# Cisco TrustSec Commands


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# address (CTS)

To configure the Cisco TrustSec policy-server address, use the **address** command in policy-server configuration mode. To remove the address of the policy server, use the **no** form of this command.

**address** {**domain-name** *name* | **ipv4** *policy-server-address* | **ipv6** *policy-server-address*}
**no address** {**domain-name** | **ipv4** | **ipv6**}

## Syntax Description

| | |
|---|---|
| **domain-name** *name* | Specifies the domain name of the policy server. |
| **ipv4** *policy-server-address* | Specifies the IP address of the policy server. |
| **ipv6** | Specifies the IPv6 address of the policy server. |

## Command Default

Policy server address is not configured.

## Command Modes

Policy-server configuration (config-policy-server)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Usage Guidelines

Configure the policy server name to enter the policy-server configuration mode.

## Examples

The following example shows how configure the domain name of the policy-server:

```
Device# enable
Device# configure terminal
Device(config)# policy-server name ise_server_2
Device(config-policy-server)# address domain-name ISE_domain
```

The following example shows how configure the IP address of the policy-server:

```
Device# enable
Device# configure terminal
Device(config)# cts policy-server name ise_server_2
Device(config-policy-server)# address ipv4 10.1.1.1
```

## Related Commands

| Command | Description |
|---|---|
| **cts policy-server name** | Configures the name of a policy server and enters policy-server configuration mode. |

# clear cts environment-data

To clear Cisco TrustSec environment data, use the **clear cts environment-data** command in privileged EXEC mode.

**clear cts environment-data**

This command has no arguments or keywords.

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Examples

The following example shows how to clear environment data:

```
Device# enable
Device# clear cts environment-data
```

## Related Commands

| Command | Description |
|---|---|
| **cts environment-data enable** | Enables the download of environment data. |
| **debug cts environment-data** | Enables the debugging of Cisco TrustSec environment data operations. |
| **show cts environment-data** | Displays Cisco TrustSec environment data information. |

# clear cts policy-server statistics

To clear Cisco TrustSec policy-server statistics, use the **clear cts policy-server statistics** command in privileged EXEC mode.

**clear cts policy-server statistics** {**active** | **all**}

## Syntax Description

| | |
|---|---|
| **active** | Clears statistics of all active policy servers. |
| **all** | Clears all policy server statistics. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Examples

The following example shows how to clear all policy-server statistics:

```
Device# enable
Device# clear cts policy-server statistics all
```

## Related Commands

| Command | Description |
|---|---|
| **cts policy-server name** | Configures a Cisco TrustSec policy server and enters policy-server configuration mode. |

# content-type json

To enable the JavaScript Object Notation (JSON) as the content type, use the **content-type json** command in policy-server configuration mode. To remove the content-type, use the **no** form of this command.

**content-type json**
**no content-type json**

This command has no arguments or keywords.

## Command Default

JSON content-type is enabled.

## Command Modes

Policy-server configuration (config-policy-server)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Usage Guidelines

JSON is used as the content-type to download Security Group access control lists (SGACLs) and environment data from the Cisco Identity Services Engine (ISE).

## Examples

The following example shows how to enable the JSON content-type:

```
Device# enable
Device# configure terminal
Device(config)# policy-server name ise_server_2
Device(config-policy-server)# content-type json
```

## Related Commands

| Command | Description |
|---|---|
| **cts policy-server name** | Configures the name of a policy server and enters policy-server configuration mode. |

# cts authorization list

To specify a list of authentication, authorization, and accounting (AAA) servers to be used by the TrustSec seed device, use the **cts authorization list** command on the Cisco TrustSec seed device in global configuration mode. Use the **no** form of the command to stop using the list during authentication.

**cts authorization list** *server_list*

**no cts authorization list** *server_list*

## Syntax Description

| | |
|---|---|
| *server_list* | Cisco TrustSec AAA server group. |

## Command Default

None

## Command Modes

Global configuration (config)

### Supported User Roles

Administrator

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

This command is only for the seed device. Non-seed devices obtain the TrustSec AAA server list from their TrustSec authenticator peer as a component of their TrustSec environment data.

The following example displays an AAA configuration of a TrustSec seed device:

```
Device# cts credentials id Device1 password Cisco123
Device# configure terminal
Device(config)# aaa new-model
Device(config)# aaa authentication dot1x default group radius
Device(config)# aaa authorization network MLIST group radius
Device(config)# cts authorization list MLIST
Device(config)# aaa accounting dot1x default start-stop group radius
Device(config)# radius-server host 10.20.3.1 auth-port 1812 acct-port 1813 pac key
AbCe1234
Device(config)# radius-server vsa send authentication
Device(config)# dot1x system-auth-control
Device(config)# exit
```

## Related Commands

| Command | Description |
|---|---|
| **show cts server-list** | Displays RADIUS server configurations. |

# cts change-password

To change the password between the local device and the authentication server, use the **cts change-password** privileged EXEC command.

**cts change-password server** *ipv4_address udp_port* {**a-id** *hex_string* | **key** *radius_key* }[**source** *interface_list*]

## Syntax Description

| | |
|---|---|
| **server** | Specifies the authentication server. |
| *ipv4_address* | IP address of the authentication server. |
| *udp_port* | UPD port of the authentication server. |
| **a-id** *hex_string* | Specifies the identification string of the ACS server. |
| **key** | Specifies the RADIUS key to be used for provisioning. |
| **source** *interface_list* | (Optional) Specifies the interface type and its identifying parameters as per the displayed list for source address in request packets. |

## Command Default

None.

## Command Modes

Privileged EXEC (#)

### Supported User Roles

Administrator

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

The **cts change-password** command allows an administrator to change the password used between the local device and the Cisco Secure ACS authentication server, without having to reconfigure the authentication server.

The following example shows how to change the Cisco TrustSec password between a switch and a Cisco Secure ACS:

```
Device# cts change-password server 192.168.2.2 88 a-id ffef
```

# cts credentials

Use the **cts credentials** command in privileged EXEC mode to specify the TrustSec ID and password of the network device. Use the **clear cts credentials** command to delete the credentials.

**cts credentials id** *cts_id* **password** *cts_pwd*

## Syntax Description

| | |
|---|---|
| **credentials id** *cts_id* | Specifies the Cisco TrustSec device ID for this device to use when authenticating with other Cisco TrustSec devices with EAP-FAST. The *cts-id* variable has a maximum length of 32 characters and is case sensitive. |
| **password** *cts_pwd* | Specifies the password for this device to use when authenticating with other Cisco TrustSec devices with EAP-FAST. |

## Command Default

None

## Command Modes

Privileged EXEC (#)

### Supported User Roles

Administrator

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

**Important** The **cts credentials**command must be configured only in privileged EXEC mode. Do not use global configuration (config) mode to configure the **cts credentials** command.

The **cts credentials** command specifies the Cisco TrustSec device ID and password for this device to use when authenticating with other Cisco TrustSec devices with EAP-FAST. The Cisco TrustSec credentials state retrieval is not performed by the nonvolatile generation process (NVGEN) because the Cisco TrustSec credential information is saved in the keystore, and not in the startup configuration. The device can be assigned a Cisco TrustSec identity by the Cisco Secure Access Control Server (ACS), or a new password auto-generated when prompted to do so by the ACS. These credentials are stored in the keystore, eliminating the need to save the running configuration. To display the Cisco TrustSec device ID, use the **show cts credentials** command. The stored password is never displayed.

To change the device ID or the password, reenter the command. To clear the keystore, use the **clear cts credentials** command.

**Note** When the Cisco TrustSec device ID is changed, all Protected Access Credentials (PACs) are flushed from the keystore because PACs are associated with the old device ID and are not valid for a new identity.

