



# **Catalyst 6500 Series Switch SSL Services Module Command Reference**

Release 3.1

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## Preface

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This preface describes the audience, organization, and conventions of this publication, and provides information on how to obtain related documentation.

## Audience

This publication is for experienced network administrators who are responsible for configuring and maintaining Catalyst 6500 series switches.

## Organization

This publication is organized as follows:

Chapter	Title	Description
Chapter 1	<a href="#">Command-Line Interface</a>	Describes the Catalyst 6500 series switch CLI.
Chapter 2	<a href="#">Commands for the Catalyst 6500 Series Switch SSL Services Module</a>	Lists alphabetically and provides detailed information for commands specific to the Catalyst 6500 series switch SSL Services Module.
Appendix A	<a href="#">Acronyms</a>	Defines the acronyms used in this publication.

## Related Documentation

The Catalyst 6500 series switch Cisco IOS documentation set includes these documents:

- *Release Notes for Catalyst 6500 Series Switch SSL Services Module Release 3.x*
- *Catalyst 6500 Series Switch SSL Services Module Configuration Note*
- *Catalyst 6500 Series Switch SSL Services Module System Message Guide*
- *Catalyst 6500 Series Switch SSL Services Module Installation and Verification Note*
- *Catalyst 6500 Series Switch Cisco IOS Software Configuration Guide*

The Cisco IOS documentation set includes these documents:

- *Configuration Fundamentals Configuration Guide*
- *Command Reference*

For information about MIBs, refer to this URL:

<http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>

## Conventions

This document uses the following conventions:

Convention	Description
<b>boldface font</b>	Commands, command options, and keywords are in <b>boldface</b> .
<i>italic font</i>	Arguments for which you supply values are in <i>italics</i> .
[ ]	Elements in square brackets are optional.
{ x   y   z }	Alternative keywords are grouped in braces and separated by vertical bars. Braces can also be used to group keywords and/or arguments; for example, { <b>interface</b> <i>interface</i> <b>type</b> }.
[ x   y   z ]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
screen font	Terminal sessions and information the system displays are in <i>screen font</i> .
<b>boldface screen font</b>	Information you must enter is in <b>boldface screen font</b> .
<i>italic screen font</i>	Arguments for which you supply values are in <i>italic screen font</i> .
^	The symbol ^ represents the key labeled Control—for example, the key combination ^D in a screen display means hold down the Control key while you press the D key.
< >	Nonprinting characters, such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.



Notes use the following conventions:

**Note**

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the publication.

Cautions use the following conventions:

**Caution**

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

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<http://www.cisco.com/cisco/web/support/index.html>

You can access the Cisco website at this URL:

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[http://www.cisco.com/en/US/products/products\\_security\\_vulnerability\\_policy.html](http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html)

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- Report security vulnerabilities in Cisco products.
- Obtain assistance with security incidents that involve Cisco products.
- Register to receive security information from Cisco.

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[http://www.cisco.com/en/US/products/products\\_psirt\\_rss\\_feed.html](http://www.cisco.com/en/US/products/products_psirt_rss_feed.html)

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- Nonemergencies—[psirt@cisco.com](mailto:psirt@cisco.com)

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532



Tip

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We encourage you to use Pretty Good Privacy (PGP) or a compatible product to encrypt any sensitive information that you send to Cisco. PSIRT can work from encrypted information that is compatible with PGP versions 2.x through 8.x.

Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one linked in the Contact Summary section of the Security Vulnerability Policy page at this URL:

[http://www.cisco.com/en/US/products/products\\_security\\_vulnerability\\_policy.html](http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html)

The link on this page has the current PGP key ID in use.

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<http://www.cisco.com/cisco/web/support/index.html>

Access to all tools on the Cisco Technical Support & Documentation website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

<http://tools.cisco.com/RPF/register/register.do>

**Note**

Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support & Documentation website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

## Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco engineer. The TAC Service Request Tool is located at this URL:

<https://tools.cisco.com/RPF/register/register.do>

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

EMEA: +32 2 704 55 55

USA: 1 800 553-2447

For a complete list of Cisco TAC contacts, go to this URL:

[http://www.cisco.com/en/US/support/tsd\\_contact\\_technical\\_support.html](http://www.cisco.com/en/US/support/tsd_contact_technical_support.html)

## Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is “down,” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

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- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:  
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- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions.
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- Networking products offered by Cisco Systems, as well as customer support services, can be obtained at this URL:  
<http://www.cisco.com/en/US/products/index.html>
- Networking Professionals Connection is an interactive website for networking professionals to share questions, suggestions, and information about networking products and technologies with Cisco experts and other networking professionals. Join a discussion at this URL:  
<https://supportforums.cisco.com/index.jspa>
- World-class networking training is available from Cisco. You can view current offerings at this URL:  
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# Command-Line Interface

This chapter provides information for understanding and using the Catalyst 6500 series switch SSL Services Module software using the command-line interface (CLI). The CLI for the Catalyst 6500 series switch SSL Services Module is based on the Cisco IOS CLI. For information about Cisco IOS commands that are not contained in this publication, refer to the current Cisco IOS documentation including:

- *Cisco IOS Release 12.2 Configuration Fundamentals Configuration Guide*
- *Cisco IOS Release 12.2 Command Reference*

This chapter includes the following sections:

- [Getting Help, page 1-1](#)
- [How to Find Command Options, page 1-2](#)
- [Understanding Command Modes, page 1-5](#)
- [Using the No and Default Forms of Commands, page 1-6](#)
- [Using the CLI String Search, page 1-7](#)

## Getting Help

To obtain a list of commands that are available for each command mode, enter a question mark (?) at the system prompt. You also can obtain a list of any command's associated keywords and arguments with the context-sensitive help feature.

[Table 1-1](#) lists commands that you can enter to get help that is specific to a command mode, a command, a keyword, or an argument.

**Table 1-1** Getting Help

Command	Purpose
<i>abbreviated-command-entry?</i>	Obtain a list of commands that begin with a particular character string. (Do not leave a space between the command and question mark.)
<i>abbreviated-command-entry&lt;Tab&gt;</i>	Complete a partial command name.
<i>?</i>	List all commands available for a particular command mode.

**Table 1-1** Getting Help (continued)

Command	Purpose
<code>command ?</code>	List a command's associated keywords. Leave a space between the command and question mark.
<code>command keyword ?</code>	List a keyword's associated arguments. Leave a space between the keyword and question mark.

This example shows how to obtain a list of commands that begin with a particular character string or complete a partial command name:

```
ssl-proxy# tu?
tunnel

simpson1-2# tu
```

This example shows how to list all commands available for a particular command mode:

```
ssl-proxy(config)# ?
Configure commands:
  aaa                               Authentication, Authorization and
                                   Accountin
  access-list                       Add an access list entry
  alias                             Create command alias
  arp                               Set a static ARP entry
  async-bootp                       Modify system bootp parameters
  banner                            Define a login banner
  boot                              Modify system boot parameters
  bridge                            Bridge Group.
  buffers                           Adjust system buffer pool parameters
  cdp                               Global CDP configuration subcommands
  class-map                         Configure QoS Class Map
  .
  .
  .
Output is truncated.
```

This example shows how to list a keyword's associated arguments:

```
ssl-proxy(config-if)# channel-group 1 mode ?
auto      Enable PAgP only if a PAgP device is detected
desirable Enable PAgP unconditionally
on        Enable Etherchannel only

ssl-proxy(config-if)#
```

## How to Find Command Options

This section provides an example of how to display syntax for a command. The syntax can consist of optional or required keywords. To display keywords for a command, enter a question mark (?) at the configuration prompt or after entering part of a command followed by a space. The Catalyst 6500 series SSL Services Module software displays a list of available keywords along with a brief description of the keywords. For example, if you are in global configuration mode and want to see all the keywords for the `ssl-proxy` command, you enter `ssl-proxy ?`.



Table 1-2 shows examples of how you can use the question mark (?) to assist you in entering commands.

**Table 1-2 How to Find Command Options**

Command	Comment
<pre>ssl-proxy&gt; enable Password: &lt;password&gt; ssl-proxy#</pre>	<p>Enter the <b>enable</b> command and password to access privileged EXEC commands.</p> <p>You are in privileged EXEC mode when the prompt changes to <code>ssl-proxy#</code>.</p>
<pre>ssl-proxy# configure terminal Enter configuration commands, one per line. End with CNTL/Z. ssl-proxy(config)#</pre>	<p>Enter global configuration mode.</p> <p>You are in global configuration mode when the prompt changes to <code>ssl-proxy(config)#</code>.</p>
<pre>ssl-proxy(config)# crypto ca trustpoint trustpoint-label ssl-proxy(ca-trustpoint)#</pre>	<p>Enter the configuration submenu.</p> <p>You are in the configuration submenu when the prompt displays the submenu, for example: <code>ssl-proxy(ca-trustpoint)#</code>.</p>
<pre>ssl-proxy(config)# interface type mod/port ssl-proxy(config-if)#</pre>	<p>From the global configuration mode, you can also enter the interface configuration mode by entering the <b>interface</b> global configuration command.</p> <p>You are in interface configuration mode when the prompt changes to <code>ssl-proxy(config-if)#</code>.</p>
<pre>ssl-proxy(config-if)# channel-group ? group channel-group of the interface  ssl-proxy(config-if)#channel-group</pre>	<p>Enter the command that you want to configure for the controller. In this example, the <b>channel-group</b> command is used.</p> <p>Enter a ? to display what you must enter next on the command line. In this example, you must enter the <b>group</b> keyword.</p> <p>Because a &lt;cr&gt; is not displayed, it indicates that you must enter more information to complete the command.</p>

Table 1-2 How to Find Command Options (continued)

Command	Comment
<pre>ssl-proxy(config-if)# <b>channel-group</b> group ? &lt;1-256&gt; Channel group number  ssl-proxy(config-if)#channel-group group</pre>	<p>After you enter the <b>group</b> keyword, enter a <b>?</b> to display what you must enter next on the command line. In this example, you must enter a channel group number from 1 to 256.</p> <p>Because a <code>&lt;cr&gt;</code> is not displayed, it indicates that you must enter more information to complete the command.</p>
<pre>ssl-proxy(config-if)# <b>channel-group</b> 1 ? mode Etherchannel Mode of the interface  ssl-proxy(config-if)#</pre>	<p>After you enter the channel group number, enter a <b>?</b> to display what you must enter next on the command line. In this example, you must enter the <b>mode</b> keyword.</p> <p>Because a <code>&lt;cr&gt;</code> is not displayed, it indicates that you must enter more information to complete the command.</p>
<pre>ssl-proxy(config-if)# <b>channel-group</b> 1 mode ? auto Enable PAgP only if a PAgP device is detected desirable Enable PAgP unconditionally on Enable Etherchannel only  ssl-proxy(config-if)#</pre>	<p>After you enter the <b>mode</b> keyword, enter a <b>?</b> to display what you must enter next on the command line. In this example, you must enter the <b>auto</b>, <b>desirable</b>, or <b>on</b> keyword.</p> <p>Because a <code>&lt;cr&gt;</code> is not displayed, it indicates that you must enter more information to complete the command.</p>
<pre>ssl-proxy(config-if)# <b>channel-group</b> 1 mode auto ? &lt;cr&gt;  ssl-proxy(config-if)#</pre>	<p>In this example, the <b>auto</b> keyword is entered. After you enter the <b>auto</b> keyword, enter a <b>?</b> to display what you must enter next on the command line.</p> <p>Because a <code>&lt;cr&gt;</code> is displayed, it indicates that you can press <b>Return</b> to complete the command. If additional keywords are listed, you can enter more keywords or press <b>Return</b> to complete the command.</p>
<pre>ssl-proxy(config-if)# <b>channel-group</b> 1 mode auto ssl-proxy(config-if)#</pre>	<p>In this example, press <b>Return</b> to complete the command.</p>

# Understanding Command Modes

This section contains descriptions of the command modes for the Cisco IOS user interface.

## Cisco IOS User Interface

The Cisco IOS user interface is divided into many different modes. The commands that are available to you depend on which mode you are currently in. You can obtain a list of commands that are available for each command mode by entering a question mark (?) at the system prompt.

When you start a session on the Catalyst 6500 series switch, you begin in user mode, often called EXEC mode. Only a limited subset of the commands are available in EXEC mode. In order to have access to all commands, you must enter privileged EXEC mode. Normally, you must enter a password to enter privileged EXEC mode. From privileged EXEC mode, you can enter any EXEC command or enter global configuration mode. Most EXEC commands are one-time commands, such as **show** commands, which show the current status of a given item, and **clear** commands, which clear counters or interfaces. The EXEC commands are not saved across reboots of the Catalyst 6500 series switch.

The configuration modes allow you to make changes to the running configuration. If you later save the configuration, these commands are stored across Catalyst 6500 series switch reboots. In order to get to the various configuration modes, you must start at global configuration mode where you can enter interface configuration mode, subinterface configuration mode, and a variety of protocol-specific modes.

ROM-monitor mode is a separate mode that is used when the Catalyst 6500 series switch cannot boot properly. If your Catalyst 6500 series switch or access server does not find a valid system image when it is booting, or if its configuration file is corrupted at startup, the system might enter ROM-monitor mode.

Table 1-3 provides a summary of the main command modes.

**Table 1-3 Summary of Main Command Modes**

Command Mode	Access Method	Prompt	Exit Method
User EXEC	Log in.	ssl-proxy>	Use the <b>logout</b> command.
Privileged EXEC	From user EXEC mode, enter the <b>enable</b> EXEC command.	ssl-proxy#	To exit to user EXEC mode, enter the <b>disable</b> command. To enter global configuration mode, enter the <b>configure terminal</b> privileged EXEC command.
Global configuration	From privileged EXEC mode, enter the <b>configure terminal</b> privileged EXEC command.	ssl-proxy(config)#	To exit to privileged EXEC mode, enter the <b>exit</b> or <b>end</b> command or press <b>Ctrl-Z</b> . To enter interface configuration mode, enter an <b>interface</b> configuration command.
Global configuration submode	From global configuration mode, enter a submode command.	ssl-proxy(config-submode)#	To exit to global configuration submode, enter the <b>exit</b> command.

Table 1-3 Summary of Main Command Modes (continued)

Command Mode	Access Method	Prompt	Exit Method
Interface configuration	From global configuration mode, enter by specifying an interface with an <b>interface</b> command.	ssl-proxy(config-if)#	To exit to global configuration mode, enter the <b>exit</b> command. To exit to privileged EXEC mode, enter the <b>exit</b> command or press <b>Ctrl-Z</b> . To enter subinterface configuration mode, specify a subinterface with the <b>interface</b> command.
Subinterface configuration	From interface configuration mode, specify a subinterface with an <b>interface</b> command.	ssl-proxy(config-subinterface)#	To exit to global configuration mode, enter the <b>exit</b> command. To enter privileged EXEC mode, enter the <b>end</b> command or press <b>Ctrl-Z</b> .
ROM monitor	From privileged EXEC mode, enter the <b>reload</b> EXEC command. Press the Break key during the first 60 seconds while the system is booting.	Rommon>	To exit ROM-monitor mode, you must reload the image by entering the <b>boot</b> command. If you use the <b>boot</b> command without specifying a file or any other boot instructions, the system boots from the default Flash image (the first image in onboard Flash memory). Otherwise, you can instruct the system to boot from a specific Flash image (using the <b>boot system flash filename</b> command).

For more information on command modes, refer to the “Using the Command Line Interface” chapter of the *Configuration Fundamentals Configuration Guide*.

**Note**

You can issue EXEC-level Cisco IOS commands (such as **show**, **clear**, and **debug** commands) from within global configuration mode or other modes by issuing the **do** command followed by the EXEC command. See the **do** command for information on how to use this command.

## Using the No and Default Forms of Commands

Almost every configuration command has a **no** form. In general, enter the **no** form to disable a function. Use the command without the keyword **no** to reenable a disabled function or to enable a function that is disabled by default. For example, IP routing is enabled by default. To disable IP routing, specify the **no ip routing** command and specify the **ip routing** command to reenable it. This publication provides the complete syntax for the configuration commands and describes what the **no** form of a command does.

Configuration commands can have a **default** form. The **default** form of a command returns the command setting to its default. Most commands are disabled by default, so the **default** form is the same as the **no** form. However, some commands are enabled by default and have variables set to certain default values. In these cases, the **default** form of the command enables the command and sets variables to their default values. This publication describes what the **default** form of a command does if the command is not the same as the **no** form.

## Using the CLI String Search

The pattern in the command output is referred to as a string. The CLI string search feature allows you to search or filter any **show** or **more** command output and allows you to search and filter at --More-- prompts. This feature is useful when you need to sort through large amounts of output, or if you want to exclude output that you do not need to see.

With the search function, you can begin unfiltered output at the first line that contains a regular expression that you specify. You can then specify a maximum of one filter per command or start a new search from the --More-- prompt.

A regular expression is a pattern (a phrase, number, or more complex pattern) that software uses to match against **show** or **more** command output. Regular expressions are case sensitive and allow for complex matching requirements. Examples of simple regular expressions are Serial, misses, and 138. Examples of complex regular expressions are 00210..., ( is ), and [Oo]utput.

You can perform three types of filtering:

- Use the **begin** keyword to begin output with the line that contains a specified regular expression.
- Use the **include** keyword to include output lines that contain a specified regular expression.
- Use the **exclude** keyword to exclude output lines that contain a specified regular expression.

You can then search this filtered output at the --More-- prompts.



### Note

The CLI string search function does not allow you to search or filter backward through previous output; filtering cannot be specified using HTTP access to the CLI.

## Regular Expressions

A regular expression can be a single character that matches the same single character in the command output or multiple characters that match the same multiple characters in the command output. This section describes how to create both single-character patterns and multiple-character patterns and how to create more complex regular expressions using multipliers, alternation, anchoring, and parentheses.

### Single-Character Patterns

The simplest regular expression is a single character that matches the same single character in the command output. You can use any letter (A-Z, a-z) or digit (0-9) as a single-character pattern. You can also use other keyboard characters (such as ! or ~) as single-character patterns, but certain keyboard characters have special meaning when used in regular expressions. [Table 1-4](#) lists the keyboard characters with special meaning.

**Table 1-4** Characters with Special Meaning

Character	Special Meaning
.	Matches any single character, including white space.
*	Matches 0 or more sequences of the pattern.
+	Matches 1 or more sequences of the pattern.
?	Matches 0 or 1 occurrences of the pattern.

**Table 1-4 Characters with Special Meaning (continued)**

Character	Special Meaning
^	Matches the beginning of the string.
\$	Matches the end of the string.
_ (underscore)	Matches a comma (,), left brace ({), right brace (}), left parenthesis ( ( ), right parenthesis ( ) ), the beginning of the string, the end of the string, or a space.

To enter these special characters as single-character patterns, remove the special meaning by preceding each character with a backslash (\). These examples are single-character patterns matching a dollar sign, an underscore, and a plus sign, respectively.

```
\$ \_ \+
```

You can specify a range of single-character patterns to match against command output. For example, you can create a regular expression that matches a string containing one of the following letters: a, e, i, o, or u. One and only one of these characters must exist in the string for pattern matching to succeed. To specify a range of single-character patterns, enclose the single-character patterns in square brackets ([ ]). For example,

```
[aeiou]
```

matches any one of the five vowels of the lowercase alphabet, while

```
[abcdABCD]
```

matches any one of the first four letters of the lower- or uppercase alphabet.

You can simplify ranges by entering only the end points of the range separated by a dash (-). Simplify the previous range as follows:

```
[a-dA-D]
```

To add a dash as a single-character pattern in your range, include another dash and precede it with a backslash:

```
[a-dA-D\-]
```

You can also include a right square bracket (]) as a single-character pattern in your range. To do so, enter the following:

```
[a-dA-D\-]]
```

The previous example matches any one of the first four letters of the lower- or uppercase alphabet, a dash, or a right square bracket.

You can reverse the matching of the range by including a caret (^) at the start of the range. This example matches any letter except the ones listed:

```
[^a-dqsv]
```

This example matches anything except a right square bracket (]) or the letter d:

```
[^\d]
```

## Multiple-Character Patterns

When creating regular expressions, you can also specify a pattern containing multiple characters. You create multiple-character regular expressions by joining letters, digits, or keyboard characters that do not have special meaning. For example, `a4%` is a multiple-character regular expression. Put a backslash in front of the keyboard characters that have special meaning when you want to remove their special meaning.

With multiple-character patterns, order is important. The regular expression `a4%` matches the character `a` followed by a `4` followed by a `%` sign. If the string does not have `a4%`, in that order, pattern matching fails. This multiple-character regular expression

**a.**

uses the special meaning of the period character to match the letter `a` followed by any single character. With this example, the strings `ab`, `a!`, or `a2` are all valid matches for the regular expression.

You can remove the special meaning of the period character by putting a backslash in front of it. In the following expression

**a\.**

only the string `a.` matches this regular expression.

You can create a multiple-character regular expression containing all letters, all digits, all keyboard characters, or a combination of letters, digits, and other keyboard characters. These examples are all valid regular expressions:

**telebit 3107 v32bis**

## Multipliers

You can create more complex regular expressions to match multiple occurrences of a specified regular expression by using some special characters with your single- and multiple-character patterns. [Table 1-5](#) lists the special characters that specify “multiples” of a regular expression.

**Table 1-5 Special Characters Used as Multipliers**

Character	Description
*	Matches 0 or more single- or multiple-character patterns.
+	Matches 1 or more single- or multiple-character patterns.
?	Matches 0 or 1 occurrences of the single- or multiple-character patterns.

This example matches any number of occurrences of the letter `a`, including none:

**a\***

This pattern requires that at least one letter `a` in the string is matched:

**a+**

This pattern matches the string `bb` or `bab`:

**ba?b**

This string matches any number of asterisks (`*`):

**\\*\***

To use multipliers with multiple-character patterns, you enclose the pattern in parentheses. In the following example, the pattern matches any number of the multiple-character string ab:

**(ab)\***

As a more complex example, this pattern matches one or more instances of alphanumeric pairs (but not none; that is, an empty string is not a match):

**([A-Za-z][0-9])+**

The order for matches using multipliers (\*, +, or ?) is to put the longest construct first. Nested constructs are matched from outside to inside. Concatenated constructs are matched beginning at the left side of the construct. The regular expression matches A9b3, but not 9Ab3 because the letters are specified before the numbers.

## Alternation

Alternation allows you to specify alternative patterns to match against a string. You separate the alternative patterns with a vertical bar (|). Exactly one of the alternatives can match the string. For example, the regular expression

**codex | telebit**

matches the string codex or the string telebit, but not both codex and telebit.

## Anchoring

You can match a regular expression pattern against the beginning or the end of the string. That is, you can specify that the beginning or end of a string contains a specific pattern. You “anchor” these regular expressions to a portion of the string using the special characters shown in [Table 1-6](#).

**Table 1-6 Special Characters Used for Anchoring**

Character	Description
^	Matches the beginning of the string.
\$	Matches the end of the string.

This regular expression matches a string only if the string starts with abcd:

**^abcd**

In contrast, this expression is in a range that matches any single letter, as long as it is not the letters a, b, c, or d:

**[^abcd]**

With this example, the regular expression matches a string that ends with .12:

**\$.12**

Contrast these anchoring characters with the special character underscore (\_). The underscore matches the beginning of a string (^), the end of a string (\$), parentheses ( ), space ( ), braces { }, comma (,), or underscore (\_). With the underscore character, you can specify that a pattern exist anywhere in the string.



For example,

```
_1300_
```

matches any string that has 1300 somewhere in the string. The string's 1300 can be preceded by or end with a space, brace, comma, or underscore. For example,

```
{1300_
```

matches the regular expression, but 21300 and 13000 do not.

Using the underscore character, you can replace long regular expression lists, such as the following:

```
^1300$ ^1300(space) (space)1300 {1300, ,1300, {1300} ,1300, (1300
```

with

```
_1300_
```

## Parentheses for Recall

As shown in the [“Multipliers” section on page 1-9](#), you use parentheses with multiple-character regular expressions to multiply the occurrence of a pattern. You can also use parentheses around a single- or multiple-character pattern to remember a pattern for use elsewhere in the regular expression.

To create a regular expression that recalls a previous pattern, you use parentheses to indicate a remembered specific pattern and a backslash (\) followed by an integer to reuse the remembered pattern. The integer specifies the occurrence of the parentheses in the regular expression pattern. If you have more than one remembered pattern in your regular expression, then \1 indicates the first remembered pattern, \2 indicates the second remembered pattern, and so on.

This regular expression uses parentheses for recall:

```
a(.)bc(.)\1\2
```

This regular expression matches an a followed by any character (call it character 1), followed by bc, followed by any character (character 2), followed by character 1 again, and then followed by character 2 again. The regular expression can match aZbcTZT. The software remembers that character 1 is Z and character 2 is T and then uses Z and T again later in the regular expression.





## Commands for the Catalyst 6500 Series Switch SSL Services Module

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This chapter contains an alphabetical listing of commands for the Catalyst 6500 series switch SSL Services Module.

For additional SSL Services Module information, refer to the following documentation:

- *Catalyst 6500 Series Switch SSL Services Module Configuration Note*
- *Catalyst 6500 Series Switch SSL Services Module System Message Guide*
- *Catalyst 6500 Series Switch SSL Services Module Installation and Verification Note*

# clear ssl-proxy conn

To clear all TCP connections on the entire system, use the **clear ssl-proxy conn** command.

```
clear ssl-proxy conn [context name [module [module]]][service name [context name [module
module]]]
```

Syntax Description	
<b>context</b> <i>name</i>	(Optional) Clears the connections for a specific context.
<b>module</b> <i>module</i>	(Optional) Clears the connections for the specified module type. The available options for the module variable are as follows: <ul style="list-style-type: none"> <li>• <b>all</b>—All CPUs</li> <li>• <b>fd</b>—FDU CPU</li> <li>• <b>ssl1</b>—SSL1 CPU</li> <li>• <b>tcp1</b>—TCP1 CPU</li> <li>• <b>tcp2</b>—TCP2 CPU</li> </ul>
<b>service</b> <i>name</i>	(Optional) Clears the connections for the specified service.

**Defaults** This command has no default settings.

**Command Modes** EXEC

Command History	Release	Modification
	Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
	SSL Services Module Release 3.1(1)	This command was changed to add the following keywords: <ul style="list-style-type: none"> <li>• <b>context</b> <i>name</i></li> <li>• <b>module</b> <i>module</i></li> </ul>

**Examples** This example shows how to clear the connections for the specified service:

```
ssl-proxy# clear ssl-proxy conn service S6
```

This example shows how to clear all TCP connections on the entire system:

```
ssl-proxy# clear ssl-proxy conn
ssl-proxy#
```

# clear ssl-proxy content

To clear all TCP connections on the entire system, use the **clear ssl-proxy conn** command.

```
clear ssl-proxy content {all | rewrite | scanning} [module [module]]
```

Syntax Description	
<b>all</b>	Clears all content statistics.
<b>scanning</b>	Clears scanning statistics.
<b>rewrite</b>	Clears rewriting statistics.
<b>module</b> <i>module</i>	(Optional) Clears statistics for the specified module type. The available options for the module variable are as follows: <ul style="list-style-type: none"> <li>• <b>all</b>—All CPUs</li> <li>• <b>fd</b>—FDU CPU</li> <li>• <b>ssl1</b>—SSL1 CPU</li> <li>• <b>tcp1</b>—TCP1 CPU</li> <li>• <b>tcp2</b>—TCP2 CPU</li> </ul>

**Defaults** This command has no default settings.

**Command Modes** EXEC

Command History	Release	Modification
	SSL Services Module Release 3.1(1)	Support for this command was introduced on the Catalyst 6500 series SSL Services Module.

**Usage Guidelines** To reset all the content statistics that the SSL Services Module maintains, use the **clear ssl-proxy content all** command.

**Examples** This example shows how to clear all of the content statistics:

```
ssl-proxy# clear ssl-proxy content all
```

# clear ssl-proxy session

To clear all entries from the session cache, use the **clear ssl-proxy session** command.

```
clear ssl-proxy session [service name] [context name] [module module]]]]
```

## Syntax Description

<b>context</b> <i>name</i>	(Optional) Clears the session cache for a specific context.
<b>module</b> <i>module</i>	(Optional) Clears session cache for the specified module type. The available options for the module variable are as follows: <ul style="list-style-type: none"> <li>• <b>all</b>—All CPUs</li> <li>• <b>fdm</b>—FDM CPU</li> <li>• <b>ssl1</b>—SSL1 CPU</li> <li>• <b>tcp1</b>—TCP1 CPU</li> <li>• <b>tcp2</b>—TCP2 CPU</li> </ul>
<b>service</b> <i>name</i>	(Optional) Clears the session cache for the specified service.

## Defaults

This command has no default settings.

## Command Modes

EXEC

## Command History

Release	Modification
SSL Services Module Release 1.2(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	This command was changed to add the following keywords: <ul style="list-style-type: none"> <li>• <b>context</b> <i>name</i></li> <li>• <b>module</b> <i>module</i></li> </ul>

## Usage Guidelines

To clear all entries from the session cache for all services, use the **clear ssl-proxy session** command without options.

## Examples

This example shows how to clear the entries from the session cache for the specified service on the SSL Services Module:

```
ssl-proxy# clear ssl-proxy session service S6
```

This example shows how to clear all entries in the session cache that are maintained on the SSL Services Module:

```
ssl-proxy# clear ssl-proxy session
ssl-proxy#
```

## clear ssl-proxy stats

To reset the statistics counters that are maintained in the different system components on the SSL Services Module, use the **clear ssl-proxy stats** command.

```
clear ssl-proxy stats [context [name] | crypto | fdu | hdr | ipc | module [module] | pki | service |
ssl | tcp | url]
```

Syntax Description	
<b>context</b>	(Optional) Clears statistics information about the context.
<i>name</i>	(Optional) Specifies the name of the context.
<b>crypto</b>	(Optional) Clears statistics information about the crypto.
<b>fdu</b>	(Optional) Clears statistics information about the FDU.
<b>hdr</b>	(Optional) Clears statistics information about HTTP header insertion.
<b>ipc</b>	(Optional) Clears statistics information about the inter-process communications (IPC).
<b>module</b> <i>module</i>	(Optional) Clears statistics information about the specified module type. The available options for the module variable are as follows: <ul style="list-style-type: none"> <li>• <b>all</b>—All CPUs</li> <li>• <b>fdu</b>—FDU CPU</li> <li>• <b>ssl1</b>—SSL1 CPU</li> <li>• <b>tcp1</b>—TCP1 CPU</li> <li>• <b>tcp2</b>—TCP2 CPU</li> </ul>
<b>pki</b>	(Optional) Clears information about the public key infrastructure (PKI).
<b>service</b> <i>name</i>	(Optional) Clears statistics information for a specific service.
<b>ssl</b>	(Optional) Clears statistics information about the SSL.
<b>tcp</b>	(Optional) Clears statistics information about the TCP.
<b>url</b>	(Optional) Clears statistics information about URL rewrite.

### Defaults

This command has no default settings.

### Command Modes

EXEC

**Command History**

Release	Modification
Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	This command was changed to add the following keywords: <ul style="list-style-type: none"> <li>• <b>context</b> <i>name</i></li> <li>• <b>hdr</b></li> <li>• <b>module</b> <i>module</i></li> <li>• <b>url</b></li> </ul>

**Usage Guidelines**

To reset all the statistics counters that the SSL Services Module maintains, use the **clear ssl-proxy stats** command without options.

