1900, 2900, and 3900 Series Integrated Services Router Platforms

```
show license statistics
```

## Cisco Catalyst 3560-E Switch Platforms

```
show license statistics
```

## Cisco Catalyst 3750-E Switch and Switch Stack Platforms

```
show license statistics [switch switch-num]
```

## Cisco Catalyst 3750-E Switch Mixed Stack Platforms

```
show license statistics switch switch-num
```

## Cisco uBR10012 Universal Broadband Routers

```
show license [statistics subslot slot/subslot]
```

## Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Routers

```
show license [statistics slot slot]
```

Syntax	Description
<b>switch</b> <i>switch-num</i>	Specifies a switch in a switch stack or in a mixed switch stack. The range is 1 to 9.
<b>subslot</b>	(Cisco uBR10012 universal broadband routers only) Shows the slot and subslot information of a line card.
<b>slot</b>	Shows the slot information of a line card.
<i>slot</i>	Slot where the line card resides: <ul style="list-style-type: none"> <li>• Cisco uBR7246VXR router—The range is 3 to 6.</li> <li>• Cisco uBR7225VXR router—The range is 1 to 2.</li> <li>• Cisco uBR10012 router—The range is 5 to 8.</li> </ul>
<i>subslot</i>	(Cisco uBR10012 universal broadband routers only) The value is either 0 or 1.

**Command Modes** Privileged EXEC (#)

**Command History**

Release	Modification
12.4(15)XZ	This command was introduced.
12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.
12.2(33)SCC	This command was integrated into Cisco IOS Release 12.2(33)SCC on Cisco uBR10012 universal broadband routers.
12.2(33)SCD	This command was modified. The <b>slot slot</b> keyword and argument were added for the Cisco uBR7225VXR and Cisco uBR7246VXR routers.

**Usage Guidelines****Cisco uBR10012 Universal Broadband Routers**

The command displays statistics information of the line card in the specified *slot/subslot*. The keyword **subslot** and *slot/subslot* arguments were added for Cisco uBR10012 universal broadband routers.

**Examples**

The following is sample output from the **show license statistics** command:

```
Router# show license statistics

      Administrative statistics
Install success count:  4
Install failure count:  1
Install duplicate count: 12
Comment add count:     2
Comment delete count:  0
Clear count:           10
Save count:            1
Save cred count:       6

      Client statistics
Request success count  0
Request failure count  0
Release count         0
Global Notify count   21

      SWIFT url status
Swift value changed by user
Current Value : https://cisco.com/SWIFT/Licensing
Default Value : https://cisco.com/SWIFT/Licensing
```

**Cisco uBR10012 Universal Broadband Routers: Example**

The following is sample output from the **show license statistics subslot 8/1** command executed on the Cisco uBR10012 router:

```
Router# show license statistics subslot 8/1

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

      Client statistics
```

```

Request success count: 1
Request failure count: 1
Release count: 0
Global Notify count: 1

```

Table 6 describes the significant fields shown in the display.

**Table 6** *show license statistics Field Descriptions*

Field	Description
Administrative statistics	<ul style="list-style-type: none"> <li>• Install success count—Number of successful installations</li> <li>• Install failure count—Number of failed installation attempts</li> <li>• Install duplicate count—Number of duplicate installations</li> <li>• Comment add count—Number of added comments</li> <li>• Comment delete count—Number of deleted comments</li> <li>• Clear count—Number of License Clear events</li> <li>• Save count—Number of License Save events</li> <li>• Save cred count—Number of License Save Credentials</li> </ul>
Client statistics	<ul style="list-style-type: none"> <li>• Request success count—Number of successful license requests</li> <li>• Request failure count—Number of failed license requests</li> <li>• Release count—Number of released licenses</li> <li>• Global Notify count—Number of global notifications</li> </ul>
SWIFT url status	<ul style="list-style-type: none"> <li>• Current Value—Current SWIFT URL</li> <li>• Default Value—Default SWIFT URL</li> </ul>

#### Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Routers: Example

The following is sample output from the **show license statistics slot 5** command executed on the Cisco uBR7246VXR router:

```

Router# show license statistics slot 5

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

      Client statistics
Request success count: 2
Request failure count: 0
Release count: 0

```

```
Global Notify count:      0
```

Table 7 describes the significant fields shown in the display.

**Table 7** *show license statistics Field Descriptions*

Field	Description
Administrative statistics	<ul style="list-style-type: none"> <li>• Install success count—Number of successful installations</li> <li>• Install failure count—Number of failed installation attempts</li> <li>• Install duplicate count—Number of duplicate installations</li> <li>• Comment add count—Number of added comments</li> <li>• Comment delete count—Number of deleted comments</li> <li>• Clear count—Number of License Clear events</li> <li>• Save count—Number of License Save events</li> <li>• Save cred count—Number of License Save Credentials</li> </ul>
Client statistics	<ul style="list-style-type: none"> <li>• Request success count—Number of successful license requests</li> <li>• Request failure count—Number of failed license requests</li> <li>• Release count—Number of released licenses</li> <li>• Global Notify count—Number of global notifications</li> </ul>

#### Related Commands

Command	Description
<b>debug license</b>	Enables controlled debugging options in the Cisco software licensing module.
<b>show license status</b>	Displays license information to troubleshoot licensing issues.

# show subsys

To display the subsystem information, use the **show subsys** command in privileged EXEC mode.

```
show subsys [class class | name name]
```

Syntax Description		
<b>class</b> <i>class</i>	(Optional) Displays the subsystems of the specified class. Valid classes are <b>driver</b> , <b>ehsa</b> , <b>ifs</b> , <b>kernel</b> , <b>library</b> , <b>license</b> , <b>management</b> , <b>microcode</b> , <b>pre-ehsa</b> , <b>pre-driver</b> , <b>protocol</b> , <b>registry</b> , and <b>sysinit</b> .	
<b>name</b> <i>name</i>	(Optional) Displays the specified subsystem. Use the asterisk (*) as a wildcard at the end of the name to list all subsystems, starting with the specified characters.	

Command Modes	
	Privileged EXEC (#)

Command History	Release	Modification
	11.1	This command was introduced.
	12.3	This command was modified. The <b>ehsa</b> , <b>ifs</b> , <b>microcode</b> , <b>pre-driver</b> , and <b>sysinit</b> classes were added.
	12.3T	This command was modified The <b>pre-ehsa</b> class was added.
	12.2(33)SRA	This command was modified. The <b>driver</b> , <b>ehsa</b> , <b>kernel</b> , <b>library</b> , <b>management</b> , <b>pre-driver</b> , <b>pre-ehsa</b> , <b>protocol</b> , and <b>registry</b> classes were added.
	12.2(35)SE2	This command was modified. The <b>driver</b> , <b>ehsa</b> , <b>kernel</b> , <b>library</b> , <b>license</b> , <b>management</b> , <b>pre-driver</b> , <b>pre-ehsa</b> , <b>protocol</b> , and <b>registry</b> classes were added.

Usage Guidelines	
	Use the <b>show subsys</b> command to confirm that all required features are in the running image.