The following example shows how to configure the Cisco TrustSec device ID and password:

```
Device# cts credentials id cts1 password password1
CTS device ID and password have been inserted in the local keystore. Please make sure that
the same ID and password are configured in the server database.
```

The following example show how to change the Cisco TrustSec device ID and password to cts_new and password123, respectively:

```
Device# cts credentials id cts_new pacssword password123
A different device ID is being configured.
This may disrupt connectivity on your CTS links.
Are you sure you want to change the Device ID? [confirm] y

TS device ID and password have been inserted in the local keystore. Please make sure that
the same ID and password are configured in the server database.
```

The following sample output displays the Cisco TrustSec device ID and password state:

```
Device# show cts credentials

CTS password is defined in keystore, device-id = cts_new
```

## Related Commands

| Command | Description |
|---|---|
| **clear cts credentials** | Clears the Cisco TrustSec device ID and password. |
| **show cts credentials** | Displays the state of the current Cisco TrustSec device ID and password. |
| **show cts keystore** | Displays contents of the hardware and software keystores. |

# cts environment-data enable

To enable the download of environment data through REST application programming interfaces (APIs), use the **cts environment-data enable** command in global configuration mode. To disable the download of environment data, use the **no** form of this command.

**cts environment-data enable**
**no cts environment-data enable**

This command has no arguments or keywords.

## Command Default

Environment data download is not enabled.

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Usage Guidelines

The **cts environment-data enable** command cannot co-exist with the **cts authorization list** command. The **cts authorization list** command enables the download of environment data through RADIUS.

If you try to configure RADIUS-based configuration by using the **cts authorization list** command, when the **cts environment-data enable** command is already configured, the following error message is displayed on the console:

```
Error: 'cts policy-server or cts environment-data' related configs are enabled.
Disable http-based configs, to enable 'cts authorization'
```

## Examples

The following example shows how to enable environment data download:

```
Device# enable
Device# configure terminal
Device(config)# cts environment-data enable
```

## Related Commands

| Command | Description |
|---|---|
| **clear cts environment-data** | Clears environment data. |
| **debug cts environment-data** | Enables the debugging of Cisco TrustSec environment data operations. |
| **show cts environment-data** | Displays Cisco TrustSec environment data information. |

# cts policy-server device-id

To configure the policy-server device ID, use the **cts policy-server device-id** command in global configuration mode. To remove the policy-server device ID, use the **no** form of this command.

**cts policy-server device-id** *device-ID*
**no cts policy-server device-id** *device-ID*

## Syntax Description

| | |
|---|---|
| *device-ID* | Device ID of the Cisco TrustSec device. |

## Command Default

Device ID is not configured.

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Usage Guidelines

The device ID must be the same one that was used to add the network access device (NAD) on Cisco Identity Services Engine (ISE). This ID is used to send environment data requests to Cisco ISE.

## Examples

The following example shows how to configure the policy-server device ID:

```
Device# enable
Device# configure terminal
Device(config)# cts policy-server device-id server1
```

## Related Commands

| Command | Description |
|---|---|
| **cts policy-server name** | Configures a Cisco TrustSec policy server and enters policy-server configuration mode. |

# cts policy-server name

To configure a Cisco TrustSec policy server and enter policy-server configuration mode, use the **cts policy-server name** command in global configuration mode. To remove the policy server, use the **no** form of this command.

**cts policy-server name** *server-name*
**no cts policy-server name** *server-name*

## Syntax Description

| | |
|---|---|
| *server-name* | Policy-server name. |

## Command Default

Policy server is not configured.

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Usage Guidelines

The policy server name will accept all characters. Once the policy-server name is configured, the configuration mode changes to policy-server configuration. You can configure other details of the policy-server in this mode.

## Examples

The following example shows how to configure policy server name:

```
Device# enable
Device# configure terminal
Device(config)# cts policy-server name ISE1
Device(config-policy-server)#
```

## Related Commands

| Command | Description |
|---|---|
| **show cts policy-server** | Displays policy server information. |

# cts policy-server order random

To change the server-selection logic to random, use the **cts policy-server order random** command in global configuration mode. To go back to the default, use the **no** form of this command.

**cts policy-server order random**
**no cts policy-server order random**

This command has no arguments or keywords.

## Command Default

In-order selection is the default.

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Usage Guidelines

When multiple HTTP policy servers are configured on a device, a single Cisco Identity Services Engine (ISE) instance may get overloaded if the device always selects the first configured server. To avoid this situation, each device randomly selects a server. A random number is generated by the device and based on this number a server is selected. For different devices to generate random numbers, the unique board ID and the Cisco TrustSec process ID of the device is used to initialize the random number generator.

To change the server selection logic to random, use the **cts policy-server order random** command. If this command is not selected, the default in-order selection is retained.

In-order selection is when servers are picked in the order in which they are configured (from the public server list) or downloaded (from the private server list). Once a server is selected, the server is used till it is marked as dead, and then the next server in the list is selected.

## Examples

The following example shows how to change the server selection logic:

```
Device# enable
Device# configure terminal
Device(config)# cts policy-server order random
```

## Related Commands

| Command | Description |
|---|---|
| **cts policy-server name** | Configures a Cisco TrustSec policy server and enters policy-server configuration mode. |

# cts policy-server username

To configure a policy-server username, use the **cts policy-server username** command in global configuration mode. To remove the policy server username, use the **no** form of this command.

**cts policy-server username** *username* **password** {**0** | **6** | **7** *password*} *password*
**no cts policy-server username**

## Syntax Description

| | |
|---|---|
| *username* | Username to access REST application programming interfaces (APIs). |
| **password** | Specifies the password to authenticate the user. |
| **0** | Specifies an unencrypted password. |
| **6** | Specifies an encrypted password. |
| **7** | Specifies a hidden password. |
| *password* | Encrypted or unencrypted password. |

## Command Default

User credentials are not configured.

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Usage Guidelines

You must configure the username and password in Cisco Identity Services Engine (ISE) as the REST API access credentials, before configuring it on the device. See the Cisco TrustSec HTTP Servers section of the "Cisco TrustSec Policies Configuration" chapter for more information.

## Examples

The following example shows how to configure the policy server credentials:

```
Device# enable
Device# configure terminal
Device(config)# policy-server username user1 password 0 ise-password
```

## Related Commands

| Command | Description |
|---|---|
| **cts policy-server name** | Configures the name of a policy server and enters policy-server configuration mode. |

# cts refresh

To refresh the TrustSec peer authorization policy of all or specific Cisco TrustSec peers, or to refresh the SGACL policies downloaded to the device by the authentication server, use the **cts refresh** command in privileged EXEC mode.

**cts refresh** {**peer** [*peer_id*] | **sgt** [*sgt_number* | **default** | **unknown**]}

## Syntax Description

| | |
|---|---|
| **environment-data** | Refreshes environment data. |
| **peer** *Peer-ID* | (Optional) If a peer-id is specified, only policies related to the specified peer connection are refreshed. |
| **sgt** *sgt_number* | (Optional) Performs an immediate refresh of the SGACL policies from the authentication server.<br>If an SGT number is specified, only policies related to that SGT are refreshed. |
| **default** | (Optional) Refreshes the default SGACL policy. |
| **unknown** | (Optional) Refreshes the unknown SGACL policy. |

## Command Default

None

## Command Modes

Privileged EXEC (#)

### Supported User Roles

Administrator

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

To refresh the Peer Authorization Policy on all TrustSec peers, enter **cts policy refresh** without specifying a peer ID.

The peer authorization policy is initially downloaded from the Cisco ACS at the end of the EAP-FAST NDAC authentication success. The Cisco ACS is configured to refresh the peer authorization policy, but the **cts policy refresh** command can force immediate refresh of the policy before the Cisco ACS timer expires. This command is relevant only to TrustSec devices that can impose Security Group Tags (SGTs) and enforce Security Group Access Control Lists (SGACLs).