**Examples**

This example shows how to reset the statistics counters that are maintained in the different system components on the SSL Services Module:

```
ssl-proxy# clear ssl-proxy stats crypto
ssl-proxy# clear ssl-proxy stats ipc
ssl-proxy# clear ssl-proxy stats pki
ssl-proxy# clear ssl-proxy stats service S6
```

This example shows how to clear all the statistic counters that the SSL Services Module maintains:

```
ssl-proxy# clear ssl-proxy stats
ssl-proxy#
```



# crypto pki export pem

To export privacy-enhanced mail (PEM) files from the SSL Services Module, use the **crypto pki export pem** command.

```
crypto pki export trustpoint_label pem {terminal {des | 3des} {url url}} pass_phrase
```

Syntax Description	
<i>trustpoint-label</i>	Name of the trustpoint.
<b>terminal</b>	Displays the request on the terminal.
<b>des</b>	Specifies the 56-bit DES-CBC encryption algorithm.
<b>3des</b>	Specifies the 168-bit DES (3DES) encryption algorithm.
<b>url url</b>	Specifies the URL location. Valid values are as follows: <ul style="list-style-type: none"> <li>• <b>ftp:</b>—Exports to the FTP: file system</li> <li>• <b>null:</b>—Exports to the NULL: file system</li> <li>• <b>nvr:</b>—Exports to the NVRAM: file system</li> <li>• <b>rcp:</b>—Exports to the RCP: file system</li> <li>• <b>scp:</b>—Exports to the SCP: file system</li> <li>• <b>system:</b>—Exports to the system: file system</li> <li>• <b>tftp:</b>—Exports to the TFTP: file system</li> </ul>
<i>pass-phrase</i>	Pass phrase that is used to protect the private key.

**Defaults** This command has no default settings.

**Command Modes** Global configuration

Command History	Release	Modification
	SSL Services Module Release 1.2(1)	Support for this command was introduced on the Catalyst 6500 series switches.
	SSL Services Module Release 3.1(1)	The syntax for this command changed from <b>crypto ca</b> to <b>crypto pki</b> .

**Usage Guidelines** The *pass\_phrase* can be any phrase including spaces and punctuation except for the question mark (?), which has a special meaning to the Cisco IOS parser.

Pass-phrase protection associates a pass phrase with the key. The pass phrase is used to encrypt the key when it is exported. When this key is imported, you must enter the same pass phrase to decrypt it.

A key that is marked as unexportable cannot be exported.

You can change the default file extensions when prompted. The default file extensions are as follows:

- public key (.pub)
- private key (.prv)
- certificate (.crt)
- CA certificate (.ca)
- signature key (-sign)
- encryption key (-encr)



#### Note

In SSL software release 1.2, only the private key (.prv), the server certificate (.crt), and the issuer CA certificate (.ca) of the server certificate are exported. To export the whole certificate chain, including all the CA certificates, use a PKCS12 file instead of PEM files.

#### Examples

This example shows how to export a PEM-formatted file on the SSL Services Module:

```
ssl-proxy(config)# crypto ca export TP5 pem url tftp://10.1.1.1/tp99 3des password
% Exporting CA certificate...
Address or name of remote host [10.1.1.1]?
Destination filename [tp99.ca]?
% File 'tp99.ca' already exists.
% Do you really want to overwrite it? [yes/no]: yes
!Writing file to tftp://10.1.1.1/tp99.ca!
% Key name: key1
    Usage: General Purpose Key
% Exporting private key...
Address or name of remote host [10.1.1.1]?
Destination filename [tp99.prv]?
% File 'tp99.prv' already exists.
% Do you really want to overwrite it? [yes/no]: yes
!Writing file to tftp://10.1.1.1/tp99.prv!
% Exporting router certificate...
Address or name of remote host [10.1.1.1]?
Destination filename [tp99.crt]?
% File 'tp99.crt' already exists.
% Do you really want to overwrite it? [yes/no]: yes
!Writing file to tftp://10.1.1.1/tp99.crt!

ssl-proxy(config)#
```

#### Related Commands

[crypto pki import pem](#)

# crypto pki import pem

To import a PEM-formatted file to the SSL Services Module, use the **crypto pki import pem** command.

```
crypto pki import trustpoint_label pem [exportable] {terminal | url url | usage-keys}
pass_phrase
```

## Syntax Description

<i>trustpoint_label</i>	Name of the trustpoint.
<b>exportable</b>	(Optional) Specifies the key that can be exported.
<b>terminal</b>	Displays the request on the terminal.
<b>url</b> <i>url</i>	Specifies the URL location. Valid values are as follows: <ul style="list-style-type: none"> <li><b>ftp:</b>—Exports to the FTP: file system</li> <li><b>null:</b>—Exports to the null: file system</li> <li><b>nvr:</b>—Exports to the NVRAM: file system</li> <li><b>rcp:</b>—Exports to the RCP: file system</li> <li><b>scp:</b>—Exports to the SCP: file system</li> <li><b>system:</b>—Exports to the system: file system</li> <li><b>tftp:</b>—Exports to the TFTP: file system</li> </ul>
<i>pass_phrase</i>	Pass phrase.
<b>usage-keys</b>	Specifies that two special-usage key pairs should be generated, instead of one general-purpose key pair.

## Defaults

This command has no default settings.

## Command History

Global configuration

## Command History

Release	Modification
SSL Services Module Release 1.2(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The syntax for this command changed from <b>crypto ca</b> to <b>crypto pki</b> .

## Usage Guidelines

You will receive an error if you enter the pass phrase incorrectly. The *pass\_phrase* can be any phrase including spaces and punctuation except for the question mark (?), which has a special meaning to the Cisco IOS parser.

Pass-phrase protection associates a pass phrase with the key. The pass phrase is used to encrypt the key when it is exported. When this key is imported, you must enter the same pass phrase to decrypt it.

When importing RSA keys, you can use a public key or its corresponding certificate.

The **crypto pki import pem** command imports only the private key (.prv), the server certificate (.crt), and the issuer CA certificate (.ca). If you have more than one level of CA in the certificate chain, you need to import the root and subordinate CA certificates before this command is issued for authentication. Use cut-and-paste or TFTP to import the root and subordinate CA certificates.

### Examples

This example shows how to import a PEM-formatted file from the SSL Services Module:

```
ssl-proxy(config)# crypto pki import TP5 pem url tftp://10.1.1.1/TP5 password
% Importing CA certificate...
Address or name of remote host [10.1.1.1]?
Destination filename [TP5.ca]?
Reading file from tftp://10.1.1.1/TP5.ca
Loading TP5.ca from 10.1.1.1 (via Ethernet0/0.168): !
[OK - 1976 bytes]

% Importing private key PEM file...
Address or name of remote host [10.1.1.1]?
Destination filename [TP5.prv]?
Reading file from tftp://10.1.1.1/TP5.prv
Loading TP5.prv from 10.1.1.1 (via Ethernet0/0.168): !
[OK - 963 bytes]

% Importing certificate PEM file...
Address or name of remote host [10.1.1.1]?
Destination filename [TP5.crt]?
Reading file from tftp://10.1.1.1/TP5.crt
Loading TP5.crt from 10.1.1.1 (via Ethernet0/0.168): !
[OK - 1692 bytes]
% PEM files import succeeded.
ssl-proxy(config)# end
ssl-proxy#
*Apr 11 15:11:29.901: %SYS-5-CONFIG_I: Configured from console by console
```

### Related Commands

[crypto pki export pem](#)

# crypto pki export pkcs12

To export a PKCS12 file from the SSL Services Module, use the **crypto pki export pkcs12** command.

```
crypto pki export trustpoint_label pkcs12 file_system [pkcs12_filename] pass_phrase
```

## Syntax Description

<i>trustpoint_label</i>	Specifies the trustpoint label.
<i>file_system</i>	Specifies the file system. Valid values are <b>scp:</b> , <b>ftp:</b> , <b>nvrाम:</b> , <b>rcp:</b> , and <b>tftp:</b> .
<i>pkcs12_filename</i>	(Optional) Specifies the name of the PKCS12 file to import.
<i>pass_phrase</i>	Specifies the pass phrase of the PKCS12 file.

## Defaults

This command has no default settings.

## Command Modes

Global configuration

## Command History

Release	Modification
Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The syntax for this command changed from <b>crypto ca</b> to <b>crypto pki</b> .

## Usage Guidelines

Imported key pairs cannot be exported.

If you are using SSH, we recommend using SCP (secure file transfer) when exporting a PKCS12 file. SCP authenticates the host and encrypts the transfer session.

If you do not specify *pkcs12\_filename*, you will be prompted to accept the default filename (the default filename is the *trustpoint\_label*) or enter the filename. For the **ftp:** or **tftp:** value, include the full path in the *pkcs12\_filename*.

You will receive an error if you enter the pass phrase incorrectly.

If there is more than one level of CA, the root CA and all the subordinate CA certificates are exported in the PKCS12 file.

**Examples**

This example shows how to export a PKCS12 file using SCP:

```
ssl-proxy(config)# crypto pki export TP1 pkcs12 scp: sky is blue
Address or name of remote host []? 10.1.1.1
Destination username [ssl-proxy]? admin-1
Destination filename [TP1]? TP1.p12

Password:

Writing TP1.p12 Writing pkcs12 file to scp://admin-1@10.1.1.1/TP1.p12

Password:
!
CRYPTO_PKI:Exported PKCS12 file successfully.
ssl-proxy(config)#
```

# crypto pki import pkcs12

To import a PKCS12 file to the SSL Services Module, use the **crypto pki import pkcs12** command.

```
crypto pki import trustpoint_label pkcs12 file_system [pkcs12_filename] pass_phrase
```

Syntax Description	
<i>trustpoint_label</i>	Name of the trustpoint who issues the certificate that a user is going to export. When you export the PKCS12 file, the trustpoint name is the RSA key name.
<i>file_system</i>	Specifies the file system. Valid values are as follows: <ul style="list-style-type: none"> <li>• <b>ftp:</b>—Imports from the FTP: file system</li> <li>• <b>nvr:</b>—Imports from the NVRAM: file system</li> <li>• <b>rcp:</b>—Imports from the RCP: file system</li> <li>• <b>scp:</b>—Imports from the SCP: file system</li> <li>• <b>tftp:</b>—Imports from the TFTP: file system</li> </ul>
<i>pkcs12_filename</i>	(Optional) Specifies the name of the PKCS12 file to import.
<i>pass_phrase</i>	Passphrase that is used to encrypt the PKCS12 file for export.

**Defaults** This command has no default settings.

**Command Modes** Global configuration

Command History	Release	Modification
	Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
	SSL Services Module Release 3.1(1)	The syntax for this command changed from <b>crypto ca</b> to <b>crypto pki</b> .

**Usage Guidelines** If you are using SSH, we recommend using SCP (secure file transfer) when importing a PKCS12 file. SCP authenticates the host and encrypts the transfer session.

If you do not specify *pkcs12\_filename*, you will be prompted to accept the default filename (the default filename is the *trustpoint\_label*) or to enter the filename. For the **ftp:** or **tftp:** value, include the full path in the *pkcs12\_filename*.

You will receive an error if you enter the pass phrase incorrectly.

If there is more than one level of CA, the root CA and all the subordinate CA certificates are exported in the PKCS12 file.

### Security Measures

Keep the PKCS12 file stored in a secure place with restricted access.

An RSA keypair is more secure than a passphrase because the private key in the key pair is not known by multiple parties. When you export an RSA key pair to a PKCS#12 file, the RSA key pair now is only as secure as the passphrase.

To create a good passphrase, be sure to include numbers, as well as both lowercase and uppercase letters. Avoid publicizing the passphrase by mentioning it in e-mail or cell phone communications because the information could be accessed by an unauthorized user.

### Examples

This example shows how to import a PKCS12 file using SCP:

```
ssl-proxy(config)# crypto pki import TP2 pkcs12 scp: sky is blue
Address or name of remote host []? 10.1.1.1
Source username [ssl-proxy]? admin-1
Source filename [TP2]? /users/admin-1/pkcs12/TP2.p12

Password:password
Sending file modes:C0644 4379 TP2.p12
!
ssl-proxy(config)#
*Aug 22 12:30:00.531:%CRYPTO-6-PKCS12IMPORT_SUCCESS:PKCS #12 Successfully Imported.
ssl-proxy(config)#
```



# crypto key generate rsa (CA)

To generate RSA key pairs, use the **crypto key generate rsa** command in global configuration mode.

```
crypto key generate rsa [usage-keys | general-keys] [key-pair-label]
```

## Syntax Description

<b>usage-keys</b>	(Optional) Specifies that two special-usage key pairs should be generated, instead of one general-purpose key pair.
<b>general-keys</b>	(Optional) Specifies that the general-purpose key pair should be generated.
<i>key-pair-label</i>	Optional) Specifies the name of the key pair that router will use. (If this argument is enabled, you must specify either <b>usage-keys</b> or <b>general-keys</b> .)

## Defaults

Rivest, Shamir, and Adelman (RSA) key pairs do not exist.

If *key-pair-label* is not specified, the fully qualified domain name (FQDN) of the router is used and general-purpose keys are generated.

## Command Modes

Global configuration mode

## Command History

Release	Modification
11.3 T	This command was introduced.
12.2(8)T	The <b>general-keys</b> keyword and the <i>key-pair-label</i> argument were added.

## Usage Guidelines

Use this command to generate RSA key pairs for your Cisco device (such as a router).

RSA keys are generated in pairs—one public RSA key and one private RSA key.

If your router already has RSA keys when you issue this command, you will be warned and prompted to replace the existing keys with new keys.



### Note

Before issuing this command, ensure your router has a host name and IP domain name configured (with the **hostname** and **ip domain-name** commands). You will be unable to complete the **crypto key generate rsa** command without a host name and IP domain name. (This is not true only when you generate a named-key-pair.)

This command is not saved in the router configuration; however, the keys generated by this command are saved in the private configuration in NVRAM (which is never displayed to the user or backed up to another device).

There are two mutually exclusive styles of RSA key pairs: special-usage keys and general-purpose keys. When you generate RSA key pairs, you will be prompted to select either generate special-usage keys or general-purpose keys.

**Examples****Special-Usage Keys**

If you generate special-usage keys, two pairs of RSA keys will be generated. One pair will be used with any Internet Key Exchange (IKE) policy that specifies RSA signatures as the authentication method, and the other pair used with any IKE policy that specifies RSA-encrypted nonces as the authentication method. (You configure RSA signatures or RSA-encrypted nonces in your IKE policies as described in the *Cisco IOS Security Configuration Guide*.)

A certification authority (CA) is used only with IKE policies specifying RSA signatures, not with IKE policies specifying RSA-encrypted nonces. (However, you could specify more than one IKE policy and have RSA signatures specified in one policy and RSA-encrypted nonces in another policy.)

If you plan to have both types of RSA authentication methods in your IKE policies, you might prefer to generate special-usage keys. With special-usage keys, each key is not unnecessarily exposed. (Without special-usage keys, one key is used for both purposes, increasing that key's exposure.)

**General-Purpose Keys**

If you generate general-purpose keys, only one pair of RSA keys will be generated. This pair will be used with IKE policies specifying either RSA signatures or RSA-encrypted nonces. Therefore, a general-purpose key pair might be used more frequently than a special-usage key pair.

**Named Key Pairs**

If you generate a named key pair using the *key-pair-label* argument, you must also specify the **usage-keys** keyword or the **general-keys** keyword. Named key pairs allow you to have multiple RSA key pairs, enabling the Cisco IOS software to maintain a different key pair for each identity certificate.

**Modulus Length**

When you generate RSA keys, you will be prompted to enter a modulus length. A longer modulus could offer stronger security but takes longer to generate (see [Table 1](#) for sample times) and takes longer to use. A length of less than 512 bits is normally not recommended. (In certain situations, the shorter modulus may not function properly with IKE, so Cisco recommends using a minimum modulus of 1024 bits.)

**Table 1** Sample Times Required to Generate RSA Keys

Router	Modulus Length			
	360 bits	512 bits	1024 bits	2048 bits
Cisco 2500	11 seconds	20 seconds	4 minutes, 38 seconds	longer than 1 hour
Cisco 4700	less than 1 second	1 second	4 seconds	50 seconds

**Examples**

The following example generates special-usage RSA keys.

**crypto key generate rsa usage-keys**

The name for the keys will be: myrouter.example.com

Choose the size of the key modulus in the range of 360 to 2048 for your Signature Keys.

Choosing a key modulus greater than 512 may take a few minutes.

How many bits in the modulus[512]? **<return>**

Generating RSA keys.... [OK].

Choose the size of the key modulus in the range of 360 to 2048 for your Encryption Keys.

Choosing a key modulus greater than 512 may take a few minutes.

How many bits in the modulus[512]? **<return>**

Generating RSA keys.... [OK].

The following example generates general-purpose RSA keys. (Note, you cannot generate both special-usage and general-purpose keys; you can generate only one or the other.)

**crypto key generate rsa**

The name for the keys will be: myrouter.example.com

Choose the size of the key modulus in the range of 360 to 2048 for your General Purpose Keys. Choosing a key modulus greater than 512 may take a few minutes.

How many bits in the modulus[512]? **<return>**

Generating RSA keys.... [OK].

The following example generates the general-purpose RSA key pair “exampleCAkeys”:

```
crypto key generate rsa general-purpose exampleCAkeys
crypto ca trustpoint exampleCAkeys
  enroll url http://exampleCAkeys/certsrv/mscep/mscep.dll
  rsakeypair exampleCAkeys 1024 1024
```

**Related Commands**

Command	Description
	Specifies which key pair to associate with the certificate.

# crypto key zeroize rsa

To delete all RSA keys from your router, use the **crypto key zeroize rsa** command in global configuration mode.

```
crypto key zeroize rsa [key-pair-label]
```

<b>Syntax Description</b>	<i>key-pair-label</i> (Optional) Specifies the name of the key pair that router will delete.
---------------------------	--

<b>Defaults</b>	No default behavior or values.
-----------------	--------------------------------

<b>Command Modes</b>	Global configuration
----------------------	----------------------

Command History	Release	Modification
	11.3 T	This command was introduced.
	12.2(8)T	The <i>key-pair-label</i> argument was added.

<b>Usage Guidelines</b>	<p>This command deletes all Rivest, Shamir, and Adelman (RSA) keys that were previously generated by your router unless you include the <i>key-pair-label</i> argument, which will delete only the specified RSA key pair. If you issue this command, you must also perform two additional tasks for each trustpoint that is associated with the key pair that was deleted:</p>
-------------------------	---

- Ask the certification authority (CA) administrator to revoke your router's certificates at the CA; you must supply the challenge password you created when you originally obtained the router's certificates using the **crypto ca enroll** command.
- Manually remove the router's certificates from the configuration by removing the configured trustpoint (using the **no crypto ca trustpoint name** command.)



<b>Note</b>	<p>This command cannot be undone (after you save your configuration), and after RSA keys have been deleted, you cannot use certificates or the CA or participate in certificate exchanges with other IP Security (IPSec) peers unless you reconfigure CA interoperability by regenerating RSA keys, getting the CA's certificate, and requesting your own certificate again.</p>
-------------	--

This command is not saved to the configuration.

**Examples**

The following example deletes the general-purpose RSA key pair that was previously generated for the router. After deleting the RSA key pair, the administrator contacts the CA administrator and requests that the router's certificate be revoked. The administrator then deletes the router's certificate from the configuration.

```
crypto key zeroize rsa
crypto ca certificate chain
no certificate
```

**Related Commands**

Command	Description
<b>certificate</b>	Adds certificates manually.
<b>crypto ca certificate chain</b>	Enters the certificate chain configuration mode.
<b>crypto ca trustpoint</b>	Declares the CA that your router should use.
	Specifies which key pair to associate with the certificate.

# crypto key decrypt rsa

To delete the encrypted key and leave only the unencrypted key, use the **crypto key decrypt rsa** command.

**crypto key decrypt** [**write**] **rsa** [**name** *key-name*] **passphrase** *passphrase*

Syntax Description	
<b>write</b>	(Optional) Writes the configuration to the startup configuration.
<b>name</b> <i>key-name</i>	(Optional) Name of the key.
<b>passphrase</b> <i>passphrase</i>	Pass phrase.

**Defaults** This command has no default settings.

**Command Modes** Global configuration mode

Command History	Release	Modification
	SSL Services Module Release 3.1(1)	Support for this command was introduced on the Catalyst 6500 series SSL Services Module.

**Usage Guidelines** Entering the **write** keyword immediately saves the unencrypted key to NVRAM. If you do not enter the **write** keyword, you must manually write the configuration to NVRAM; otherwise, the key remains encrypted the next time that the router is reloaded.

**Examples** This example shows how to display the administration VLAN and related IP and gateway addresses:

```
ssl-proxy(config)# crypto key decrypt rsa name pkil-72a.cisco.com passphrase cisco1234
WARNING: Configuration with decrypted key not saved.
  Please save it manually as soon as possible to
  save decrypted key
ssl-proxy(config)# end
ssl-proxy# show crypto key mypubkey rsa
Key name: pkil-72a.cisco.com
Usage: General Purpose Key
Key is not exportable.
Key Data:
  30819F30 0D06092A 864886F7 0D010101 05000381
  ...
% Key pair was generated at: 15:42:15 PST Jun

ssl-proxy#
```

**Related Commands**

- [crypto key encrypt rsa](#)
- [crypto key lock rsa](#)
- [crypto key unlock rsa](#)

# crypto key encrypt rsa

To encrypt the RSA keys, use the **crypto key encrypt rsa** command.

```
crypto key encrypt [write] rsa [name key-name] passphrase passphrase
```

Syntax Description	
<b>write</b>	(Optional) Writes the configuration to the startup configuration.
<b>name</b> <i>key-name</i>	(Optional) Name of the key.
<b>passphrase</b> <i>passphrase</i>	Pass phrase.

**Defaults** This command has no default settings.

**Command Modes** Global configuration

Command History	Release	Modification
	SSL Services Module Release 3.1(1)	Support for this command was introduced on the Catalyst 6500 series SSL Services Module.

**Usage Guidelines** After you enter this command, the router can continue to use the key; the key remains unlocked. If you do not enter the **write** keyword, you must manually write the configuration to NVRAM; otherwise, the encrypted key will be lost the next time that the router is reloaded.

**Examples** This example shows how to encrypt the RSA key “pkil-72a.cisco.com.” Enter the **show crypto key mypubkey rsa** command to verify that the RSA key is encrypted (protected) and unlocked.

```
ssl-proxy(config)# crypto key encrypt rsa name pkil-72a.cisco.com passphrase cisco1234
ssl-proxy(config)# exit
ssl-proxy# show crypto key mypubkey rsa
Key name:pkil-72a.cisco.com
Usage:General Purpose Key
*** The key is protected and UNLOCKED. ***
Key is not exportable.
Key Data:
 305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00E0CC9A 1D23B52C
...
% Key pair was generated at:00:15:32 GMT Jun 25 2003

ssl-proxy#
```

**Related Commands**

- [crypto key decrypt rsa](#)
- [crypto key lock rsa](#)
- [crypto key unlock rsa](#)

# crypto key export rsa pem

To export a PEM-formatted RSA key to the SSL Services Module, use the **crypto key export rsa pem** command.

```
crypto key export rsa keylabel pem {terminal | url url} {{3des | des} [exportable] pass_phrase}
```

Syntax Description		
<i>keylabel</i>		Name of the key.
<b>terminal</b>		Displays the request on the terminal.
<b>url</b> <i>url</i>		Specifies the URL location. Valid values are as follows: <ul style="list-style-type: none"> <li>• <b>ftp:</b>—Exports to the FTP: file system</li> <li>• <b>null:</b>—Exports to the null: file system</li> <li>• <b>nvr:</b>—Exports to the NVRAM: file system</li> <li>• <b>rcp:</b>—Exports to the RCP: file system</li> <li>• <b>scp:</b>—Exports to the SCP: file system</li> <li>• <b>system:</b>—Exports to the system: file system</li> <li>• <b>tftp:</b>—Exports to the TFTP: file system</li> </ul>
<b>3des</b>		Specifies the 168-bit DES (3DES) encryption algorithm.
<b>des</b>		Specifies the 56-bit DES-CBC encryption algorithm.
<b>exportable</b>		(Optional) Specifies that the key can be exported.
<i>pass_phrase</i>		Pass phrase.

**Defaults** This command has no default settings.

**Command Modes** Global configuration

Command History	Release	Modification
	SSL Services Module Release 1.2(1)	Support for this command was introduced on the Catalyst 6500 series switches.

**Usage Guidelines** The pass phrase can be any phrase including spaces and punctuation except for the question mark (?), which has a special meaning to the Cisco IOS parser.

Pass-phrase protection associates a pass phrase with the key. The pass phrase is used to encrypt the key when it is exported. When this key is imported, you must enter the same pass phrase to decrypt it.



**Examples**

This example shows how to export a key from the SSL Services Module:

```
ssl-proxy(config)# crypto key export rsa test-keys pem url scp: 3des password
% Key name:test-keys
  Usage:General Purpose Key
Exporting public key...
Address or name of remote host []? 7.0.0.7
Destination username [ssl-proxy]? lab
Destination filename [test-keys.pub]?

Password:

Writing test-keys.pub Writing file to scp://lab@7.0.0.7/test-keys.pub
Password:
!
Exporting private key...
Address or name of remote host []? 7.0.0.7
Destination username [ssl-proxy]? lab
Destination filename [test-keys.prv]?

Password:

Writing test-keys.prv Writing file to scp://lab@7.0.0.7/test-keys.prv
Password:
ssl-proxy(config)#
```

# crypto key import rsa pem

To import a PEM-formatted RSA key from an external system, use the **crypto key import rsa pem** command.

```
crypto key import rsa keylabel pem [usage-keys] {terminal | url url} [exportable] passphrase
```

Syntax Description	
<i>keylabel</i>	Name of the key.
<b>usage-keys</b>	(Optional) Specifies that two special-usage key pairs should be generated, instead of one general-purpose key pair.
<b>terminal</b>	Displays the request on the terminal.
<b>url url</b>	Specifies the URL location. Valid values are as follows: <ul style="list-style-type: none"> <li><b>ftp:</b>—Imports from the FTP: file system</li> <li><b>null:</b>—Imports from the null: file system</li> <li><b>nvr:</b>—Imports from the NVRAM: file system</li> <li><b>rcp:</b>—Imports from the RCP: file system</li> <li><b>scp:</b>—Imports from the SCP: file system</li> <li><b>system:</b>—Imports from the system: file system</li> <li><b>tftp:</b>—Imports from the TFTP: file system</li> </ul>
<b>exportable</b>	(Optional) Specifies that the key can be exported.
<i>passphrase</i>	Pass phrase.

**Defaults** This command has no default settings.

**Command Modes** Global configuration

Command History	Release	Modification
	SSL Services Module Release 1.2(1)	Support for this command was introduced on the Catalyst 6500 series switches.

**Usage Guidelines** The pass phrase can be any phrase including spaces and punctuation except for the question mark (?), which has a special meaning to the Cisco IOS parser.

Pass-phrase protection associates a pass phrase with the key. The pass phrase is used to encrypt the key when it is exported. When this key is imported, you must enter the same pass phrase to decrypt it.

**Examples**

This example shows how to import a PEM-formatted RSA key from an external system and export the PEM-formatted RSA key to the SSL Services Module:

```
ssl-proxy(config)# crypto key import rsa newkeys pem url scp: password
% Importing public key or certificate PEM file...
Address or name of remote host []? 7.0.0.7
Source username [ssl-proxy]? lab
Source filename [newkeys.pub]? test-keys.pub

Password:
Sending file modes:C0644 272 test-keys.pub
Reading file from scp://lab@7.0.0.7/test-keys.pub!
% Importing private key PEM file...
Address or name of remote host []? 7.0.0.7
Source username [ssl-proxy]? lab
Source filename [newkeys.prv]? test-keys.prv

Password:
Sending file modes:C0644 963 test-keys.prv
Reading file from scp://lab@7.0.0.7/test-keys.prv!% Key pair import succeeded.

ssl-proxy(config)#
```

# crypto key lock rsa

To lock the encrypted private key, use the **crypto key lock rsa** command.

```
crypto key lock rsa [name key-name] passphrase passphrase
```

## Syntax Description

<b>name</b> <i>key-name</i>	(Optional) Name of the key.
<b>passphrase</b> <i>passphrase</i>	Pass phrase.

## Defaults

This command has no default settings.

## Command Modes

EXEC

## Command History

Release	Modification
SSL Services Module Release 3.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.

## Usage Guidelines

After the key is locked, it cannot be used to authenticate the router to a peer device. This behavior disables any IPsec or SSL connections that use the locked key.

Any existing IPsec tunnels created on the basis of the locked key will be closed.

If all RSA keys are locked, SSH will automatically be disabled.

## Examples

This example shows how to lock the key “pki1-72a.cisco.com.” Enter the **show crypto key mypubkey rsa** command to verify that the key is protected (encrypted) and locked.

```
ssl-proxy# crypto key lock rsa name pki1-72a.cisco.com passphrase cisco1234
ssl-proxy# show crypto key mypubkey rsa
Key name:pki1-72a.cisco.com
Usage:General Purpose Key
*** The key is protected and LOCKED. ***
Key is exportable.
Key Data:
 305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00D7808D C5FF14AC
...
% Key pair was generated at: 16:00:11 PST Feb 28 2002

ssl-proxy#
```

## Related Commands

[crypto key decrypt rsa](#)  
[crypto key encrypt rsa](#)  
[crypto key unlock rsa](#)

# crypto key unlock rsa

To unlock the encrypted private key, use the **crypto key unlock rsa** command.

```
crypto key unlock rsa [name key-name] passphrase passphrase
```

## Syntax Description

<b>name</b> <i>key-name</i>	(Optional) Name of the key.
<b>passphrase</b> <i>passphrase</i>	Pass phrase.

## Defaults

This command has no default settings.

## Command Modes

EXEC

## Command History

Release	Modification
SSL Services Module Release 3.1(1)	Support for this command was introduced on the Catalyst 6500 series SSL Services Module.

## Examples

This example shows how to lock the key “pkil-72a.cisco.com.” Enter the **show crypto key mypubkey rsa** command to verify that the key is protected (encrypted) and locked.

```
ssl-proxy# crypto key unlock rsa name pkil-72a.cisco.com passphrase cisco1234
...
*Jun 18 00:26:08.275: %STE-5-UPDOWN: ssl-proxy service vip1 changed state to UP
...
ssl-proxy# show crypto key mypubkey rsa
Key name:pkil-72a.cisco.com
Usage:General Purpose Key
*** The key is protected and UNLOCKED. ***
Key is exportable.
Key Data:
  305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00D7808D C5FF14AC
...
% Key pair was generated at: 16:00:11 PST Feb 28 2002

ssl-proxy#
```

## Related Commands

[crypto key decrypt rsa](#)  
[crypto key encrypt rsa](#)  
[crypto key lock rsa](#)

## debug ssl-proxy

To turn on the debug flags in different system components, use the **debug ssl-proxy** command. Use the **no** form of this command to turn off the debug flags.

```
debug ssl-proxy { app | content [type] | fdu [type] | flash [module [module]] | health-probe | ipc |
pki [type] | ssl [type] | tcp [type] | vlan }
```

Syntax	Description
<b>app</b>	Turns on App debugging.
<b>content</b> <i>type</i>	Turns on content debugging; (optional) <i>type</i> valid values are <b>detail</b> , <b>error</b> , <b>ipc</b> , <b>module</b> <i>module</i> , <b>rewriting</b> , and <b>scanning</b> . See the “Usage Guidelines” section for additional information.
<b>fdu</b> <i>type</i>	Turns on FDU debugging; (optional) <i>type</i> valid values are <b>cli</b> , <b>hash</b> , <b>ipc</b> , and <b>trace</b> . See the “Usage Guidelines” section for additional information.
<b>flash</b>	Turns on Flash debugging.
<b>module</b> <i>module</i>	Specifies the module to be debugged.  The available options for the module variable are as follows: <ul style="list-style-type: none"> <li>• <b>fdu</b>—FDU CPU</li> <li>• <b>ssl1</b>—SSL1 CPU</li> <li>• <b>tcp1</b>—TCP1 CPU</li> </ul>
<b>health-probe</b>	Turns on health probe debugging.
<b>ipc</b>	Turns on IPC debugging.
<b>pki</b> <i>type</i>	Turns on PKI debugging; (optional) <i>type</i> valid values are <b>cert</b> , <b>events</b> , <b>history</b> , <b>ipc</b> , and <b>key</b> . See the “Usage Guidelines” section for additional information.
<b>ssl</b> <i>type</i>	Turns on SSL debugging; (optional) <i>type</i> valid values are <b>alert</b> , <b>error</b> , <b>handshake</b> , and <b>pkt</b> . See the “Usage Guidelines” section for additional information.
<b>tcp</b> <i>type</i>	Turns on TCP debugging; (optional) <i>type</i> valid values are <b>event</b> , <b>packet</b> , <b>state</b> , and <b>timers</b> . See the “Usage Guidelines” section for additional information.
<b>vlan</b>	Turns on VLAN debugging.