Examples	
	The following is sample output from the <b>show subsys</b> command:

```
Router# show subsys

Name           Class      Version
static_map     Kernel    1.000.001
arp            Kernel    1.000.001
ether          Kernel    1.000.001
compress       Kernel    1.000.001
alignment      Kernel    1.000.002
monvar         Kernel    1.000.001
slot           Kernel    1.000.001
oir            Kernel    1.000.001
atm            Kernel    1.000.001
ip_addrpool_sys Library    1.000.001
chat           Library    1.000.001
dialer         Library    1.000.001
```

```

flash_services      Library      1.000.001
ip_localpool_sys    Library      1.000.001
nvram_common        Driver       1.000.001
ASP                 Driver       1.000.001
sonict              Driver       1.000.001
oc3suni             Driver       1.000.001
oc12suni            Driver       1.000.001
ds3suni             Driver       1.000.001

```

The following is sample output from the **show subsys** command that includes the **license** class:

```
Router# show subsys name license
```

```

Name                Class      Version
license_mgmt_local  Management 1.000.001
license_admin_local Management 1.000.001
license_debug_core  Management 1.000.001
license_test_ui     Management 1.000.001
test_license_parser Management 1.000.001
license_ui          Management 1.000.001
license_parser      Management 1.000.001
license_registry    Registry   1.000.001
license_client      License    1.000.001

```

[Table 8](#) describes the fields shown in the display.

**Table 8** *show subsys Field Descriptions*

Field	Description
Name	Name of the subsystem.
Class	Class of the subsystem. Possible classes include Driver, Ehsa, Ifs, Kernel, Library, License, Management, Microcode, Pre-Ehsa, Pre-driver, Protocol, Registry, and Sysinit.
Version	Version of the subsystem.

# show subsys license

To display the subsystem running for a feature set, use the **show subsys license** command in either user EXEC or privileged EXEC mode.

**show subsys license** *subsystem*

Syntax Description	<i>subsystem</i>	Name of the subsystem for a specified license.
--------------------	------------------	--

**Command Default** Subsystem information is not displayed.

**Command Modes** User EXEC (>)  
Privileged EXEC (#)

Command History	Release	Modification
	12.2(35)SE2	This command was introduced.
	12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.

**Usage Guidelines** Use this command to display license information and to help with troubleshooting issues related to Cisco IOS software licenses.

**Examples** The following is sample output that shows the subsystem running the IP base feature set:

```
Router# show subsys license ipbase
```

```
License level: ipbase
```

Name	Class	Version
obfl_env_app	Kernel	1.000.001
exception	Kernel	1.000.001
xml_proxy_client	Kernel	1.000.000
proto_counter	Kernel	1.000.001
sched_ui	Kernel	1.000.001
policy_manager	Kernel	1.000.001
fib_table_trace	Kernel	1.000.001
ifmibapi_access	Kernel	1.000.000
xml_engine	Kernel	1.000.000
fddi_mtu	Kernel	1.000.001
fib_trace	Kernel	1.000.001
.		
.		
qos_set	Protocol	1.000.001
rip	Protocol	1.000.001
ipdiag	Protocol	1.000.001
aaa_peruser	Protocol	1.000.001
identity_cli	Management	1.000.001

## show subsys license

```

notification_log_mib           Management  1.000.000
pagpmib                       Management  1.000.000
ifmib                         Management  1.000.000
rtty_chain                    Management  1.000.001
cdpmib                        Management  1.000.000
vlmem                         Management  1.000.000
.
.
.
psecure_registry             Registry   1.000.001
ip_ios_registry              Registry   1.000.001
sys_name_registry            Registry   1.000.001
INIT                         SystemInit 2.000.001
parser                       EHSA      1.000.001
tmphys_ifs                   EHSA      1.000.001
hulc_fib_rf_ehsa             EHSA      1.000.001
regex_ui                     EHSA      1.000.001
system_ifs                   EHSA      1.000.001
chunk_ui                     EHSA      1.000.001
rbcp                         EHSA      1.000.000
gdb_ui                       EHSA      1.000.001
ifs_image_elf                EHSA      1.000.001
nvram_common                 EHSA      1.000.001
ifs_image_ascii              EHSA      1.000.001
clock_ui                     EHSA      1.000.001
nv_ifs                       EHSA      1.000.001
sff8472                      Pre-Driver 1.000.001
aggmgr                       Pre-Driver 1.000.000
ifindex_pers                 Pre-Driver 1.000.001
sff8472_fixed                Pre-Driver 1.000.000
fib_rp_predriver             Pre-Driver 1.000.001
system_capability            Pre-Driver 1.000.001
fib_lc_predriver             Pre-Driver 1.000.001
fib_ios_chain                Pre-Driver 1.000.001
transceiver                  Pre-Driver 1.000.002
fib_ios_predriver            Pre-Driver 1.000.001
license_client                License    1.000.001
hulc_flash                   License    1.000.001
ios_licensing_image_application License    1.000.001
ifs                           License    1.000.001
sdb                           License    1.000.001
boot_upgrade                 License    1.000.001
hulc_universal_only          License    1.000.001

```

Table 8 describes the fields shown in the display.

**Table 9** show subsys license Field Descriptions

Field	Description
License level	Feature set for which the license is issued; for example, Advanced IP services, IP services, or IP base.
Name	Name of the subsystem.
Class	Class of the subsystem. Possible classes include Driver, Kernel, Library, License, Management, Protocol, Registry.
Version	Version of the subsystem.

# snmp-server enable traps

To enable all Simple Network Management Protocol (SNMP) notification types that are available on your system, use the **snmp-server enable traps** command in global configuration mode. To disable all available SNMP notifications, use the **no** form of this command.

**snmp-server enable traps** [*notification-type*] [**vrrp**]

**no snmp-server enable traps** [*notification-type*] [**vrrp**]

## Syntax Description

*notification-type*

(Optional) Type of notification (trap or inform) to enable or disable. If no type is specified, all notifications available on your device are enabled or disabled (if the **no** form is used). The notification type can be one of the following keywords:

**alarms**—Enables alarm filtering to limit the number of syslog messages generated. Alarms are generated for the severity configured as well as for the higher severity values.

- The *severity* argument is an integer or string value that identifies the severity of an alarm. Integer values are from 1 to 4. String values are critical, major, minor, and informational. The default is 4 (informational). Severity levels are defined as follows:
  - 1—Critical. The condition affects service.
  - 2—Major. Immediate action is needed.
  - 3—Minor. Minor warning conditions.
  - 4—Informational. No action is required. This is the default.
- **auth-framework [sec-violation]**—Enables the SNMP CISCO-AUTH-FRAMEWORK-MIB traps. The optional **sec-violation** keyword enables the SNMP camSecurityViolationNotif notification.<sup>1</sup>
- **config**—Controls configuration notifications, as defined in the CISCO-CONFIG-MAN-MIB (enterprise 1.3.6.1.4.1.9.9.43.2). The notification type is (1) ciscoConfigManEvent.
- **dot1x**—Enables IEEE 802.1X traps. This notification type is defined in the CISCO PAE MIB.

### Catalyst 6500 Series Switches

The following keywords are available under the **dot1x** keyword:

- **auth-fail-vlan**—Enables the SNMP cpaeAuthFailVlanNotif notification.
- **no-auth-fail-vlan**—Enables the SNMP cpaeNoAuthFailVlanNotif notification.
- **guest-vlan**—Enables the SNMP cpaeGuestVlanNotif notification.
- **no-guest-vlan**—Enables the SNMP cpaeNoGuestVlanNotif notification.