The following example shows how to refresh the TrustSec peer authorization policy of all peers:

```
Device# cts policy refresh
Policy refresh in progress
```

The following sample output displays the TrustSec peer authorization policy of all peers:

```
VSS-1# show cts policy peer
```

```
CTS Peer Policy
===============
device-id of the peer that this local device is connected to
Peer name: VSS-2T-1
Peer SGT: 1-02
Trusted Peer: TRUE
Peer Policy Lifetime = 120 secs
Peer Last update time = 12:19:09 UTC Wed Nov 18 2009
Policy expires in 0:00:01:51 (dd:hr:mm:sec)
Policy refreshes in 0:00:01:51 (dd:hr:mm:sec)
Cache data applied = NONE
```

## Related Commands

| Command | Description |
|---|---|
| **clear cts policy** | Clears all Cisco TrustSec policies, or by the peer ID or SGT. |
| **show cts policy peer** | Displays peer authorization policy for all or specific TrustSec peers. |

# cts rekey

To regenerate the Pairwise Master Key used by the Security Association Protocol (SAP), use the **cts rekey** privileged EXEC command.

**cts rekey interface type** *slot/port*

## Syntax Description

| | |
|---|---|
| **interface type** *slot/port* | Specifies the Cisco TrustSec interface on which to regenerate the SAP key. |

## Command Default

None.

## Command Modes

Privileged EXEC (#)

### Supported User Roles

Administrator

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

SAP Pair-wise Master Key key (PMK) refresh ordinarily occurs automatically, triggered by combinations of network events and non-configurable internal timers related to dot1X authentication. The ability to manually refresh encryption keys is often part of network administration security requirements. To manually force a PMK refresh, use the **cts rekey** command.

TrustSec supports a manual configuration mode where dot1X authentication is not required to create link-to-link encryption between switches. In this case, the PMK is manually configured on devices on both ends of the link with the **sap pmk** Cisco TrustSec manual interface configuration command.

The following example shows how to regenerate the PMK on a specified interface:

```
Device# cts rekey interface gigabitEthernet 2/1
```

## Related Commands

| Command | Description |
|---|---|
| **sap mode-list (cts manual)** | Configures Cisco TrustSec SAP for manual mode. |

# cts role-based enforcement

To enable role-based access control globally and on specific Layer 3 interfaces using Cisco TrustSec, use the **cts role-based enforcement** command in global configuration mode and interface configuration mode respectively. To disable the enforcement of role-based access control at an interface level, use the **no** form of this command.

**cts role-based enforcement**
**no cts role-based enforcement**

## Syntax Description

This command has no keywords or arguments.

## Command Default

Enforcement of role-based access control at an interface level is disabled globally.

## Command Modes

Global configuration (config)

Interface configuration (config-if)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

The **cts role-based enforcement** command in global configuration mode enables role-based access control globally. Once role-based access control is enabled globally, it is automatically enabled on every Layer 3 interface on the device. To disable role-based access control on specific Layer 3 interfaces, use the **no** form of the command in interface configuration mode. The **cts role-based enforcement** command in interface configuration mode enables enforcement of role-based access control on specific Layer 3 interfaces.

The attribute-based access control list organizes and manages the Cisco TrustSec access control on a network device. The security group access control list (SGACL) is a Layer 3-4 access control list to filter access based on the value of the security group tag (SGT). The filtering usually occurs at an egress port of the Cisco TrustSec domain. The terms role-based access control list (RBACL) and SGACL can be used interchangeably, and they refer to a topology-independent ACL used in an attribute-based access control (ABAC) policy model.

The following example shows how to enable role-based access control on a Gigabit Ethernet interface:

```
Device> enable
Device# configure terminal
Device(config)# interface gigabitethernet 1/1/3
Device(config-if)# cts role-based enforcement
Device(config-if)# end
```

# cts role-based l2-vrf

To select a virtual routing and forwarding (VRF) instance for Layer 2 VLANs, use the **cts role-based l2-vrf** command in global configuration mode. To remove the configuration, use the **no** form of this command.

**cts role-based l2-vrf** *vrf-name* **vlan-list** {**all** *vlan-ID*} [**,**] [**-**]
**no cts role-based l2-vrf** *vrf-name* **vlan-list** {**all** *vlan-ID*} [**,**] [**-**]

## Syntax Description

| | |
|---|---|
| *vrf-name* | Name of the VRF instance. |
| **vlan-list** | Specifies the list of VLANs to be assigned to a VRF instance. |
| **all** | Specifies all VLANs. |
| *vlan-ID* | VLAN ID. Valid values are from 1 to 4094. |
| **,** | (Optional) Specifies another VLAN separated by a comma. |
| **-** | (Optional) Specifies a range of VLANs separated by a hyphen. |

## Command Default

VRF instances are not selected.

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

The *vlan-list* argument can be a single VLAN ID, a list of comma-separated VLAN IDs, or hyphen-separated VLAN ID ranges.

The **all** keyword is equivalent to the full range of VLANs supported by the network device. The **all** keyword is not preserved in the nonvolatile generation (NVGEN) process.

If the **cts role-based l2-vrf** command is issued more than once for the same VRF, each successive command entered adds the VLAN IDs to the specified VRF.

The VRF assignments configured by the **cts role-based l2-vrf** command are active as long as a VLAN remains a Layer 2 VLAN. The IP–SGT bindings learned while a VRF assignment is active are also added to the Forwarding Information Base (FIB) table associated with the VRF and the IP protocol version. If an Switched Virtual Interface (SVI) becomes active for a VLAN, the VRF-to-VLAN assignment becomes inactive and all bindings learned on the VLAN are moved to the FIB table associated with the VRF of the SVI.

Use the **interface vlan** command to configure an SVI interface, and the **vrf forwarding** command to associate a VRF instance to the interface.

The VRF-to-VLAN assignment is retained even when the assignment becomes inactive. It is reactivated when the SVI is removed or when the SVI IP address is changed. When reactivated, the IP–SGT bindings are moved back from the FIB table associated with the VRF of the SVI to the FIB table associated with the VRF assigned by the **cts role-based l2-vrf** command.

The following example shows how to select a list of VLANS to be assigned to a VRF instance:

```
Device(config)# cts role-based l2-vrf vrf1 vlan-list 20
```

The following example shows how to configure an SVI interface and associate a VRF instance:

```
Device(config)# interface vlan 101
Device(config-if)# vrf forwarding vrf1
```

## Related Commands

| Command | Description |
|---|---|
| **interface vlan** | Configures a VLAN interface. |
| **vrf forwarding** | Associates a VRF instance or a virtual network with an interface or subinterface. |
| **show cts role-based permissions** | Displays the SGACL permission list. |

# cts role-based monitor

To enable role-based (security-group) access list monitoring, use the **cts role-based monitor** command in global configuration mode. To remove role-based access list monitoring, use the **no** form of this command.

**cts role-based monitor** {**all** | **permissions** {**default** [**ipv4** | **ipv6**] | **from** {*sgt* | **unknown**} **to** {*sgt* | **unknown**} [**ipv4** | **ipv6**]}}
**no cts role-based monitor** {**all** | **permissions** {**default** [**ipv4** | **ipv6**] | **from** {*sgt* | **unknown**} **to** {*sgt* | **unknown**} [**ipv4** | **ipv6**]}}

## Syntax Description

| | |
|---|---|
| **all** | Monitors permissions for all source tags to all destination tags. |
| **permissions** | Monitors permissions from a source tags to a destination tags. |
| **default** | Monitors the default permission list. |
| **ipv4** | (Optional) Specifies the IPv4 protocol. |
| **ipv6** | (Optional) Specifies the IPv6 protocol. |
| **from** | Specifies the source group tag for filtered traffic. |
| *sgt* | Security Group Tag (SGT). Valid values are from 2 to 65519. |
| **unknown** | Specifies an unknown source or destination group tag (DST). |

## Command Default

Role-based access control monitoring is not enabled.