**Defaults** This command has no default settings.

**Command Modes** EXEC

**Command History**

Release	Modification
Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	This command was changed to add the following keywords: <ul style="list-style-type: none"> <li>• <b>content type</b></li> <li>• <b>flash</b></li> <li>• <b>health-probe</b></li> <li>• <b>module module</b></li> <li>• <b>vlan</b></li> </ul>

**Usage Guidelines**

The **content type** includes the following values:

- **detail**—content detail
- **error**—content error
- **ipc**—content ipc
- **module module**—module to be debugged; *module* includes the following values:
  - **fdU**—fdU cpu
  - **ssl1**—ssl1 cpu
  - **tcp1**—tcp1 cpu
- **rewriting**—content rewriting
- **scanning**—content scanning

The **fdU type** includes the following values:

- **cli**—Debugs the FDU CLI.
- **hash**—Debugs the FDU hash.
- **ipc**—Debugs the FDU IPC.
- **trace**—Debugs the FDU trace.

The **pki type** includes the following values:

- **certs**—Debugs the certificate management.
- **events**—Debugs events.
- **history**—Debugs the certificate history.
- **ipc**—Debugs the IPC messages and buffers.
- **key**—Debugs key management.

The **ssl type** includes the following values:

- **alert**—Debugs the SSL alert events.
- **error**—Debugs the SSL error events.
- **handshake**—Debugs the SSL handshake events.
- **pkt**—Debugs the received and transmitted SSL packets.

**Note**

Use the TCP debug commands only to troubleshoot basic connectivity issues under little or no load conditions (for instance, when no connection is being established to the virtual server or real server).

If you run TCP debug commands, the TCP module displays large amounts of debug information on the console, which can significantly slow down module performance. Slow module performance can lead to delayed processing of TCP connection timers, packets, and state transitions.

The **tcp** type includes the following values:

- **events**—Debugs the TCP events.
- **pkt**—Debugs the received and transmitted TCP packets.
- **state**—Debugs the TCP states.
- **timers**—Debugs the TCP timers.

**Examples**

This example shows how to turn on App debugging:

```
ssl-proxy# debug ssl-proxy app
ssl-proxy#
```

This example shows how to turn on FDU debugging:

```
ssl-proxy# debug ssl-proxy fdu
ssl-proxy#
```

This example shows how to turn on IPC debugging:

```
ssl-proxy# debug ssl-proxy ipc
ssl-proxy#
```

This example shows how to turn on PKI debugging:

```
ssl-proxy# debug ssl-proxy pki
ssl-proxy#
```

This example shows how to turn on SSL debugging:

```
ssl-proxy# debug ssl-proxy ssl
ssl-proxy#
```

This example shows how to turn on TCP debugging:

```
ssl-proxy# debug ssl-proxy tcp
ssl-proxy#
```

This example shows how to turn off TCP debugging:

```
ssl-proxy# no debug ssl-proxy tcp
ssl-proxy#
```



# do

To execute EXEC-level commands from global configuration mode or other configuration modes or submodes, use the **do** command.

**do** *command*

## Syntax Description

*command* EXEC-level command to be executed.

## Defaults

This command has no default settings.

## Command Modes

Global configuration or any other configuration mode or submode from which you are executing the EXEC-level command.

## Command History

Release	Modification
Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.

## Usage Guidelines



### Caution

Do not enter the **do** command in EXEC mode. Interruption of service may occur.

You cannot use the **do** command to execute the **configure terminal** command because entering the **configure terminal** command changes the mode to configuration mode.

You cannot use the **do** command to execute the **copy** or **write** command in the global configuration or any other configuration mode or submode.

## Examples

This example shows how to execute the EXEC-level **show interfaces** command from within global configuration mode:

```
ssl-proxy(config)# do show interfaces serial 3/0

Serial3/0 is up, line protocol is up
  Hardware is M8T-RS232
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
  Last input never, output 1d17h, output hang never
  Last clearing of "show interface" counters never
  .
  .
  .
ssl-proxy(config)#
```

# interface ssl-proxy

To enter the subinterface configuration submode, use the **interface ssl-proxy** command. In interface configuration submode, you can configure a subinterface for the SSL Services Module.



## Note

The ssl-proxy0 interface is enabled by default and should not be shut down or otherwise configured.

**interface 0.subinterface-number**

## Syntax Description

*subinterface-number* Subinterface ID; valid values are from 0 to 4294967295.

## Defaults

This command has no default settings.

## Command Modes

Global configuration

## Command History

Release	Modification
SSL Services Module Release 3.1(1)	Support for this command was introduced on the Catalyst 6500 series SSL Services Module.
	This command replaces the <b>ssl-proxy vlan</b> command.

## Usage Guidelines

When you upgrade to SSL software release 3.x from SSL software release 2.x or 1.x, the VLAN configuration is converted automatically to an subinterface configuration. For example, **ssl-proxy vlan 3** is converted to **interface ssl-proxy0.3**.



## Note

The ssl-proxy0 interface is enabled by default and should not be shut down or otherwise configured.

[Table 2-2](#) lists the commands that are available in subinterface configuration submode.

**Table 2-2 Subinterface Configuration Submode Command Descriptions**

Syntax	Description
<b>default</b>	Sets a command to its defaults.
<b>description</b>	Allows you to enter a description for the subinterface.
<b>encapsulation dot1q vlan_ID [native]</b>	Sets the encapsulation type for the interface. Enter the <b>native</b> keyword to make this a native VLAN.
<b>exit</b>	Exits from the subinterface configuration submode.
<b>ip address ipaddress subnet [secondary]</b>	Configures the subinterface with an IP address and a subnet mask. Enter the <b>secondary</b> keyword to make this IP address a secondary address.
<b>no</b>	Negates a command or sets its defaults.

Table 2-2 Subinterface Configuration Submode Command Descriptions (continued)

Syntax	Description
<b>[no] shutdown</b>	Shuts down the subinterface. Use the <b>no</b> form of this command to put the subinterface in service.
<b>standby</b> [ <i>group-number</i> ] { <b>authentication text</b> <i>string</i> }   { <b>delay minimum</b> [ <i>min-delay</i> ] }   { <b>reload</b> [ <i>reload-delay</i> ] }   { <b>ip</b> [ <i>ip-address</i> ] [ <b>secondary</b> ] }   { <b>mac-address</b> <i>mac-address</i> }   { <b>mac-refresh</b> <i>seconds</i> }   { <b>name</b> <i>group-name</i> }   { <b>preempt</b> [ <b>delay</b> { <b>minimum</b> <i>delay</i>   <b>reload</b> <i>delay</i>   <b>sync</b> <i>delay</i> } ] }   { <b>priority</b> <i>priority</i> }   { <b>redirects</b> [ <b>enable</b>   <b>disable</b> ] }   { <b>timers advertisement holddown</b> [ <b>unknown</b> ] }   { <b>timers</b> [ <b>msec</b> ] <i>hellotime</i> [ <b>msec</b> ] <i>holdtime</i> }   { <b>track</b> <i>object-number</i> [ <b>decrement</b> <i>priority</i> ] }   [ <b>version</b> { <b>1</b>   <b>2</b> } ]	Configures redundancy on the subinterface. See the following commands for valid values: <ul style="list-style-type: none"> <li>• <a href="#">standby authentication</a></li> <li>• <a href="#">standby delay minimum reload</a></li> <li>• <a href="#">standby ip</a></li> <li>• <a href="#">standby mac-address</a></li> <li>• <a href="#">standby mac-refresh</a></li> <li>• <a href="#">standby name</a></li> <li>• <a href="#">standby preempt</a></li> <li>• <a href="#">standby priority</a></li> <li>• <a href="#">standby redirects</a></li> <li>• <a href="#">standby timers</a></li> <li>• <a href="#">standby track</a></li> <li>• <a href="#">standby use-bia</a></li> <li>• <a href="#">standby version</a></li> </ul>
<b>timeout absolute</b> <i>minutes seconds</i>	Sets the session timeout values for this interface. Valid values for <i>minutes</i> are from 0 to 71582787 minutes. Valid values for <i>seconds</i> are from 0 to 59 seconds.

The valid values for configuring HSRP are as follows:

- **group-number**—(Optional) Group number on the interface for which HSRP is being activated; valid values are from 0 to 255 for HSRP version 1; valid values are from 0 to 4095 for HSRP version 2. See the “[standby version](#)” section on page 2-132 for information about changing the HSRP version. If you do not specify a *group-number*, group **0** is used.
- **ip ip-addr**—Specifies the IP address of the HSRP interface.
- **priority priority**— Specifies the priority for the HSRP interface. Increase the priority of at least one interface in the HSRP group. The interface with the highest priority becomes active for that HSRP group.
- **preempt** —Enables preemption. When you enable preemption, if the local router has a hot standby priority that is higher than the current active router, the local router attempts to assume control as the active router. If you do not configure preemption, the local router assumes control as the active router only if it receives information indicating that no router is in the active state (acting as the designated router).
- **delay**—(Optional) Specifies the preemption delay. When a router first comes up, it does not have a complete routing table. If it is configured to preempt, it becomes the active router but cannot provide adequate routing services. You can configure a delay before the preempting router actually preempts the currently active router.

- *type time*—Specifies the preemption type and delay; valid values are as follows:
  - **minimum time**—Specifies the minimum delay period in delay seconds; valid values are from 0 to 3600 seconds (1 hour).
  - **reload time**—Specifies the preemption delay after a reload only.
  - **sync time**—Specifies the maximum synchronization period in delay seconds.
- **timers [msec] hellotime holdtime**—Configures the time between hello packets and the time before other routers declare the active hot standby or standby router to be down; valid values are as follows:
  - **msec**—(Optional) Interval in milliseconds. Millisecond timers allow for faster failover.
  - *hellotime*—Hello interval (in seconds); valid values are from 1 to 254 seconds. If you specify the **msec** keyword, the hello interval is in milliseconds; valid values are from 15 to 999 milliseconds. The default is 3 seconds.
  - *holdtime*—Time (in seconds) before the active or standby router is declared to be down; valid values are from x to 255; x is the *hellotime* plus 50 milliseconds and is rounded up to the nearest 1 second. If you specify the **msec** keyword, the holdtime is in milliseconds; valid values are from y to 3000 milliseconds; y is greater than or equal to 3 times the *hellotime* and is not less than 50 milliseconds. The default is 10 seconds.

### Examples

This example shows how to enter the subinterface configuration submode:

```
ssl-proxy (config)# interface ssl-proxy 0.6
ssl-proxy (config-subif)#
```

This example shows how to configure the specified subinterface with an IP address and subnet mask:

```
ssl-proxy (config-subif)# ip address 208.59.100.18 255.0.0.0
ssl-proxy (config-subif)#
```

This example shows how to configure the HSRP on the SSL module:

```
ssl-proxy(config)# interface ssl-proxy 0.100
ssl-proxy(config-subif)# ip address 10.1.0.20 255.255.255.0
ssl-proxy(config-subif)# standby 1 ip 10.1.0.21
ssl-proxy(config-subif)# standby 1 priority 110
ssl-proxy(config-subif)# standby 1 preempt
ssl-proxy(config-subif)# standby 2 ip 10.1.0.22
ssl-proxy(config-subif)# standby 2 priority 100
ssl-proxy(config-subif)# standby 2 preempt
ssl-proxy(config-subif)# end
ssl-proxy#
```

### Related Commands

[show interfaces ssl-proxy](#)  
[show ssl-proxy vlan](#)

# natpool

To define a pool of IP addresses, which the SSL Services Module uses for implementing the client NAT, use the **natpool** command.

```
natpool nat-pool-name start_ip_addr end_ip_addr netmask netmask
```

## Syntax Description

<i>nat-pool-name</i>	NAT pool name.
<i>start-ip-addr</i>	First IP address in the pool.
<i>end-ip-addr</i>	Last IP address in the pool.
<b>netmask</b> <i>netmask</i>	Specifies the netmask address.

## Defaults

This command has no default settings.

## Command Modes

Context subcommand mode

## Command History

Release	Modification
Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The <b>natpool</b> command (entered in context subcommand mode) replaces the <b>ssl-proxy natpool</b> command (entered in global subcommand mode).

## Examples

This example shows how to define a pool of IP addresses:

```
ssl-proxy(config)# ssl-proxy context Example
ssl-proxy (config-context)# natpool NP2 207.59.10.01 207.59.10.08 netmask 255.0.0.0
ssl-proxy (config-context)#
```

## Related Commands

[show ssl-proxy natpool](#)

## policy health-probe tcp

To enter the TCP health probe configuration submode, use the **policy health-probe** command. In TCP health probe configuration submode, you can define the TCP health probe policy that is applied.

**policy health-probe tcp** *policy-name*

### Syntax Description

*policy-name* TCP health probe policy name.

### Defaults

The defaults are as follows:

- **failed-interval** is 60 seconds.
- **interval** is 30 seconds.
- **maximum-retry** is 0.
- **open-timeout** is 80 seconds.
- **port** is the port of the server IP address that you configured in the SSL server proxy service.

### Command Modes

Context subcommand mode

### Command History

Release	Modification
SSL Services Module Release 3.1(1)	Support for this command was introduced on the Catalyst 6500 series SSL Services Module.

### Usage Guidelines

[Table 2-10](#) lists the commands that are available in TCP health probe policy configuration submode.

**Table 2-3 TCP Health Probe Submode Command Descriptions**

Syntax	Description
<b>interval</b> <i>seconds</i>	(Optional) Allows you to set the interval between probes in seconds (from the end of the previous probe to the beginning of the next probe) when the server is healthy. The default is 30 seconds. The valid range is from 30 to 300 seconds.
<b>failed-interval</b> <i>seconds</i>	(Optional) Allows you to set the time between health checks after the service has been marked as failed. The default is 60 seconds. The valid range is from 30 to 3600 seconds.
<b>maximum-retry</b> <i>retries</i>	(Optional) Sets the number of failed probes that are allowed before marking the service as failed. The default is 0 retries. The valid range is from 1 to 5 retries.

Table 2-3 TCP Health Probe Submode Command Descriptions (continued)

Syntax	Description
<b>open-timeout</b> <i>seconds</i>	(Optional) Allows you to set the maximum time to wait to establish a TCP connection. The default is 80 seconds. The valid range is from 70 to 120 seconds.
<b>port</b> <i>port_number</i>	<p>(Optional) Allows you to configure an optional port for the health probe. Valid values are from 1 to 65535.</p> <p>By default, the TCP health probe uses the server IP address and port for the SSL server proxy service. Enter the <b>port</b> command to specify a different port for the health probe.</p> <p>If you configured the SSL server proxy service with <b>no nat server</b>, the TCP health probe uses the virtual IP address that you configured on the SSL server proxy service instead of the server IP address.</p> <p><b>Note</b> TCP health probe is not supported when you configure a wildcard proxy and <b>no nat server</b> on the SSL server proxy service.</p> <p>See the “<a href="#">service</a>” section on page 2-58 for information on configuring the SSL server proxy service.</p>

**Examples**

This example shows how to configure TCP health probe to check whether service at port 80 is up and running on server IP address 19.0.0.1:

```
ssl-proxy(config)# ssl-proxy context ssl
ssl-proxy(config-context)# service ssl-1
ssl-proxy(config-ctx-ssl-proxy)# virtual ipaddr 7.100.100.180 protocol tcp port 443
ssl-proxy(config-ctx-ssl-proxy)# server ipaddr 19.0.0.1 protocol tcp port 80
ssl-proxy(config-ctx-ssl-proxy)# certificate rsa general-purpose trustpoint cert1024
ssl-proxy(config-ctx-ssl-proxy)# policy health-probe tcp probe1
ssl-proxy(config-ctx-ssl-proxy)# inservice
ssl-proxy(config-ctx-ssl-proxy)# exit
ssl-proxy(config-context)# policy health-probe tcp probe1
ssl-proxy(config-ctx-tcp-probe)# end
ssl-proxy#
```

This example shows the state of the SSL proxy service when the health probe has failed:

**Note**

The proxy service is down until service at port 81 is up and running again.

```
ssl-proxy# show ssl-proxy service ssl-1 context ssl
Service id: 0, bound_service_id: 256
Virtual IP: 7.100.100.180, port: 443
Server IP: 19.0.0.1, port: 81
TCP Health Probe Policy: probe1
rsa-general-purpose certificate trustpoint: cert1024
Certificate chain for new connections:
Certificate:
  Key Label: cert1024.key, 1024-bit, exportable
  Key Timestamp: 05:18:23 UTC Dec 30 2005
  Serial Number: 12F332E2000000000000D
Root CA Certificate:
  Serial Number: 6522F512C30E078447D8AFC35567B101
Certificate chain complete
```

```
Context name: ssl
Context Id : 1
Admin Status: up
Operation Status: down
Proxy status: Health Probe Failed
```

This example shows how to configure TCP health probe to check whether service at port 81 is up and running on server IP address 19.0.0.1:

```
ssl-proxy(config-context)# service ssoffload
ssl-proxy(config-ctx-ssl-proxy)# virtual ipaddr 7.100.100.180 protocol tcp port 443
ssl-proxy(config-ctx-ssl-proxy)# server ipaddr 19.0.0.1 protocol tcp port 80
ssl-proxy(config-ctx-ssl-proxy)# certificate rsa general-purpose trustpoint cert1024
ssl-proxy(config-ctx-ssl-proxy)# policy health-probe tcp probe1
ssl-proxy(config-ctx-ssl-proxy)# nat client natpool
ssl-proxy(config-ctx-ssl-proxy)# inservice
ssl-proxy(config-ctx-ssl-proxy)# exit
ssl-proxy(config-context)# policy health-probe tcp probe1
ssl-proxy(config-ctx-tcp-probe)# 81
Warning: Port in the service ssoffload configuration (80) differs from the port in the
health probe configuration (81)
ssl-proxy(config-ctx-tcp-probe)# exit
ssl-proxy(config-context)#
```

This example shows how to configure TCP health probe to check whether service at port 80 is up and running on virtual IP address 7.100.100.180:

```
ssl-proxy(config-context)# service ssoffload
ssl-proxy(config-ctx-ssl-proxy)# virtual ipaddr 7.100.100.180 protocol tcp port 443
ssl-proxy(config-ctx-ssl-proxy)# server ipaddr 19.0.0.1 protocol tcp port 80
ssl-proxy(config-ctx-ssl-proxy)# certificate rsa general-purpose trustpoint cert1024
ssl-proxy(config-ctx-ssl-proxy)# policy health-probe tcp probe1
ssl-proxy(config-ctx-ssl-proxy)# no nat server
ssl-proxy(config-ctx-ssl-proxy)# nat client natpool
ssl-proxy(config-ctx-ssl-proxy)# inservice
ssl-proxy(config-ctx-ssl-proxy)# exit
ssl-proxy(config-context)# policy health-probe tcp probe1
ssl-proxy(config-ctx-tcp-probe)# exit
ssl-proxy(config-context)#
```

This example shows how to configure TCP health probe to check whether service at port 444 is up and running on virtual IP address 7.100.100.180:

```
ssl-proxy(config-context)# service ssoffload
ssl-proxy(config-ctx-ssl-proxy)# virtual ipaddr 7.100.100.180 protocol tcp port 443
ssl-proxy(config-ctx-ssl-proxy)# server ipaddr 19.0.0.1 protocol tcp port 80
ssl-proxy(config-ctx-ssl-proxy)# certificate rsa general-purpose trustpoint cert1024
ssl-proxy(config-ctx-ssl-proxy)# policy health-probe tcp probe1
ssl-proxy(config-ctx-ssl-proxy)# no nat server
ssl-proxy(config-ctx-ssl-proxy)# nat client natpool
ssl-proxy(config-ctx-ssl-proxy)# inservice
ssl-proxy(config-ctx-ssl-proxy)# exit
ssl-proxy(config-context)# policy health-probe tcp probe1
ssl-proxy(config-ctx-tcp-probe)# 444
ssl-proxy(config-ctx-tcp-probe)# exit
Warning: Port in the service ssoffload configuration (80) differs from the port in the
health probe configuration (444)
ssl-proxy(config-context)#
```

#### Related Commands

[show ssl-proxy policy](#)  
[show ssl-proxy service](#)



# policy http-header

To enter the HTTP header insertion configuration submode, use the **policy http-header** command.

**policy http-header** *http-header-policy-name*

## Syntax Description

*http-header-policy-name* HTTP header policy name.

## Defaults

This command has no default settings.

## Command Modes

Context subcommand mode

## Command History

Release	Modification
SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The <b>policy http-header</b> command (entered in context subcommand mode) replaces the <b>ssl-proxy policy http-header</b> command (entered in global subcommand mode).  This command was changed to add the following submode commands: <ul style="list-style-type: none"> <li>• <b>client-cert pem</b></li> <li>• <b>alias</b></li> </ul>
SSL Services Module Release 3.1(5)	The following Context HTTP Header Insert Policy Configuration submode commands were introduced: <ul style="list-style-type: none"> <li>• <b>pre-remove-http-hdr</b></li> </ul>

## Usage Guidelines

In HTTP header insertion configuration submode, you can define the HTTP header insertion content policy that is applied to the payload.

HTTP header insertion allows you to insert additional HTTP headers to indicate to the real server that the connection is actually an SSL connection. These headers allow server applications to collect correct information for each SSL session and/or client.

You can insert these header types:

- **Client Certificate**—Client certificate header insertion allows the back-end server to see the attributes of the client certificate that the SSL module has authenticated and approved. When you specify **client-cert**, the SSL module passes the following headers to the back-end server:

Field To Insert	Description
ClientCert-Valid	Certificate validity state
ClientCert-Error	Error conditions
ClientCert-Fingerprint	Hash output

Field To Insert	Description
ClientCert-Subject-CN	X.509 subject's common name
ClientCert-Issuer-CN	X.509 certificate issuer's common name
ClientCert-Certificate-Version	X.509 certificate version
ClientCert-Serial-Number	Certificate serial number
ClientCert-Data-Signature-Algorithm	X.509 hashing and encryption method
ClientCert-Subject	X.509 subject's distinguished name
ClientCert-Issuer	X.509 certificate issuer's distinguished name
ClientCert-Not-Before	Certificate is not valid before this date
ClientCert-Not-After	Certificate is not valid after this date
ClientCert-Public-Key-Algorithm	The algorithm used for the public key
ClientCert-RSA-Public-Key-Size	Size of the RSA public key
ClientCert-RSA-Modulus-Size	Size of the RSA private key
ClientCert-RSA-Modulus	RSA modulus
ClientCert-RSA-Exponent	The public RSA exponent
ClientCert-X509v3-Authority-Key-Identifier	X.509 authority key identifier
ClientCert-X509v3-Basic-Constraints	X.509 basic constraints
ClientCert-X509v3-Key-Usage	X.509 key usage
ClientCert-X509v3-Subject-Alternative-Name	X.509 subject alternative name
ClientCert-X509v3-CRL-Distribution-Points	X.509 CRL distribution points
ClientCert-X509v3-Authority-Information-Access	X.509 authority information access
ClientCert-Signature-Algorithm	Certificate signature algorithm
ClientCert-Signature	Certificate signature

- Client Certificate in PEM format—When you specify **client-cert pem**, the SSL module sends the entire client certificate in PEM format.
- Client IP and Port Address—Network address translation (NAT) removes the client IP address and port information. When you specify **client-ip-port**, the SSL module inserts the client IP address and information about the client port into the HTTP header, allowing the server to see the client IP address and port.
- Custom—When you specify **custom** *custom-string*, the SSL module inserts the user-defined header into the HTTP header.
- Prefix—When you specify **prefix** *prefix-string*, the SSL module adds the specified prefix into the HTTP header to enable the server to identify that the connections are coming from the SSL module, not from other appliances.
- Header alias—Some applications use different names for the standard header. You can create an alias for the standard name of the header so that the same value is passed using the aliased name instead of the standard name that the SSL Services Module sends. If you have specified a prefix for header insertion, the prefix is also applied to the aliased name.

- **SSL Session**—Session headers, including the session ID, are used to cache client certificates that are based on the session ID. The session headers are also cached on a session basis if the server wants to track connections that are based on a particular cipher suite. When you specify **session**, the SSL Services Module passes information specific to an SSL connection to the back-end server in the form of the following session headers.

Field to insert	Description
Session-Id	The SSL session ID
Session-Cipher-Name	The symmetric cipher suite
Session-Cipher-Key-Size	The symmetric cipher key size
Session-Cipher-Use-Size	The symmetric cipher use size
Session-Step-Up	TRUE if the server presented a stepup certificate and the client renegotiated the cipher; otherwise FALSE
Session-Initial-Cipher-Name	If Session-Step-Up is TRUE, the initially negotiated cipher name
Session-Initial-Cipher-Key-Size	If Session-Step-Up is TRUE, the initially negotiated cipher's key size
Session-Initial-Cipher-Use-Size	If Session-Step-Up is TRUE, the initially negotiated cipher's use size

Table 2-4 lists the commands available in HTTP header insertion configuration submode.

**Table 2-4 HTTP Header Insertion Configuration Submode Command Descriptions**

Syntax	Description
<b>alias</b> <i>user-defined-name</i> <i>standard-name</i>	Specifies the alias name of the header. <b>Note</b> You can configure only one alias per standard name. You cannot configure the same alias name for multiple standard names.
<b>client-cert</b> [pem]	Allows the back-end server to see the attributes of the client certificate that the SSL module has authenticated and approved. <b>Note</b> You can insert the headers listed below by entering the <b>client-cert</b> command, or you can send the entire client certificate in PEM format by entering the <b>client-cert pem</b> command. <b>Note</b> The client certificate headers, or the client certificate in PEM format, are inserted only if the policy's service is configured for client authentication. The root CA and intermediate CA certificates will not be inserted the when client certificate is inserted in the HTTP header.

**Table 2-4 HTTP Header Insertion Configuration Submode Command Descriptions (continued)**

Syntax	Description
<b>client-ip-port</b>	Inserts the client IP address and information about the client port into the HTTP header, allowing the server to see the client IP address and port.
<b>custom</b> <i>custom-string</i>	Inserts the <i>custom-string</i> header into the HTTP header. The maximum <i>custom-string</i> length is 239 characters. If this length is exceeded, an “Incomplete command” error will display. If the string includes spaces, you must enclose it in quotes (“”).
<b>prefix</b>	Adds the <i>prefix-string</i> to the HTTP header to enable the server to identify the connections that come from the SSL module, not from other appliances
<b>session</b>	Passes information that is specific to an SSL connection to the back-end server as session headers.

**Examples**

This example shows how to enter the HTTP header insertion configuration submode:

```
ssl-proxy(config)# ssl-proxy context s1
ssl-proxy(config-context)# policy http-header test1
ssl-proxy(config-ctx-http-header-policy)#
```

This example shows how to allow the back-end server to see the attributes of the client certificate that the SSL module has authenticated and approved:

```
ssl-proxy(config-ctx-http-header-policy)# client-cert
ssl-proxy(config-ctx-http-header-policy)#
```

This example shows how to insert the client IP address and information about the client port into the HTTP header, allowing the server to see the client IP address and port:

```
ssl-proxy(config-ctx-http-header-policy)# client-ip-port
ssl-proxy(config-ctx-http-header-policy)#
```

This example shows how to insert the custom-string header into the HTTP header:

```
ssl-proxy(config-ctx-http-header-policy)# custom "SOFTWARE VERSION:3.1(1)"
ssl-proxy(config-ctx-http-header-policy)# custom "module:SSL MODULE - CATALYST 6500"
ssl-proxy(config-ctx-http-header-policy)# custom
type-of-proxy:server_proxy_1024_bit_key_size
ssl-proxy(config-ctx-http-header-policy)#
```

This example shows how to add the prefix-string into the HTTP header:

```
ssl-proxy(config-ctx-http-header-policy)# prefix SSL-OFFLOAD
ssl-proxy(config-ctx-http-header-policy)#
```

This example shows how to pass information that is specific to an SSL connection to the back-end server as session headers:

```
ssl-proxy(config-ctx-http-header-policy)# session
ssl-proxy(config-ctx-http-header-policy)#
```

This example shows how to create a header alias for the standard “session-cipher-name” header:

```
ssl-proxy(config-ctx-http-header-policy)# alias My-Session-Cipher session-cipher-name
```

In addition to the standard HTTP headers, the following header information is inserted:

This example shows how to remove fields used for http header insert if found:

```
ssl-proxy(config-ctx-http-header-policy)# pre-remove-http-header
ssl-proxy(config-ctx-http-header-policy)#
```



**Note**

The alias name (My-Session-Cipher) is used instead of the standard name (session-cipher-name).

```
SSL-OFFLOAD-Client-IP:7.100.100.1
SSL-OFFLOAD-Client-Port:59008
SSL-OFFLOAD-SOFTWARE VERSION:3.1(1)
SSL-OFFLOAD-module:SSL MODULE - CATALYST 6500
SSL-OFFLOAD-type-of-proxy:server_proxy_1024_bit_key_size
SSL-OFFLOAD-Session-Id:33:FF:2C:2D:25:15:3C:50:56:AB:FA:5A:81:0A:EC:E9:00:00:0A:03:00:60:
  2F:30:9C:2F:CD:56:2B:91:F2:FF
SSL-OFFLOAD-My-Session-Cipher:RC4-SHA
SSL-OFFLOAD-Session-Cipher-Key-Size:128
SSL-OFFLOAD-Session-Cipher-Use-Size:128
SSL-OFFLOAD-Session-Step-Up:FALSE
SSL-OFFLOAD-Session-Initial-Cipher-Key-Size:
SSL-OFFLOAD-Session-Initial-Cipher-Name:
SSL-OFFLOAD-Session-Initial-Cipher-Use-Size:
SSL-OFFLOAD-ClientCert-Valid:1
SSL-OFFLOAD-ClientCert-Error:none
SSL-OFFLOAD-ClientCert-Fingerprint:1B:11:0F:E8:20:3F:6C:23:12:9C:76:C0:C1:C2:CC:85
SSL-OFFLOAD-ClientCert-Subject-CN:a
SSL-OFFLOAD-ClientCert-Issuer-CN:Certificate Manager
SSL-OFFLOAD-ClientCert-Certificate-Version:3
SSL-OFFLOAD-ClientCert-Serial-Number:0F:E5
SSL-OFFLOAD-ClientCert-Data-Signature-Algorithm:sha1WithRSAEncryption
SSL-OFFLOAD-ClientCert-Subject:OID.1.2.840.113549.1.9.2 = ste2-server.cisco.com +
  OID.2.5.4.5 = B0FFF22E, CN = a, O = Cisco
SSL-OFFLOAD-ClientCert-Issuer:CN = Certificate Manager, OU = HSS, O = Cisco, L = San Jose,
  ST = California, C = US
SSL-OFFLOAD-ClientCert-Not-Before:22:29:26 UTC Jul 30 2003
SSL-OFFLOAD-ClientCert-Not-After:07:00:00 UTC Apr 27 2006
SSL-OFFLOAD-ClientCert-Public-Key-Algorithm:rsaEncryption
SSL-OFFLOAD-ClientCert-RSA-Public-Key-Size:1024 bit
SSL-OFFLOAD-ClientCert-RSA-Modulus-Size:1024 bit
SSL-OFFLOAD-ClientCert-RSA-Modulus:B3:32:3C:5E:C9:D1:CC:76:FF:81:F6:F7:97:58:91:4D:B2:0E:
  C1:3A:7B:62:63:BD:5D:F6:5F:68:F0:7D:AC:C6:72:F5:72:46:7E:FD:38:D3:A2:E1:03:8B:EC:F7:C9:9A:
  80:C7:37:DA:F3:BE:1F:F4:5B:59:BD:52:72:94:EE:46:F5:29:A4:B3:9B:2E:4C:69:D0:11:59:F7:68:3A:
  D9:6E:ED:6D:54:4E:B5:A7:89:B9:45:9E:66:0B:90:0B:B1:BD:F4:C8:15:12:CD:85:13:B2:0B:FE:7E:8D:
  F0:D7:4A:98:BB:08:88:6E:CC:49:60:37:22:74:4D:73:1E:96:58:91
SSL-OFFLOAD-ClientCert-RSA-Exponent:00:01:00:01
SSL-OFFLOAD-ClientCert-X509v3-Authority-Key-Identifier:keyid=EE:EF:5B:BD:4D:CD:F5:6B:60:
  9D:CF:46:C2:EA:25:7B:22:A5:08:00
SSL-OFFLOAD-ClientCert-X509v3-Basic-Constraints:
SSL-OFFLOAD-ClientCert-Signature-Algorithm:sha1WithRSAEncryption
SSL-OFFLOAD-ClientCert-Signature:87:09:C1:F8:86:C1:15:C5:57:18:8E:B3:0D:62:E1:0F:6F:D4:9D:
  75:DA:5D:53:E2:C6:0B:73:99:61:BE:B0:F6:19:83:F2:E5:48:1B:D2:6C:92:83:66:B3:63:A6:58:B4:5C:
  0E:5D:1B:60:F9:86:AF:B3:93:07:77:16:74:4B:C5
SSL-OFFLOAD-ClientCert-X509v3-Subject-Alternative-Name:
  ipAddress=192.168.1.100,rfc822Name=my@other.com
SSL-OFFLOAD-ClientCert-X509v3-Key-Usage: Digital Signature,Non-Repudiation,Key
  Encipherment,
  Data Encipherment,Key Agreement,Key Cert Sign,CRL Signature,Encipher Only,Decipher Only
SSL-OFFLOAD-ClientCert-X509v3-Authority-Information-Access: Access Method=OCSP,Access
  Location=http://ocsp.my.host/"
SSL-OFFLOAD-ClientCert-X509v3-CRL-Distribution-Points: http://myhost.com/myca.crl
```

■ `policy http-header`

---

**Related Commands**    [show ssl-proxy policy](#)

# policy ssl

To enter the SSL-policy configuration submode, use the **policy ssl** command. In the SSL-policy configuration submode, you can define the SSL policy for one or more SSL-proxy services.

```
policy ssl ssl-policy-name
```

---

## Syntax Description

<i>ssl-policy-name</i>	SSL policy name.
------------------------	------------------

---



---

## Defaults

The defaults are as follows:

- **cipher** is all-strong.
- **close-protocol** is disabled.
- **session-caching** is enabled.
- **version** is all.
- **session-cache size** *size* is 262143 entries.
- **timeout session** *timeout* is 0 seconds.
- **timeout handshake** *timeout* is 0 seconds.
- **cert-req empty** is disabled.
- **tls-rollback** is disabled.
- **renegotiation** is disabled.