- **ds0-busyout**—Sends notification when the busyout of a DS0 interface changes state (Cisco AS5300 platform only). This notification is defined in the CISCO-POP-MGMT-MIB (enterprise 1.3.6.1.4.1.9.10.19.2), and the notification type is (1) cpmDS0BusyoutNotification.
- **ds1-loopback**—Sends notification when the DS1 interface goes into loopback mode (Cisco AS5300 platform only). This notification type is defined in the CISCO-POP-MGMT-MIB (enterprise 1.3.6.1.4.1.9.10.19.2) as (2) cpmDS1LoopbackNotification.
- **dsp**—Enables SNMP digital signal processing (DSP) traps. This notification type is defined in the CISCO-DSP-MGMT-MIB.
- **dsp oper-state**—Sends a DSP notification made up of both a DSP ID that indicates which DSP is affected and an operational state that indicates whether the DSP has failed or recovered.
- **l2tc**—Enable the SNMP Layer 2 tunnel configuration traps. This notification type is defined in CISCO-L2-TUNNEL-CONFIG-MIB.<sup>1</sup>
- **entity**—Controls Entity MIB modification notifications. This notification type is defined in the ENTITY-MIB (enterprise 1.3.6.1.2.1.47.2) as (1) entConfigChange.
- **entity-diag type**—Enables the SNMP CISCO-ENTITY-DIAG-MIB traps. The valid *type* values are as follows:<sup>1</sup>
  - **boot-up-fail**—(Optional) Enables the SNMP ceDiagBootUpFailedNotif traps.<sup>1</sup>
  - **hm-test-recover**—(Optional) Enables the SNMP ceDiagHMTestRecoverNotif traps.<sup>1</sup>
  - **hm-thresh-reached**—(Optional) Enables the SNMP ceDiagHMThresholdReachedNotif traps.<sup>1</sup>
  - **scheduled-fail**—(Optional) Enables the SNMP ceDiagScheduledJobFailedNotif traps.<sup>1</sup>
- **flowmon**—Controls flow monitoring notifications.
- **hsrp**—Controls Hot Standby Routing Protocol (HSRP) notifications, as defined in the CISCO-HSRP-MIB (enterprise 1.3.6.1.4.1.9.9.106.2). The notification type is (1) cHsrpStateChange.
- **ipmulticast**—Controls IP multicast notifications.
- **license**—Enables licensing notifications as traps or informs. The notifications are grouped into categories that can be individually controlled by combining the keywords with the **license** keyword, or as a group by using the **license** keyword by itself.
  - **deploy**—Controls notifications generated as a result of install, clear, or revoke license events.
  - **error**—Controls notifications generated as a result of a problem with the license or with the usage of the license.
  - **imagelevel**—Controls notifications related to the image level of the license.
  - **usage**—Controls usage notifications related to the license.
- **modem-health**—Controls modem-health notifications.

- **ds0-busyout**—Sends notification when the busyout of a DS0 interface changes state (Cisco AS5300 platform only). This notification is defined in the CISCO-POP-MGMT-MIB (enterprise 1.3.6.1.4.1.9.10.19.2), and the notification type is (1) cpmDS0BusyoutNotification.
- **ds1-loopback**—Sends notification when the DS1 interface goes into loopback mode (Cisco AS5300 platform only). This notification type is defined in the CISCO-POP-MGMT-MIB (enterprise 1.3.6.1.4.1.9.10.19.2) as (2) cpmDS1LoopbackNotification.
- **dsp**—Enables SNMP digital signal processing (DSP) traps. This notification type is defined in the CISCO-DSP-MGMT-MIB.
- **dsp oper-state**—Sends a DSP notification made up of both a DSP ID that indicates which DSP is affected and an operational state that indicates whether the DSP has failed or recovered.
- **l2tc**—Enable the SNMP Layer 2 tunnel configuration traps. This notification type is defined in CISCO-L2-TUNNEL-CONFIG-MIB.<sup>1</sup>
- **entity**—Controls Entity MIB modification notifications. This notification type is defined in the ENTITY-MIB (enterprise 1.3.6.1.2.1.47.2) as (1) entConfigChange.
- **entity-diag type**— Enables the SNMP CISCO-ENTITY-DIAG-MIB traps. The valid *type* values are as follows:<sup>1</sup>
  - **boot-up-fail**—(Optional) Enables the SNMP ceDiagBootUpFailedNotif traps.<sup>1</sup>
  - **hm-test-recover**—(Optional) Enables the SNMP ceDiagHMTTestRecoverNotif traps.<sup>1</sup>
  - **hm-thresh-reached**—(Optional) Enables the SNMP ceDiagHMThresholdReachedNotif traps.<sup>1</sup>
  - **scheduled-fail**—(Optional) Enables the SNMP ceDiagScheduledJobFailedNotif traps.<sup>1</sup>
- **flowmon**—Controls flow monitoring notifications.
- **hsrp**—Controls Hot Standby Routing Protocol (HSRP) notifications, as defined in the CISCO-HSRP-MIB (enterprise 1.3.6.1.4.1.9.9.106.2). The notification type is (1) cHsrpStateChange.
- **ipmulticast**—Controls IP multicast notifications.
- **license**—Enables licensing notifications as traps or informs. The notifications are grouped into categories that can be individually controlled by combining the keywords with the **license** keyword, or as a group by using the **license** keyword by itself.
  - **deploy**—Controls notifications generated as a result of install, clear, or revoke license events.
  - **error**—Controls notifications generated as a result of a problem with the license or with the usage of the license.
  - **imagelevel**—Controls notifications related to the image level of the license.
  - **usage**—Controls usage notifications related to the license.
- **modem-health**—Controls modem-health notifications.

- **module-auto-shutdown [status]**—Enables the SNMP CISCO-MODULE-AUTO-SHUTDOWN-MIB traps. The optional **status** keyword enables the SNMP Module Auto Shutdown status change traps.<sup>1</sup>
- **rsvp**—Controls Resource Reservation Protocol (RSVP) flow change notifications.
- **sys-threshold**—(Optional) Enables the SNMP cltcTunnelSysDropThresholdExceeded notification. This notification type is an enhancement to the CISCO-L2-TUNNEL-CONFIG-MIB.<sup>1</sup>
- **tty**—Controls TCP connection notifications.
- **xgcp**—Sends External Media Gateway Control Protocol (XGCP) notifications. This notification is from the XGCP-MIB-V1SMI.my, and the notification is enterprise 1.3.6.1.3.90.2 (1) xgcpUpDownNotification.