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

Use the **cts role-based monitor all** command to enable the global monitor mode. If the **cts role-based monitor all** command is configured, the output of the **show cts role-based permissions** command displays monitor mode for all configured policies as true.

The following examples shows how to configure SGACL monitor from a source tag to a destination tag:

```
Device(config)# cts role-based monitor permissions from 10 to 11
```

## Related Commands

| Command | Description |
|---|---|
| **show cts role-based permissions** | Displays the SGACL permission list. |

# cts role-based permissions

To enable permissions from a source group to a destination group, use the **cts role-based permissions** command in global configuration mode. To remove the permissions, use the **no** form of this command.

**cts role-based permissions** {**default** | **from** {*sgt* | **unknown**}**to** {*sgt* | **unknown**}} {*rbacl-name* | **ipv4** | **ipv6**}
**no cts role-based permissions** {**default** | **from** {*sgt* | **unknown**}**to** {*sgt* | **unknown**}} {*rbacl-name* | **ipv4** | **ipv6**}

## Syntax Description

| | |
|---|---|
| **default** | Specifies the default permissions list. Every cell (an SGT pair) for which, security group access control list (SGACL) permission is not configured statically or dynamically falls under the default category. |
| **from** | Specifies the source group tag of the filtered traffic. |
| *sgt* | Security Group Tag (SGT). Valid values are from 2 to 65519. |
| **unknown** | Specifies an unknown source or destination group tag. |
| *rbacl-name* | Role-based access control list (RBACL) or SGACL name. Up to 16 SGACLs can be specified in the configuration. |
| **ipv4** | Specifies the IPv4 protocol. |
| **ipv6** | Specifies the IPv6 protocol. |

## Command Default

Permissions from a source group to a destination group is not enabled.

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

Use the **cts role-based permissions** command to define, replace, or delete the list of SGACLs for a given source group tag (SGT), destination group tag (DGT) pair. This policy is in effect as long as there is no dynamic policy for the same DGT or SGT.

The **cts role-based permissions default** command defines, replaces, or deletes the list of SGACLs of the default policy as long as there is no dynamic policy for the same DGT.

The following example shows how to enable permissions for a destination group:

```
Device(config)# cts role-based permissions from 6 to 6 mon_2
```

**Related Commands**

| Command | Description |
|---|---|
| **show cts role-based permissions** | Displays the SGACL permission list. |

# cts role-based sgt-caching

To enable Security Group Tag (SGT) caching globally, use the **cts role-based sgt-caching** command in global configuration mode. To remove SGT caching, use the **no** form of this command.

**cts role-based sgt-caching** [**vlan-list** {*vlan-id* | **all**}]
**no cts role-based sgt-caching** [**vlan-list** {*vlan-id* | **all**}]

## Syntax Description

| | |
|---|---|
| **vlan-list** *vlan-id* | (Optional) Specifies VLAN IDs. Individual VLAN IDs are separated by commas, and a range of IDs specified with a hyphen. Valid values are from 1 to 4094. |
| **all** | (Optional) Selects all VLANs. |

## Command Default

SGT caching is not configured.

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

To enable SGT caching on a VLAN, both **cts role-based sgt-caching** and **cts role-based sgt-caching vlan-list** commands must be configured.

### Example

The following example shows how to enable SGT caching on a VLAN:

```
Device# configure terminal
Device(config)# cts role-based sgt-caching
Device(config)# cts role-based sgt-caching vlan-list 4
```

# cts role-based sgt-map

To manually map a source IP address to a Security Group Tag (SGT) on either a host or a VRF, use the **cts role-based sgt-map** command in global configuration mode. Use the **no** form of the command to remove the mapping.

**cts role-based sgt-map** {*ipv4_netaddress* | *ipv6_netaddress* | *ipv4_netaddress/prefix* | *ipv6_netaddress/prefix*} **sgt** *sgt-number*
**cts role-based sgt-map host** {*ipv4_hostaddress* | *ipv6_hostaddress*} **sgt** *sgt-number*
**cts role-based sgt-map vlan-list** [*vlan_ids* | **all**] **sgt** *sgt-number*
**cts role-based sgt-map vrf** *instance_name*
{*ipv4_netaddress* | *ipv6_netaddress* | *ipv4_netaddress/prefix* | *ipv6_netaddress/prefix* | **host** {*ipv4_hostaddress* | *ipv6_hostaddress*}} **sgt** *sgt-number*
**no cts role-based sgt-map**

## Syntax Description

| | |
|---|---|
| *ipv4_netaddress* \| **ipv6_netaddress** | Specifies the network to be associated with an SGT. Enter IPv4 address in dot decimal notation; IPv6 in colon hexadecimal notation. |
| *ipv4_netaddress/prefix* \| **ipv6_netaddress/prefix** | Maps the SGT to all hosts of the specified subnet address (IPv4 or IPv6). IPv4 is specified in dot decimal CIDR notation, IPv6 in colon hexadecimal notation |
| **host** {*ipv4_hostaddress* \| *ipv6_hostaddress*} | Binds the specified host IP address with the SGT. Enter the IPv4 address in dot decimal notation; IPv6 in colon hexadecimal notation. |
| **vlan-list** {*vlan_ids* \| **all**} | Specifies VLAN IDs.<br>• (Optional) *vlan_ids*: Individual VLAN IDs are separated by commas, a range of IDs specified with a hyphen.<br>• (Optional) **all**: Specifies all VLAN IDs. |
| **vrf** *instance_name* | Specifies a VRF instance, previously created on the device. |
| **sgt** *sgt-number* | Specifies the SGT number from 0 to 65,535. |

## Command Default

None

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

If you do not have a Cisco Identity Services Engine, Cisco Secure ACS, dynamic Address Resolution Protocol (ARP) inspection, Dynamic Host Control Protocol (DHCP) snooping, or Host Tracking available on your

device to automatically map SGTs to source IP addresses, you can manually map an SGT to the following with the **cts role-based sgt-map** command:

- A single host IPv4 or IPv6 address
- All hosts of an IPv4 or IPv6 network or subnetwork
- VRFs
- Single or multiple VLANs

The **cts role-based sgt-map** command binds the specified SGT with packets that fall within the specified network address.

SXP exports an exhaustive expansion of all possible individual IP–SGT bindings within the specified network or subnetwork. IPv6 bindings and subnet bindings are exported only to SXP listener peers of SXP version 2 or later. The expansion does not include host bindings which are known individually or are configured or learnt from SXP for any nested subnet bindings.

The **cts role-based sgt-map host** command binds the specified SGT with incoming packets when the IP source address is matched by the specified host address. This IP-SGT binding has the lowest priority and is ignored in the presence of any other dynamically discovered bindings from other sources (such as, SXP or locally authenticated hosts). The binding is used locally on the device for SGT imposition and SGACL enforcement. It is exported to SXP peers if it is the only binding known for the specified host IP address.

The **vrf** keyword specifies a virtual routing and forwarding table previously defined with the vrf definition global configuration command. The IP-SGT binding specified with the **cts role-based sgt-map vrf** global configuration command is entered into the IP-SGT table associated with the specified VRF and the IP protocol version which is implied by the type of IP address entered.

The **cts role-based sgt-map vlan-list** command binds an SGT with a specified VLAN or a set of VLANs. The keyword **all** is equivalent to the full range of VLANs supported by the device and is not preserved in the nonvolatile generation (NVGEN) process. The specified SGT is bound to incoming packets received in any of the specified VLANs. The system uses discovery methods such as DHCP and/or ARP snooping (a.k.a. IP device tracking) to discover active hosts in any of the VLANs mapped by this command. Alternatively, the system could map the subnet associated with the SVI of each VLAN to the specified SGT. SXP exports the resulting bindings as appropriate for the type of binding.