---

## Command Modes

Context subcommand mode

---

## Command History

Release	Modification
Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 1.2(1)	This command was changed to add the following subcommands: <ul style="list-style-type: none"> <li>• <b>session-cache size</b> <i>size</i></li> <li>• <b>timeout session</b> <i>timeout</i> [<b>absolute</b>]</li> </ul>

---

Release	Modification
SSL Services Module Release 2.1(5)	This command was changed to add the following subcommands: <ul style="list-style-type: none"> <li>• <b>cert-req empty</b></li> <li>• <b>tls-rollback [current   any]</b></li> </ul>
SSL Services Module Release 3.1(1)	The <b>policy ssl</b> command (entered in context subcommand mode) replaces the <b>ssl-proxy policy ssl</b> command (entered in global subcommand mode).  This command was changed to add the following submode commands: <ul style="list-style-type: none"> <li>• <b>cipher rsa-exp-with-des40-cbc-sha</b></li> <li>• <b>cipher rsa-exp-with-rc4-40-md5</b></li> <li>• <b>cipher rsa-exp1024-with-des-cbc-sha</b></li> <li>• <b>cipher rsa-exp1024-with-rc4-56-md5</b></li> <li>• <b>cipher rsa-exp1024-with-rc4-56-sha</b></li> <li>• <b>cipher rsa-with-null-md5</b></li> <li>• <b>renegotiation volume</b></li> <li>• <b>renegotiation interval</b></li> <li>• <b>renegotiation wait-time</b></li> <li>• <b>renegotiation optional</b></li> </ul>

**Usage Guidelines**

Each SSL-policy configuration submode command is entered on its own line.

[Table 2-5](#) lists the commands available in SSL-policy configuration submode.

**Table 2-5 SSL-Policy Configuration Submode Command Descriptions**

Syntax	Description
<b>cert-req empty</b>	Allows you to specify that the SSL Services Module backend service always returns the certificate associated with the trustpoint and does not look for a CA-name match.
<b>cipher-suite {all   all-export   all-strong   rsa-exp-with-des40-cbc-sha   rsa-exp-with-rc4-40-md5   rsa-exp1024-with-des-cbc-sha   rsa-exp1024-with-rc4-56-md5   rsa-exp1024-with-rc4-56-sha   rsa-with-3des-edc-cbc-sha   rsa-with-des-cbc-sha   rsa-with-null-md5   rsa-with-rc4-128-md5   rsa-with-rc4-128-sha }</b>	Allows you to configure a list of cipher-suites acceptable to the proxy-server.
<b>[no] close-protocol {strict   none }</b>	Allows you to configure the SSL close-protocol behavior. Use the <b>no</b> form of this command to disable close protocol.
<b>default {cipher   close-protocol   session-cache   version }</b>	Sets a command to its default settings.
<b>exit</b>	Exits from SSL-policy configuration submode.



Table 2-5 SSL-Policy Configuration Submode Command Descriptions (continued)

Syntax	Description
<b>help</b>	Provides a description of the interactive help system.
<b>renegotiation volume</b> <i>size</i>	Allows you to enable autorenegotiation and specifies the data volume size (in kilobytes).  When the encrypted or decrypted data amount exceeds this size, the SSL Services Module sends a renegotiation request. This setting is disabled by default. The valid range is from 1024 to 1073741824 kilobytes.
<b>renegotiation interval</b> <i>time</i>	Allows you to enable autorenegotiation and specifies the interval (in seconds).  After the set interval, the SSL Services Module sends an renegotiation request. This setting is disabled by default. The valid range is from 60 to 86400 seconds.
<b>renegotiation wait-time</b> <i>time</i>	(Optional) When you enable autorenegotiation, this command specifies the amount of time (in seconds) that the SSL Services Module waits for the peer to respond to the renegotiation request. The default is 100 seconds. The valid range is from 10 to 300 seconds.
<b>renegotiation optional</b>	(Optional) When you enable autorenegotiation, the SSL Services Module allows the session to continue if the peer does not respond to the renegotiation request after timeout. This setting is disabled by default and the session is disconnected after timeout.
<b>[no] session-cache</b>	Allows you to enable the session-caching feature. Use the <b>no</b> form of this command to disable session caching.
<b>session-cache size</b> <i>size</i>	Specifies the maximum number of session entries to be allocated for a given service; valid values are from 1 to 262143 entries.
<b>timeout handshake</b> <i>timeout</i>	Allows you to configure how long the module keeps the connection in the handshake phase; valid values are from 0 to 65535 seconds.
<b>timeout session</b> <i>timeout</i> [ <b>absolute</b> ]	Allows you to configure the session timeout. The syntax description is as follows: <ul style="list-style-type: none"> <li><i>timeout</i>—Session timeout; valid values are from 0 to 72000 seconds.</li> <li><b>absolute</b>—(Optional) The session entry is not removed until the configured timeout has completed.</li> </ul>
<b>tls-rollback</b> [ <b>current</b>   <b>any</b> ]	Allows you to specify if the SSL protocol version number in the TLS/SSL premaster secret message is either the maximum version or the negotiated version ( <b>current</b> ) or if the version is not checked ( <b>any</b> ).
<b>version</b> { <b>all</b>   <b>ssl3</b>   <b>tls1</b> }	Allows you to set the version of SSL to one of the following: <ul style="list-style-type: none"> <li><b>all</b>—Both SSL3 and TLS1 versions are used.</li> <li><b>ssl3</b>—SSL version 3 is used.</li> <li><b>tls1</b>—TLS version 1 is used.</li> </ul>

You can define the SSL policy templates using the **policy ssl** *ssl-policy-name* command and associate a SSL policy with a particular proxy server using the proxy server configuration CLI. The SSL policy template allows you to define various parameters that are associated with the SSL handshake stack.

When you enter the **close-notify strict** command, the SSL Services Module sends a close-notify alert message to the SSL peer, and the SSL Services Module expects a close-notify alert message from the SSL peer. If the SSL Services Module does not receive a close-notify alert, SSL resumption is not allowed for that session.

When you enter the **close-notify none** command, the SSL Services Module does not send a close-notify alert message to the SSL peer, and the SSL Services Module does not expect a close-notify alert message from the SSL peer. The SSL Services Module preserves the session information so that SSL resumption can be used for future SSL connections.

When close-notify is disabled (default), the SSL Services Module sends a close-notify alert message to the SSL peer; however, the SSL peer does not expect a close-notify alert before removing the session. Whether the SSL peer sends the close-notify alert or not, the session information is preserved allowing session resumption for future SSL connections.

The cipher-suite names follow the same convention as the existing SSL stacks.

The cipher-suites that are acceptable to the proxy-server are as follows:

- all-export—All export ciphers
- all-strong—All strong ciphers (default)
- all—All supported ciphers
- RSA-WITH-3DES-EDE-CBC-SHA—RSA with 3des-sha
- RSA-WITH-DES-CBC-SHA—RSA with des-sha
- RSA-WITH-RC4-128-MD5—RSA with rc4-md5
- RSA-WITH-RC4-128-SHA—RSA with rc4-sha
- RSA-EXP-WITH-DES40-CBC-SHA—RSA export with des40-sha
- RSA-EXP-WITH-RC4-40-MD5—RSA export with rc4-md5
- RSA-EXP1024-WITH-DES-CBC-SHA—RSA export1024 with des-sha
- RSA-EXP1024-WITH-RC4-56-MD5—RSA export1024 with rc4-md5
- RSA-EXP1024-WITH-RC4-56-SHA—RSA export1024 with rc4-sha
- RSA-WITH-NUL-MD5—RSA with null-md5

If you enter the **timeout session *timeout* absolute** command, the session entry is kept in the session cache for the configured timeout before it is cleaned up. If the session cache is full, the timers are active for all the entries, the **absolute** keyword is configured, and all further new sessions are rejected.

If you enter the **timeout session *timeout*** command without the **absolute** keyword, the specified timeout is treated as the maximum timeout and a best-effort attempt is made to keep the session entry in the session cache. If the session cache runs out of session entries, the session entry that is currently being used is removed for incoming new connections.

When you enter the **cert-req empty** command, the SSL Services Module back-end service always returns the certificate associated with the trustpoint and does not look for a CA-name match. By default, the SSL Services Module always looks for a CA-name match before returning the certificate. If the SSL server does not include a CA-name list in the certificate request during client authentication, the handshake fails.

By default, the SSL Services Module uses the maximum supported SSL protocol version (SSL2.0, SSL3.0, or TLS1.0) in the ClientHello message. Enter the **tls-rollback [current | any]** command if the SSL client uses the negotiated version instead of the maximum supported version (as specified in the ClientHello message).

When you enter the **tls-rollback current** command, the SSL protocol version can be either the maximum supported version or the negotiated version.

When you enter the **tls-rollback any** command, the SSL protocol version is not checked at all.

## Examples

This example shows how to enter the SSL-policy configuration submode:

```
ssl-proxy(config)# ssl-proxy context s1
ssl-proxy(config-context)# policy ssl sslp11
ssl-proxy (config-ctx-ssl-policy)#
```

This example shows how to define the cipher suites that are supported for the SSL-policy:

```
ssl-proxy (config-ctx-ssl-policy)# cipher RSA_WITH_3DES_EDE_CBC_SHA
ssl-proxy (config-ctx-ssl-policy)#
```

This example shows how to enable the SSL-session closing protocol and configure the strict closing protocol behavior:

```
ssl-proxy (config-ctx-ssl-policy)# close-protocol strict
ssl-proxy (config-ctx-ssl-policy)#
```

This example shows how to disable the SSL-session closing protocol:

```
ssl-proxy (config-ctx-ssl-policy)# no close-protocol
ssl-proxy (config-ctx-ssl-policy)#
```

These examples show how to set a given command to its default setting:

```
ssl-proxy (config-ctx-ssl-policy)# default cipher
ssl-proxy (config-ctx-ssl-policy)# default close-protocol
ssl-proxy (config-ctx-ssl-policy)# default session-cache
ssl-proxy (config-ctx-ssl-policy)# default version
ssl-proxy (config-ctx-ssl-policy)#
```

This example shows how to enable a session cache:

```
ssl-proxy (config-ctx-ssl-policy)# session-cache
ssl-proxy (config-ctx-ssl-policy)#
```

This example shows how to disable a session cache:

```
ssl-proxy (config-ctx-ssl-policy)# no session-cache
ssl-proxy (config-ctx-ssl-policy)#
```

This example shows how to set the maximum number of session entries to be allocated for a given service:

```
ssl-proxy (config-ctx-ssl-policy)# session-cache size 22000
ssl-proxy (config-ctx-ssl-policy)#
```

This example shows how to configure the session timeout to absolute:

```
ssl-proxy (config-ctx-ssl-policy)# timeout session 30000 absolute
ssl-proxy (config-ctx-ssl-policy)#
```

These examples show how to enable the support of different SSL versions:

```
ssl-proxy (config-ctx-ssl-policy)# version all
ssl-proxy (config-ctx-ssl-policy)# version ssl3
ssl-proxy (config-ctx-ssl-policy)# version tls1
ssl-proxy (config-ctx-ssl-policy)#
```

■ policy ssl

**Related Commands** [show ssl-proxy stats](#)  
[show ssl-proxy stats ssl](#)

# policy tcp

To enter the proxy policy TCP configuration submode, use the **policy tcp** command. In proxy-policy TCP configuration submode, you can define the TCP policy templates.

**policy tcp** *tcp-policy-name*

## Syntax Description

*tcp-policy-name* TCP policy name.

## Defaults

The defaults are as follows:

- **buffer-share rx** is 32768 bytes.
- **buffer-share tx** is 32768 bytes.
- **delayed-ack-threshold** is 2.
- **delayed-ack-timeout** is 200 seconds.
- **mss** is 1460 bytes.
- **nagle** is enabled.
- **timeout syn** is 75 seconds.
- **timeout reassembly** is 60 seconds.
- **timeout inactivity** is 600 seconds.
- **timeout fin-wait** is 600 seconds.
- **tos carryover** is disabled.

## Command Modes

Context subcommand mode

## Command History

Release	Modification
Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 1.2(1)	This command was changed to add the <b>timeout reassembly</b> <i>time</i> subcommand.
SSL Services Module Release 2.1(4)	This command was changed to add the <b>tos carryover</b> subcommand.

Release	Modification
SSL Services Module Release 3.1(1)	The <b>policy tcp</b> command (entered in context subcommand mode) replaces the <b>ssl-proxy policy tcp</b> command (entered in global subcommand mode).  This command was changed to add the following submode commands: <ul style="list-style-type: none"> <li>• <b>forced-ack</b></li> <li>• <b>nagle</b></li> </ul>
SSL Services Module Release 3.1(5)	This command was changed to add the following submode command: <ul style="list-style-type: none"> <li>• <b>timeout time-wait</b></li> </ul>

**Usage Guidelines**

After you define the TCP policy, you can associate the TCP policy with a proxy server using the proxy-policy TCP configuration submode commands.

Each proxy-policy TCP configuration submode command is entered on its own line.

Table 2-6 lists the commands that are available in proxy-policy TCP configuration submode.

**Table 2-6 Proxy-policy TCP Configuration Submode Command Descriptions**

Syntax	Description
[no] <b>buffer-share rx</b> <i>buffer-limit-in-bytes</i>	Allows you to configure the maximum size of the receive buffer share per connection; valid values are from 8192 to 262144. Use the <b>no</b> form of this command to return to the default setting.  <b>Note</b> When large encrypted files are transferred by the module, the receive buffer size must be at least the maximum SSL record size of 16384 bytes for reassembly of the SSL record. We recommend a receive buffer size of at least 20000 bytes for optimal performance.
[no] <b>buffer-share tx</b> <i>buffer-limit-in-bytes</i>	Allows you to configure the maximum size of the transmit buffer share per connection; valid values are from 8192 to 262144. Use the <b>no</b> form of this command to return to the default setting.  <b>Note</b> When large encrypted files are transferred by the module, the transmit buffer size must be at least the maximum SSL record size of 16384 bytes for reassembly of the SSL record. We recommend a transmit buffer size of at least 20000 bytes for optimal performance.
<b>default</b>	Sets a command to its default settings.
<b>delayed-ack-threshold</b> <i>delay</i>	Allows you to configure the delayed ACK threshold. The default is 2. The valid range is from 1 to 10.
<b>delayed-ack-timeout</b> <i>timer</i>	Allows you to configure the delayed ACK timeout. The default is 200 seconds. The valid range is from 50 to 500 seconds.
<b>exit</b>	Exits from proxy-service configuration submode.
<b>forced-ack</b>	Allows you to enable the forced-ACK algorithm.
<b>help</b>	Provides a description of the interactive help system.
[no] <b>mss</b> <i>max-segment-size-in-bytes</i>	Allows you to configure the maximum segment size that the connection identifies in the generated SYN packet; valid values are from 64 to 1460. Use the <b>no</b> form of this command to return to the default setting.

Table 2-6 Proxy-policy TCP Configuration Submode Command Descriptions (continued)

Syntax	Description
[no] nagle	Allows you to enable or disable the Nagle algorithm, which combines many small packets for more efficient transmission. Nagle is enabled by default.
[no] timeout fin-wait <i>timeout-in-seconds</i>	Allows you to configure the FIN wait timeout; valid values are from 75 to 600 seconds. Use the <b>no</b> form of this command to return to the default setting.
[no] timeout inactivity <i>timeout-in-seconds</i>	Allows you to configure the inactivity timeout; valid values are from 0 to 960 seconds. This command allows you to set the aging timeout for an idle connection and helps protect the connection resources. Use the <b>no</b> form of this command to return to the default setting.
[no] timeout syn <i>timeout-in-seconds</i>	Allows you to configure the connection establishment timeout; valid values are from 5 to 75 seconds. Use the <b>no</b> form of this command to return to the default setting.
[no] timeout reassembly <i>time</i>	Allows you to configure the amount of time in seconds before the reassembly queue is cleared; valid values are from 0 to 960 seconds (0 = disabled). If the transaction is not complete within the specified time, the reassembly queue is cleared and the connection is dropped. Use the <b>no</b> form of this command to return to the default setting.
[no] tos carryover	Forwards the type of service (ToS) value to all packets within a flow. <b>Note</b> If the policy is configured as a server TCP policy, the ToS value is sent from the server to the client. If the policy is configured as a virtual policy, the ToS value is sent from the client to the server. <b>Note</b> The ToS value needs to be learned before it can be propagated. For example, when a ToS value is configured to be propagated from the server to client connection, the server connection must be established before the value is learned and propagated. Therefore, some of the initial packets will not carry the ToS value.

**Usage Guidelines**

TCP commands that you enter on the SSL Services Module can apply either globally or to a particular proxy server.

You can configure a different maximum segment size for the client side and the server side of the proxy server.

The TCP policy template allows you to define parameters that are associated with the TCP stack.

You can either enter the **no** form of the command or use the **default** keyword to return to the default setting.

**Examples**

This example shows how to enter the proxy-policy TCP configuration submode:

```
ssl-proxy(config)# ssl-proxy context s1
ssl-proxy(config-context)# ssl-proxy policy tcp tcppl1
ssl-proxy(config-ctx-tcp-policy)#
```

These examples show how to set a given command to its default value:

```
ssl-proxy (config-ctx-tcp-policy)# default timeout fin-wait
```

```

ssl-proxy (config-ctx-tcp-policy)# default inactivity-timeout
ssl-proxy (config-ctx-tcp-policy)# default buffer-share rx
ssl-proxy (config-ctx-tcp-policy)# default buffer-share tx
ssl-proxy (config-ctx-tcp-policy)# default mss
ssl-proxy (config-ctx-tcp-policy)# default timeout syn
ssl-proxy (config-ctx-tcp-policy)#

```

This example shows how to define the FIN-wait timeout in seconds:

```

ssl-proxy (config-ctx-tcp-policy)# timeout fin-wait 200
ssl-proxy (config-ctx-tcp-policy)#

```

This example shows how to define the inactivity timeout in seconds:

```

ssl-proxy (config-ctx-tcp-policy)# timeout inactivity 300
ssl-proxy (config-ctx-tcp-policy)#

```

This example shows how to define the maximum size for the receive buffer configuration:

```

ssl-proxy (config-ctx-tcp-policy)# buffer-share rx 16384
ssl-proxy (config-ctx-tcp-policy)#

```

This example shows how to define the maximum size for the transmit buffer configuration:

```

ssl-proxy (config-ctx-tcp-policy)# buffer-share tx 13444
ssl-proxy (config-ctx-tcp-policy)#

```

This example shows how to define the maximum size for the TCP segment:

```

ssl-proxy (config-ctx-tcp-policy)# mss 1460
ssl-proxy (config-ctx-tcp-policy)#

```

This example shows how to define the initial connection (SYN)-timeout value:

```

ssl-proxy (config-ctx-tcp-policy)# timeout syn 5
ssl-proxy (config-ctx-tcp-policy)#

```

This example shows how to define the reassembly-timeout value:

```

ssl-proxy (config-ctx-tcp-policy)# timeout reassembly 120
ssl-proxy (config-ctx-tcp-policy)#

```

This example shows how to carryover the ToS value to all packets within a flow:

```

ssl-proxy (config-ctx-tcp-policy)# tos carryover
ssl-proxy (config-ctx-tcp-policy)#

```

**Related Commands**    [show ssl-proxy policy](#)



# policy url-rewrite

To enter the URL rewrite configuration submode, use the **policy url-rewrite** command. In URL rewrite configuration submode, you can define the URL-rewrite content policy that is applied to the payload.

**policy url-rewrite** *url-rewrite-policy-name*

## Syntax Description

*url-rewrite-policy-name* URL rewrite policy name.

## Defaults

This command has no default settings.

## Command Modes

Context subcommand mode

## Command History

Release	Modification
SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The <b>policy url-rewrite</b> command (entered in context subcommand mode) replaces the <b>ssl-proxy policy url-rewrite</b> command (entered in global subcommand mode).

## Usage Guidelines

URL rewrite allows you to rewrite redirection links only.

A URL rewrite policy consists of up to 32 rewrite rules for each SSL proxy service.

[Table 2-7](#) lists the commands that are available in proxy-policy configuration submode.

**Table 2-7 Proxy-policy Configuration Submode Command Descriptions**

<b>default</b>	Sets a command to its default settings.
<b>exit</b>	Exits from proxy-policy configuration submode.
<b>help</b>	Provides a description of the interactive help system.
<b>[no] url</b> <i>url-string</i> <b>[clearport</b> <i>port-number</i>   <b>sslport</b> <i>port-number</i> ]	Allows you to configure the URL string to be rewritten. Use the <b>no</b> form of this command to remove the policy.

*url-string*—Specifies the host portion of the URL link to be rewritten; it can have a maximum of 251 characters. You can use the asterisk (\*) wildcard only as a prefix or a suffix of a *hostname* in a rewrite rule. For example, you can use the *hostname* in one of the following ways:

- www.cisco.com
- \*.cisco.com
- wwwin.cisco.\*

**clearport** *port-number*—(Optional) Specifies the port portion of the URL link that is to be rewritten; valid values are from 1 to 65535.

**sslport** *port-number*—(Optional) Specifies the *port* portion of the URL link that is to be written; valid values are from 1 to 65535.

Enter the **no** form of the command to remove the policy.

**Note**

When a server includes the default HTTP port number 80 in a URL redirect (for example, `www.example.com:80`), then the **url** command must be configured in the same manner (for example, **url www.example.com:80**). Non-standard port numbers need not be configured as part of the URL, but may instead be configured using the **clearport** keyword.

**Examples**

This example shows how to enter the URL rewrite configuration submode for the test1 policy:

```
ssl-proxy(config)# ssl-pro context s1
ssl-proxy(config-context)# ssl-proxy policy url-rewrite test1
ssl-proxy(config-ctx-url-rewrite-policy#
```

This example shows how to define the URL rewrite policy for the test1 policy:

```
ssl-proxy(config)# ssl-pro context s1
ssl-proxy(config-context)# ssl-proxy policy url-rewrite test1
ssl-proxy(config-ctx-url-rewrite-policy# url www.cisco.com clearport 80 sslport 443
ssl-proxy(config-ctx-url-rewrite-policy#
```

This example shows how to delete the URL rewrite policy for the test1 policy:

```
ssl-proxy(config)# ssl-pro context s1
ssl-proxy(config-context)# ssl-proxy policy url-rewrite test1
ssl-proxy(config-ctx-url-rewrite-policy# no url www.cisco.com clearport 80 sslport 443
ssl-proxy(config-ctx-url-rewrite-policy#
```

**Related Commands**

[show ssl-proxy policy](#)

# pool ca

To enter the certificate authority pool configuration submode, use the **pool ca** command. In the certificate authority pool configuration submode, you can configure a certificate authority pool, which lists the CAs that the module can trust.

**pool ca** *ca-pool-name*

## Syntax Description

<i>ca-pool-name</i>	Certificate authority pool name.
---------------------	----------------------------------

## Defaults

This command has no arguments or keywords.

## Command Modes

Context subcommand mode

## Command History

Release	Modification
SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The <b>pool ca</b> command (entered in context subcommand mode) replaces the <b>ssl-proxy pool ca</b> command (entered in global subcommand mode).

## Usage Guidelines

Enter each certificate-authority pool configuration submode command on its own line.

[Table 2-8](#) lists the commands that are available in certificate-authority pool configuration submode.

**Table 2-8 Proxy-policy TCP Configuration Submode Command Descriptions**

Syntax	Description
<b>ca</b>	Configures a certificate authority. The available subcommand is as follows: <b>trustpoint</b> <i>ca-trustpoint-name</i> —Configures a certificate-authority trustpoint. Use the <b>no</b> form of this command to return to the default setting.
<b>default</b>	Sets a command to its default settings.
<b>exit</b>	Exits from proxy-service configuration submode.
<b>help</b>	Allows you to configure the connection-establishment timeout; valid values are from 5 to 75 seconds. Use the <b>no</b> form of this command to return to the default setting.

## Examples

This example shows how to add a certificate-authority trustpoint to a pool:

```
ssl-proxy(config)# ssl-proxy context s1
ssl-proxy(config-context)# pool ca test1
ssl-proxy(config-ctx-ca-pool)# ca trustpoint test20
ssl-proxy(config-ctx-ca-pool)#
```

# service

To enter the proxy-service configuration submode, use the **service** command.

```
service ssl-proxy-name [client]
```

Syntax Description	
<i>ssl-proxy-name</i>	SSL proxy name.
<b>client</b>	(Optional) Allows you to configure the SSL-client proxy services. See the <a href="#">service client</a> command.

**Defaults** Server NAT is enabled, and client NAT is disabled.

**Command Modes** Context subcommand mode

Command History	Release	Modification
	Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
	SSL Services Module Release 2.1(1)	This command was changed to add the following submode commands: <ul style="list-style-type: none"> <li>• <b>authenticate</b></li> <li>• <b>policy urlrewrite</b> <i>policy-name</i></li> <li>• <b>trusted-ca</b> <i>ca-pool-name</i></li> <li>• <b>ssl2</b>—See the <b>server ipaddr</b> subcommand.</li> </ul>
	SSL Services Module Release 3.1(1)	The <b>service</b> command (entered in context subcommand mode) replaces the <b>ssl-proxy service</b> command (entered in global subcommand mode). This command was changed to add the following submode commands: <ul style="list-style-type: none"> <li>• <b>policy health-probe tcp</b> <i>policy-name</i></li> <li>• <b>policy http-header</b> <i>policy-name</i></li> </ul>

## Usage Guidelines

You cannot use the same *service\_name* for both the server proxy service and the client proxy service.

In proxy-service configuration submode, you can configure the virtual IP address and port that is associated with the proxy service and the associated target IP address and port. You can also define TCP and SSL policies for both the client side (beginning with the **virtual** keyword) and the server side of the proxy (beginning with the **server** keyword).

In client proxy-service configuration submode, you specify that the proxy service accept clear-text traffic, encrypt it into SSL traffic, and forward it to the back-end SSL server.

In most cases, all of the SSL-server-proxy configurations that are performed are also valid for the SSL-client-proxy configuration, except for the following:

- You must configure a certificate for the SSL-server-proxy but you do not have to configure a certificate for the SSL-client-proxy. If you configure a certificate for the SSL-client-proxy, that certificate is sent in response to the certificate request message that is sent by the server during the client-authentication phase of the handshake protocol.
- The SSL policy is attached to the **virtual** subcommand for the SSL server proxy service; whereas, the SSL policy is attached to the **server** subcommand for the SSL client proxy service.

Enter each proxy-service or proxy-client configuration submode command on its own line.

Table 2-9 lists the commands that are available in proxy-service or proxy-client configuration submode.

**Table 2-9 Proxy-service Configuration Submode Command Descriptions**

Syntax	Description
<b>authenticate verify</b> { <b>all</b>   <b>signature-only</b> }	Configures the method for certificate verification. You can specify the following: <ul style="list-style-type: none"> <li>• <b>all</b>—Verifies CRLs and signature authority.</li> <li>• <b>signature-only</b>—Verifies the signature only.</li> </ul>
<b>certificate rsa general-purpose trustpoint</b> <i>trustpoint-name</i>	Configures the certificate with RSA general-purpose keys and associates a trustpoint to the certificate.
<b>default</b> { <b>certificate</b>   <b>inservice</b>   <b>nat</b>   <b>server</b>   <b>virtual</b> }	Sets a command to its default settings.
<b>description</b>	Allows you to enter a description for proxy service.
<b>exit</b>	Exits from proxy-service or proxy-client configuration submode.
<b>help</b>	Provides a description of the interactive help system.
<b>inservice</b>	Declares a proxy server or client as administratively up.
<b>nat</b> { <b>server</b>   <b>client</b> } { <i>natpool-name</i> }	Specifies the usage of either server NAT or client NAT for the server-side connection that is opened by the SSL Services Module.
<b>policy health-probe tcp</b> <i>policy-name</i>	Applies a TCP health probe policy to a proxy server.
<b>policy http-header</b> <i>policy-name</i>	Applies an HTTP header insertion policy to a proxy server.
<b>policy urlrewrite</b> <i>policy-name</i>	Applies a URL rewrite policy to a proxy server.
<b>server ipaddr</b> <i>ip-addr</i> <b>protocol</b> <i>protocol</i> <b>port</b> <i>portno</i> [ <b>ssl2</b> ]	Defines the IP address of the target server for the proxy server. You can also specify the port number and the transport protocol. The target IP address can be a virtual IP address of an SLB device or a real IP address of a web server. The <b>ssl2</b> keyword specifies the server that is used for handling SSL version 2 traffic.
<b>server policy tcp</b> <i>server-side-tcp-policy-name</i>	Applies a TCP policy to the server side of a proxy server. You can specify the port number and the transport protocol.
<b>trusted-ca</b> <i>ca-pool-name</i>	Applies a trusted certificate authenticate configuration to a proxy server.
<b>virtual ipaddr</b> <i>ip-addr</i> <b>protocol</b> <i>protocol</i> <b>port</b> <i>portno</i> [ <b>secondary</b> ]	Defines the virtual IP address of the virtual server to which the STE is proxying. You can also specify the port number and the transport protocol. The valid values for <i>protocol</i> are <b>tcp</b> ; valid values for <i>portno</i> is from 1 to 65535. The <b>secondary</b> keyword (optional) prevents the STE from replying to the ARP request coming to the virtual IP address.