**Note** For additional notification types, see the Related Commands table.

---

**vrrp** (Optional) Specifies the Virtual Router Redundancy Protocol (VRRP).

---

1. Supported on the Catalyst 6500 series switches.

---

**Command Default** No notifications controlled by this command are sent.

---

**Command Modes** Global configuration (config)

---

Command History	Release	Modification
	10.3	This command was introduced.
	12.0(2)T	The <b>rsvp</b> notification type was added in Cisco IOS Release 12.0(2)T.
	12.0(3)T	The <b>hsrp</b> notification type was added in Cisco IOS Release 12.0(3)T.
	12.0(24)S	This command was integrated into Cisco IOS Release 12.0(24)S.
	12.2(14)SX	Support for this command was implemented on the Supervisor Engine 720.
	12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
	12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was integrated into Cisco IOS Release 12.2(17d)SXB.
	12.3(11)T	The <b>vrrp</b> notification type was added in Cisco IOS Release 12.3(11)T.
	12.4(4)T	Support for the <b>alarms</b> notification type and <i>severity</i> argument was added in Cisco IOS Release 12.4(4)T.  Support for the <b>dsp</b> and <b>dsp oper-state</b> notification types was added in Cisco IOS Release 12.4(4)T.
	12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.4(11)T	The <b>dot1x</b> notification type was added in Cisco IOS Release 12.4(11)T.
	12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

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Release	Modification
12.4(20)T	The <b>license</b> notification type keyword was added.
12.2(33)SXH	The <b>l2tc</b> keyword was added and supported on the Catalyst 6500 series switch.
12.2(33)SXI	The following keywords were added and supported on the Catalyst 6500 series switch: <ul style="list-style-type: none"> <li>• <b>auth-fail-vlan</b></li> <li>• <b>entity-diag</b></li> <li>• <b>guest-vlan</b></li> <li>• <b>module-auto-shutdown</b></li> <li>• <b>no-auth-fail-vlan</b></li> <li>• <b>no-guest-vlan</b></li> <li>• <b>sys-threshold</b></li> </ul>
Cisco IOS XE Release 2.6	This command was integrated into Cisco IOS XE Release 2.6.
15.0(1)S	This command was modified. The <b>flowmon</b> notification type was added in Cisco IOS Release 15.0(1)S.
Cisco IOS XE 3.1.0SG	This command was modified. Licensing SNMP traps are enabled by default on Catalyst 4500 series switches.

### Usage Guidelines

For additional notification types, see the Related Commands table for this command.

SNMP notifications can be sent as traps or inform requests. This command enables both traps and inform requests for the specified notification types. To specify whether the notifications should be sent as traps or informs, use the **snmp-server host [traps | informs]** command.

To configure the router to send these SNMP notifications, you must enter at least one **snmp-server enable traps** command. If you enter the command with no keywords, all notification types are enabled. If you enter the command with a keyword, only the notification type related to that keyword is enabled. To enable multiple types of notifications, you must issue a separate **snmp-server enable traps** command for each notification type and notification option.

Most notification types are disabled by default but some cannot be controlled with the **snmp-server enable traps** command.

The **snmp-server enable traps** command is used in conjunction with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications. To send notifications, you must configure at least one **snmp-server host** command.

### Catalyst 6500 Series Switches

The following MIBs were enhanced or supported in Cisco IOS Release 12.2(33)SXI and later releases on the Catalyst 6500 series switch:

- CISCO-L2-TUNNEL-CONFIG-MIB-LLDP—Enhancement. The CISCO-L2-TUNNEL-CONFIG-MIB provides SNMP access to the Layer 2 tunneling-related configurations.
- CISCO-PAE-MIB—Enhancement for critical condition and includes traps when the port goes into the Guest Vlan or AuthFail VLAN.

- CISCO-MODULE-AUTO-SHUTDOWN-MIB—Supported. The CISCO-MODULE-AUTO-SHUTDOWN-MIB provides SNMP access to the Catalyst 6500 series switch Module Automatic Shutdown component.
- CISCO-AUTH-FRAMEWORK-MIB—Supported. The CISCO-AUTH-FRAMEWORK-MIB provides SNMP access to the Authentication Manager component.
- CISCO-ENTITY-DIAG-MIB—The CISCO-ENTITY-DIAG-MIB provides SNMP traps for generic online diagnostics (GOLD) notification enhancements.

## Examples

The following example shows how to enable the router to send all traps to the host specified by the name myhost.cisco.com, using the community string defined as public:

```
Router(config)# snmp-server enable traps
Router(config)# snmp-server host myhost.cisco.com public
```

The following example shows how to configure an alarm severity threshold of 3:

```
Router# snmp-server enable traps alarms 3
```

The following example shows how to enable the generation of a DSP operational state notification from from the command-line interface (CLI):

```
Router(config)# snmp-server enable traps dsp oper-state
```

The following example shows how to enable the generation of a DSP operational state notification from a network management device:

```
setany -v2c 1.4.198.75 test cdspEnableOperStateNotification.0 -i 1
cdspEnableOperStateNotification.0=true(1)
```

The following example shows how to send no traps to any host. The Border Gateway Protocol (BGP) traps are enabled for all hosts, but the only traps enabled to be sent to a host are ISDN traps (which are not enabled in this example).

```
Router(config)# snmp-server enable traps bgp
Router(config)# snmp-server host user1 public isdn
```

The following example shows how to enable the router to send all inform requests to the host at the address myhost.cisco.com, using the community string defined as public:

```
Router(config)# snmp-server enable traps
Router(config)# snmp-server host myhost.cisco.com informs version 2c public
```

The following example shows how to send HSRP MIB traps to the host myhost.cisco.com using the community string public:

```
Router(config)# snmp-server enable traps hsrp
Router(config)# snmp-server host myhost.cisco.com traps version 2c public hsrp
```

The following example shows that VRRP will be used as the protocol to enable the traps:

```
Router(config)# snmp-server enable traps vrrp
Router(config)# snmp-server host myhost.cisco.com traps version 2c vrrp
```

The following example shows how to send IEEE 802.1X MIB traps to the host “myhost.example.com” using the community string defined as public:

```
Router(config)# snmp-server enable traps dot1x
Router(config)# snmp-server host myhost.example.com traps public
```

Related Commands	Command	Description
	<b>snmp-server enable traps atm pvc</b>	Enables ATM PVC SNMP notifications.
	<b>snmp-server enable traps atm pvc extension</b>	Enables extended ATM PVC SNMP notifications.
	<b>snmp-server enable traps bgp</b>	Enables BGP server state change SNMP notifications.
	<b>snmp-server enable traps calltracker</b>	Enables Call Tracker callSetup and callTerminate SNMP notifications.
	<b>snmp-server enable traps envmon</b>	Enables environmental monitor SNMP notifications.
	<b>snmp-server enable traps frame-relay</b>	Enables Frame Relay DLCI link status change SNMP notifications.
	<b>snmp-server enable traps ipsec</b>	Enables IPsec SNMP notifications.
	<b>snmp-server enable traps isakmp</b>	Enables IPsec ISAKMP SNMP notifications.
	<b>snmp-server enable traps isdn</b>	Enables ISDN SNMP notifications.
	<b>snmp-server enable traps memory</b>	Enables memory pool and buffer pool SNMP notifications.
	<b>snmp-server enable traps mpls ldp</b>	Enables MPLS LDP SNMP notifications.
	<b>snmp-server enable traps mpls traffic-eng</b>	Enables MPLS TE tunnel state-change SNMP notifications.
	<b>snmp-server enable traps mpls vpn</b>	Enables MPLS VPN specific SNMP notifications.
	<b>snmp-server enable traps repeater</b>	Enables RFC 1516 hub notifications.
	<b>snmp-server enable traps snmp</b>	Enables RFC 1157 SNMP notifications.
	<b>snmp-server enable traps syslog</b>	Enables the sending of system logging messages via SNMP.
	<b>snmp-server host</b>	Specifies whether you want the SNMP notifications sent as traps or informs, the version of SNMP to use, the security level of the notifications (for SNMPv3), and the destination host (recipient) for the notifications.
	<b>snmp-server informs</b>	Specifies inform request options.
	<b>snmp-server trap-source</b>	Specifies the interface (and the corresponding IP address) from which an SNMP trap should originate.
	<b>snmp trap illegal-address</b>	Issues an SNMP trap when a MAC address violation is detected on an Ethernet hub port of a Cisco 2505, Cisco 2507, or Cisco 2516 router.
	<b>vrrp shutdown</b>	Disables a VRRP group.