## Examples

The following example shows how to manually map a source IP address to an SGT:

```
Device(config)# cts role-based sgt-map 10.10.1.1 sgt 77
```

In the following example, a device binds host IP address 10.1.2.1 to SGT 3 and 10.1.2.2 to SGT 4. These bindings are forwarded by SXP to an SGACL enforcement device.

```
Device(config)# cts role-based sgt-map host 10.1.2.1 sgt 3
Device(config)# cts role-based sgt-map host 10.1.2.2 sgt 4
```

## Related Commands

| Command | Description |
|---|---|
| **show cts role-based sgt-map** | Displays role-based access control information. |

# cts sxp connection peer

To enter the Cisco TrustSec Security Group Tag (SGT) Exchange Protocol (CTS-SXP) peer IP address, to specify if a password is used for the peer connection, to specify the global hold-time period for a listener or speaker device, and to specify if the connection is bidirectional, use the **cts sxp connection peer** command in global configuration mode. To remove these configurations for a peer connection, use the **no** form of this command.

**cts sxp connection peer** *ipv4-address* {**source** | **password**} {**default** | **none**} **mode** {**local** | **peer**} [[[**listener** | **speaker**] [**hold-time** *minimum-time maximum-time* | **vrf** *vrf-name*]] | **both** [**vrf** *vrf-name*]]
**cts sxp connection peer** *ipv4-address* {**source** | **password**} {**default** | **none**} **mode** {**local** | **peer**} [[[**listener** | **speaker**] [**hold-time** *minimum-time maximum-time* | **vrf** *vrf-name*]] | **both** [**vrf** *vrf-name*]]

## Syntax Description

| | |
|---|---|
| *ipv4-address* | SXP peer IPv4 address. |
| **source** | Specifies the source IPv4 address. |
| **password** | Specifies that an SXP password is used for the peer connection. |
| **default** | Specifies that the default SXP password is used. |
| **none** | Specifies no password is used. |
| **mode** | Specifies either the local or peer SXP connection mode. |
| **local** | Specifies that the SXP connection mode refers to the local device. |
| **peer** | Specifies that the SXP connection mode refers to the peer device. |
| **listener** | (Optional) Specifies that the device is the listener in the connection. |
| **speaker** | (Optional) Specifies that the device is the speaker in the connection. |
| **hold-time** *minimum-time maximum-time* | (Optional) Specifies the hold-time period, in seconds, for the device. The range for minimum and maximum time is from 0 to 65535.<br>A *maximum-time* value is required only when you use the following keywords: **peer speaker** and **local listener**. In other instances, only a *minimum-time* value is required.<br>**Note**<br>If both minimum and maximum times are required, the *maximum-time* value must be greater than or equal to the *minimum-time* value. |
| **vrf** *vrf-name* | (Optional) Specifies the virtual routing and forwarding (VRF) instance name to the peer. |
| **both** | (Optional) Specifies that the device is both the speaker and the listener in the bidirectional SXP connection. |

## Command Default

The CTS-SXP peer IP address is not configured and no CTS-SXP peer password is used for the peer connection.

The default setting for a CTS-SXP connection password is **none**.

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

When a CTS-SXP connection to a peer is configured with the **cts sxp connection peer** command, only the connection mode can be changed. The **vrf** keyword is optional. If a VRF name is not provided or a VRF name is provided with the **default** keyword, then the connection is set up in the default routing or forwarding domain.

A **hold-time** *maximum-period* value is required only when you use the following keywords: **peer speaker** and **local listener**. In other instances, only a **hold-time** *minimum-period* value is required.

**Note** The *maximum-period* value must be greater than or equal to the *minimum-period* value.

Use the **both** keyword to configure a bidirectional SXP connection. With the support for bidirectional SXP configuration, a peer can act as both a speaker and a listener and propagate SXP bindings in both directions using a single connection.

## Examples

The following example shows how to enable CTS-SXP and configure the CTS-SXP peer connection on Device_A, a speaker, for connection to Device_B, a listener:

```
Device_A> enable
Device_A# configure terminal
Device_A#(config)# cts sxp enable
Device_A#(config)# cts sxp default password Cisco123
Device_A#(config)# cts sxp default source-ip 10.10.1.1
Device_A#(config)# cts sxp connection peer 10.20.2.2 password default mode local speaker
```

The following example shows how to configure the CTS-SXP peer connection on Device_B, a listener, for connection to Device_A, a speaker:

```
Device_B> enable
Device_B# configure terminal
Device_B(config)# cts sxp enable
Device_B(config)# cts sxp default password Cisco123
Device_B(config)# cts sxp default source-ip 10.20.2.2
Device_B(config)# cts sxp connection peer 10.10.1.1 password default mode local listener
```

You can also configure both peer and source IP addresses for an SXP connection. The source IP address specified in the **cts sxp connection** command overwrites the default value.

```
Device_A(config)# cts sxp connection peer 51.51.51.1 source 51.51.51.2 password none mode
local speaker
```

```
Device_B(config)# cts sxp connection peer 51.51.51.2 source 51.51.51.1 password none mode
local listener
```

The following example shows how to enable bidirectional CTS-SXP and configure the SXP peer connection on Device_A to connect to Device_B:

```
Device_A> enable
Device_A# configure terminal
Device_A#(config)# cts sxp enable
Device_A#(config)# cts sxp default password Cisco123
Device_A#(config)# cts sxp default source-ip 10.10.1.1
Device_A#(config)# cts sxp connection peer 10.20.2.2 password default mode local both
```

## Related Commands

| Command | Description |
|---|---|
| **cts sxp default password** | Configures the Cisco TrustSec SXP default password. |
| **cts sxp default source-ip** | Configures the Cisco TrustSec SXP source IPv4 address. |
| **cts sxp enable** | Enables Cisco TrustSec SXP on a device. |
| **cts sxp log** | Enables logging for IP-to-SGT binding changes. |
| **cts sxp reconciliation** | Changes the Cisco TrustSec SXP reconciliation period. |
| **cts sxp retry** | Changes the Cisco TrustSec SXP retry period timer. |
| **cts sxp speaker hold-time** | Configures the global hold-time period of a speaker device in a Cisco TrustSec SGT SXPv4 network. |
| **cts sxp listener hold-time** | Configures the global hold-time period of a listener device in a Cisco TrustSec SGT SXPv4 network. |
| **show cts sxp** | Displays the status of all Cisco TrustSec SXP configurations. |

# cts sxp default password

To specify the Cisco TrustSec Security Group Tag (SGT) Exchange Protocol (CTS-SXP) default password, use the **cts sxp default password** command in global configuration mode. To remove the CTS-SXP default password, use the **no** form of this command.

**cts sxp default password** {**0** *unencrypted-pwd* | **6** *encrypted-key* | **7** *encrypted-keycleartext-pwd*}
**no cts sxp default password** {**0** *unencrypted-pwd* | **6** *encrypted-key* | **7** *encrypted-keycleartext-pwd*}

## Syntax Description

| | |
|---|---|
| **0** *unencrypted-pwd* | Specifies that an unencrypted CTS-SXP default password follows. The maximum password length is 32 characters. |
| **6** *encrypted-key* | Specifies that a 6 encryption type password is used as the CTS-SXP default password. The maximum password length is 32 characters. |
| **7** *encrypted-key* | Specifies that a 7 encryption type password is used as the CTS-SXP default password. The maximum password length is 32 characters. |
| *cleartext-pwd* | Specifies a cleartext CTS-SXP default password. The maximum password length is 32 characters. |

## Command Default

Type **0** (cleartext)

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

The **cts sxp default password** command sets the CTS-SXP default password to be optionally used for all CTS-SXP connections configured on the device. The CTS-SXP password can be cleartext, or encrypted with the **0**, **7**, **6** encryption type keywords. If the encryption type is 0, then an unencrypted cleartext password follows.