Table 2-9 Proxy-service Configuration Submode Command Descriptions (continued)

Syntax	Description
<b>virtual policy ssl</b> <i>ssl-policy-name</i>	Applies an SSL policy with the client side of a proxy server.
<b>virtual policy tcp</b> <i>client-side-tcp-policy-name</i>	Applies a TCP policy to the client side of a proxy server.
<b>vlan</b> <i>vlan</i>	Virtual Service VLAN configuration

Both secured and bridge mode between the Content Switching Module (CSM) and the SSL Services Module is supported.

Use the **secondary** keyword (optional) for bridge-mode topology.

### Examples

This example shows how to enter the proxy-service configuration submode:

```
ssl-proxy (config)# ssl-proxy context s1
ssl-proxy (config-context)# service S6
ssl-proxy (config-ctx-ssl-proxy)#
```

This example shows how to configure the method for certificate verification:

```
ssl-proxy (config-ctx-ssl-proxy)# authenticate verify all
ssl-proxy (config-ctx-ssl-proxy)#
```

This example shows how to configure the certificate for the specified SSL-proxy services:

```
ssl-proxy (config-ctx-ssl-proxy)# certificate rsa general-purpose trustpoint tp1
ssl-proxy (config-ctx-ssl-proxy)#
```

These examples show how to set a specified command to its default value:

```
ssl-proxy (config-ctx-ssl-proxy)# default certificate
ssl-proxy (config-ctx-ssl-proxy)# default inservice
ssl-proxy (config-ctx-ssl-proxy)# default nat
ssl-proxy (config-ctx-ssl-proxy)# default server
ssl-proxy (config-ctx-ssl-proxy)# default virtual
ssl-proxy (config-ctx-ssl-proxy)#
```

This example shows how to apply a trusted-certificate authenticate configuration to a proxy server:

```
ssl-proxy (config-ctx-ssl-proxy)# trusted-ca test1
ssl-proxy (config-ctx-ssl-proxy)#
```

This example shows how to configure a virtual IP address for the specified virtual server:

```
ssl-proxy (config-ctx-ssl-proxy)# virtual ipaddr 207.59.100.20 protocol tcp port 443
ssl-proxy (config-ctx-ssl-proxy)#
```

This example shows how to configure the SSL policy for the specified virtual server:

```
ssl-proxy (config-ctx-ssl-proxy)# virtual policy ssl sslp11
ssl-proxy (config-ctx-ssl-proxy)#
```

This example shows how to configure the TCP policy for the specified virtual server:

```
ssl-proxy (config-ctx-ssl-proxy)# virtual policy tcp tcppl1
ssl-proxy (config-ctx-ssl-proxy)#
```

This example shows how to configure a clear-text web server for the SSL Services Module to forward the decrypted traffic:

```
ssl-proxy (config-ctx-ssl-proxy) # server ipaddr 207.50.0.50 protocol tcp port 80  
ssl-proxy (config-ctx-ssl-proxy) #
```

This example shows how to configure a TCP policy for the given clear-text web server:

```
ssl-proxy (config-ctx-ssl-proxy) # server policy tcp tcpp11  
ssl-proxy (config-ctx-ssl-proxy) #
```

This example shows how to configure a NAT pool for the client address that is used in the server connection of the specified service SSL offload:

```
ssl-proxy (config-ctx-ssl-proxy) # nat client NP1  
ssl-proxy (config-ctx-ssl-proxy) #
```

This example shows how to enable a NAT server address for the server connection of the specified service SSL offload:

```
ssl-proxy (config-ctx-ssl-proxy) # nat server  
ssl-proxy (config-ctx-ssl-proxy) #
```

---

**Related Commands**

[show ssl-proxy service](#)

# service client

To enter the client proxy-service configuration submode, use the **service client** command.

**service** *ssl-proxy-name* **client**

<b>Syntax Description</b>	<i>ssl-proxy-name</i> SSL proxy service name.
---------------------------	---

<b>Defaults</b>	Client NAT is disabled.
-----------------	-------------------------

<b>Command Modes</b>	Context subcommand mode
----------------------	-------------------------

Command History	Release	Modification
	SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
	SSL Services Module Release 3.1(1)	The <b>service client</b> command (entered in context subcommand mode) replaces the <b>ssl-proxy service client</b> command (entered in global subcommand mode).  This command was changed to add the following submode commands: <ul style="list-style-type: none"> <li>• <b>policy health-probe tcp</b></li> <li>• <b>policy http-header</b></li> </ul>

<b>Usage Guidelines</b>	<p>You cannot use the same <i>service_name</i> for both the server proxy service and the client proxy service.</p> <p>In client proxy-service configuration submode, you specify that the proxy service accept clear-text traffic, encrypt it into SSL traffic, and forward it to the back-end SSL server.</p>
-------------------------	--

In most cases, all of the SSL-server-proxy configurations that are performed are also valid for the SSL-client-proxy configuration, except for the following:

- You must configure a certificate for the SSL-server-proxy but you do not have to configure a certificate for the SSL-client-proxy. If you configure a certificate for the SSL-client-proxy, that certificate is sent in response to the certificate request message that is sent by the server during the client-authentication phase of the handshake protocol.
- The SSL policy is attached to the **virtual** subcommand for the SSL server proxy service; whereas, the SSL policy is attached to the **server** subcommand for the SSL client proxy service.

Each proxy-service or proxy-client configuration submode command is entered on its own line.



Table 2-10 lists the commands that are available in proxy-client configuration submode.

**Table 2-10 Proxy-client Configuration Submode Command Descriptions**

Syntax	Description
<b>certificate rsa general-purpose trustpoint</b> <i>trustpoint-name</i>	Configures the certificate with RSA general-purpose keys and associates a trustpoint to the certificate.
<b>default</b> { <b>certificate</b>   <b>inservice</b>   <b>nat</b>   <b>server</b>   <b>virtual</b> }	Sets a command to its default settings.
<b>description</b>	Allows you to enter a description for the proxy service.
<b>exit</b>	Exits from proxy-client configuration submode.
<b>help</b>	Provides a description of the interactive help system.
<b>inservice</b>	Declares a proxy client as administratively up.
<b>nat</b> { <b>server</b>   <b>client</b> <i>natpool-name</i> }	Specifies the usage of either server NAT or client NAT for the server-side connection that is opened by the SSL Services Module.
<b>policy health-probe tcp</b> <i>policy-name</i>	Applies a TCP health probe policy to a proxy server.
<b>policy http-header</b> <i>policy-name</i>	Applies an HTTP header insertion policy to a proxy server.
<b>policy urlrewrite</b> <i>policy-name</i>	Applies a URL rewrite policy to the proxy server.
<b>server ipaddr</b> <i>ip-addr</i> <b>protocol</b> <i>protocol</i> <b>port</b> <i>portno</i> [ <b>ssl2</b> ]	Defines the IP address of the target server for the proxy server. You can also specify the port number and the transport protocol. The target IP address can be a virtual IP address of an SLB device or a real IP address of a web server. The <b>ssl2</b> keyword enables SSL version 2.
<b>server policy tcp</b> <i>server-side-tcp-policy-name</i>	Applies a TCP policy to the server side of a proxy server. You can specify the port number and the transport protocol.
<b>virtual ipaddr</b> <i>ip-addr</i> <b>protocol</b> <i>protocol</i> <b>port</b> <i>portno</i> [ <b>secondary</b> ]	Defines the IP address of the target server for the proxy server. You can also specify the port number and the transport protocol. The target IP address can be a virtual IP address of an SLB device or a real IP address of a web server.
<b>virtual policy ssl</b> <i>ssl-policy-name</i>	Applies an SSL policy with the client side of a proxy server.
<b>virtual policy tcp</b> <i>client-side-tcp-policy-name</i>	Applies a TCP policy to the client side of a proxy server.
<b>vlan</b> <i>vlan</i>	Virtual Service VLAN configuration.

Both secured mode and bridge mode between the Content Switching Module (CSM) and the SSL Services Module are supported.

Use the **secondary** keyword (optional) for the bridge-mode topology.

**Examples**

This example shows how to enter the client proxy-service configuration submode:

```
ssl-proxy (config)# ssl-proxy context s1
ssl-proxy (config-context)# service S7 client
ssl-proxy (config-ctx-ssl-proxy)#
```

This example shows how to configure the certificate for the specified SSL-proxy services:

```
ssl-proxy (config-ctx-ssl-proxy)# certificate rsa general-purpose trustpoint tp1
ssl-proxy (config-ctx-ssl-proxy)#
```

These examples show how to set a specified command to its default value:

```
ssl-proxy (config-ctx-ssl-proxy)# default certificate
ssl-proxy (config-ctx-ssl-proxy)# default inservice
ssl-proxy (config-ctx-ssl-proxy)# default nat
ssl-proxy (config-ctx-ssl-proxy)# default server
ssl-proxy (config-ctx-ssl-proxy)# default virtual
ssl-proxy (config-ctx-ssl-proxy)#
```

This example shows how to configure a virtual IP address for the specified virtual server:

```
ssl-proxy (config-ctx-ssl-proxy)# virtual ipaddr 207.59.100.20 protocol tcp port 443
ssl-proxy (config-ctx-ssl-proxy)#
```

This example shows how to configure the SSL policy for the specified virtual server:

```
ssl-proxy (config-ctx-ssl-proxy)# virtual policy ssl sslp11
ssl-proxy (config-ctx-ssl-proxy)#
```

This example shows how to configure the TCP policy for the specified virtual server:

```
ssl-proxy (config-ctx-ssl-proxy)# virtual policy tcp tcpp11
ssl-proxy (config-ctx-ssl-proxy)#
```

This example shows how to configure a clear-text web server for the SSL Services Module to forward the decrypted traffic:

```
ssl-proxy (config-ctx-ssl-proxy)# server ipaddr 207.50.0.50 protocol tcp port 80
ssl-proxy (config-ctx-ssl-proxy)#
```

This example shows how to configure a TCP policy for the given clear-text web server:

```
ssl-proxy (config-ctx-ssl-proxy)# server policy tcp tcpp11
ssl-proxy (config-ctx-ssl-proxy)#
```

This example shows how to configure a NAT pool for the client address that is used in the server connection of the specified service SSL offload:

```
ssl-proxy (config-ctx-ssl-proxy)# nat client NP1
ssl-proxy (config-ctx-ssl-proxy)#
```

This example shows how to enable a NAT server address for the server connection of the specified service SSL offload:

```
ssl-proxy (config-ctx-ssl-proxy)# nat server
ssl-proxy (config-ctx-ssl-proxy)#
```

**Related Commands**

[show ssl-proxy service](#)

# show interfaces ssl-proxy

To display information about the configured subinterfaces, use the **show interfaces ssl-proxy** command.

**show interfaces ssl-proxy 0.subinterface**

<b>Syntax Description</b>	<i>subinterface-number</i> Subinterface ID; valid values are from 0 to 4294967295.
---------------------------	--

<b>Defaults</b>	This command has no default settings.
-----------------	---------------------------------------

<b>Command Modes</b>	EXEC
----------------------	------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	SSL Services Module Release 3.1(1)	Support for this command was introduced on the Catalyst 6500 series SSL Services Module.

<b>Examples</b>	This example shows how to display information about the configured subinterfaces:
-----------------	---

```
ssl-proxy# show interfaces 0.3
SSL-Proxy0.3 is up, line protocol is up
  Hardware is STE interface, address is 0001.6445.c744 (bia 00e0.14c1.30e9)
  Internet address is 10.10.0.16/8
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation 802.1Q Virtual LAN, Vlan ID 3.
  ARP type: ARPA, ARP Timeout 04:00:00
  Last clearing of "show interface" counters never

ssl-proxy#
```

<b>Related Commands</b>	<a href="#">policy tcp</a>
-------------------------	----------------------------

# show ssl-proxy buffers

To display information about TCP buffer usage, use the **show ssl-proxy buffers** command.

**show ssl-proxy buffers**

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

**Defaults** This command has no default settings.

**Command Modes** EXEC

Command History	Release	Modification
	Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.

**Examples** This example shows how to display the buffer usage and other information in the TCP subsystem:

```
ssl-proxy# show ssl-proxy buffers
Buffers info for TCP module 1
  TCP data buffers used 2817 limit 88064
  TCP ingress buffer pool size 44032 egress buffer pool size 44032
  TCP ingress data buffers min-thresh 5636096 max-thresh 9017344
  TCP ingress data buffers used Current 0 Max 0
  TCP ingress buffer RED shift 9 max drop prob 10
  Conns consuming ingress data buffers 0
  Buffers with App 0
  TCP egress data buffers used Current 0 Max 0
  Conns consuming egress data buffers 0
  In-sequence queue bufs 0 OOO bufs 0
  Per-flow avg qlen 0 Global avg qlen 0

ssl-proxy#
```

**Related Commands** [policy tcp](#)

# show ssl-proxy certificate-history

To display information about the event history of the certificate, use the **show ssl-proxy certificate-history** command.

```
show ssl-proxy certificate-history [service name]
```

<b>Syntax Description</b>	<b>service <i>name</i></b>	Displays all certificate records of a proxy service and (optionally) for a specific proxy service.
---------------------------	----------------------------	--

**Defaults** This command has no default settings.

**Command Modes** EXEC

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.

**Usage Guidelines** The **show ssl-proxy certificate-history** command displays these records:

- Service name
- Key pair name
- Generation or import time
- Trustpoint name
- Certificate subject name
- Certificate issuer name
- Serial number
- Date

A syslog message is generated for each record. The oldest records are deleted after the limit of 512 records is reached.

**Examples**

This example shows how to display the event history of all the certificate processing:

```

ssl-proxy# show ssl-proxy certificate-history
Record 1, Timestamp:00:00:51, 16:36:34 UTC Oct 31 2002
  Installed Server Certificate, Index 5
  Proxy Service:s1, Trust Point:t3
  Key Pair Name:k3, Key Usage:RSA General Purpose, Exportable
  Time of Key Generation:12:27:58 UTC Oct 30 2002
  Subject Name:OID.1.2.840.113549.1.9.2 = simpson5-2-ste.cisco.com,
OID.1.2.840.113549.1.9.8 = 207.79.1.9, OID.2.5.4.5 = B0FFF235
  Issuer Name:CN = SimpsonTestCA, OU = Simpson Lab, O = Cisco Systems, L = San Jose, ST
= CA, C = US, EA =<16> simpson-pki@cisco.com
  Serial Number:5D3D1931000100000D99
  Validity Start Time:21:58:12 UTC Oct 30 2002
  End Time:22:08:12 UTC Oct 30 2003
  Renew Time:00:00:00 UTC Jan 1 1970
  End of Certificate Record

Record 2, Timestamp:00:01:06, 16:36:49 UTC Oct 31 2002
  Installed Server Certificate, Index 6
  Proxy Service:s5, Trust Point:t10
  Key Pair Name:k10, Key Usage:RSA General Purpose, Exportable
  Time of Key Generation:07:56:43 UTC Oct 11 2002
  Subject Name:CN = host1.cisco.com, OID.1.2.840.113549.1.9.2 =
simpson5-2-ste.cisco.com, OID.1.2.840.113549.1.9.8 = 207.79.1.9, OID.2.5.4.5 = B0FFF235
  Issuer Name:CN = SimpsonTestCA, OU = Simpson Lab, O = Cisco Systems, L = San Jose, ST
= CA, C = US, EA =<16> simpson-pki@cisco.com
  Serial Number:24BC81B7000100000D85
  Validity Start Time:22:38:00 UTC Oct 19 2002
  End Time:22:48:00 UTC Oct 19 2003
  Renew Time:00:00:00 UTC Jan 1 1970
  End of Certificate Record

Record 3, Timestamp:00:01:34, 16:37:18 UTC Oct 31 2002
  Installed Server Certificate, Index 7
  Proxy Service:s6, Trust Point:t10
  Key Pair Name:k10, Key Usage:RSA General Purpose, Exportable
  Time of Key Generation:07:56:43 UTC Oct 11 2002
  Subject Name:CN = host1.cisco.com, OID.1.2.840.113549.1.9.2 =
simpson5-2-ste.cisco.com, OID.1.2.840.113549.1.9.8 = 207.79.1.9, OID.2.5.4.5 = B0FFF235
  Issuer Name:CN = SimpsonTestCA, OU = Simpson Lab, O = Cisco Systems, L = San Jose, ST
= CA, C = US, EA =<16> simpson-pki@cisco.com
  Serial Number:24BC81B7000100000D85
  Validity Start Time:22:38:00 UTC Oct 19 2002
  End Time:22:48:00 UTC Oct 19 2003
  Renew Time:00:00:00 UTC Jan 1 1970
  End of Certificate Record

Record 4, Timestamp:00:01:40, 16:37:23 UTC Oct 31 2002
  Deleted Server Certificate, Index 0
  Proxy Service:s6, Trust Point:t6
  Key Pair Name:k6, Key Usage:RSA General Purpose, Not Exportable
  Time of Key Generation:00:28:28 UTC Mar 1 1993
  Subject Name:CN = host1.cisco.com, OID.1.2.840.113549.1.9.2 =
simpson5-2-ste.cisco.com, OID.1.2.840.113549.1.9.8 = 207.79.1.8, OID.2.5.4.5 = B0FFF235
  Issuer Name:CN = SimpsonTestCA, OU = Simpson Lab, O = Cisco Systems, L = San Jose, ST
= CA, C = US, EA =<16> simpson-pki@cisco.com
  Serial Number:5CB5CFD6000100000D97
  Validity Start Time:19:30:26 UTC Oct 30 2002
  End Time:19:40:26 UTC Oct 30 2003
  Renew Time:00:00:00 UTC Jan 1 1970
  End of Certificate Record
% Total number of certificate history records displayed = 4
ssl-proxy#

```

This example shows how to display the certificate record for a specific proxy service:

```
ssl-proxy# show ssl-proxy certificate-history service s6
Record 3, Timestamp:00:01:34, 16:37:18 UTC Oct 31 2002
  Installed Server Certificate, Index 7
  Proxy Service:s6, Trust Point:t10
  Key Pair Name:k10, Key Usage:RSA General Purpose, Exportable
  Time of Key Generation:07:56:43 UTC Oct 11 2002
  Subject Name:CN = host1.cisco.com, OID.1.2.840.113549.1.9.2 =
simpson5-2-ste.cisco.com, OID.1.2.840.113549.1.9.8 = 207.79.1.9, OID.2.5.4.5 = B0FFF235
  Issuer Name:CN = SimpsonTestCA, OU = Simpson Lab, O = Cisco Systems, L = San Jose, ST
= CA, C = US, EA =<16> simpson-pki@cisco.com
  Serial Number:24BC81B7000100000D85
  Validity Start Time:22:38:00 UTC Oct 19 2002
  End Time:22:48:00 UTC Oct 19 2003
  Renew Time:00:00:00 UTC Jan 1 1970
End of Certificate Record

Record 4, Timestamp:00:01:40, 16:37:23 UTC Oct 31 2002
  Deleted Server Certificate, Index 0
  Proxy Service:s6, Trust Point:t6
  Key Pair Name:k6, Key Usage:RSA General Purpose, Not Exportable
  Time of Key Generation:00:28:28 UTC Mar 1 1993
  Subject Name:CN = host1.cisco.com, OID.1.2.840.113549.1.9.2 =
simpson5-2-ste.cisco.com, OID.1.2.840.113549.1.9.8 = 207.79.1.8, OID.2.5.4.5 = B0FFF235
  Issuer Name:CN = SimpsonTestCA, OU = Simpson Lab, O = Cisco Systems, L = San Jose, ST
= CA, C = US, EA =<16> simpson-pki@cisco.com
  Serial Number:5CB5CFD6000100000D97
  Validity Start Time:19:30:26 UTC Oct 30 2002
  End Time:19:40:26 UTC Oct 30 2003
  Renew Time:00:00:00 UTC Jan 1 1970
End of Certificate Record
Total number of certificate history records displayed = 2
```

## Related Commands [service](#)

## show ssl-proxy conn

To display the TCP connections from the SSL Services Module, use the **show ssl-proxy conn** command.

```
show ssl-proxy conn 4tuple [local {ip local-ip-addr local-port} [remote [{ip remote-ip-addr [port remote-port]} | {port remote-port [ip remote-ip-addr]}]]]
```

```
show ssl-proxy conn 4tuple [local {port local-port} [remote [{ip remote-ip-addr [port remote-port]} | {port remote-port [ip remote-ip-addr]}]]]
```

```
show ssl-proxy conn 4tuple [local {remote [{ip remote-ip-addr [port remote-port]} | {port remote-port [ip remote-ip-addr]}]]]
```

```
show ssl-proxy conn module module
```

```
show ssl-proxy conn service name [context name] module [module]
```

### Syntax Description

<b>4tuple</b>	Displays the TCP connections for a specific address.
<b>local</b>	(Optional) Displays the TCP connections for a specific local device.
<b>ip local-ip-addr</b>	IP address of a local device.
<i>local-port</i>	Port number of a local device.
<b>remote</b>	(Optional) Displays the TCP connections for a specific remote device.
<b>ip remote-ip-addr</b>	IP address of a remote device.
<b>port remote-port</b>	Port number of a remote device.
<b>port local-port</b>	(Optional) Displays the TCP connections for a specific local port.
<b>module module</b>	(Optional) Displays the information for a specific module. The available options for the module variable are as follows: <ul style="list-style-type: none"> <li>• <b>all</b>—all CPUs</li> <li>• <b>fd</b>—FDU CPU</li> <li>• <b>ssl1</b>—SSL1 CPU</li> <li>• <b>tcp1</b>—TCP1 CPU</li> </ul>
<b>service name</b>	Displays the connections for a specific proxy service.
<b>context name</b>	(Optional) Displays information about the specified context.

### Defaults

This command has no default settings.

### Command Modes

EXEC



**Command History**

Release	Modification
Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	This command was changed to add the following keywords: <ul style="list-style-type: none"> <li>• <b>context</b> <i>name</i></li> <li>• <b>module</b> <i>module</i></li> </ul>

**Usage Guidelines**

The **show ssl-proxy conn** command displays these records:

- Local Address
- Remote Address
- VLAN
- Conid
- Send-Q
- Recv-Q
- State

The State record indicates the TCP state of the connection between the SSL Services Module and a remote device. The TCP states are described in the following table:

**Table 2-11 TCP Connection State Descriptions**

<b>LISTEN</b>	This module is waiting for a request to initiate a TCP connection.
<b>SYN_SEND</b>	This module has sent a SYN packet to another device in order to initiate the opening of a TCP connection.
<b>SYN_RECEIVED</b>	This module has received a SYN packet from another device that is requesting to open a TCP connection.
<b>ESTABLISHED or ESTAB</b>	The three-way TCP handshake (SYN, SYN/ACK, ACK) has been completed and a TCP connection is now established between this module and another device.
<b>FIN_WAIT_1</b>	This module has sent a FIN packet to a connected device in order to close the TCP connection.
<b>TIME_WAIT or TWAIT</b>	This module has successfully completed a FIN sequence to close a TCP connection with a connected device. The connection will be held in this state for 30-120 seconds to receive any late packets.
<b>CLOSE_WAIT</b>	This module has received a FIN packet from a connected device that is requesting to close the TCP connection.
<b>FIN_WAIT_2</b>	After sending a FIN packet to a connected device in order to close the TCP connection, this module has received an ACK packet and is waiting for a FIN packet.
<b>LAST_ACK</b>	At the request of a connected device, this module has closed the TCP connection and is waiting for a final ACK from the other device.

**Table 2-11 TCP Connection State Descriptions (continued)**

<b>CLOSING</b>	This module has actively closed the TCP connection and is waiting for a final ACK from the other device before entering the TIME_WAIT state.
<b>CLOSED</b>	A TCP connection has been closed with all wait times and acknowledgments completed.

**Examples**

These examples show different ways to display the TCP connection that is established from the SSL Services Module:

```
ssl-proxy# show ssl-proxy conn
Connections for TCP module 1
Local Address      Remote Address      VLAN Conid  Send-Q Recv-Q State
-----
2.0.0.10:4430     1.200.200.14:48582  2    0      0      0      ESTAB
1.200.200.14:48582 2.100.100.72:80    2    1      0      0      ESTAB

2.0.0.10:4430     1.200.200.14:48583  2    2      0      0      ESTAB
1.200.200.14:48583 2.100.100.72:80    2    3      0      0      ESTAB

2.0.0.10:4430     1.200.200.14:48584  2    4      0      0      ESTAB
1.200.200.14:48584 2.100.100.72:80    2    5      0      0      ESTAB

2.0.0.10:4430     1.200.200.14:48585  2    6      0      0      ESTAB
1.200.200.14:48585 2.100.100.72:80    2    7      0      0      ESTAB

2.0.0.10:4430     1.200.200.14:48586  2    8      0      0      ESTAB
1.200.200.14:48586 2.100.100.72:80    2    9      0      0      ESTAB

ssl-proxy# show ssl-proxy conn 4tuple local port 443
Connections for TCP module 1
Local Address      Remote Address      VLAN Conid  Send-Q Recv-Q State
-----
2.50.50.133:443   1.200.200.12:39728  2   113676  0      0      TWAIT
No Bound Connection

2.50.50.133:443   1.200.200.12:39729  2   113680  0      0      TWAIT
No Bound Connection

2.50.50.131:443   1.200.200.14:40599  2   113684  0      0      TWAIT
No Bound Connection

2.50.50.132:443   1.200.200.13:48031  2   114046  0      0      TWAIT
No Bound Connection

2.50.50.132:443   1.200.200.13:48032  2   114048  0      0      TWAIT
No Bound Connection

2.50.50.132:443   1.200.200.13:48034  2   114092  0      0      TWAIT
No Bound Connection

2.50.50.132:443   1.200.200.13:48035  2   114100  0      0      TWAIT
No Bound Connection
```

## show ssl-proxy conn

```
ssl-proxy# show ssl-proxy conn 4tuple remote ip 1.200.200.14
```

```
Connections for TCP module 1
```

Local Address	Remote Address	VLAN	Conid	Send-Q	Recv-Q	State
2.50.50.131:443	1.200.200.14:38814	2	58796	0	0	TWAIT
No Bound Connection						
2.50.50.131:443	1.200.200.14:38815	2	58800	0	0	TWAIT
No Bound Connection						
2.50.50.131:443	1.200.200.14:38817	2	58802	0	0	TWAIT
No Bound Connection						
2.50.50.131:443	1.200.200.14:38818	2	58806	0	0	TWAIT
No Bound Connection						
2.50.50.131:443	1.200.200.14:38819	2	58810	0	0	TWAIT
No Bound Connection						
2.50.50.131:443	1.200.200.14:38820	2	58814	0	0	TWAIT
No Bound Connection						
2.50.50.131:443	1.200.200.14:38821	2	58818	0	0	TWAIT
No Bound Connection						

```
ssl-proxy# show ssl-proxy conn service iis1
```

```
Connections for TCP module 1
```

Local Address	Remote Address	VLAN	Conid	Send-Q	Recv-Q	State
2.50.50.131:443	1.200.200.14:41217	2	121718	0	0	TWAIT
No Bound Connection						
2.50.50.131:443	1.200.200.14:41218	2	121722	0	0	TWAIT
No Bound Connection						
2.50.50.131:443	1.200.200.14:41219	2	121726	0	0	TWAIT
No Bound Connection						
2.50.50.131:443	1.200.200.14:41220	2	121794	0	0	TWAIT
No Bound Connection						
2.50.50.131:443	1.200.200.14:41221	2	121808	0	0	TWAIT
No Bound Connection						
2.50.50.131:443	1.200.200.14:41222	2	121940	0	0	TWAIT
No Bound Connection						
2.50.50.131:443	1.200.200.14:41223	2	122048	0	0	TWAIT
No Bound Connection						

# show ssl-proxy context

To display context information, use the **show ssl-proxy context** command.

```
show ssl-proxy context [name]
```

<b>Syntax Description</b>	<i>name</i> (Optional) Name of the context.
---------------------------	---

**Defaults** This command has no default settings.

**Command Modes** EXEC

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	SSL Services Module Release 3.1(1)	Support for this command was introduced on the Catalyst 6500 series SSL Services Module.

**Examples** This example shows how to display all context information on the SSL Services Module:

```
ssl-proxy# show ssl-proxy context
```

```
Total number of contexts : 2
```

Context Name	VRF	Num Proxies
-----	---	-----
Default		2
c1		200

This example shows how to display specific context information on the SSL Services Module:

```
ssl-proxy# show ssl-proxy context Default
```

```
Context id          : 0
Number of proxies   : 2
Num max conns allowed : 65536
```

```
Context 'Default' has the following service(s) configured..
```

```
s2
s3
```

```
ssl-proxy#
```

## show ssl-proxy crash-info

To collect information about the software-forced reset from the SSL Services Module, use the **show ssl-proxy crash-info** command.

**show ssl-proxy crash-info [brief | details]**

Syntax Description	
<b>brief</b>	(Optional) Collects a small subset of software-forced reset information, limited to processor registers.
<b>details</b>	(Optional) Collects the full set of software-forced reset information, including exception and interrupt stacks dump (this process can take up to 10 minutes to complete printing).

**Defaults** This command has no default settings.

**Command Modes** EXEC

Command History	Release	Modification
	Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.

**Examples** This example shows how to collect information about the software-forced reset:

```
ssl-proxy# show ssl-proxy crash-info

===== SSL SERVICE MODULE - START OF CRASHINFO COLLECTION =====

----- COMPLEX 0 [FDU_IOS] -----

NVRAM CHKSUM:0xEB28
NVRAM MAGIC:0xC8A514F0
NVRAM VERSION:1

+++++++ CORE 0 (FDU) ++++++

    CID:0
    APPLICATION VERSION:2003.04.15 14:50:20 built for cantuc
    APPROXIMATE TIME WHEN CRASH HAPPENED:14:06:04 UTC Apr 16 2003
    THIS CORE DIDN'T CRASH
    TRACEBACK:222D48 216894
    CPU CONTEXT -----

$0 :00000000, AT :00240008, v0 :5A27E637, v1 :000F2BB1
a0 :00000001, a1 :0000003C, a2 :002331B0, a3 :00000000
t0 :00247834, t1 :02BFAAA0, t2 :02BF8BB0, t3 :02BF8BA0
t4 :02BF8BB0, t5 :00247834, t6 :00000000, t7 :00000001
```

```

s0 :00000000, s1 :0024783C, s2 :00000000, s3 :00000000
s4 :00000001, s5 :0000003C, s6 :00000019, s7 :0000000F
t8 :00000001, t9 :00000001, k0 :00400001, k1 :00000000
gp :0023AE80, sp :031FFF58, s8 :00000019, ra :00216894
LO :00000000, HI :0000000A, BADVADDR :828D641C
EPC :00222D48, ErrorEPC :BFC02308, SREG :34007E03
Cause 0000C000 (Code 0x0):Interrupt exception

CACHE ERROR registers -----

CacheErrI:00000000, CacheErrD:00000000
ErrCtl:00000000, CacheErrDPA:0000000000000000

PROCESS STACK -----
stack top:0x3200000

Process stack in use:

sp is close to stack top;

printing 1024 bytes from stack top:

031FFC00:06405DE0 002706E0 0000002D 00000001 .@]\`.'.`...-....
031FFC10:06405DE0 002706E0 00000001 0020B800 .@]\`.'.`..... 8.
031FFC20:031FFC30 8FBF005C 14620010 24020004 ..|0.?.\b..$...
.....
.....
.....
FFFFFFD0:00000000 00000000 00000000 00000000 .....
FFFFFFE0:00627E34 00000000 00000000 00000000 .b-4.....
FFFFFFF0:00000000 00000000 00000000 00000006 .....

===== SSL SERVICE MODULE - END OF CRASHINFO COLLECTION =====

This example shows how to collect a small subset of software-forced reset information:

ssl-proxy# show ssl-proxy crash-info brief

===== SSL SERVICE MODULE - START OF CRASHINFO COLLECTION =====

----- COMPLEX 0 [FDU_IOS] -----

SKE CRASH INFO Error: wrong MAGIC # 0

CLI detected an error in FDU_IOS crash-info; wrong magic.

----- COMPLEX 1 [TCP_SSL] -----

Crashinfo fragment #0 from core 2 at offset 0 error:
Remote system reports wrong crashinfo magic.
Bad fragment received. Reception abort.

CLI detected an error in TCP_SSL crash-info;

===== SSL SERVICE MODULE - END OF CRASHINFO COLLECTION =====

```

# show ssl-proxy mac address

To display the current MAC address, use the **show ssl-proxy mac address** command.