# snmp-server host

To specify the recipient of a Simple Network Management Protocol (SNMP) notification operation, use the **snmp-server host** command in global configuration mode. To remove the specified host from the configuration, use the **no** form of this command.

```
snmp-server host {hostname | ip-address} [vrf vrf-name] [informs | traps] [version {1 | 2c | 3
[auth | noauth | priv]]] community-string [udp-port port] [notification-type]
```

```
no snmp-server host {hostname | ip-address} [vrf vrf-name] [informs | traps] [version {1 | 2c | 3
[auth | noauth | priv]]] community-string [udp-port port] [notification-type]
```

## Command Syntax on Cisco ME 3400, ME 3400E, and Catalyst 3750 Metro Switches

```
snmp-server host ip-address {community-string | {informs | traps} {community-string |
version {1 | 2c | 3 {auth | noauth}}}} community-string | version {1 | 2c | 3 {auth | noauth}}
community-string | vrf vrf-name {informs | traps} {community-string | version {1 | 2c | 3 {auth
| noauth}} community-string}} [notification-type]
```

```
no snmp-server host ip-address {community-string | {informs | traps} {community-string |
version {1 | 2c | 3 {auth | noauth}}}} community-string | version {1 | 2c | 3 {auth | noauth}}
community-string | vrf vrf-name {informs | traps} {community-string | version {1 | 2c | 3 {auth
| noauth}} community-string}} [notification-type]
```

## Command Syntax on Cisco 7600 Series Router

```
snmp-server host ip-address {community-string | {informs | traps} {community-string |
version {1 | 2c | 3 {auth | noauth | priv}}}} community-string | version {1 | 2c | 3 {auth | noauth
| priv}} community-string | vrf vrf-name {informs | traps} {community-string | version {1 | 2c
| 3 {auth | noauth | priv}}}} community-string}} [notification-type]
```

```
no snmp-server host ip-address {community-string | {informs | traps} {community-string |
version {1 | 2c | 3 {auth | noauth | priv}}}} community-string | version {1 | 2c | 3 {auth | noauth
| priv}} community-string | vrf vrf-name {informs | traps} {community-string | version {1 | 2c
| 3 {auth | noauth | priv}}}} community-string}} [notification-type]
```

### Syntax Description

<i>hostname</i>	Name of the host. The SNMP notification host is typically a network management station (NMS) or SNMP manager. This host is the recipient of the SNMP traps or informs.
<i>ip-address</i>	IPv4 address or IPv6 address of the SNMP notification host.
<b>vrf</b>	(Optional) Specifies that a Virtual Private Network (VPN) routing and forwarding (VRF) instance should be used to send SNMP notifications. <ul style="list-style-type: none"> <li>In Cisco IOS Release 12.2(54)SE, the <b>vrf</b> keyword is required.</li> </ul>
<i>vrf-name</i>	(Optional) VPN VRF instance used to send SNMP notifications. <ul style="list-style-type: none"> <li>In Cisco IOS Release 12.2(54)SE, the <i>vrf-name</i> argument is required.</li> </ul>
<b>informs</b>	(Optional) Specifies that notifications should be sent as informs. <ul style="list-style-type: none"> <li>In Cisco IOS Release 12.2(54)SE, the <b>informs</b> keyword is required.</li> </ul>

<b>traps</b>	<p>(Optional) Specifies that notifications should be sent as traps. This is the default.</p> <ul style="list-style-type: none"> <li>In Cisco IOS Release 12.2(54)SE, the <b>traps</b> keyword is required.</li> </ul>
<b>version</b>	<p>(Optional) Specifies the version of the SNMP that is used to send the traps or informs. The default is 1.</p> <ul style="list-style-type: none"> <li>In Cisco IOS Release 12.2(54)SE, the <b>version</b> keyword is required and the <b>priv</b> keyword is not supported.</li> </ul> <p>If you use the <b>version</b> keyword, one of the following keywords must be specified:</p> <ul style="list-style-type: none"> <li><b>1</b>—SNMPv1.</li> <li><b>2c</b>—SNMPv2C.</li> <li><b>3</b>—SNMPv3. The most secure model because it allows packet encryption with the <b>priv</b> keyword. The default is <b>noauth</b>.</li> </ul> <p>One of the following three optional security level keywords can follow the <b>3</b> keyword:</p> <ul style="list-style-type: none"> <li><b>auth</b>—Enables message digest algorithm 5 (MD5) and Secure Hash Algorithm (SHA) packet authentication.</li> <li><b>noauth</b>—Specifies that the noAuthNoPriv security level applies to this host. This is the default security level for SNMPv3.</li> <li><b>priv</b>—Enables Data Encryption Standard (DES) packet encryption (also called “privacy”).</li> </ul>
<i>community-string</i>	<p>Password-like community string sent with the notification operation.</p> <p><b>Note</b> You can set this string using the <b>snmp-server host</b> command by itself, but Cisco recommends that you define the string using the <b>snmp-server community</b> command prior to using the <b>snmp-server host</b> command.</p> <p><b>Note</b> The “at” sign (@) is used for delimiting the context information.</p>
<b>udp-port</b>	<p>(Optional) Specifies that SNMP traps or informs are to be sent to an NMS host.</p> <ul style="list-style-type: none"> <li>In Cisco IOS Release 12.2(54)SE, the <b>udp-port</b> keyword is not supported.</li> </ul>
<i>port</i>	<p>(Optional) User Datagram Protocol (UDP) port number of the NMS host. The default is 162.</p> <ul style="list-style-type: none"> <li>In Cisco IOS Release 12.2(54)SE, the <i>port</i> argument is not supported.</li> </ul>
<i>notification-type</i>	<p>(Optional) Type of notification to be sent to the host. If no type is specified, all available notifications are sent. See the <a href="#">“Notification-Type Keywords” section on page 89</a> for more information about the keywords available.</p>

**Command Default**

This command behavior is disabled by default. A recipient is not specified to receive notifications.