## Examples

The following example shows how to enable CTS-SXP and configure the CTS-SXP peer connection on Device_A, a speaker, for connection to Device_B, a listener:

```
Device_A# configure terminal
Device_A#(config)# cts sxp enable
Device_A#(config)# cts sxp default password Cisco123
Device_A#(config)# cts sxp default source-ip 10.10.1.1
Device_A#(config)# cts sxp connection peer 10.20.2.2 password default mode local speaker
```

The following example shows how to configure the CTS-SXP peer connection on Device_B, a listener, for connection to Device_A, a speaker:

```
Device_B# configure terminal
```

```
Device_B(config)# cts sxp enable
Device_B(config)# cts sxp default password Cisco123
Device_B(config)# cts sxp default source-ip 10.20.2.2
Device_B(config)# cts sxp connection peer 10.10.1.1 password default mode local listener
```

## Related Commands

| Command | Description |
|---|---|
| **cts sxp connection peer** | Enters the CTS-SXP peer IP address and specifies if a password is used for the peer connection. |
| **cts sxp default source-ip** | Configures the CTS-SXP source IPv4 address. |
| **cts sxp enable** | Enables CTS-SXP on a device. |
| **cts sxp log** | Enables logging for IP-to-SGT binding changes. |
| **cts sxp reconciliation** | Changes the CTS-SXP reconciliation period. |
| **cts sxp retry** | Changes the CTS-SXP retry period timer. |
| **show cts sxp** | Displays the status of all SXP configurations. |

# cts sxp default source-ip

To configure the Cisco TrustSec Security Group Tag (SGT) Exchange Protocol (CTS-SXP) source IPv4 address, use the **cts sxp default source-ip** command in global configuration mode. To remove the CTS-SXP default source IP address, use the **no** form of this command.

**cts sxp default source-ip** *ipv4-address*
**no cts sxp default source-ip** *ipv4-address*

## Syntax Description

| | |
|---|---|
| *ip-address* | Default source CTS-SXP IPv4 address. |

## Command Default

The CTS-SXP source IP address is not configured.

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

The **cts sxp default source-ip** command sets the default source IP address that CTS-SXP uses for all new TCP connections where a source IP address is not specified. Preexisting TCP connections are not affected when this command is entered. CTS-SXP connections are governed by three timers:

- Retry timer
- Delete Hold Down timer
- Reconciliation timer

## Examples

The following example shows how to enable CTS-SXP and configure the CTS-SXP peer connection on Device_A, a speaker, for connection to Device_B, a listener:

```
Device_A# configure terminal
Device_A#(config)# cts sxp enable
Device_A#(config)# cts sxp default password Cisco123
Device_A#(config)# cts sxp default source-ip 10.10.1.1
Device_A#(config)# cts sxp connection peer 10.20.2.2 password default mode local speaker
```

The following example shows how to configure the CTS-SXP peer connection on Device_B, a listener, for connection to Device_A, a speaker:

```
Device_B# configure terminal
Device_B(config)# cts sxp enable
Device_B(config)# cts sxp default password Cisco123
Device_B(config)# cts sxp default source-ip 10.20.2.2
Device_B(config)# cts sxp connection peer 10.10.1.1 password default mode local listener
```

## Related Commands

| Command | Description |
|---|---|
| **cts sxp connectionpeer** | Enters the CTS-SXP peer IP address and specifies if a password is used for the peer connection. |
| **cts sxp default password** | Configures the CTS-SXP default password. |
| **cts sxp enable** | Enables CTS-SXP on a device. |
| **cts sxp log** | Enables logging for IP-to-SGT binding changes. |
| **cts sxp reconciliation** | Changes the CTS-SXP reconciliation period. |
| **cts sxp retry** | Changes the CTS-SXP retry period timer. |
| **show cts sxp** | Displays the status of all SXP configurations. |

# cts sxp filter-enable

To enable filtering after creating filter lists and filter groups, use the **cts sxp filter-enable** command in global configuration mode. To disable filtering, use the **no** form of the command.

**cts sxp filter-enable**
**no cts sxp filter-enable**

## Syntax Description

This command has no keywords or arguments.

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

This command can be used at any time to enable or disable filtering. Configured filter lists and filter groups can be used to implement filtering only after filtering is enabled. The filter action will only filter bindings that are exchanged after filtering is enabled; there won't be any effect on the bindings that were exchanged before filtering was enabled.

## Examples

```
Device(config)# cts sxp filter-enable
```

## Related Commands

| Command | Description |
|---|---|
| **cts sxp filter-list** | Creates a SXP filter list to filter IP-SGT bindings based on IP prefixes, SGT or a combination of both. |
| **cts sxp filter-group** | Creates a filter group for grouping a set of peers and applying a filter list to them. |
| **show cts sxp filter-group** | Displays information about the configured filter groups.. |
| **show cts sxp filter-list** | Displays information about the configured filter lists. |
| **debug cts sxp filter events** | Logs events related to the creation, deletion and update of filter-lists and filter-groups |

# cts sxp filter-group

To create a filter group for grouping a set of peers and applying a filter list to them, use the **cts sxp filter-group** command in global configuration mode. To delete a filter group, use the **no** form of this command.

**cts sxp filter-group** {**listener** | **speaker**} {*filter-group-name* | **global** *filter-list-name*}
**no cts sxp filter-group** {**listener** | **speaker**} {*filter-group-name* | **global** *filter-list-name*}

## Syntax Description

| | |
|---|---|
| **listener** | Creates a filter group for a set of listeners. |
| **speaker** | Creates a filter group for a set of speakers. |
| **global** | Groups all speakers or listeners on the device. |
| *filter-group-name* | Name of the filter group. |
| *filter-list-name* | Name of the filter list. |

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

Issuing this command, places the device in the filter group configuration mode. From this mode, you can specify the devices to be grouped and apply a filter list to the filter group.

The command format to add devices or peers to the group is a follows:

**peer ipv4** *peer-IP*

In a single command, you can add one peer. To add more peers, repeat the command as many times as required.

The command format to apply a filter list to the group is as follows:

**filter** *filter-list-name*

You cannot specify a peer list for the global listener and global speaker filter-group options because in this case the filter is applied to all SXP connections.

When both the global filter group and peer-based filter groups are applied, the global filter takes priority. If only a global listener or global speaker filter group is configured, then the global filtering takes precendence only in that specific direction. For the other direction, the peer-based filter group is implemented.

## Examples

The following example shows how to create a listener group called **group_1**, and assign peers and a filter list to this group:

```
Device# configure terminal
Device(config)# cts sxp filter-group listener group_1
Device(config-filter-group)# filter filter_1
```

```
Device(config-filter-group)# peer ipv4 10.0.0.1
Device(config-filter-group)# peer ipv4 10.10.10.1
```

The following example shows how to create a global listener group called **group_2**:

```
Device# configure terminal
Device(config)# cts sxp filter-group listener global group_2
```

## Related Commands

| Command | Description |
|---|---|
| **cts sxp filter-list** | Creates a SXP filter list to filter IP-SGT bindings based on IP prefixes, SGT or a combination of both. |
| **cts sxp filter-enable** | Enables filtering. |
| **show cts sxp filter-group** | Displays information about the configured filter groups. |
| **show cts sxp filter-list** | Displays information about the configured filter lists. |
| **debug cts sxp filter events** | Logs events related to the creation, deletion and update of filter-lists and filter-groups |

# cts sxp filter-list

To create a SXP filter list to hold a set of filter rules for filtering IP-SGT bindings, use the **cts sxp filter-list** command in global configuration mode. To delete a filter list, use the **no** form of the command.