**show ssl-proxy mac address**

---

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

---

**Defaults** This command has no default settings.

---

**Command Modes** EXEC

---

Command History	Release	Modification
	Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.

---



---

**Examples** This example shows how to display the current MAC address that is used in the SSL Services Module:

```
ssl-proxy# show ssl-proxy mac address
STE MAC address: 00e0.b0ff.f232
ssl-proxy#
```



# show ssl-proxy natpool

To display information about the NAT pool, use the **show ssl-proxy natpool** command.

```
show ssl-proxy natpool [name][context name]
```

Syntax Description	
<i>name</i>	(Optional) NAT pool name.
<b>context</b> <i>name</i>	(Optional) Context name.

**Defaults** This command has no default settings.

**Command Modes** EXEC

Command History	Release	Modification
	Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
	SSL Services Module Release 3.1(1)	This command was changed to add the <b>context</b> <i>name</i> keyword.

**Examples** This example shows how to display information for a specific NAT address pool that is configured on the SSL Services Module:

```
ssl-proxy# show ssl-proxy natpool
No context name provided, assuming context 'Default'...
natpool-name      start-ip      end-ip      netmask      use-count
n1                207.57.110.1 207.57.110.8 255.0.0.0    2
ssl-proxy#
```

This example shows how to display information for a specific NAT address pool that is configured on the SSL Services Module:

```
ssl-proxy# show ssl-proxy natpool n1
No context name provided, assuming context 'Default'...
Start ip: 207.57.110.1
End ip: 207.57.110.8
netmask: 255.0.0.0
vlan associated with natpool: 2
SSL proxy services using this natpool:
    S2
    S3
Num of proxies using this natpool: 2
ssl-proxy#
```

**Related Commands** [natpool](#)

# show ssl-proxy policy

To display the configured SSL proxy policies, use the **show ssl-proxy policy** command.

```
show ssl-proxy policy {health-probe tcp [name] [context name] | http-header | ssl | tcp |
url-rewrite} [name]
```

Syntax Description		
<b>health-probe tcp</b>		Displays the configured TCP health probe policies.
<i>name</i>		(Optional) TCP health probe name.
<b>context name</b>		(Optional) Displays the TCP health probe policies in this context.
<b>http-header</b>		Displays the configured HTTP header policies.
<b>ssl</b>		Displays the configured SSL policies.
<b>tcp</b>		Displays the configured TCP policies.
<b>url-rewrite</b>		Displays the configured URL rewrite policies.
<i>name</i>		(Optional) Policy name.

**Defaults** This command has no default settings.

**Command Modes** EXEC

Command History	Release	Modification
	Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
	SSL Services Module Release 2.1(1)	This command was changed to include the <b>http-header</b> and <b>url-rewrite</b> keywords.
	SSL Services Module Release 3.1(1)	This command was changed to add the <b>health-probe tcp</b> keyword.

**Examples** This example shows how to display information about the HTTP header policy:

```
ssl-proxy# show ssl-proxy policy http-header h1
No context name provided, assuming context 'Default'...
Prefix                               SSL
Client Certificate Insertion          Not Enabled
Session Header Insertion              All
Client IP/Port Insertion              Not Enabled
Hdr #   Custom Header
0   "a:"
1   "b:"
2   "c:"
3   "d:"
4   "e:"
5   "f:"
```

```

6  "g:"
7  "h:"
8  "i:"
9  "j:"
10 "k:"
11 "l:"
12 "m:"
13 "n:"

```

Usage count of this policy: 0

```
ssl-proxy#
```

This example shows how to display policy information about a specific SSL policy that is configured on the SSL Services Module:

```
ssl-proxy# show ssl-proxy policy ssl ssl-policy1
```

No context name provided, assuming context 'Default'...

```

Cipher suites: (None configured, default ciphers included)
  rsa-with-rc4-128-md5
  rsa-with-rc4-128-sha
  rsa-with-des-cbc-sha
  rsa-with-3des-ede-cbc-sha
SSL Versions enabled:SSL3.0, TLS1.0
close protocol: default (close_notify sent but not expected from peer)
Session Cache:enabled
Session timeout: 72000 seconds
Renegotiation timeout: 100 seconds
Handshake timeout not configured (never times out)
TLS Rollback: default (version number rollback not allowed)
No. of policy users : 0

```

```
ssl-proxy#
```

This example shows how to display policy information about a specific TCP policy that is configured on the SSL Services Module:

```
ssl-proxy# show ssl-proxy policy tcp tcp-policy1
```

No context name provided, assuming context 'Default'...

```

MSS                1460
SYN timeout        75
Idle timeout       600
FIN wait timeout   75
Reassembly timeout 60
Persist timeout    0
Rx Buffer Share     32768
Tx Buffer Share     65536
TOS Carryover      Disabled
Delayed ACK timer  200
Delayed ACK Threshold 2
Nagle algorithm    Enabled
Forced ACK         Enabled

```

No. of policy users : 0

```
ssl-proxy#
```

## show ssl-proxy policy

This example shows how to display information about the URL rewrite policy:

```
ssl-proxy# show ssl-proxy policy url-rewrite urlrw-policy
No context name provided, assuming context 'Default'...
Rule URL                                     Clearport SSLport
 1 wwwin.cisco.com                          80             443
 2 www.cisco.com                             8080           444
```

Usage count of this policy: 0

```
ssl-proxy#
```

This example shows how to display information about the TCP health probe policy:

```
ssl-proxy# show ssl-proxy policy health-probe tcp
No context name provided, assuming context 'Default'...
```

TCP Health Probe Policy Name	Usage-Count
tcp-health	1

This example shows how to display information about the specified TCP health probe policy:

```
ssl-proxy# show ssl-proxy policy health-probe tcp tcp-health
No context name provided, assuming context 'Default'...
```

```
TCP Health Probe Details : tcp-health
Server Port number          80
Interval between probe     30
Interval between failed probe 60
TCP Connection open timeout 80
Maximum retries for success probe 3
No. of policy users        1
SSL proxy services using this policy:
s3                          Connected
Usage count of this policy: 1
```

### Related Commands

- [policy health-probe tcp](#)
- [policy http-header](#)
- [policy ssl](#)
- [policy tcp](#)
- [policy url-rewrite](#)

# show ssl-proxy service

To display information about the configured SSL virtual service, use the **show ssl-proxy service** command.

```
show ssl-proxy service [name][context name]
```

## Syntax Description

<b>name</b>	(Optional) Service name.
<b>context name</b>	(Optional) Displays service information for the specified context name.

## Defaults

This command has no default settings.

## Command Modes

EXEC

## Command History

Release	Modification
Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	This command was changed to add the <b>context name</b> keyword.

## Examples

This example shows how to display all SSL virtual services that are configured on the SSL Services Module:

```
ssl-proxy# show ssl-proxy service
No context name provided, assuming context 'Default'...

Proxy Service Name  Context Name      Admin  Operation
                    status status
s2                   Default           up     up
s3                   Default           up     up

ssl-proxy#
```

This example shows how to display a specific SSL virtual service that is configured on the SSL Services Module:

```
ssl-proxy# show ssl-proxy service S6
No context name provided, assuming context 'Default'...

Service id: 1, bound_service_id: 257
Virtual IP: 10.10.1.104, port: 443
Server IP: 10.10.1.100, port: 80
Virtual SSL Policy: SSL1_PLC
Server TCP Policy: nagle
TCP Health Probe Policy: tcp-health
```

---

**show ssl-proxy service**

```

Nat pool: n2
rsa-general-purpose certificate trustpoint: tptest
Certificate chain for new connections:
Certificate:
  Key Label: mytp, 1024-bit, not exportable
  Key Timestamp: 07:21:09 UTC Apr 20 2005
  Serial Number: 0FE5
Root CA Certificate:
  Serial Number: 01
Certificate chain complete
Context name: Default
Context Id : 0
Admin Status: up
Operation Status: up

ssl-proxy#

```

This example shows how to display a specific SSL virtual service on a specific context that is configured on the SSL Services Module:

```

ssl-proxy# show ssl-proxy service s2 context c1
Service id: 214, bound_service_id: 470
Virtual IP: 10.12.0.2, port: 443
Server IP: 10.0.207.203, port: 80
TCP Health Probe Policy: h1
rsa-general-purpose certificate trustpoint: mytp
Certificate chain for new connections:
Certificate:
  Key Label: mytp, 1024-bit, not exportable
  Key Timestamp: 07:21:09 UTC Apr 20 2005
  Serial Number: 0FE5
Root CA Certificate:
  Serial Number: 01
Certificate chain complete
Context name: c1
Context Id : 167
Admin Status: up
Operation Status: up

ssl-proxy#

```

---

**Related Commands**

[service](#)  
[service client](#)

# show ssl-proxy stats

To display information about the statistics counter, use the **show ssl-proxy stats** command.

```
show ssl-proxy stats [type]
```

<b>Syntax Description</b>	<i>type</i> (Optional) Information type; valid values are <b>content</b> , <b>context</b> , <b>crypto</b> , <b>fdi</b> , <b>hdr</b> , <b>ipc</b> , <b>module</b> , <b>pki</b> , <b>service</b> , <b>ssl</b> , <b>tcp</b> , and <b>url</b> . See the “Usage Guidelines” section for additional information.
---------------------------	--

<b>Defaults</b>	This command has no default settings.
-----------------	---------------------------------------

<b>Command Modes</b>	EXEC
----------------------	------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
	SSL Services Module Release 1.2(1)	The output of the <b>show ssl-proxy stats</b> command was changed to include information about the session allocation failure and session limit-exceed table.
	SSL Services Module Release 3.1(1)	This command was changed to add the following keywords: <ul style="list-style-type: none"> <li>• <b>content</b></li> <li>• <b>context</b></li> <li>• <b>hdr</b></li> <li>• <b>module</b> <i>module</i></li> <li>• <b>url</b></li> </ul>

**Usage Guidelines** The *type* values are defined as follows:

- **content**—Displays content scan object statistics.
- **context**—Displays context statistics information.
- **crypto**—Displays crypto statistics.
- **fdi**—Displays FDU statistics.
- **hdr**—Displays HTTP header insertion statistics.
- **ipc**—Displays IPC statistics.

## ■ show ssl-proxy stats

- **module** *module*—Displays statistics for the specified module; module type includes the following:
  - **all**—all CPUs
  - **fdU**—FDU CPU
  - **ssl1**—SSL1 CPU
  - **tcp1**—TCP1 CPU
- **pki**—Displays PKI statistics.
- **service**—Displays proxy service statistics.
- **ssl**—Displays SSL detailed statistics.
- **tcp**—Displays TCP detailed statistics.
- **url**—Displays URL rewrite statistics.

**Examples**

This example shows how to display ssl-proxy statistics:

```
ssl-proxy# show ssl-proxy stats
TCP Statistics:
  Conns initiated      : 14415157      Conns accepted       : 14415157
  Conns established   : 27748020      Conns dropped        : 14414667
  Conns Allocated     : 14415157      Conns Deallocated   : 14415157
  Conns closed        : 28830314      SYN timeouts        : 1081918
  Idle timeouts       : 0              Total pkts sent      : 2621810445
  Data packets sent   : 4048216786     Data bytes sent      : 406938953
  Total Pkts rcvd     : 4175351636     Pkts rcvd in seq    : 4182198218
  Bytes rcvd in seq   : 2528520209

SSL Statistics:
  conns attempted     : 14415157      conns completed      : 14415157
  full handshakes     : 14415157      resumed handshakes   : 0
  active conns        : 0              active sessions      : 0
  renegs attempted    : 0              conns in reneg       : 0
  handshake failures  : 0              data failures        : 0
  fatal alerts rcvd   : 0              fatal alerts sent    : 0
  no-cipher alerts    : 0              ver mismatch alerts  : 0
  no-compress alerts  : 0              bad macs received    : 0
  pad errors          : 0              session fails        : 0

FDU Statistics:
  IP Reass in progress: 0              Frag Svc full Drops  : 0
  IPFlow create Drops : 0              TTL expired Drops    : 0
  IP Frag Drops        : 0              Frag reass complete  : 0
  Frag nodes freed     : 0              IP Version Drops     : 0
  IP Addr Discards     : 0              Serv_Id Drops        : 4266052
  Conn Id Drops        : 0              Bound Conn Drops     : 0
  Vlan Id Drops        : 0              TCP HW Checksum      : 4179625097
  TCP SW Checksum      : 0              TCP Checksum Drops   : 0
  Hash Full Drops      : 0              Hash Alloc Fails     : 0
  Flow Creates         : 28830314      Flow Deletes         : 28830314
  Conn Id allocs       : 14415157      Conn Id deallocs     : 14415157
  Tagged Pkts Drops    : 0              Non-Tagg Pkts Drops  : 0
  Add ipcs             : 3              Delete ipcs          : 0
  Disable ipcs         : 0              Enable ipcs          : 0
  Unsolicited ipcs     : 0              Duplicate Add ipcs   : 0
  IOS Broadcast Pkts   : 5330879      IOS Unicast Pkts     : 3752
  IOS Multicast Pkts   : 0              IOS Total Pkts       : 5334631
  IOS Congest Drops    : 0              SYN Discards         : 7400
  UDP datagrams Rcvd   : 0              UDP datagrams Sent   : 0
```



```

UDP HW Checksum      : 0          UDP SW Checksum      : 0
UDP Flow Misses     : 0          UDP Length Errors    : 0
TCP 5-tuple reuse   : 0          FDU Reset Drops     : 0

```

```
ssl-proxy#
```

This example shows how to display ssl statistics:

```

ssl-proxy# show ssl-proxy stats ssl
SSL Statistics:
  conns attempted      : 14415157   conns completed      : 14415157
  conns in handshake  : 0          conns in data        : 0
  renegs attempted     : 0          conns in renegot    : 0
  active sessions     : 0          max handshake conns : 505
  rand bufs allocated : 803902     cached rand buf miss: 0
  current device q len: 0          max device q len    : 327
  sslv2 forwards      : 0          cert reqs processed : 0
  fatal alerts rcvd   : 0          fatal alerts sent   : 0
  stale packet drops  : 0          service_id discards : 0
  session reuses      : 0          hs handle in use    : 0
  netscape step-ups   : 0          SGC step-ups        : 0
  alloc msg received  : 14415157   delete msg received: 14415157
  delayed conn delete : 57         timer expires       : 0
  multi timer expires : 0          callwheel NULL list: 0
  bad clnt session id: 0          expired session id  : 0

SSL3 Statistics:
  full handshakes      : 5882754   resumed handshakes  : 0
  handshake failures   : 0          data failures       : 0
  bad macs received    : 0          pad errors          : 0
  conns established with cipher rsa-with-rc4-128-md5      : 0
  conns established with cipher rsa-with-rc4-128-sha      : 0
  conns established with cipher rsa-with-des-cbc-sha      : 0
  conns established with cipher rsa-with-3des-edc-cbc-sha : 5882754
  conns established with cipher rsa-with-null-md5         : 0
  conns established with cipher rsa-exp1024-with-des-cbc-sha : 0
  conns established with cipher rsa-exp1024-with-rc4-56-sha : 0
  conns established with cipher rsa-exp1024-with-rc4-56-md5 : 0
  conns established with cipher rsa-exp-with-rc4-40-md5   : 0
  conns established with cipher rsa-exp-with-des40-cbc-sha : 0

TLS1 Statistics:
  full handshakes      : 8532403   resumed handshakes  : 0
  handshake failures   : 0          data failures       : 0
  bad macs received    : 0          pad errors          : 0
  conns established with cipher rsa-with-rc4-128-md5      : 8532403
  conns established with cipher rsa-with-rc4-128-sha      : 0
  conns established with cipher rsa-with-des-cbc-sha      : 0
  conns established with cipher rsa-with-3des-edc-cbc-sha : 0
  conns established with cipher rsa-with-null-md5         : 0
  conns established with cipher rsa-exp1024-with-des-cbc-sha : 0
  conns established with cipher rsa-exp1024-with-rc4-56-sha : 0
  conns established with cipher rsa-exp1024-with-rc4-56-md5 : 0
  conns established with cipher rsa-exp-with-rc4-40-md5   : 0
  conns established with cipher rsa-exp-with-des40-cbc-sha : 0

SSL error statistics:
  session alloc fails : 0          session limit exceed: 0
  handshake init fails: 0          renegotiation fails  : 0
  no-cipher alerts    : 0          ver mismatch alerts : 0
  no-compress alerts  : 0          multi buf rec errors: 0
  ssl peer closes     : 0          non-ssl peer closes : 0
  unexpected record   : 0          rec formatting error: 0
  rsa pkcs pad errors : 0          premaster errors    : 0

```

## show ssl-proxy stats

```

failed rsa reqs      : 0          failed random reqs : 0
failed key-material : 0          failed master-secret: 0
failed md5 hash     : 0          failed tls exp key  : 0
failed tls exp iv   : 0          failed srvr key exch: 0
failed update hash  : 0          failed finish hash  : 0
failed encrypts     : 0          failed decrypts     : 0
bad record version  : 0          bad record size     : 0
cert verify errors  : 0          unsupported certs   : 0
conn aborted       : 0          empty cert records  : 0
overload drops     : 0          hs limit exceeded  : 0
hs handle mem fails: 0          conn reuse error    : 0
dev invalid params  : 0          dev failed requests: 0
dev timeout        : 0          dev busy            : 0
dev cancelled      : 0          no dev fails        : 0
dev resource fails  : 0          dev unknown errors  : 0
dev conn ctx fails  : 0          dev cmd ctx fails   : 0
mem alloc fails    : 0          buf alloc fails     : 0
invalid cipher algo: 0          invalid hash algo   : 0
unaligned buf addr : 0          unaligned buf len   : 0
internal error     : 0          unknown ipc         : 0
double free attempts: 0        alert-send fails    : 0

SSL Crypto Statistics:
blocks encrypted   : 4138812209  blocks decrypted    : 347762407
bytes encrypted    : 1789594329  bytes decrypted     : 1217509979
crypto failures    : 0
device dma errors  : 0
PushMCR_nopkts    : 2532831724  PushMCR_pushed     : 0
PushMCR_full      : 2115169602  PushMCR_push       : 146595780
GetFreeMCR_busy   : 0          GetFreeMCR_dma_error: 0
GetFreeMCR_no_rsrc: 0          GetFreeMCR_success : 45670677

SSL last 5 sec average Statistics:
full handshakes   : 0          resumed handshakes : 0
handshake failures: 0          data failures       : 0
bytes encrypted   : 0          bytes decrypted     : 0

SSL last 1 min average Statistics:
full handshakes   : 0          resumed handshakes : 0
handshake failures: 0          data failures       : 0
bytes encrypted   : 0          bytes decrypted     : 0

SSL last 5 min average Statistics:
full handshakes   : 0          resumed handshakes : 0
handshake failures: 0          data failures       : 0
bytes encrypted   : 0          bytes decrypted     : 0

SSL PKI Statistics:
number of malloc  : 1455663450  number of free      : 1455663198
ssl buf allocated : 7          ssl buf freed       : 1

Peer Certificate Verify Statistics:
cert approved     : 0          cert disapproved   : 0
peer cert empty   : 0          total num of request: 0
req being processed: 0          req pending        : 0
longest queue     : 0          longest pending    : 0
verify congestion  : 0          req dropped, q full: 0
no memory for verify: 0        verify data error   : 0
verify context error: 0        context delete error: 0
timer expired error: 0          timer expired count : 0
late verify result : 0          timer turned on     : 0
timer turned off   : 0          context created     : 0
context deleted    : 0

```

```

High Priority IPC:
ipc request received: 1455663049      ipc request dropped : 0
ipc req duplicated : 0                ipc req fragment err: 0
ipc req parm len err: 0              ipc req op code err : 0
ipc req cert len err: 0              ipc response sent   : 1455663049
ipc resp no memory : 0                ipc resp no ssl buf : 0
ipc buffer allocated: 0               ipc buffer freed    : 0
ipc buf alloc failed: 0               ipc send msg failed : 0

Normal Priority IPC:
ipc buffer allocated: 0                ipc buffer freed    : 0
ipc request sent : 0                   ipc request received: 0
ipc buf alloc failed: 0                ipc send msg failed : 0
ipc requests dropped: 0

Subject_Name Allocation:
subject_name allocs : 0                subject_name frees  : 0
subject_name memory : 0

Session Queue Sizes:
ssl_free_sess_q_size: 262144           ssl_free_sess_active_timer_q_size: 0
ssl_delete_conn_q_size: 0

SSL Queue Sizes:
bcm_cmd_ctx_pool_size : 64              bcm_asym_cmd_ctx_pool_sz: 9000
bcm_info_pool_size : 65538              buf_desc_free_q_size : 94710
cert_result_free_q_size : 11048          delete_conn_q_size : 0
event_q_size : 0                        free_conn_q_size : 65536
free_sess_q_size : 262144                free_sess_active_tmr_qsz: 0
global_pending_q_size : 0                to_app_ctx_pool_size : 512
ste_asym_req_q_size : 0                  ste_free_req_ctx_pool_sz: 20480
ste_sym_req_q_size : 0                   available ctx count : 64
ctx cleanup count : 0                    device reset count : 0

SSL Random Buffer Info:
psuedo_rand_req_pending : 0              rand_req_pending : 0
pseudo_rand_req_count : 297
curr_psuedo_rand_buf : 0x0AEBF2A4        curr_rand_buf : 0x0AEBF220
psuedo_rand_buf_a : 0x0AEBF278           psuedo_rand_buf_a_rx_sz : 3044
psuedo_rand_buf_b : 0x0AEBF2A4           psuedo_rand_buf_b_rx_sz : 3884
rand_buf_a : 0x0AEBF220                   rand_buf_a_rx_size : 4064
rand_buf_b : 0x0AEBF24C                   rand_buf_b_rx_size : 4064

```

This example shows how to display the TCP statistics:

```
ssl-proxy# show ssl-proxy stats tcp
```

TCP Statistics:

```

Connection related :
  Initiated : 14415157 Accepted : 14415157
  Established : 27748020 Dropped : 14414667
  Dropped before est : 1082294 Closed : 28830314
  Persist timeout drops : 0 Rxmt timeout drops : 0
  Current TIME-WAIT : 0 Current ESTABLISHED : 0
  Maximum TIME-WAIT : 17254 Maximum ESTABLISHED : 1911
  Conns Allocated : 14415157 Conns Deallocated : 14415157
  Conn Deletes sent : 28830314 Credit Updates : 0
  Credit Enable Req : 0 Credit Disable Req : 0
  Probe resets : 0

Timer related :
  RTT estimates : 4272088584 RTT est. updates : 4282749990
  delayed acks sent : 16011985 FIN-WAIT2 timeouts : 0
  Retransmit timeouts : 6263673 Persist Timeouts : 0
  SYN timeouts : 1081918 Idle Timeouts : 0

```

## show ssl-proxy stats

```

Reassembly timeouts      : 0
Packet Transmit related :
  Total packets          : 2621810445 Data packets          : 4048216786
  Data bytes sent        : 406938953  Retransmitted pkts   : 1015590
  Retransmitted bytes    : 184932379  Ack only pkts        : 54472646
  Window probes          : 0          URG only pkts        : 0
  Window Update pkts     : 2764579114 Cntrl pkts (S/F/R)   : 48493321
  Tx TOS - normal        : 2621810161 Tx TOS - Min. Cost    : 0
  Tx TOS - max. rel.     : 0          Tx TOS - Max. thru.  : 0
  Tx TOS - min. delay    : 0          Tx TOS - invalid     : 0
Packet Receive related :
  Total packets          : 4175351636 In seq data pkts     : 4182198218
  In seq data bytes      : 2528520209 Bad Offset            : 0
  Too short               : 0          Dup-only data pkts   : 1180058
  Dup-only data bytes     : 1528138278 Part. dup. data pkts : 0
  Part. Dup. data bytes  : 0          OOO data pkts        : 0
  OOO data bytes rcvd    : 0          Pkts after rx win    : 0
  Bytes after rx window  : 0          Pkts after close     : 0
  Window Probes          : 0          Duplicate ACKs        : 16539602
  ACKs for unseq data    : 0          ACK-only pkts         : 1528035
  Bytes acked by acks    : 433284808 Window Update pkts   : 23
  PAWS dropped pkts      : 0          Hdr pred. ACKs        : 4109450673
  Hdr pred. data pkts   : 4123685217 TCB cache misses     : 1114110201
  3 dup-only pkts       : 9          Partial Acks          : 6
  Rx TOS - normal        : 4171511079 Rx TOS - Min. Cost    : 0
  Rx TOS - max. rel.     : 0          Rx TOS - Max. thru.  : 0
  Rx TOS - min. delay    : 0          Rx TOS - invalid     : 0
  Unrecognized Options   : 0          Unaligned MSS         : 0
  Unaligned Timestamp    : 0          Unaligned SACK        : 0
  Forced ACKs            : 0          RST ACK's sent        : 0
  Recycled Client Conns  : 14415157  Recycled Server Conns: 14415157

Packet Drop statistics :
  Per-flow limit drops   : 0          Aggregate tail drops : 0
  Aggregate random drps  : 0          Egress Bufpool drops : 0

Connection Drop/Close statistics :
  Active                  : 13332005  Passive                : 81
  App closed early        : 0          Client Reuse           : 0
  Client RST Rcvd        : 1184     Server RST Rcvd        : 83
  App aborted client      : 1082001  App aborted server     : 13333042
  Unexp. SYNs            : 0          Server Refused         : 0
  Conn Bufpool Drops     : 0          Invalid MSS Drops      : 0
  User clear Drops       : 0          Unexp. Data Rcvd       : 0
  Server Reuse           : 0          Conn init failures     : 0
  SYN Timeout            : 1081918  Age Timeout            : 0
  Reass Timeout          : 0          FinWait2 Timeout       : 0
  Rexmit Timeout         : 0          Persist Timeout        : 0
  RST Closed             : 0          ACK Closed             : 0
  NOSYN Closed           : 0          MSS                    : 0
  Conn Pool Fails        : 0          No Buffers             : 0

Debug Statistics :
  Unaccounted Buffers    : 0          Invalid Conns          : 0
  Output Failures        : 0          Header Bufpool Fails  : 0
  MAC channel Fails      : 0          DM Channel Fails      : 0
  Invalid App Opcodes    : 0          MAC Bufpool Fails     : 0
  MAC BufDesc Fails      : 0          Recycle Conn Fails    : 0
  DM chan congested     : 0          MAC chan congested    : 0
  Connid_alloc Deallocs  : 0          Connid_alloc Failures : 0
  Connid_free Bad_Connid: 0          Connid_free Dups      : 0
  AppConnEntry GC Frees  : 0          RST rcvd in SYN state: 0
  RST rcvd in EST state  : 1150     RST rcvd in FW1 state: 3
  RST rcvd in FW2 state  : 0          RST rcvd in CWT state: 57

```

```

RST rcvd in CLG state : 0           RST rcvd in LCK state: 57
Lcte Free Pool Count  : 262144     AppConn Free Pool Cnt: 65536

```

This example shows how to display the PKI statistics:

```

ssl-proxy# show ssl-proxy stats pki
Authentication request timeout: 180 seconds
Max in process: 50 (requests)
Max queued before dropping: 500 (requests)
Certificate Authentication & Authorization Statistics:
  Requests started: 0
  Requests finished: 0
  Requests pending to be processed: 0
  Requests waiting for CRL: 0
  Signature only requests: 0
  Valid certificates: 0
  Certificate date out of range: 0
  Total number of invalid certificates: 0
  Approved with warning (no crl check): 0
  Number of times polling CRL: 0
  Failed to get CRL: 0
  Not authorized (e.g. denied by ACL): 0
  Root certificates not self-signed: 0
  Verify requests failed (e.g. CRL operation failed): 0
  Number of times polling OCSP: 0
  OCSP invalid response date: 0
  Unknown failure: 0
  Empty certificate chain: 0
  No memory to process requests: 0
  DER encoded certificates missing: 0
  Bad DER certificate length: 0
  Failed to get key from certificate: 0
  Issuer CA not in trusted CA pool: 0
  Issuer CA certificates not valid yet: 0
  Expired issuer CA certificates: 0
  Peer certificates not valid yet: 0
  Expired peer certificates: 0
  Peer certificates revoked: 0
  Auth failures logged      : 0
  Auth failures allowed    : 0
  Revoked certs allowed    : 0
  Internal buffer overflow: 0
Peer certificate cache size: 0 (entries), aging timeout: 15 (minutes)
Peer certificate cache statistics:
  In use: 0 (entries)
  Cache hit: 0
  Cache miss: 0
  Cache allocated: 0
  Cache freed: 0
  Cache entries expired: 0
  Cache error: 0
  Cache full (wrapped around): 0
  No memory for caching: 0
Certificate Expiration Warning statistics:
  Proxy service certificates expiring: 0
  CA certificates expiring: 0
  CA pool certificates expiring: 0
  Proxy service certificates expiring SNMP traps sent: 0
Certificate headers statistics:
  Certificate headers formed: 0
  Errors in forming headers: 0
  Prefix error: 0
Key Certificate Table Current Usage (cannot be cleared):
  Total number of entries in table: 8192

```

```

Entries in use: 5
Free entries: 8187
Complete service entries: 2
Incomplete new/renew service entries: 0
Retiring service entries: 0
Obsolete service entries: 0
Complete intermediate CA cert: 2
Complete root CA cert: 1
Obsolete intermediate CA cert: 0
Obsolete root CA cert: 0
PKI Accumulative Counters (cannot be cleared):
Proxy service trustpoint added: 2
Proxy service trustpoint deleted: 0
Proxy service trustpoint modified: 0
Keypair added: 2
Keypair deleted: 0
Wrong key type: 0
Service certificate added: 2
Service certificate deleted: 0
Service certificate rolled over: 0
Service certificate completed: 2
Intermediate CA certificate added: 2
Intermediate CA certificate deleted: 0
Root CA certificate added: 1
Root CA certificate deleted: 0
Certificate overwritten: 0
No free table entries: 0
Rollover failed: 0
Certificate History Statistics (cannot be cleared):
History records written: 0
History records deleted: 0
History records malloc: 0
History records free: 0
History records errors: 0
History records currently kept in memory: 0
History records have been cleared: 0 times
PKI IPC Counters for normal priority messages:
Request buffer sent: 0
Request buffer received: 0
Request duplicated: 0
Request send failed: 0
Response buffer sent: 0
Response buffer received: 0
Response timeout: 0
Response failed: 0
Response with error reported by SSL Processor: 0
Response with no request: 0
Response duplicated: 0
Message type error: 0
Message length error: 0
PKI IPC Counters for high priority messages:
Request buffer sent: 1455695939
Request buffer received: 0
Request duplicated: 0
Request send failed: 0
Response buffer sent: 0
Response buffer received: 1455695938
Response timeout: 0
Response failed: 0
Response with error reported by SSL Processor: 0
Response with no request: 0
Response duplicated: 0
Message type error: 0
Message length error: 0