**Command Modes**

Global configuration (config)

## Command History

Release	Modification
10.0	This command was introduced.
<b>Cisco IOS Release 12 Mainline/T Train</b>	
12.0(3)T	<ul style="list-style-type: none"> <li>The <b>version 3 [auth   noauth   priv]</b> syntax was added as part of the SNMPv3 Support feature.</li> <li>The <b>hsrp</b> notification-type keyword was added.</li> <li>The <b>voice</b> notification-type keyword was added.</li> </ul>
12.1(3)T	The <b>calltracker</b> notification-type keyword was added for the Cisco AS5300 and AS5800 platforms.
12.2(2)T	<ul style="list-style-type: none"> <li>The <b>vrf vrf-name</b> keyword and argument combination was added.</li> <li>The <b>ipmobile</b> notification-type keyword was added.</li> <li>Support for the <b>vsimaster</b> notification-type keyword was added for the Cisco 7200 and Cisco 7500 series.</li> </ul>
12.2(4)T	<ul style="list-style-type: none"> <li>The <b>pim</b> notification-type keyword was added.</li> <li>The <b>ipsec</b> notification-type keyword was added.</li> </ul>
12.2(8)T	<ul style="list-style-type: none"> <li>The <b>mpls-traffic-eng</b> notification-type keyword was added.</li> <li>The <b>director</b> notification-type keyword was added.</li> </ul>
12.2(13)T	<ul style="list-style-type: none"> <li>The <b>srp</b> notification-type keyword was added.</li> <li>The <b>mpls-ldp</b> notification-type keyword was added.</li> </ul>
12.3(2)T	<ul style="list-style-type: none"> <li>The <b>flash</b> notification-type keyword was added.</li> <li>The <b>l2tun-session</b> notification-type keyword was added.</li> </ul>
12.3(4)T	<ul style="list-style-type: none"> <li>The <b>cpu</b> notification-type keyword was added.</li> <li>The <b>memory</b> notification-type keyword was added.</li> <li>The <b>ospf</b> notification-type keyword was added.</li> </ul>
12.3(8)T	The <b>iplocalpool</b> notification-type keyword was added for the Cisco 7200 and 7301 series routers.
12.3(11)T	The <b>vrp</b> keyword was added.
12.3(14)T	<ul style="list-style-type: none"> <li>Support for SNMP over IPv6 transport was integrated into Cisco IOS Release 12.3(14)T. Either an IP or IPv6 Internet address can be specified as the <i>hostname</i> argument.</li> <li>The <b>eigrp</b> notification-type keyword was added.</li> </ul>
12.4(20)T	The <b>license</b> notification-type keyword was added.
15.0(1)M	<ul style="list-style-type: none"> <li>The <b>nhrp</b> notification-type keyword was added.</li> <li>The automatic insertion of the <b>snmp-server community</b> command into the configuration, along with the community string specified in the <b>snmp-server host</b> command, is changed. The <b>snmp-server community</b> command has to be manually configured.</li> </ul>
<b>Cisco IOS Release 12.0S</b>	
12.0(17)ST	The <b>mpls-traffic-eng</b> notification-type keyword was added.
12.0(21)ST	The <b>mpls-ldp</b> notification-type keyword was added.

Release	Modification
12.0(22)S	<ul style="list-style-type: none"> <li>All features in Cisco IOS Release 12.0ST were integrated into Cisco IOS Release 12.0(22)S.</li> <li>The <b>mpls-vpn</b> notification-type keyword was added.</li> </ul>
12.0(23)S	The <b>l2tun-session</b> notification-type keyword was added.
12.0(26)S	The <b>memory</b> notification-type keyword was added.
12.0(27)S	<ul style="list-style-type: none"> <li>Support for SNMP over IPv6 transport was added. Either an IP or IPv6 Internet address can be specified as the <i>hostname</i> argument.</li> <li>The <b>vrf vrf-name</b> keyword and argument combination was added to support multiple Lightweight Directory Protocol (LDP) contexts for VPNs.</li> </ul>
12.0(31)S	The <b>l2tun-pseudowire-status</b> notification-type keyword was added.
<b>Release 12.2S</b>	
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.2(25)S	<ul style="list-style-type: none"> <li>The <b>cpu</b> notification-type keyword was added.</li> <li>The <b>memory</b> notification-type keyword was added.</li> </ul>
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	The <b>cef</b> notification-type keyword was added.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
12.2(33)SB	This command was integrated into Cisco IOS Release 12.2(33)SB.
12.2(33)SXI5	<ul style="list-style-type: none"> <li>The <b>dhcp-snooping</b> notification-type keyword was added.</li> <li>The <b>errdisable</b> notification-type keyword was added.</li> </ul>
12.2(54)SE	This command was modified. See the <a href="#">“Command Syntax on Cisco ME 3400, ME 3400E, and Catalyst 3750 Metro Switches”</a> section on page 84 for the command syntax for these switches.
<b>Cisco IOS Release 15S</b>	
15.0(1)S	This command was integrated into Cisco IOS Release 15.0(1)S. The <b>flowmon</b> notification-type keyword was added.
<b>Cisco IOS XE</b>	
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

### Usage Guidelines

If you enter this command with no optional keywords, the default is to send all notification-type traps to the host. No informs will be sent to the host.

The **no snmp-server host** command with no keywords disables traps, but not informs, to the host. To disable informs, use the **no snmp-server host informs** command.

**Note**

If a community string is not defined using the **snmp-server community** command prior to using this command, the default form of the **snmp-server community** command will automatically be inserted into the configuration. The password (community string) used for this automatic configuration of the **snmp-server community** will be the same as that specified in the **snmp-server host** command. This automatic command insertion and use of passwords is the default behavior for Cisco IOS Release 12.0(3) and later releases.

SNMP notifications can be sent as traps or inform requests. Traps are unreliable because the receiver does not send acknowledgments when it receives traps. The sender cannot determine if the traps were received. However, an SNMP entity that receives an inform request acknowledges the message with an SNMP response protocol data unit (PDU). If the sender never receives the response, the inform request can be sent again. Thus, informs are more likely than traps to reach their intended destination.

Compared to traps, informs consume more resources in the agent and in the network. Unlike a trap, which is discarded as soon as it is sent, an inform request must be held in memory until a response is received or the request times out. Also, traps are sent only once; an inform may be tried several times. The retries increase traffic and contribute to a higher overhead on the network.

If you do not enter an **snmp-server host** command, no notifications are sent. To configure the router to send SNMP notifications, you must enter at least one **snmp-server host** command. If you enter the command with no optional keywords, all trap types are enabled for the host.

To enable multiple hosts, you must issue a separate **snmp-server host** command for each host. You can specify multiple notification types in the command for each host.

When multiple **snmp-server host** commands are given for the same host and kind of notification (trap or inform), each succeeding command overwrites the previous command. Only the last **snmp-server host** command will be in effect. For example, if you enter an **snmp-server host inform** command for a host and then enter another **snmp-server host inform** command for the same host, the second command will replace the first.

The **snmp-server host** command is used in conjunction with the **snmp-server enable** command. Use the **snmp-server enable** command to specify which SNMP notifications are sent globally. For a host to receive most notifications, at least one **snmp-server enable** command and the **snmp-server host** command for that host must be enabled.

Some notification types cannot be controlled with the **snmp-server enable** command. Some notification types are always enabled, and others are enabled by a different command. For example, the **linkUpDown** notifications are controlled by the **snmp trap link-status** command. These notification types do not require an **snmp-server enable** command.

The availability of a notification-type options depends on the router type and the Cisco IOS software features supported on the router. For example, the **envmon** notification type is available only if the environmental monitor is part of the system. To see what notification types are available on your system, use the command **help ?** at the end of the **snmp-server host** command.

The **vrf** keyword allows you to specify the notifications being sent to a specified IP address over a specific Virtual Routing and Forwarding (VRF) VPN. The VRF defines a VPN membership of a user so data is stored using the VPN.