**cts sxp filter-list** *filter-list-name*
**no cts sxp filter-list** *filter-list-name*

## Syntax Description

| | |
|---|---|
| *filter-list-name* | Name of the filter-list. |

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

Issuing this command, places the device in the filter list configuration mode. From this mode, you can specify rules for the filter lists.

A filter rule can be based on SGT or IP Prefixes or a combination of both SGT and IP Prefixes.

The command format to add rules to the group is a follows:

*sequence-number* **action(permit/deny) filter-type(ipv4/ipv6/sgt)** *value/values*

For example, to permit SGT-IP bindings whose SGT value is 20, the rule is as follows:

```
30 permit sgt 20
```

Note that the sequence number is optional. If you do not specify a sequence number, it is generated by the system. Sequence numbers are automatically incremented by a value of 10 from the last used/configured sequence number. A new rule can be inserted by specifying a sequence number in between two existing rules.

The range of valid SGT values is between 2 and 65519. To provide multiple SGT values in a rule, seperate the values using a space. A maximum of 8 SGT values are allowed in a rule.

In a SGT and IP prefix combination rule, if there is a match for the binding in both the parts of the rule, then the action specified in the second part of the rule takes precedence. For example, in the following rule, if the SGT value of the IP prefix 10.0.0.1 is 20, the corresponding binding will be denied even if the first part of the rule permits the binding.

```
Device(config-filter-list)# 10 permit sgt 30 20 deny 10.0.0.1/24
```

Similarly, in the rule below the binding with the sgt value 20 will be permitted even if the sgt of the IP prefix 10.0.0.1 is 20, and the first action does not permit the binding.

```
Device(config-filter-list)# 10 deny 10.0.0.1/24 permit sgt 30 20
```

## Examples

The following example shows how to create a filter list and add some rules to the list:

```
Device# configure terminal
Device(config)# cts sxp filter-list filter_1
Device (config-filter-list)# 10 deny ipv4 10.0.0.1/24 permit sgt 100
Device(config-filter-list)# 20 permit sgt 60 61 62 63
```

## Related Commands

| Command | Description |
|---|---|
| **cts sxp filter-enable** | Enable SXP IP-prefix and SGT-based filtering. |
| **cts sxp filter-group** | Creates a filter group for grouping a set of peers and applying a filter list to them. |
| **show cts sxp filter-group** | Displays information about the configured filter groups. |
| **show cts sxp filter-list** | Displays information about the configured filter lists. |
| **debug cts sxp filter events** | Logs events related to the creation, deletion and update of filter-lists and filter-groups. |

# cts sxp log binding-changes

To enable logging for IP-to-Cisco TrustSec Security Group Tag (SGT) Exchange Protocol (CTS-SXP) binding changes, use the **cts sxp log binding-changes** command in global configuration mode. To disable logging, use the **no** form of this command.

**cts sxp log binding-changes**
**no cts sxp log binding-changes**

## Command Default

Logging is disabled.

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

The **cts sxp log binding-changes** command enables logging for IP-to-SGT binding changes. SXP syslogs (sev 5 syslogs) are generated whenever IP address-to-SGT binding occurs (add, delete, change). These changes are learned and propagated on the SXP connection.

## Related Commands

| Command | Description |
|---|---|
| **cts sxp connectionpeer** | Enters the CTS-SXP peer IP address and specifies if a password is used for the peer connection |
| **cts sxp default password** | Configures the CTS-SXP default password. |
| **cts sxp default source-ip** | Configures the CTS-SXP source IPv4 address. |
| **cts sxp enable** | Enables CTS-SXP on a device. |
| **cts sxp reconciliation** | Changes the CTS-SXP reconciliation period. |
| **cts sxp retry** | Changes the CTS-SXP retry period timer. |
| **show cts sxp** | Displays status of all SXP configurations. |

# cts sxp reconciliation period

To change the Cisco TrustSec Security Group Tag (SGT) Exchange Protocol (CTS-SXP) reconciliation period, use the **cts sxp reconciliation period** command in global configuration mode. To return the CTS-SXP reconciliation period to its default value, use the **no** form of this command.

**cts sxp reconciliation period** *seconds*
**no cts sxp reconciliation period** *seconds*

## Syntax Description

| | |
|---|---|
| *seconds* | CTS-SXP reconciliation timer in seconds. The range is from 0 to 64000. The default is 120. |

## Command Default

120 seconds (2 minutes)

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

After a peer terminates a CTS-SXP connection, an internal delete hold-down timer starts. If the peer reconnects before the delete hold-down timer expires, then the CTS-SXP reconciliation timer starts. While the CTS-SXP reconciliation period timer is active, the CTS-SXP software retains the SGT mapping entries learned from the previous connection and removes invalid entries. Setting the SXP reconciliation period to 0 seconds disables the timer and causes all entries from the previous connection to be removed.

## Related Commands

| Command | Description |
|---|---|
| **cts sxp connection peer** | Enters the CTS-SXP peer IP address and specifies if a password is used for the peer connection. |
| **cts sxp default password** | Configures the CTS-SXP default password. |
| **cts sxp default source-ip** | Configures the CTS-SXP source IPv4 address. |
| **cts sxp enable** | Enables CTS-SXP on a device. |
| **cts sxp log** | Turns on logging for IP to SGT binding changes. |
| **cts sxp retry** | Changes the CTS-SXP retry period timer. |
| **show cts sxp** | Displays status of all CTS-SXP configurations. |

# cts sxp retry period

To change the Cisco TrustSec Security Group Tag (SGT) Exchange Protocol (CTS-SXP) retry period timer, use the **cts sxp retry period** command in global configuration mode. To return the CTS-SXP retry period timer to its default value, use the **no** form of this command.

**cts sxpretry period** *seconds*
**no cts sxpretry period** *seconds*

## Syntax Description

| | |
|---|---|
| *seconds* | CTS-SXP retry timer in seconds. The range is from 0 to 64000. The default is 120. |

## Command Default

120 seconds (2 minutes)

## Command Modes

Global configuration (config)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

The retry timer is triggered if there is at least one CTS-SXP connection that is not up. A new CTS-SXP connection is attempted when this timer expires. A zero value results in no retry being attempted.

## Related Commands

| Command | Description |
|---|---|
| **cts sxp connectionpeer** | Enters the CTS-SXP peer IP address and specifies if a password is used for the peer connection. |
| **cts sxp default password** | Configures the CTS-SXP default password. |
| **cts sxp default source-ip** | Configures the CTS-SXP source IPv4 address. |
| **cts sxp enable** | Enables CTS-SXP on a device. |
| **cts sxp log** | Enables logging for IP-to-SGT binding changes. |
| **cts sxp reconciliation** | Changes the CTS-SXP reconciliation period. |
| **show cts sxp** | Displays the status of all CTS-SXP configurations. |

# debug cts environment-data

To enable the debugging of Cisco TrustSec environment data operations, use the **debug cts environment-data** command in privileged EXEC mode. To stop the debugging of environment data operations, use the **no** form of this command.

**debug cts environment-data** [**aaa** | **all** | **default-epg** | **default-sg** | **events** | **platform** | **sg-epg**]
**no debug cts environment-data** [**aaa** | **all** | **default-epg** | **default-sg** | **events** | **platform** | **sg-epg**]

## Syntax Description

| | |
|---|---|
| **aaa** | (Optional) Specifies the debugging of authentication, authorization, and accounting (AAA) messages. |
| **all** | (Optional) Specifies the debugging of all environment-data messages. |
| **default-epg** | (Optional) Specifies the debugging of default end-point group (EPG) messages. |
| **default-sg** | (Optional) Specifies the debugging of default server group messages. |
| **events** | (Optional) Specifies the debugging of environment data events. |
| **platform** | (Optional) Specifies the debugging of Security Group Tag (SGT)-EPG platform messages. |
| **sg-epg** | (Optional) Specifies the debugging of SP-EPG mapping. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Examples

The following example shows how to enable the debugging of environment data events:

```
Device# enable
Device# debug cts environment-data events
```

## Related Commands

| Command | Description |
|---|---|
| **cts environment-data enable** | Enables the download of environment data. |
| **clear cts environment-data** | Clears environment data. |

| Command | Description |
|---|---|
| **show cts environment-data** | Displays Cisco TrustSec environment data information. |

# debug cts policy-server

To enable Cisco TrustSec policy-server debugging, use the **debug cts policy-server** command in privileged EXEC mode.