```

```

PKI Memory Usage Counters:
  Malloc count: 2911392424
  Free count: 2911392363
  Malloc failed: 0
  High Priority IPC:
  Ipc alloc count: 2911391878
  Ipc free count: 72120518
  Ipc alloc failed: 0
  Normal Priority IPC:
  Ipc alloc count: 0
  Ipc free count: 0
  Ipc alloc failed: 0
Ephemeral Key Generation Statistics:
  512 bit ephemeral keys : 14
  1024 bit ephemeral keys: 14
ssl-proxy#

```

This example shows how to display FDU statistics:

```

ssl-proxy# show ssl-proxy stats fdu
FDU Statistics:
  IP Reass in progress: 0          Frag Svc full Drops : 0
  IPFlow create Drops : 0          TTL expired Drops   : 0
  IP Frag Drops       : 0          Frag reass complete : 0
  Frag nodes freed    : 0          IP Version Drops    : 0
  IP Addr Discards    : 0          Serv_Id Drops       : 4266052
  Conn Id Drops       : 0          Bound Conn Drops    : 0
  Vlan Id Drops       : 0          TCP HW Checksum     : 4179625097
  TCP SW Checksum     : 0          TCP Checksum Drops  : 0
  Hash Full Drops     : 0          Hash Alloc Fails    : 0
  Flow Creates        : 28830314   Flow Deletes        : 28830314
  Conn Id allocs      : 14415157   Conn Id deallocs    : 14415157
  Tagged Pkts Drops   : 0          Non-Tagg Pkts Drops : 0
  Add ipcs            : 3          Delete ipcs         : 0
  Disable ipcs        : 0          Enable ipcs         : 0
  Unsolicited ipcs    : 0          Duplicate Add ipcs  : 0
  IOS Broadcast Pkts  : 5331232    IOS Unicast Pkts    : 3937
  IOS Multicast Pkts  : 0          IOS Total Pkts      : 5335169
  IOS Congest Drops   : 0          SYN Discards        : 7400
  UDP datagrams Rcvd  : 0          UDP datagrams Sent  : 0
  UDP HW Checksum     : 0          UDP SW Checksum     : 0
  UDP Flow Misses     : 0          UDP Length Errors   : 0
  TCP 5-tuple reuse   : 0          FDU Reset Drops     : 0

FDU Debug Counters:
  Inv. Conn Drops     : 0          Inv. Conn Pkt Drops : 0
  Inv. UDP Pkt Drops  : 0          Inv. TCP opcodes    : 0
  UDP Broadcast Drops : 0

```

This example shows how to display the HTTP header insertion statistics:

```

ssl-proxy# show ssl-proxy stats hdr
Header Insert Statistics:
  Session Headers Inserted : 0          Custom Headers Inserted : 0
  Session Id's Inserted    : 10149105   Client Cert. Inserted   : 0
  Client IP/Port Inserted  : 0          PEM Cert. Inserted      : 0
  Aliased Hdrs Inserted    : 0          Request boundry found   : 10149105
  Content Length Headers   : 0          Chunked Headers         : 0
  Content Length Splt Bufs : 0          Content Length Read Errs: 0
  Buffers allocated        : 0          Buffers Scanned         : 16031859
  Insertion Points Found   : 10149105   Hdrs Spanning Records   : 5882754
  End of Header Found      : 10149105   Buffers Accumulated     : 16031859
  Multi-buffer IP Port     : 0          Multi-buffer Session Id : 0

```

## show ssl-proxy stats

```

Multi-buffer Session Hdr : 0           Multi-buffer Custom Hdr : 0
HTTP Struct Allocs      : 14415156    HTTP Struct Frees       : 14415156
No End of Hdr Detected  : 0           Payload no HTTP header  : 0
Desc Alloc Failed       : 0           Buffer Alloc Failed      : 0
Client Cert Errors      : 10149105     Malloc failed           : 0
Service Errors          : 0           Conn Entry Invalid      : 0
Scan Internal Error     : 0           Database Not Initialized: 0
Unsupported headers     : 0           Client Cert. Insrt Basic: 0
Missing Subject Name Errs: 0         Chunk Parse Errors      : 0
Http headers removed    : 0           Http header removal errs: 0

```

This example shows how to display context statistics:

```

ssl-proxy# show ssl-proxy stats context
Context name : Def
TCP Context Statistics
=====
Current conns ACTIVE           : 0
Num conns DROPPED (hit max limit) : 0
Maximum conns ESTABLISHED      : 0

Context name : Default
TCP Context Statistics
=====
Current conns ACTIVE           : 0
Num conns DROPPED (hit max limit) : 0
Maximum conns ESTABLISHED      : 1150

```

This example shows how to display the URL rewrite statistics:

```

ssl-proxy# show ssl-proxy stats url
URL Rewrite Statistics:
Rewrites Succeeded   : 0           Rewrites Failed        : 0
Rsp Scan Incomplete : 0           URL Scan Incomplete    : 0
Invalid Conn Entry   : 0           URL Mismatch           : 0
URL Object Error     : 0           Dbase not initialized: 0
3xx URL Not Rewritten: 0           Scan Internal Error    : 0
Scan Dbase not Init. : 0           Slash Delim not found: 0

```

This example shows how to display content statistics:

```

ssl-proxy# show ssl-proxy stats content
Scan object statistics in CPU: SSL1
Objects in use       : 0
Obj alloc failures   : 0
Max obj in use       : 73

```



# show ssl-proxy status

To display information about the SSL Services Module proxy status, use the **show ssl-proxy status** command.

**show ssl-proxy status** [**fdu** | **ssl** | **tcp**]

Syntax Description	fdu	(Optional) Displays the FDU status.
	ssl	(Optional) Displays the SSL status.
	tcp	(Optional) Displays the TCP status.

**Defaults** This command has no default settings.

**Command Modes** EXEC

Command History	Release	Modification
	Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
	SSL Services Module Release 1.2(1)	The output of the <b>show ssl-proxy status</b> command was changed to include statistics that are displayed at a 5-second, 1-minute, and 5-minute traffic rate for CPU utilization.
	SSL Services Module Release 3.1(1)	This command was changed to add the following keywords: <ul style="list-style-type: none"> <li>• <b>fdu</b></li> <li>• <b>ssl</b></li> <li>• <b>tcp</b></li> </ul>

**Examples** This example shows how to display the status of the SSL Services Module:

```
ssl-proxy# show ssl-proxy status
FDU cpu is alive!
FDU cpu utilization:
  % process util      : 0                % interrupt util : 0

  proc cycles : 0x2DB3980C                int cycles  : 0x2ADACD71
  total cycles: 0x4E75127FCEA4
  % process util (5 sec) : 0                % interrupt util (5 sec) : 0
  % process util (1 min) : 0                % interrupt util (1 min) : 0
  % process util (5 min) : 0                % interrupt util (5 min) : 0
```

## ■ show ssl-proxy status

```

TCP cpu is alive!
TCP cpu utilization:
  % process util    : 0                % interrupt util : 0

  proc cycles : 0x2E42C686             int cycles  : 0x47F7C36A91
  total cycles: 0x4E799DB3F5F8
  % process util (5 sec) : 0            % interrupt util (5 sec) : 0
  % process util (1 min) : 0            % interrupt util (1 min) : 0
  % process util (5 min) : 0            % interrupt util (5 min) : 0

SSL cpu is alive!
SSL cpu utilization:
  % process util    : 0                % interrupt util : 0

  proc cycles : 0x9E396A4              int cycles  : 0xDB85C98B
  total cycles: 0x4E798224EDC1
  % process util (5 sec) : 0            % interrupt util (5 sec) : 0
  % process util (1 min) : 0            % interrupt util (1 min) : 0
  % process util (5 min) : 0            % interrupt util (5 min) : 0

```

This example shows how to display the status of the TCP CPU on the SSL Services Module:

```

ssl-proxy# show ssl-proxy status tcp
TCP cpu is alive!
TCP cpu utilization:
  % process util    : 0                % interrupt util : 0

  proc cycles : 0x2E45DAEE             int cycles  : 0x47FC7C2AC5
  total cycles: 0x4E7EC4499DC8
  % process util (5 sec) : 0            % interrupt util (5 sec) : 0
  % process util (1 min) : 0            % interrupt util (1 min) : 0
  % process util (5 min) : 0            % interrupt util (5 min) : 0

```

# show ssl-proxy version

To display the current image version, use the **show ssl-proxy version** command.

**show ssl-proxy version**

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

**Defaults** This command has no default settings.

**Command Modes** EXEC

Command History	Release	Modification
	Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.

**Examples** This example shows how to display the image version that is currently running on the SSL Services Module:

```
ssl-proxy# show ssl-proxy version
Cisco IOS Software, SVCSSL Software (SVCSSL-K9Y9-M)
Copyright (c) 1986-2006 by Cisco Systems, Inc.
Compiled Mon 09-Jan-06 16:54 by integ

ROM: System Bootstrap, Version 12.2(11)YS1 RELEASE SOFTWARE

ssl-proxy uptime is 1 day, 15 hours, 57 minutes
System returned to ROM by power-on
System image file is "tftp://10.1.1.1/unknown"
AP Version 3.1(1)

ssl-proxy#
```

# show ssl-proxy vlan

To display VLAN information, use the **show ssl-proxy vlan** command.

```
show ssl-proxy vlan [vlan-id][debug][module module]
```

Syntax Description	
<i>vlan-id</i>	(Optional) VLAN ID. Displays information for a specific VLAN; valid values are from 1 to 1005.
<b>debug</b>	(Optional) Displays debug information.
<b>module module</b>	(Optional) Displays statistics for the specified module; module type includes the following: <ul style="list-style-type: none"> <li>• <b>all</b>—all CPUs</li> <li>• <b>fd</b>—FDU CPU</li> <li>• <b>ssl1</b>—SSL1 CPU</li> <li>• <b>tcp1</b>—TCP1 CPU</li> </ul>

**Defaults** This command has no default settings.

**Command Modes** EXEC

Command History	Release	Modification
	Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
	SSL Services Module Release 3.1(1)	This command was changed to add the <b>module module</b> keyword.

**Examples** This example shows how to display all the VLANs that are configured on the SSL Services Module:

```
ssl-proxy# show ssl-proxy vlan
VLAN index 2:
  Associated with interface SSL-Proxy0.2 (UP)
  IP addr 207.10.0.16 NetMask 255.0.0.0
VLAN index 3:
  Associated with interface SSL-Proxy0.3 (UP)
  IP addr 208.10.0.16 NetMask 255.0.0.0
VLAN index 4:
  Associated with interface SSL-Proxy0.4 (UP)
  IP addr 209.10.0.16 NetMask 255.0.0.0
ssl-proxy#
```

**Related Commands** [interface ssl-proxy](#)

# snmp-server enable

To configure the SNMP traps and informs, use the **snmp-server enable** command. Use the **no** form of this command to disable SNMP traps and informs.

```
snmp-server enable {informs | traps {ipsec | isakmp | snmp | {ssl-proxy [cert-expiring]
[oper-status]}}
```

```
no snmp-server enable {informs | traps {ipsec | isakmp | snmp | {ssl-proxy [cert-expiring]
[oper-status]}}
```

Syntax Description		
<b>informs</b>		Enables SNMP informs.
<b>traps</b>		Enables SNMP traps.
<b>ipsec</b>		Enables IPsec traps.
<b>isakmp</b>		Enables ISAKMP traps.
<b>snmp</b>		Enables SNMP traps.
<b>ssl-proxy</b>		Enables SNMP SSL proxy notification traps.
<b>cert-expiring</b>		(Optional) Enables SSL proxy certificate-expiring notification traps.
<b>oper-status</b>		(Optional) Enables SSL proxy operation-status notification traps.

**Defaults** This command has no default setting.

**Command Modes** Global configuration

Command History	Release	Modification
	SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series SSL Services Module.

**Examples** This example shows how to enable SNMP informs:

```
ssl-proxy (config)# snmp-server enable informs
ssl-proxy (config)#
```

This example shows how to enable SSL-proxy traps:

```
ssl-proxy (config)# snmp-server enable traps ssl-proxy
ssl-proxy (config)#
```

This example shows how to enable SSL-proxy notification traps:

```
ssl-proxy (config)# snmp-server enable traps ssl-proxy cert-expiring oper-status
ssl-proxy (config)#
```

## ssl pre-remove-http-hdr

To remove existing headers prior to inserting a new header, use the **ssl pre-remove-http-hdr** command. Use the **no** form of this command to ignore headers before insertion.

**ssl pre-remove-http-hdr**

**no ssl pre-remove-http-hdr**

---

### Defaults

The default behavior for this command is to ignore the existing headers before inserting a new header.

---

### Command Modes

Global configuration

---

### Command History

Release	Modification
SSL Services Module Release 3.1(5)	Support for this command was introduced on the Catalyst 6500 series switches.

---

### Usage Guidelines

This command requests that the SSLM search HTTP messages for all http headers that the SSLM can insert except for custom headers. If any headers are found, they are removed. The command does not search for header prefixes or aliases. This command might impact SSLM performance based on the number of headers present.

---

### Examples

This example shows how to remove existing headers:

```
ssl-proxy (config)# policy http-header example
ssl-proxy (config)# pre-remove-http-hdr
!
```

## ssl-proxy context

To enter the SSL context submode and define the virtual SSL context, use the **ssl-proxy context** command. Use the **no** form of this command to remove any commands that you have entered in the SSL context subcommand mode from the configuration.

**ssl-proxy context** *[name]*

**no ssl-proxy context** *name*

<b>Syntax Description</b>	<i>name</i>	Name of the context.
---------------------------	-------------	----------------------

<b>Defaults</b>	The default context name is “Default.”
-----------------	--

<b>Command Modes</b>	Global configuration
----------------------	----------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	SSL Services Module Release 3.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.

<b>Usage Guidelines</b>	<p>The <i>name</i> argument is case sensitive.</p> <p>After you enter the <b>ssl-proxy context</b> command, the prompt changes to the following:</p> <pre>ssl-proxy(config-context)#</pre> <p>After you enter the context submode, you can use the context submode commands listed in <a href="#">Table 2-12</a> to configure the context services.</p>
-------------------------	---

**Table 2-12 Context Submode Commands**

<b>Command</b>	<b>Purpose and Guidelines</b>	<b>Defaults</b>
<b>default</b>	Set a command to its defaults	
<b>description</b> <i>description</i>	(Optional) Allows you to enter a short description for this context.	
<b>exit</b>	Exit from context configuration mode.	
<b>maxconns</b> <i>connections</i>	(Optional) Configures the maximum number of connections for this context. Valid values are from 1 to 65536.	65536
<b>natpool</b> <i>name start_ip_addr end_ip_addr netmask netmask</i>	Configures the NAT pool settings. See the “ <a href="#">natpool</a> ” section on page 2-35.	
<b>policy health-probe tcp</b> <i>policy-name</i>	Configures the TCP health probe policy. See the “ <a href="#">policy health-probe tcp</a> ” section on page 2-36.	

Table 2-12 Context Submode Commands (continued)

Command	Purpose and Guidelines	Defaults
<b>policy http-header</b> <i>policy-name</i>	Configures the HTTP header insertion policy. See the “ <a href="#">policy http-header</a> ” section on page 2-39.	
<b>policy ssl</b> <i>policy-name</i>	Configures the SSL policy. See the “ <a href="#">policy ssl</a> ” section on page 2-45.	
<b>policy tcp</b> <i>policy-name</i>	Configures the TCP policy. See the “ <a href="#">policy tcp</a> ” section on page 2-51.	
<b>policy url-rewrite</b> <i>policy-name</i>	Configures the URL rewrite policy. See the “ <a href="#">policy url-rewrite</a> ” section on page 2-55.	
<b>pool ca</b> <i>name</i>	Configures a pool of resources. See the “ <a href="#">pool ca</a> ” section on page 2-57.	
<b>service</b> <i>service_name</i>	Enters SSL proxy service subcommand mode and lets you configure the SSL client or server proxy service. See the “ <a href="#">service</a> ” section on page 2-58 for information about SSL proxy services.	
<b>vrf-name</b> <i>name</i>	Configures the VRF associated with this context.	

**Examples**

This example shows how to configure the context “hubble”:

```

ssl-proxy# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
ssl-proxy(config)# ssl-proxy context hubble
ssl-proxy(config-context)# vrf-name hubble
ssl-proxy(config-context)# service hubble
ssl-proxy(config-ctx-ssl-proxy)# virtual ipaddr 3.100.100.108 protocol tcp port 443
ssl-proxy(config-ctx-ssl-proxy)# server ipaddr 5.100.100.41 protocol tcp port 80
ssl-proxy(config-ctx-ssl-proxy)# certificate rsa general-purpose trustpoint shuttle
ssl-proxy(config-ctx-ssl-proxy)# nat client hubble
ssl-proxy(config-ctx-ssl-proxy)# inservice
ssl-proxy(config-ctx-ssl-proxy)# exit
ssl-proxy(config-context)# natpool hubble 5.100.100.20 5.100.100.27 netmask 255.255.255.0
ssl-proxy(config-context)# policy health-probe tcp probe1
ssl-proxy(config-ctx-tcp-probe)# port 80
ssl-proxy(config-ctx-tcp-probe)# exit
ssl-proxy(config-context)#
ssl-proxy(config-context)# description Example context
ssl-proxy(config-context)# end
ssl-proxy#

```



# ssl-proxy crypto selftest

To initiate a cryptographic self-test, use the **ssl-proxy crypto selftest** command. Use the **no** form of this command to disable the testing.

```
ssl-proxy crypto selftest [time-interval seconds]
```

```
no ssl-proxy crypto selftest
```

## Syntax Description

**time-interval** (Optional) Sets the time interval between test cases; valid values are from *seconds* 1 to 8 seconds.

## Defaults

3 seconds

## Command Modes

Global configuration

## Command History

Release	Modification
Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.

## Usage Guidelines

The **ssl-proxy crypto selftest** command enables a set of crypto algorithm tests to be run on the SSL processor in the background. Random number generation, hashing, encryption and decryption, and MAC generation are tested with a time interval between test cases.

This test is run only for troubleshooting purposes. Running this test will impact run-time performance.

To display the results of the self-test, enter the **show ssl-proxy stats crypto** command.

## Examples

This example shows how to start a cryptographic self-test:

```
ssl-proxy (config)# ssl-proxy crypto selftest
ssl-proxy (config)#
```

# ssl-proxy device-check

To check the health of the crypto device, use the **ssl-proxy device-check** command.

**ssl-proxy device-check interval** *milliseconds* **reset-limit** *number*

Syntax Description	interval	Device check interval in milliseconds. The range is from 10 to 60000.
	<i>milliseconds</i>	0 = device check disabled.
reset-limit	number	Number of consecutive resets before rebooting. The range is from 0 to 60.
		0 = unlimited.

**Defaults** The device check is disabled.

**Command Modes** Global configuration

Command History	Release	Modification
	SSL Services Module Release 3.1(5)	Support for this command was introduced on the Catalyst 6500 series switches.

**Usage Guidelines** This command is normally disabled (device check interval is 0). If the command is enabled, the SSLM checks the crypto device at every interval for proper operation. If there are outstanding requests older than the request interval, the crypto device is reset to return to operational status. A reset limit can also be configured. If the reset limit is set to default (zero), there is no limit. If the reset limit is non zero, the SSLM reboots if the device is reset for more than the reset-limit number of consecutive poll intervals.

**Examples** This example shows how to set the device-check interval to 20 milliseconds, and reset-limit to 0:

```
ssl-proxy (config)# ssl-proxy device-check interval 20 reset-limit 0
```

This example shows how to check the number of resets that have occurred using the **show ssl-proxy stats ssl** command. Note the 'device reset count' in the output.

```
ssl-proxy# show ssl-proxy stats ssl
SSL Queue Sizes:
  bcm_cmd_ctx_pool_size      : 64          bcm_asym_cmd_ctx_pool_sz: 9000
  bcm_info_pool_size         : 65538       buf_desc_free_q_size    : 94710
  cert_result_free_q_size    : 11048     delete_conn_q_size      : 0
  event_q_size                : 0           free_conn_q_size        : 65536
  free_sess_q_size           : 262144      free_sess_active_tmr_qsz: 0
  global_pending_q_size      : 0           to_app_ctx_pool_size    : 512
  ste_asym_req_q_size        : 0           ste_free_req_ctx_pool_sz: 20480
  ste_sym_req_q_size         : 0           available ctx count     : 64
  ctx cleanup count          : 0           device reset count      : 0
```

# ssl-proxy disable-eth-pad

To disable the padding of Ethernet payload to even length, use the **ssl-proxy disable-eth-pad** command.

**ssl-proxy disable-eth-pad**

---

**Defaults** Ethernet payload padding is enabled by default.

---

**Command Modes** Global configuration

---

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	SSL Services Module Release 3.1(5)	Support for this command was introduced on the Catalyst 6500 series switches.

---

---

**Usage Guidelines** When enabled, this command instructs the SSLM not to pad odd-length Ethernet payloads by one byte.

# ssl-proxy mac address

To configure a MAC address, use the **ssl-proxy mac address** command.

**ssl-proxy mac address** *mac-addr*

<b>Syntax Description</b>	<i>mac-addr</i>	MAC address; see the “Usage Guidelines” section for additional information.
---------------------------	-----------------	---

**Defaults** This command has no default settings.

**Command Modes** Global configuration

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.

**Usage Guidelines** Enter the MAC address in this format: H.H.H.

**Examples** This example shows how to configure a MAC address:

```
ssl-proxy (config)# ssl-proxy mac address 00e0.b0ff.f232
ssl-proxy (config)#
```

**Related Commands** [show ssl-proxy mac address](#)

# ssl-proxy pki

To configure and define the PKI implementation on the SSL Services Module, use the **ssl-proxy pki** command. Use the **no** form of this command to disable the logging and clear the memory.

```
ssl-proxy pki {{authenticate {timeout seconds}} | {cache {{size entries} | {timeout minutes}}}}
| {certificate {check-expiring {interval hours}} | history}
```

```
no ssl-proxy pki {authenticate | cache | certificate | history}
```

## Syntax Description

<b>authenticate</b>	Configures the certificate authentication and authorization.
<b>timeout seconds</b>	Specifies the timeout in seconds for each request; valid values are from 1 to 600 seconds.
<b>cache</b>	Configures the peer-certificate cache.
<b>size entries</b>	Specifies the maximum number of cache entries; valid values are from 0 to 5000 entries.
<b>timeout minutes</b>	Specifies the aging timeout value of entries; valid values are from 1 to 600 minutes.
<b>certificate</b>	Configures the check-expiring interval.
<b>check-expiring interval hours</b>	Specifies the check-expiring interval; valid values are from 0 to 720 hours.
<b>history</b>	Key and certificate history.

## Defaults

The default settings are as follows:

- **timeout seconds**—**180** seconds
- **size entries**—**0** entries
- **timeout minutes**—**15** minutes
- **interval hours**—**0** hours, do not check

## Command Modes

Global configuration

## Command History

Release	Modification
Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 2.1(1)	This command was changed to add the following keywords: <ul style="list-style-type: none"> <li>• <b>authenticate</b></li> <li>• <b>cache</b></li> <li>• <b>certificate</b></li> </ul>

---

**Usage Guidelines**

The **ssl-proxy pki history** command enables logging of certificate history records per-proxy service into memory and generates a syslog message per record. Each record tracks the addition or deletion of a key pair or certificate into the proxy services key and the certificate table.

When the index of the table changes, this command logs the following information:

- Key pair name
- Trustpoint label
- Service name
- Subject name
- Serial number of the certificate

Up to 512 records can be stored in the memory at one time.

---

**Examples**

This example shows how to specify the timeout in seconds for each request:

```
ssl-proxy (config)# ssl-proxy pki authenticate timeout 200  
ssl-proxy (config)#
```

This example shows how to specify the cache size:

```
ssl-proxy (config)# ssl-proxy pki cache size 50  
ssl-proxy (config)#
```

This example shows how to specify the aging timeout value of entries:

```
ssl-proxy (config)# ssl-proxy pki cache timeout 20  
ssl-proxy (config)#
```

This example shows how to specify the check-expiring interval:

```
ssl-proxy (config)# ssl-proxy pki certificate check-expiring interval 100  
ssl-proxy (config)#
```

This example shows how to enable PKI event-history:

```
ssl-proxy (config)# ssl-proxy pki history  
ssl-proxy (config)#
```

---

**Related Commands**

[show ssl-proxy stats](#)

## ssl-proxy crypto key unlock rsa

To unlock the key automatically after a reload, use the **ssl-proxy crypto key unlock rsa** command.

```
ssl-proxy crypto key unlock rsa key-name passphrase passphrase
```

Syntax Description		
	<i>key-name</i>	Name of the key.
	<i>passphrase</i>	Pass phrase.

**Defaults** This command has no default settings.

**Command Modes** Global configuration

Command History	Release	Modification
	SSL Services Module Release 3.1(1)	Support for this command was introduced on the Catalyst 6500 series SSL Services Module.

**Examples** This example shows how to unlock the keys automatically after a reload:

```
ssl-proxy(config)# ssl-proxy crypto key unlock rsa pki1-72a.cisco.com passphrase cisco1234
ssl-proxy(config)#
```

## ssl-proxy ip-frag-ttl

To adjust the IP fragment reassembly timer, use the **ssl-proxy ip-frag-ttl** command.

**ssl-proxy ip-frag-ttl** *time*

<b>Syntax Description</b>	<i>time</i>	(Optional) Adjust the IP fragment reassembly timer; valid values are from 3 to 120 seconds.
---------------------------	-------------	---

<b>Defaults</b>	<i>time</i> is 6 seconds.
-----------------	---------------------------

<b>Command Modes</b>	Global configuration
----------------------	----------------------

Command History	Release	Modification
	SSL Services Module Release 3.1(1)	Support for this command was introduced on the Catalyst 6500 series SSL Services Module.

<b>Examples</b>	This example shows how to configure the IP reassembly timeout to 60 seconds:
-----------------	--

```
ssl-proxy(config)# ssl-proxy ip-frag-ttl 60
ssl-proxy(config)#
```



# ssl-proxy ssl ratelimit

To prohibit new connections during overload conditions, use the **ssl-proxy ssl ratelimit** command. Use the **no** form of this command to allow new connections if memory is available.

**ssl-proxy ssl ratelimit**

**no ssl-proxy ssl ratelimit**

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

**Defaults** This command has no default settings.

**Command Modes** Global configuration

Command History	Release	Modification
	Cisco IOS Release 12.1(13)E and SSL Services Module Release 1.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.

**Examples** This example shows how to prohibit new connections during overload conditions:

```
ssl-proxy (config)# ssl-proxy ssl ratelimit
ssl-proxy (config)#
```

This example shows how to allow new connections during overload conditions if memory is available:

```
ssl-proxy (config)# no ssl-proxy ssl ratelimit
ssl-proxy (config)#
```

# standby authentication

To configure an authentication string for HSRP, use the **standby authentication** command. Use the **no** form of this command to delete an authentication string.

**standby** [*group-number*] **authentication text** *string*

**no standby** [*group-number*] **authentication text** *string*

## Syntax Description

<i>group-number</i>	(Optional) Group number on the interface to which this authentication string applies. Valid values are from 0 to 255 for HSRP version 1; valid values are from 0 to 4095 for HSRP version 2. See the “ <a href="#">standby version</a> ” section on <a href="#">page 2-132</a> for information about changing the HSRP version.
<b>text</b> <i>string</i>	Specifies the authentication string, which can be up to eight characters.

## Defaults

The defaults are as follows:

- *group-number* is **0**.
- *string* is **cisco**.

## Command Modes

Subinterface configuration submode

## Command History

Release	Modification
SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The command mode for this command was changed from Proxy-VLAN to Subinterface.

## Usage Guidelines

HSRP ignores unauthenticated HSRP messages.

The authentication string is sent unencrypted in all HSRP messages. You must configure the same authentication string on all routers and access servers on a cable to ensure interoperability. Authentication mismatch prevents a device from learning the designated hot standby IP address and the hot standby timer values from the other routers that are configured with HSRP.

When you use group number 0, no group number is written to NVRAM, providing backward compatibility.

## Examples

This example shows how to configure “word” as the authentication string to allow hot standby routers in group 1 to interoperate:

```
ssl-proxy (config-subif)# standby 1 authentication text word
ssl-proxy (config-subif)#
```

# standby delay minimum reload

To configure a delay before the HSRP groups are initialized, use the **standby delay minimum reload** command. Use the **no** form of this command to disable the delay.

**standby delay minimum** [*min-delay*] **reload** [*reload-delay*]

**no standby delay minimum** [*min-delay*] **reload** [*reload-delay*]

## Syntax Description

<i>min-delay</i>	(Optional) Minimum time (in seconds) to delay HSRP group initialization after an interface comes up; valid values are from 0 to 10000 seconds.
<i>reload-delay</i>	(Optional) Time (in seconds) to delay after the router has reloaded; valid values are from 0 to 10000 seconds.

## Defaults

The defaults are as follows:

- *min-delay* is **1** second.
- *reload-delay* is **5** seconds.

## Command Modes

Subinterface configuration submode

## Command History

Release	Modification
SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The command mode for this command was changed from Proxy-VLAN to Subinterface.

## Usage Guidelines

The *min-delay* applies to all subsequent interface events.

The *reload-delay* applies only to the first interface-up event after the router has reloaded.

If the active router fails or you remove it from the network, the standby router automatically becomes the new active router. If the former active router comes back online, you can control whether it takes over as the active router by using the **standby preempt** command.

However, in some cases, even if you do not use the **standby preempt** command, the former active router resumes the active role after it reloads and comes back online. Use the **standby delay minimum reload** command to set a delay for HSRP group initialization. This command allows time for the packets to get through before the router resumes the active role.

We recommend that you use the **standby delay minimum reload** command if the **standby timers** command is configured in milliseconds or if HSRP is configured on a VLAN interface of a switch.

In most configurations, the default values provide sufficient time for the packets to get through and configuring longer delay values is not necessary.

The delay is canceled if an HSRP packet is received on an interface.

---

**Examples**

This example shows how to set the minimum delay to 30 seconds and the delay after the first reload to 120 seconds:

```
ssl-proxy(config)# interface ssl-proxy 0.100
ssl-proxy (config-subif)# standby delay minimum 30 reload 120
ssl-proxy (config-subif)#
```

---

**Related Commands**

**show standby delay**  
**standby preempt**  
**standby timers**

# standby ip

To activate HSRP, use the **standby ip** command. Use the **no** form of this command to disable HSRP.

```
standby [group-number] ip [ip-address [secondary]]
```

```
no standby [group-number] ip [ip-address]
```

## Syntax Description

<i>group-number</i>	(Optional) Group number on the interface for which HSRP is being activated.
<i>ip-address</i>	(Optional) IP address of the hot standby router interface.
<b>secondary</b>	(Optional) Indicates the IP address is a secondary hot standby router interface.

## Defaults

The defaults are as follows:

- *group-number* is 0.
- HSRP is disabled by default.

## Command Modes

Subinterface configuration submode

## Command History

Release	Modification
SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The command mode for this command was changed from Proxy-VLAN to Subinterface.

## Usage Guidelines

The **standby ip** command allows you to configure primary and secondary HSRP addresses.

The **standby ip** command activates HSRP on the configured interface. If you specify an IP address, that address is used as the designated address for the hot standby group. If you do not specify an IP address, the designated address is learned through the standby function. So that HSRP can elect a designated router, at least one router on the cable must have been configured with, or have learned, the designated address. Configuring the designated address on the active router always overrides a designated address that is currently in use.

When you enable the **standby ip** command on an interface, the handling of proxy ARP requests is changed (unless proxy ARP was disabled). If the hot standby state of the interface is active, proxy ARP requests are answered using the MAC address of the hot standby group. If the interface is in a different state, proxy ARP responses are suppressed.

When you use group number 0, no group number is written to NVRAM, providing backward compatibility.