In the case of the NMS sending the query having a correct SNMP community but that does not have a read or a write view, the SNMP agent returns the following error values:

- For a get or a getnext query, returns GEN\_ERROR for SNMPv1 and AUTHORIZATION\_ERROR for SNMPv2C.
- For a set query, returns NO\_ACCESS\_ERROR.

### Notification-Type Keywords

The notification type can be one or more of the following keywords:



**Note** The available notification types differ based on the platform and Cisco IOS release. For a complete list of available notification types, use the question mark (?) online help function.

- **aaa server**—Sends SNMP authentication, authorization, and accounting (AAA) traps.
- **adsl**—Sends Asymmetric Digital Subscriber Line (ADSL) LINE-MIB traps.
- **atm**—Sends ATM notifications.
- **authenticate-fail**—Sends SNMP 802.11 Authentication Fail Trap.
- **auth-framework**—Sends SNMP CISCO-AUTH-FRAMEWORK-MIB notifications.
- **bgp**—Sends Border Gateway Protocol (BGP) state change notifications.
- **bridge**—Sends SNMP STP Bridge MIB notifications.
- **bstun**—Sends Block Serial Tunneling (bstun) event notifications.
- **bulkstat**—Sends Data-Collection-MIB notifications.
- **c6kxbar**—Sends SNMP crossbar notifications.
- **callhome**—Sends Call Home MIB notifications.
- **calltracker**—Sends Call Tracker call-start/call-end notifications.
- **casa**—Sends Cisco Appliances Services Architecture (CASA) event notifications.
- **ccme**—Sends SNMP ccme traps.
- **cef**—Sends notifications related to Cisco Express Forwarding.
- **chassis**—Sends SNMP chassis notifications.
- **cnpd**—Sends Network-Based application Recognition (NBAR) Protocol Discovery traps.
- **config**—Sends configuration change notifications.
- **config-copy**—Sends SNMP config-copy notifications.
- **config-ctid**—Sends SNMP config-ctid notifications.
- **cpu**—Sends CPU-related notifications.
- **csg**—Sends SNMP Content Services Gateway (CSG) notifications.
- **deauthenticate**—Sends an SNMP 802.11 Deauthentication Trap.
- **dhcp-snooping**—Sends Dynamic Host Configuration Protocol (DHCP) snooping MIB notifications.
- **director**—Sends notifications related to DistributedDirector.
- **disassociate**—Sends SNMP 802.11 Disassociation Trap.
- **dls**—Sends data-link switching (DLSW) notifications.
- **dnis**—Sends SNMP Dialed Number Identification Service (DNIS) traps.
- **dot1x**—Sends 802.1X notifications.
- **dot11-mibs**—Sends dot11 traps.
- **dot11-qos**—Sends SNMP 802.11 QoS Change Trap.
- **ds0-busyout**—Sends ds0-busyout traps.

- **ds1**—Sends SNMP digital signaling 1 (DS1) notifications.
- **ds1-loopback**—Sends ds1-loopback traps.
- **dspu**—Sends downstream physical unit (DSPU) notifications.
- **eigrp**—Sends Enhanced Interior Gateway Routing Protocol (EIGRP) stuck-in-active (SIA) and neighbor authentication failure notifications.
- **energywise**—Sends SNMP energywise notifications.
- **entity**—Sends Entity MIB modification notifications.
- **entity-diag**—Sends SNMP entity diagnostic MIB notifications.
- **envmon**—Sends Cisco enterprise-specific environmental monitor notifications when an environmental threshold is exceeded.
- **errdisable**—Sends error disable notifications.
- **ethernet-cfm**—Sends SNMP Ethernet Connectivity Fault Management (CFM) notifications.
- **event-manager**—Sends SNMP Embedded Event Manager notifications.
- **firewall**—Sends SNMP Firewall traps.
- **flash**—Sends flash media insertion and removal notifications.
- **flexlinks**—Sends FLEX links notifications.
- **flowmon**—Sends flow monitoring notifications.
- **frame-relay**—Sends Frame Relay notifications.
- **fru-ctrl**—Sends entity field-replaceable unit (FRU) control notifications.
- **hsrp**—Sends Hot Standby Routing Protocol (HSRP) notifications.
- **icsudsu**—Sends SNMP ICSUDSU traps.
- **iplocalpool**—Sends IP local pool notifications.
- **ipmulticast**—Sends IP multicast notifications.
- **ipmobile**—Sends Mobile IP notifications.
- **ipsec**—Sends IP Security (IPsec) notifications.
- **isakmp**—Sends SNMP ISAKMP notifications.
- **isdn**—Sends ISDN notifications.
- **l2tc**—Sends SNMP L2 tunnel configuration notifications.
- **l2tun-pseudowire-status**—Sends pseudowire state change notifications.
- **l2tun-session**—Sends Layer 2 tunneling session notifications.
- **license**—Sends licensing notifications as traps or informs.
- **llc2**—Sends Logical Link Control, type 2 (LLC2) notifications.
- **mac-notification**—Sends SNMP MAC notifications.
- **memory**—Sends memory pool and memory buffer pool notifications.
- **module**—Sends SNMP module notifications.
- **module-auto-shutdown**—Sends SNMP module autosutdown MIB notifications.
- **mpls-fast-reroute**—Sends SNMP Multiprotocol Label Switching (MPLS) traffic engineering fast reroute notifications.

- **mpls-ldp**—Sends MPLS Label Distribution Protocol (LDP) notifications indicating status changes in LDP sessions.
- **mpls-traffic-eng**—Sends MPLS traffic engineering notifications indicating changes in the status of MPLS traffic engineering tunnels.
- **mpls-vpn**—Sends MPLS VPN notifications.
- **msdp**—Sends SNMP Multicast Source Discovery Protocol (MSDP) notifications.
- **mvpn**—Sends multicast VPN notifications.
- **nhrp**—Sends Next Hop Resolution Protocol (NHRP) notifications.
- **ospf**—Sends Open Shortest Path First (OSPF) sham-link notifications.
- **pim**—Sends Protocol Independent Multicast (PIM) notifications.
- **port-security**—Sends SNMP port-security notifications.
- **power-ethernet**—Sends SNMP power Ethernet notifications.
- **pw-vc**—Sends SNMP pseudowire virtual circuit (VC) notifications.
- **repeater**—Sends standard repeater (hub) notifications.
- **resource-policy**—Sends CISCO-ERM-MIB notifications.
- **rf**—Sends SNMP RF MIB notifications.
- **rogue-ap**—Sends an SNMP 802.11 Rogue AP Trap.
- **rsrb**—Sends remote source-route bridging (RSRB) notifications.
- **rsvp**—Sends Resource Reservation Protocol (RSVP) notifications.
- **rtr**—Sends Response Time Reporter (RTR) notifications.
- **sdlc**—Sends Synchronous Data Link Control (SDLC) notifications.
- **sdllc**—Sends SDLC Logical Link Control (SDLLC) notifications.
- **slb**—Sends SNMP server load balancer (SLB) notifications.
- **snmp**—Sends any enabled RFC 1157 SNMP linkUp, linkDown, authenticationFailure, warmStart, and coldStart notifications.




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**Note** To enable RFC 2233-compliant link up/down notifications, you should use the **snmp server link trap** command.