---

**Examples**

This example shows how to activate HSRP for group 1 on Ethernet interface 0. The IP address that is used by the hot standby group is learned using HSRP.

```
ssl-proxy (config-subif)# standby 1 ip  
ssl-proxy (config-subif)#
```

This example shows how to indicate that the IP address is a secondary hot standby router interface:

```
ssl-proxy (config-subif)# standby ip 1.1.1.254  
ssl-proxy (config-subif)# standby ip 1.2.2.254 secondary  
ssl-proxy (config-subif)# standby ip 1.3.3.254 secondary
```

# standby mac-address

To specify a virtual MAC address for HSRP, use the **standby mac-address** command. Use the **no** form of this command to revert to the standard virtual MAC address (0000.0C07.ACxy).

**standby** [*group-number*] **mac-address** *mac-address*

**no standby** [*group-number*] **mac-address**

## Syntax Description

<i>group-number</i>	(Optional) Group number on the interface for which HSRP is being activated. The default is 0.
<i>mac-address</i>	MAC address.

## Defaults

If this command is not configured, and the **standby use-bia** command is not configured, the standard virtual MAC address is used: 0000.0C07.ACxy, where xy is the group number in hexadecimal. This address is specified in RFC 2281, *Cisco Hot Standby Router Protocol (HSRP)*.

## Command Modes

Subinterface configuration submode

## Command History

Release	Modification
SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The command mode for this command was changed from Proxy-VLAN to Subinterface.

## Usage Guidelines

This command cannot be used on a Token Ring interface.

You can use HSRP to help end stations locate the first-hop gateway for IP routing. The end stations are configured with a default gateway. However, HSRP can provide first-hop redundancy for other protocols. Some protocols, such as Advanced Peer-to-Peer Networking (APPN), use the MAC address to identify the first hop for routing purposes. In this case, it is often necessary to be able to specify the virtual MAC address; the virtual IP address is unimportant for these protocols. Use the **standby mac-address** command to specify the virtual MAC address.

The specified MAC address is used as the virtual MAC address when the router is active.

This command is intended for certain APPN configurations. The parallel terms are shown in [Table 2-13](#).

**Table 2-13 Parallel Terms Between APPN and IP**

APPN	IP
End node	Host
Network node	Router or gateway

In an APPN network, an end node is typically configured with the MAC address of the adjacent network node. Use the **standby mac-address** command in the routers to set the virtual MAC address to the value that is used in the end nodes.

---

**Examples**

This example shows how to configure HSRP group 1 with the virtual MAC address:

```
ssl-proxy (config-subif)# standby 1 mac-address 4000.1000.1060  
ssl-proxy (config-subif)#
```

---

**Related Commands**

**show standby**  
**standby version**



# standby mac-refresh

To change the interval at which packets are sent to refresh the MAC cache when HSRP is running over FDDI, use the **standby mac-refresh** command. Use the **no** form of this command to restore the default value.

**standby mac-refresh** *seconds*

**no standby mac-refresh**

<b>Syntax Description</b>	<i>seconds</i>	Number of seconds in the interval at which a packet is sent to refresh the MAC cache; valid values are from 1 to 255 seconds.
---------------------------	----------------	---

<b>Defaults</b>	<i>seconds</i> is <b>10</b> seconds.
-----------------	--------------------------------------

<b>Command Modes</b>	Subinterface configuration submode
----------------------	------------------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
	SSL Services Module Release 3.1(1)	The command mode for this command was changed from Proxy-VLAN to Subinterface.

**Usage Guidelines** This command applies to HSRP running over FDDI only. Packets are sent every 10 seconds to refresh the MAC cache on learning bridges or switches. By default, the MAC cache entries age out in 300 seconds (5 minutes).

All other routers participating in HSRP on the FDDI ring receive the refresh packets, although the packets are intended only for the learning bridge or switch. Use this command to change the interval. Set the interval to 0 if you want to prevent refresh packets (if you have FDDI but do not have a learning bridge or switch).

**Examples** This example shows how to change the MAC-refresh interval to 100 seconds. In this example, a learning bridge needs to miss three packets before the entry ages out.

```
ssl-proxy (config-subif)# standby mac-refresh 100
ssl-proxy (config-subif)#
```

# standby name

To configure the name of the standby group, use the **standby name** command. Use the **no** form of this command to disable the name.

**standby name** *group-name*

**no standby name** *group-name*

## Syntax Description

<i>group-name</i>	Name of the standby group.
-------------------	----------------------------

## Defaults

HSRP is disabled.

## Command Modes

Subinterface configuration submode

## Command History

Release	Modification
SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The command mode for this command was changed from Proxy-VLAN to Subinterface.

## Usage Guidelines

The *group-name* argument specifies the HSRP group.

## Examples

This example shows how to specify the standby name as SanJoseHA:

```
ssl-proxy (config-subif)# standby name SanJoseHA
ssl-proxy (config-subif)#
```

## Related Commands

**ip mobile home-agent redundancy** (refer to the *Cisco IOS Release 12.2 Command Reference*)

# standby preempt

To configure HSRP preemption and preemption delay, use the **standby preempt** command. Use the **no** form of this command to restore the default values.

```
standby [group-number] preempt [delay {minimum delay | reload delay | sync delay}]
```

```
no standby [group-number] preempt [delay {minimum delay | reload delay | sync delay}]
```

Syntax Description	
<i>group-number</i>	(Optional) Group number on the interface to which the other arguments in this command apply.
<b>delay</b>	(Optional) Required if either the <b>minimum</b> , <b>reload</b> , or <b>sync</b> keywords are specified.
<b>minimum</b> <i>delay</i>	(Optional) Specifies the minimum delay in <i>delay</i> seconds; valid values are from 0 to 3600 seconds (1 hour).
<b>reload</b> <i>delay</i>	(Optional) Specifies the preemption delay after a reload only.
<b>sync</b> <i>delay</i>	(Optional) Specifies the maximum synchronization period in <i>delay</i> seconds.

## Defaults

The defaults are as follows:

- *group-number* is 0.
- *delay* is 0 seconds; the router preempts immediately. By default, the router that comes up later becomes the standby router.

## Command Modes

Subinterface configuration submode

## Command History

Release	Modification
SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The command mode for this command was changed from Proxy-VLAN to Subinterface.

## Usage Guidelines

The *delay* argument causes the local router to postpone taking over the active role for *delay* (minimum) seconds since that router was last restarted.

When you use this command, the router is configured to preempt, which means that when the local router has a hot standby priority that is higher than the current active router, the local router should attempt to assume control as the active router. If you do not configure preemption, the local router assumes control as the active router only if it receives information indicating no router is in the active state (acting as the designated router).

When a router first comes up, it does not have a complete routing table. If you configure the router to preempt, it becomes the active router, but it cannot provide adequate routing services. You can configure a delay before the preempting router actually preempts the currently active router.

When you use group number 0, no group number is written to NVRAM, providing backward compatibility.

IP-redundancy clients can prevent preemption from taking place. The **standby preempt delay sync** *delay* command specifies a maximum number of seconds to allow IP-redundancy clients to prevent preemption. When this expires, preemption takes place regardless of the state of the IP-redundancy clients.

The **standby preempt delay reload** *delay* command allows preemption to occur only after a router reloads. This provides stabilization of the router at startup. After this initial delay at startup, the operation returns to the default behavior.

The **no standby preempt delay** command disables the preemption delay but preemption remains enabled. The **no standby preempt delay minimum** *delay* command disables the minimum delay but leaves any synchronization delay if it was configured.

---

### Examples

This example shows how to configure the router to wait for 300 seconds (5 minutes) before attempting to become the active router:

```
ssl-proxy (config-subif)# standby preempt delay minimum 300  
ssl-proxy (config-subif)#
```

# standby priority

To configure the priority for HSRP, use the **standby priority** command. Use the **no** form of this command to restore the default values.

**standby** [*group-number*] **priority** *priority*

**no standby** [*group-number*] **priority** *priority*

## Syntax Description

<i>group-number</i>	(Optional) Group number on the interface to which the other arguments in this command apply.
<i>priority</i>	Priority value that prioritizes a potential hot standby router; valid values are from 1 to 255, where 1 denotes the lowest priority and 255 denotes the highest priority.

## Defaults

The defaults are as follows:

- *group-number* is 0.
- *priority* is 100.

## Command Modes

Subinterface configuration submode

## Command History

Release	Modification
SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The command mode for this command was changed from Proxy-VLAN to Subinterface.

## Usage Guidelines

The router in the HSRP group with the highest priority value becomes the active router.

When you use group number 0, no group number is written to NVRAM, providing backward compatibility.

The assigned priority is used to help select the active and standby routers. Assuming that preemption is enabled, the router with the highest priority becomes the designated active router. In case of ties, the primary IP addresses are compared, and the higher IP address has priority.

The priority of the device can change dynamically if an interface is configured with the **standby track** command and another interface on the router goes down.

■ **standby priority**

---

**Examples**

This example shows how to change the router priority:

```
ssl-proxy (config-subif)# standby priority 120  
ssl-proxy (config-subif)#
```

---

**Related Commands**

[standby track](#)

# standby redirects

To enable HSRP filtering of Internet Control Message Protocol (ICMP) redirect messages, use the **standby redirects** command. Use the **no** form of this command to disable the HSRP filtering of ICMP redirect messages.

**standby redirects** [**enable** | **disable**] [**timers** *advertisement holddown*] [**unknown**]

**no standby redirects** [**unknown**]

## Syntax Description

<b>enable</b>	(Optional) Allows the filtering of ICMP redirect messages on interfaces that are configured with HSRP, where the next-hop IP address may be changed to an HSRP virtual IP address.
<b>disable</b>	(Optional) Disables the filtering of ICMP redirect messages on interfaces that are configured with HSRP.
<b>timers</b>	(Optional) Adjusts HSRP-router advertisement timers.
<i>advertisement</i>	(Optional) HSRP-router advertisement interval in seconds; valid values are from 10 to 180 seconds.
<i>holddown</i>	(Optional) HSRP-router holddown interval in seconds; valid values are from 61 to 3600.
<b>unknown</b>	(Optional) Allows sending of ICMP packets to be sent when the next-hop IP address that is contained in the packet is unknown in the HSRP table of real IP addresses and active virtual IP addresses.

## Defaults

The defaults are as follows:

- HSRP filtering of ICMP redirect messages is enabled if you configure HSRP on an interface.
- *advertisement* is 60 seconds.
- *holddown* is 180 seconds.

## Command Modes

Subinterface configuration submode

## Command History

Release	Modification
SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The command mode for this command was changed from Proxy-VLAN to Subinterface.

## Usage Guidelines

You can configure the **standby redirects** command globally or on a per-interface basis. When you first configure HSRP on an interface, the setting for that interface inherits the global value. If you explicitly disable the filtering of ICMP redirects on an interface, then the global command cannot reenact this functionality.

The **no standby redirects** command is the same as the **standby redirects disable** command. We do not recommend that you save the **no** form of this command to NVRAM. Because the command is enabled by default, we recommend that you use the **standby redirects disable** command to disable the functionality.

With the **standby redirects** command enabled, the real IP address of a router can be replaced with a virtual IP address in the next-hop address or gateway field of the redirect packet. HSRP looks up the next-hop IP address in its table of real IP addresses versus virtual IP addresses. If HSRP does not find a match, the HSRP router allows the redirect packet to go out unchanged. The host HSRP router is redirected to a router that is unknown, that is, a router with no active HSRP groups. You can specify the **no standby redirects unknown** command to stop these redirects from being sent.

---

**Examples**

This example shows how to allow HSRP to filter ICMP redirect messages:

```
ssl-proxy (config-subif)# standby redirects  
ssl-proxy (config-subif)#
```

This example shows how to change the HSRP router advertisement interval to 90 seconds and the holddown timer to 270 seconds on interface Ethernet 0:

```
ssl-proxy (config-subif)# standby redirects timers 90 270  
ssl-proxy (config-subif)#
```

---

**Related Commands**

**show standby**  
**show standby redirect**



## standby timers

To configure the time between hello packets and the time before other routers declare the active hot standby or standby router to be down, use the **standby timers** command. Use the **no** form of this command to return to the default settings.

```
standby [group-number] timers [msec] hellotime [msec] holdtime
```

```
no standby [group-number] timers [msec] hellotime [msec] holdtime
```

### Syntax Description

<i>group-number</i>	(Optional) Group number on the interface to which the timers apply.
<b>msec</b>	(Optional) Specifies the interval in milliseconds.
<i>hellotime</i>	Hello interval (in seconds); see the “Usage Guidelines” section for valid values.
<i>holdtime</i>	Time (in seconds) before the active or standby router is declared to be down; see the “Usage Guidelines” section for valid values.

### Defaults

The defaults are as follows:

- *group-number* is 0.
- *hellotime* is 3 seconds.
- *holdtime* is 10 seconds.

### Command Modes

Subinterface configuration submode

### Command History

Release	Modification
SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The command mode for this command was changed from Proxy-VLAN to Subinterface.

### Usage Guidelines

The valid values for *hellotime* are as follows:

- If you did not enter the **msec** keyword, valid values are from 1 to 254 seconds.
- If you enter the **msec** keyword, valid values are from 15 to 999 milliseconds.

The valid values for *holdtime* are as follows:

- If you did not enter the **msec** keyword, valid values are from *x* to 255 seconds, where *x* is the *hellotime* and 50 milliseconds and is rounded up to the nearest 1 second.
- If you enter the **msec** keyword, valid values are from *y* to 3000 milliseconds, where *y* is greater than or equal to 3 times the *hellotime* and is not less than 50 milliseconds.

If you specify the **msec** keyword, the hello interval is in milliseconds. Millisecond timers allow for faster failover.

The **standby timers** command configures the time between standby hello packets and the time before other routers declare the active or standby router to be down. Routers or access servers on which timer values are not configured can learn timer values from the active or standby router. The timers configured on the active router always override any other timer settings. All routers in a Hot Standby group should use the same timer values. Normally, holdtime is greater than or equal to three times the value of hellotime. The range of values for holdtime force the holdtime to be greater than the hellotime. If the timer values are specified in milliseconds, the holdtime is required to be at least three times the hellotime value and not less than 50 milliseconds.

Some HSRP state flapping can occasionally occur if the holdtime is set to less than 250 milliseconds, and the processor is busy. It is recommended that holdtime values less than 250 milliseconds be used. Setting the **process-max-time** command to a suitable value may also help with flapping.

The value of the standby timer will not be learned through HSRP hellos if it is less than 1 second.

When group number 0 is used, no group number is written to NVRAM, providing backward compatibility.

---

## Examples

This example sets, for group number 1 on Ethernet interface 0, the time between hello packets to 5 seconds, and the time after which a router is considered to be down to 15 seconds:

```
interface ethernet 0
 standby 1 ip
 standby 1 timers 5 15
```

This example sets, for the hot router interface that is located at 172.19.10.1 on Ethernet interface 0, the time between hello packets to 300 milliseconds, and the time after which a router is considered to be down to 900 milliseconds:

```
interface ethernet 0
 standby ip 172.19.10.1
 standby timers msec 300 msec 900
```

This example sets, for the hot router interface that is located at 172.18.10.1 on Ethernet interface 0, the time between hello packets to 15 milliseconds, and the time after which a router is considered to be down to 50 milliseconds. Note that the holdtime is three times larger than the hellotime because the minimum holdtime value in milliseconds is 50.

```
interface ethernet 0
 standby ip 172.18.10.1
 standby timers msec 15 msec 50
```

# standby track

To configure HSRP to track an object and change the hot standby priority based on the state of the object, use the **standby track** command. Use the **no** form of this command to remove the tracking.

**standby** [*group-number*] **track** *object-number* [**decrement** *priority*]

**no standby** [*group-number*] **track** *object-number* [**decrement** *priority*]

## Syntax Description

<i>group-number</i>	(Optional) Group number to which the tracking applies.
<i>object-number</i>	Object number in the range from 1 to 500 representing the object to be tracked.
<b>decrement</b> <i>priority</i>	(Optional) Specifies the amount by which the hot standby priority for the router is decremented (or incremented) when the tracked object goes down (or comes back up).

## Defaults

The defaults are as follows:

- *group-number* is **0**.
- *priority* is **10**.

## Command Modes

Subinterface configuration submode

## Command History

Release	Modification
SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The command mode for this command was changed from Proxy-VLAN to Subinterface.

## Usage Guidelines

This command ties the hot standby priority of the router to the availability of its tracked objects. Use the **track interface** or **track ip route** global configuration command to track an interface object or an IP route object. The HSRP client can register its interest in the tracking process by using the **standby track** command commands and take action when the object changes.

When a tracked object goes down, the priority decreases by 10. If an object is not tracked, its state changes do not affect the priority. For each object configured for hot standby, you can configure a separate list of objects to be tracked.

The optional *priority* argument specifies how much to decrement the hot standby priority when a tracked object goes down. When the tracked object comes back up, the priority is incremented by the same amount.

When multiple tracked objects are down, the decrements are cumulative, whether configured with *priority* values or not.

Use the **no standby** *group-number* **track** command to delete all tracking configuration for a group.

When you use group number 0, no group number is written to NVRAM, providing backward compatibility.

The **standby track** command syntax prior to Release 12.2(15)T is still supported. Using the older form will cause a tracked object to be created in the new tracking process. This tracking information can be displayed using the **show track** command.

### Examples

This example shows how to track the IP routing capability of serial interface 1/0. HSRP on Ethernet interface 0/0 registers with the tracking process to be informed of any changes to the IP routing state of serial interface 1/0. If the IP state on Serial interface 1/0 goes down, the priority of the HSRP group is reduced by 10.

If both serial interfaces are operational, Router A becomes the HSRP active router because it has the higher priority.

However, if IP routing on serial interface 1/0 in Router A fails, the HSRP group priority is reduced and Router B takes over as the active router, thus maintaining a default virtual gateway service to hosts on the 10.1.0.0 subnet.

#### Router A Configuration

```
!
track 100 interface serial1/0 ip routing
!
interface Ethernet0/0
 ip address 10.1.0.21 255.255.0.0
 standby 1 ip 10.1.0.1
 standby 1 priority 105
 standby 1 track 100 decrement 10
```

#### Router B Configuration

```
!
track 100 interface serial1/0 ip routing
!
interface Ethernet0/0
 ip address 10.1.0.22 255.255.0.0
 standby 1 ip 10.1.0.1
 standby 1 priority 100
 standby 1 track 100 decrement 10
```

### Related Commands

[standby preempt](#)  
[standby priority](#)

## standby use-bia

To configure HSRP to use the burned-in address of the interface as its virtual MAC address instead of the preassigned MAC address (on Ethernet and FDDI) or the functional address (on Token Ring), use the **standby use-bia** command. Use the **no** form of this command to restore the default virtual MAC address.

**standby use-bia** [scope interface]

**no standby use-bia**

### Syntax Description

**scope interface** (Optional) Specifies that this command is configured only for the subinterface on which it was entered, instead of the major interface.

### Defaults

HSRP uses the preassigned MAC address on Ethernet and FDDI or the functional address on Token Ring.

### Command Modes

Subinterface configuration submode

### Command History

Release	Modification
SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
SSL Services Module Release 3.1(1)	The command mode for this command was changed from Proxy-VLAN to Subinterface.

### Usage Guidelines

You can configure multiple standby groups on an interface when you enter the **standby use-bia** command. Hosts on the interface must have a default gateway configured. We recommend that you set the **no ip proxy-arp** command on the interface. We also recommend that you configure the **standby use-bia** command on a Token Ring interface if there are devices that reject ARP replies with source hardware addresses that are set to a functional address.

When HSRP runs on a multiple-ring, source-routed bridging environment and the HSRP routers reside on different rings, configuring the **standby use-bia** command can prevent confusion about the routing information field (RFI).

Without the **scope interface** keywords, the **standby use-bia** command applies to all subinterfaces on the major interface. You cannot enter the **standby use-bia** command both with and without the **scope interface** keywords at the same time.

### Examples

This example shows how to map the virtual MAC address to the virtual IP address:

```
ssl-proxy (config-subif)# standby use-bia
ssl-proxy (config-subif)#
```

# standby version

To change the version of the Hot Standby Router Protocol (HSRP), use the **standby version** command:

```
standby version {1 | 2}
```

Syntax Description	1	Specifies HSRP version 1.
	2	Specifies HSRP version 2.

**Defaults** The default HSRP version is 1.

**Command Modes** Subinterface configuration submode

Command History	Release	Modification
	SSL Services Module Release 2.1(1)	Support for this command was introduced on the Catalyst 6500 series switches.
	SSL Services Module Release 3.1(1)	The command mode for this command was changed from Proxy-VLAN to Subinterface.

**Usage Guidelines** HSRP version 2 addresses limitations of HSRP version 1 by providing an expanded group number range of 0 to 4095.

HSRP version 2 will not interoperate with HSRP version 1. An interface cannot operate both version 1 and version 2 because both versions are mutually exclusive. You cannot change from version 2 to version 1 if you have configured groups above 255. Using the **no standby version** command sets the HSRP version to the default version, version 1.

If an HSRP version is changed, each group will reinitialize because it now has a new virtual MAC address.

**Examples** This example shows how to configure HSRP version 2:

```
ssl-proxy (config-subif)# standby version 2
ssl-proxy (config-subif)#
```



# Acronyms

Table A-1 defines the acronyms that are used in this publication.

**Table A-1 List of Acronyms**

Acronym	Expansion
AAL	ATM adaptation layer
ACE	access control entry
ACL	access control list
ACNS	Application and Content Networking System
AFI	authority and format identifier
Agport	aggregation port
ALPS	Airline Protocol Support
AMP	Active Monitor Present
APaRT	Automated Packet Recognition and Translation
ARP	Address Resolution Protocol
ATA	Analog Telephone Adaptor
ATM	Asynchronous Transfer Mode
AV	attribute value
BDD	binary decision diagrams
BECN	backward explicit congestion notification
BGP	Border Gateway Protocol
Bidir	bidirectional PIM
BPDU	bridge protocol data unit
BRF	bridge relay function
BSC	Bisync
BSTUN	Block Serial Tunnel
BUS	broadcast and unknown server
BVI	bridge-group virtual interface
CAM	content-addressable memory
CAR	committed access rate

**Table A-1 List of Acronyms (continued)**

<b>Acronym</b>	<b>Expansion</b>
CBAC	context based access control
CCA	circuit card assembly
CDP	Cisco Discovery Protocol
CEF	Cisco Express Forwarding
CHAP	Challenge Handshake Authentication Protocol
CIR	committed information rate
CIST	Common and Internal Spanning Tree
CLI	command-line interface
CLNS	Connection-Less Network Service
CMNS	Connection-Mode Network Service
CNS	Cisco Networking Services
COPS	Common Open Policy Server
COPS-DS	Common Open Policy Server Differentiated Services
CoS	class of service
CPLD	Complex Programmable Logic Device
CRC	cyclic redundancy check
CRF	concentrator relay function
CSM	Content Switching Module
CST	Common Spanning Tree
CUDD	University of Colorado Decision Diagram
DCC	Data Country Code
dCEF	distributed Cisco Express Forwarding
DDR	dial-on-demand routing
DE	discard eligibility
DEC	Digital Equipment Corporation
DF	designated forwarder
DFC	Distributed Forwarding Card
DFI	Domain-Specific Part Format Identifier
DFP	Dynamic Feedback Protocol
DISL	Dynamic Inter-Switch Link
DLC	Data Link Control
DLSw	Data Link Switching
DMP	data movement processor
DNS	Domain Name System
DoD	Department of Defense
DoS	denial of service



**Table A-1 List of Acronyms (continued)**

<b>Acronym</b>	<b>Expansion</b>
dot1q	802.1Q
dot1x	802.1x
DRAM	dynamic RAM
DRiP	Dual Ring Protocol
DSAP	destination service access point
DSCP	differentiated services code point
DSPU	downstream SNA Physical Units
DTP	Dynamic Trunking Protocol
DTR	data terminal ready
DXI	data exchange interface
EAP	Extensible Authentication Protocol
EARL	Enhanced Address Recognition Logic
EEPROM	electrically erasable programmable read-only memory
EHSA	enhanced high system availability
EIA	Electronic Industries Association
ELAN	Emulated Local Area Network
EOBC	Ethernet out-of-band channel
EOF	end of file
EoMPLS	Ethernet over Multiprotocol Label Switching
ESI	end-system identifier
FAT	File Allocation Table
FIB	Forwarding Information Base
FIE	Feature Interaction Engine
FECN	forward explicit congestion notification
FM	feature manager
FRU	field replaceable unit
fsck	file system consistency check
FSM	feasible successor metrics
FSU	fast software upgrade
FWSM	Firewall Services Module
GARP	General Attribute Registration Protocol
GBIC	Gigabit Interface Converter
GMRP	GARP Multicast Registration Protocol
GVRP	GARP VLAN Registration Protocol
HSRP	Hot Standby Routing Protocol
ICC	Inter-card Communication or interface controller card

**Table A-1 List of Acronyms (continued)**

<b>Acronym</b>	<b>Expansion</b>
ICD	International Code Designator
ICMP	Internet Control Message Protocol
IDB	interface descriptor block
IDP	initial domain part or Internet Datagram Protocol
IDSM	Intrusion Detection System Module
IFS	IOS File System
IGMP	Internet Group Management Protocol
IGMPv2	IGMP version 2
IGMPv3	IGMP version 3
IGRP	Interior Gateway Routing Protocol
ILMI	Integrated Local Management Interface
IP	Internet Protocol
IPC	interprocessor communication
IPX	Internetwork Packet Exchange
IS-IS	Intermediate System-to-Intermediate System Intradomain Routing Protocol
ISL	Inter-Switch Link
ISL VLANs	Inter-Switch Link VLANs
ISO	International Organization of Standardization
ISR	Integrated SONET router
LACP	Link Aggregation Control Protocol
LACPDU	Link Aggregation Control Protocol data unit
LAN	local area network
LANE	LAN Emulation
LAPB	Link Access Procedure, Balanced
LCP	Link Control Protocol
LDA	Local Director Acceleration
LEC	LAN Emulation Client
LECS	LAN Emulation Configuration Server
LEM	link error monitor
LER	link error rate
LES	LAN Emulation Server
LLC	Logical Link Control
LOU	logical operation units
LTL	Local Target Logic
MAC	Media Access Control

**Table A-1 List of Acronyms (continued)**

<b>Acronym</b>	<b>Expansion</b>
MD5	message digest 5
MDIX	media-dependent interface crossover
MDSS	Multicast Distributed Shortcut Switching
MFD	multicast fast drop
MIB	Management Information Base
MII	media-independent interface
MLS	Multilayer Switching
MLSE	maintenance loop signaling entity
MLSM	multilayer switching for multicast
MOP	Maintenance Operation Protocol
MOTD	message-of-the-day
MPLS	Multiprotocol Label Switching
MRM	multicast routing monitor
MSDP	Multicast Source Discovery Protocol
MSFC	Multilayer Switching Feature Card
MSM	Multilayer Switch Module
MST	Multiple Spanning Tree (802.1s)
MTU	maximum transmission unit
MVAP	multiple VLAN access port
NAM	Network Analysis Module
NBP	Name Binding Protocol
NCIA	Native Client Interface Architecture
NDE	NetFlow Data Export
NDR	no drop rate
NET	network entity title
NetBIOS	Network Basic Input/Output System
NFFC	NetFlow Feature Card
NMP	Network Management Processor
NSAP	network service access point
NTP	Network Time Protocol
NVGEN	nonvolatile generation
NVRAM	nonvolatile RAM
OAM	Operation, Administration, and Maintenance
ODM	order dependent merge
OIF	Outgoing interface of a multicast {*,G} or {source, group} flow

**Table A-1 List of Acronyms (continued)**

<b>Acronym</b>	<b>Expansion</b>
OSI	Open System Interconnection
OSM	Optical Services Module
OSPF	open shortest path first
PAE	port access entity
PAgP	Port Aggregation Protocol
PBD	packet buffer daughterboard
PBR	policy-based routing
PC	Personal Computer (formerly PCMCIA)
PCM	pulse code modulation
PCR	peak cell rate
PDP	policy decision point
PDU	protocol data unit
PEP	policy enforcement point
PFC	Policy Feature Card
PGM	Pragmatic General Multicast
PHY	physical sublayer
PIB	policy information base
PIM	protocol independent multicast
PPP	Point-to-Point Protocol
ppsec	packets per second
PRID	Policy Rule Identifiers
PVLANs	private VLANs
PVST+	Per-VLAN Spanning Tree+
QDM	QoS device manager
QM	QoS manager
QM-SP	SP QoS manager
QoS	quality of service
Q-in-Q	802.1Q in 802.1Q
RACL	router interface access control list
RADIUS	Remote Access Dial-In User Service
RAM	random-access memory
RCP	Remote Copy Protocol
RF	Redundancy Facility
RGMP	Router-Ports Group Management Protocol
RIB	routing information base
RIF	Routing Information Field

**Table A-1 List of Acronyms (continued)**

<b>Acronym</b>	<b>Expansion</b>
RMON	remote network monitor
ROM	read-only memory
ROMMON	ROM monitor
RP	route processor or rendezvous point
RPC	remote procedure call
RPF	reverse path forwarding
RPR	Route Processor Redundancy
RPR+	Route Processor Redundancy+
RSPAN	remote SPAN
RST	reset
RSTP	Rapid Spanning Tree Protocol
RSTP+	Rapid Spanning Tree Protocol plus
RSVP	ReSerVation Protocol
SAID	Security Association Identifier
SAP	service access point
SCM	service connection manager
SCP	Switch-Module Configuration Protocol
SDLC	Synchronous Data Link Control
SFP	small form factor pluggable
SGBP	Stack Group Bidding Protocol
SIMM	single in-line memory module
SLB	server load balancing
SLCP	Supervisor Line-Card Processor
SLIP	Serial Line Internet Protocol
SMDS	Software Management and Delivery Systems
SMF	software MAC filter
SMP	Standby Monitor Present
SMRP	Simple Multicast Routing Protocol
SMT	Station Management
SNAP	Subnetwork Access Protocol
SNMP	Simple Network Management Protocol
SPAN	Switched Port Analyzer
SREC	S-Record format, Motorola defined format for ROM contents
SSL	Secure Sockets Layer
SSM	Source Specific Multicast
SSTP	Cisco Shared Spanning Tree

**Table A-1 List of Acronyms (continued)**

<b>Acronym</b>	<b>Expansion</b>
STP	Spanning Tree Protocol
SVC	switched virtual circuit
SVI	switched virtual interface
TACACS+	Terminal Access Controller Access Control System Plus
TARP	Target Identifier Address Resolution Protocol
TCAM	Ternary Content Addressable Memory
TCL	table contention level
TCP/IP	Transmission Control Protocol/Internet Protocol
TFTP	Trivial File Transfer Protocol
TIA	Telecommunications Industry Association
TopN	Utility that allows the user to analyze port traffic by reports
ToS	type of service
TLV	type-length-value
TTL	Time To Live
TVX	valid transmission
UDLD	UniDirectional Link Detection Protocol
UDP	User Datagram Protocol
UNI	User-Network Interface
UTC	Coordinated Universal Time
VACL	VLAN access control list
VCC	virtual channel circuit
VCI	virtual circuit identifier
VCR	Virtual Configuration Register
VINES	Virtual Network System
VLAN	virtual LAN
VMPS	VLAN Membership Policy Server
VMR	value mask result
VPN	virtual private network
VRF	VPN routing and forwarding
VTP	VLAN Trunking Protocol
VVID	voice VLAN ID
WAN	wide area network
WCCP	Web Cache Coprocessor Protocol
WFQ	weighted fair queueing
WRED	weighted random early detection

**Table A-1** *List of Acronyms (continued)*

<b>Acronym</b>	<b>Expansion</b>
WRR	weighted round-robin
XNS	Xerox Network System







## Acknowledgments for Open-Source Software

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The Cisco IOS software on the Catalyst 6500 series switches software pipe command uses Henry Spencer's regular expression library (regex).

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