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- **sonet**—Sends SNMP SONET notifications.
- **srp**—Sends Spatial Reuse Protocol (SRP) notifications.
- **stp**—Sends SNMP STP MIB notifications.
- **srst**—Sends SNMP SRST traps.
- **stun**—Sends serial tunnel (STUN) notifications.
- **switch-over**—Sends an SNMP 802.11 Standby Switch-over Trap.
- **syslog**—Sends error message notifications (Cisco Syslog MIB). Use the **logging history level** command to specify the level of messages to be sent.
- **syslog**—Sends error message notifications (Cisco Syslog MIB). Use the **logging history level** command to specify the level of messages to be sent.
- **tty**—Sends Cisco enterprise-specific notifications when a TCP connection closes.

- **udp-port**—Sends the notification host's UDP port number.
- **vlan-mac-limit**—Sends SNMP L2 control VLAN MAC limit notifications.
- **vlancreate**—Sends SNMP VLAN created notifications.
- **vlandelete**—Sends SNMP VLAN deleted notifications.
- **voice**—Sends SNMP voice traps.
- **vrrp**—Sends Virtual Router Redundancy Protocol (VRRP) notifications.
- **vsimaster**—Sends Virtual Switch Interface (VSI) Master notifications.
- **vswitch**—Sends SNMP virtual switch notifications.
- **vtp**—Sends SNMP VLAN Trunking Protocol (VTP) notifications.
- **wlan-wep**—Sends an SNMP 802.11 WLAN WEP trap.
- **x25**—Sends X.25 event notifications.
- **xgcp**—Sends XGCP protocol traps.

#### SNMP-Related Notification-Type Keywords

The *notification-type* keywords used in the **snmp-server host** command do not always match the keywords used in the corresponding **snmp-server enable traps** command. For example, the notification keyword applicable to Multiprotocol Label Switching Protocol (MPLS) traffic engineering tunnels is specified as **mpls-traffic-eng** (containing two hyphens and no embedded spaces). The corresponding parameter in the **snmp-server enable traps** command is specified as **mpls traffic-eng** (containing an embedded space and a hyphen).

This syntax difference is necessary to ensure that the command-line interface (CLI) interprets the *notification-type* keyword of the **snmp-server host** command as a unified, single-word construct, which preserves the capability of the **snmp-server host** command to accept multiple *notification-type* keywords in the command line. The **snmp-server enable traps** commands, however, often use two-word constructs to provide hierarchical configuration options and to maintain consistency with the command syntax of related commands. Table 10 maps some examples of **snmp-server enable traps** commands to the keywords used in the **snmp-server host** command.

**Table 10** *SNMP-server enable traps Commands and Corresponding Notification Keywords*

<b>snmp-server enable traps Command</b>	<b>snmp-server host Command Keyword</b>
<b>snmp-server enable traps l2tun session</b>	<b>l2tun-session</b>
<b>snmp-server enable traps mpls ldp</b>	<b>mpls-ldp</b>
<b>snmp-server enable traps mpls traffic-eng<sup>1</sup></b>	<b>mpls-traffic-eng</b>
<b>snmp-server enable traps mpls vpn</b>	<b>mpls-vpn</b>

1. See the *Cisco IOS Multiprotocol Label Switching Command Reference* for documentation of this command.

#### Examples

If you want to configure a unique SNMP community string for traps but prevent SNMP polling access with this string, the configuration should include an access list. The following example shows how to name a community string comaccess and number an access list 10:

```
Router(config)# snmp-server community comaccess ro 10
Router(config)# snmp-server host 192.20.2.160 comaccess
Router(config)# access-list 10 deny any
```

**Note**

The “at” sign (@) is used as a delimiter between the community string and the context in which it is used. For example, specific VLAN information in BRIDGE-MIB may be polled using *community@VLAN-ID* (for example, *public@100*), where 100 is the VLAN number.

The following example shows how to send RFC 1157 SNMP traps to a specified host named myhost.cisco.com. Other traps are enabled, but only SNMP traps are sent because only **snmp** is specified in the **snmp-server host** command. The community string is defined as comaccess.

```
Router(config)# snmp-server enable traps
Router(config)# snmp-server host myhost.cisco.com comaccess snmp
```

The following example shows how to send the SNMP and Cisco environmental monitor enterprise-specific traps to address 192.30.2.160 using the community string public:

```
Router(config)# snmp-server enable traps snmp
Router(config)# snmp-server enable traps envmon
Router(config)# snmp-server host 192.30.2.160 public snmp envmon
```

The following example shows how to enable the router to send all traps to the host myhost.cisco.com using the community string public:

```
Router(config)# snmp-server enable traps
Router(config)# snmp-server host myhost.cisco.com public
```

The following example will not send traps to any host. The BGP traps are enabled for all hosts, but only the ISDN traps are enabled to be sent to a host. The community string is defined as public.

```
Router(config)# snmp-server enable traps bgp
Router(config)# snmp-server host myhost.cisco.com public isdn
```

The following example shows how to enable the router to send all inform requests to the host myhost.cisco.com using the community string public:

```
Router(config)# snmp-server enable traps
Router(config)# snmp-server host myhost.cisco.com informs version 2c public
```

The following example shows how to send HSRP MIB informs to the host specified by the name myhost.cisco.com. The community string is defined as public.

```
Router(config)# snmp-server enable traps hsrp
Router(config)# snmp-server host myhost.cisco.com informs version 2c public hsrp
```

The following example shows how to send all SNMP notifications to example.com over the VRF named trap-vrf using the community string public:

```
Router(config)# snmp-server host example.com vrf trap-vrf public
```

The following example shows how to configure an IPv6 SNMP notification server with the IPv6 address 2001:0DB8:0000:ABCD:1 using the community string public:

```
Router(config)# snmp-server host 2001:0DB8:0000:ABCD:1 version 2c public udp-port 2012
```

The following example shows how to specify VRRP as the protocol using the community string public:

```
Router(config)# snmp-server enable traps vrrp
Router(config)# snmp-server host myhost.cisco.com traps version 2c public vrrp
```

The following example shows how to send all Cisco Express Forwarding informs to the notification receiver with the IP address 192.40.3.130 using the community string public:

```
Router(config)# snmp-server enable traps cef
Router(config)# snmp-server host 192.40.3.130 informs version 2c public cef
```

The following example shows how to enable all NHRP traps, and how to send all NHRP traps to the notification receiver with the IP address 192.40.3.130 using the community string public:

```
Router(config)# snmp-server enable traps nhrp
Router(config)# snmp-server host 192.40.3.130 traps version 2c public nhrp
```

#### Related Commands

Command	Description
<b>show snmp host</b>	Displays recipient details configured for SNMP notifications.
<b>snmp-server enable peer-trap poor qov</b>	Enables poor quality of voice notifications for applicable calls associated with a specific voice dial peer.
<b>snmp-server enable traps</b>	Enables SNMP notifications (traps and informs).
<b>snmp-server enable traps nhrp</b>	Enables SNMP notifications (traps) for NHRP.
<b>snmp-server informs</b>	Specifies inform request options.
<b>snmp-server link trap</b>	Enables linkUp/linkDown SNMP trap that are compliant with RFC 2233.
<b>snmp-server trap-source</b>	Specifies the interface from which an SNMP trap should originate.
<b>snmp-server trap-timeout</b>	Defines how often to try resending trap messages on the retransmission queue.