**debug cts policy-server** {**all** | {**http** | **json**} {**all** | **error** | **events**}}

## Syntax Description

| | |
|---|---|
| **all** | Enables all policy-server debugs. |
| **http** | Enables HTTP client debugs. |
| **json** | Enables JSON parser debugs. |
| **error** | Enables HTTP error debugs. |
| **events** | Enables HTTP event debugs. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Examples

The following example shows how to enable HTTP client error debugs:

```
Device# enable
Device# debug cts policy-server http error
```

## Related Commands

| Command | Description |
|---|---|
| **cts policy-server name** | Configures the name of a policy server and enters policy-server configuration mode. |
| **show cts policy-server** | Displays Cisco TrustSec policy-server information. |

# port (CTS)

To configure the policy server port, use the **port** command in policy-server configuration mode. To remove the policy server port, use the **no** form of this command.

**port** *port-number*
**no port**

## Syntax Description

| | |
|---|---|
| *port-number* | Policy server port number. Valid values are from 1025 to 65535. |

## Command Default

Default port is 9063.

## Command Modes

Policy-server configuration (config-policy-server)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Usage Guidelines

Only 9063 is supported as the External RESTful Services (ERS) port.

## Examples

The following example shows how to configure the policy-server port:

```
Device# enable
Device# configure terminal
Device(config)# policy-server name ise_server_2
Device(config-policy-server)# port 9063
```

## Related Commands

| Command | Description |
|---|---|
| **cts policy-server name** | Configures the name of a policy server and enters policy-server configuration mode. |

# propagate sgt (cts manual)

To enable Security Group Tag (SGT) propagation at Layer 2 on Cisco TrustSec Security (CTS) interfaces, use the **propagate sgt** command in interface configuration mode. To disable SGT propagation, use the **no** form of this command.

**propagate sgt**

## Syntax Description

This command has no arguments or keywords.

## Command Default

SGT processing propagation is enabled.

## Command Modes

CTS manual interface configuration mode (config-if-cts-manual)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

SGT processing propagation allows a CTS-capable interface to accept and transmit a CTS Meta Data (CMD) based L2 SGT tag. The **no propagate sgt** command can be used to disable SGT propagation on an interface in situations where a peer device is not capable of receiving an SGT, and as a result, the SGT tag cannot be put in the L2 header.

## Examples

The following example shows how to disable SGT propagation on a manually-configured TrustSec-capable interface:

```
Device# configure terminal
Device(config)# interface gigabitethernet 0
Device(config-if)# cts manual
Device(config-if-cts-manual)# no propagate sgt
```

The following example shows that SGT propagation is disabled on Gigabit Ethernet interface 0:

```
Device#show cts interface brief
Global Dot1x feature is Disabled
Interface GigabitEthernet0:
    CTS is enabled, mode:    MANUAL
    IFC state:               OPEN
    Authentication Status:   NOT APPLICABLE
        Peer identity:       "unknown"
        Peer's advertised capabilities: ""
    Authorization Status:    NOT APPLICABLE
    SAP Status:              NOT APPLICABLE
    Propagate SGT:           Disabled
    Cache Info:
        Cache applied to link : NONE
```

## Related Commands

| Command | Description |
|---|---|
| **cts manual** | Enables an interface for CTS. |

| Command | Description |
|---|---|
| **show cts interface** | Displays Cisco TrustSec states and statistics per interface. |

# retransmit (CTS)

To configure the maximum number of retries from the server, use the **retransmit** command in policy-server configuration mode. To go back to the default, use the **no** form of this command.

**retransmit** *number-of-retries*
**no retransmit**

## Syntax Description

| | |
|---|---|
| *number-of-retries* | Maximum number of retries. Valid values are from 0 to 5. |

## Command Default

The default is 4.

## Command Modes

Policy-server configuration (config-policy-server)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Examples

The following example shows how to change the maximum number of retries:

```
Device# enable
Device# configure terminal
Device(config)# policy-server name ise_server_2
Device(config-policy-server)# retransmit 3
```

## Related Commands

| Command | Description |
|---|---|
| **cts policy-server name** | Configures the name of a policy server and enters policy-server configuration mode. |

# sap mode-list (cts manual)

To select the Security Association Protocol (SAP) authentication and encryption modes (prioritized from highest to lowest) used to negotiate link encryption between two interfaces, use the **sap mode-list** command in CTS dot1x interface configuration mode. To remove a mode-list and revert to the default, use the **no** form of this command.

Use the **sap mode-list** command to manually specify the Pairwise Master Key (PMK) and the Security Association Protocol (SAP) authentication and encryption modes to negotiate MACsec link encryption between two interfaces. Use the **no** form of the command to disable the configuration.

**sap pmk mode-list** {**gcm-encrypt** | **gmac** | **no-encap** | **null**} [**gcm-encrypt** | **gmac** | **no-encap** | **null**]
**no sap pmk mode-list** {**gcm-encrypt** | **gmac** | **no-encap** | **null**} [**gcm-encrypt** | **gmac** | **no-encap** | **null**]

## Syntax Description

| | |
|---|---|
| **pmk** *hex_value* | Specifies the Hex-data PMK (without leading 0x; enter even number of hex characters, or else the last character is prefixed with 0.). |
| **mode-list** | Specifies the list of advertised modes (prioritized from highest to lowest). |
| **gcm-encrypt** | Specifies GMAC authentication, GCM encryption. |
| **gmac** | Specifies GMAC authentication only, no encryption. |
| **no-encap** | Specifies no encapsulation. |
| **null** | Specifies encapsulation present, no authentication, no encryption. |

## Command Default

The default encryption is **sap pmk mode-list gcm-encrypt null**. When the peer interface does not support 802.1AE MACsec or 802.REV layer-2 link encryption, the default encryption is **null**.

## Command Modes

CTS manual interface configuration (config-if-cts-manual)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

Use the **sap pmk mode-list** command to specify the authentication and encryption method.

The Security Association Protocol (SAP) is an encryption key derivation and exchange protocol based on a draft version of the 802.11i IEEE protocol. SAP is used to establish and maintain the 802.1AE link-to-link encryption (MACsec) between interfaces that support MACsec.

SAP and the Pairwise Master Key (PMK) can be manually configured between two interfaces with the **sap pmk mode-list** command. When using 802.1X authentication, both sides (supplicant and authenticator) receive the PMK and the MAC address of the peer's port from the Cisco Secure Access Control Server.

If a device is running CTS-aware software but the hardware is not CTS-capable, disallow encapsulation with the **sap mode-list no-encap** command.

## Examples

The following example shows how to configure SAP on a Gigabit Ethernet interface:

```
Device# configure terminal
Device(config)# interface gigabitethernet 2/1
DeviceD(config-if)# cts manual
Device(config-if-cts-manual)# sap pmk FFFEE mode-list gcm-encrypt
```

## Related Commands

| Command | Description |
|---|---|
| **cts manual** | Enables an interface for CTS. |
| **propagate sgt (cts manual)** | Enables Security Group Tag (SGT) propagation at Layer 2 on Cisco TrustSec Security (CTS) interfaces. |
| **show cts interface** | Displays Cisco TrustSec interface configuration statistics. |

# show cts credentials

To display the Cisco TrustSec (CTS) device ID, use the **show cts credentials** command in EXEC or privileged EXEC mode.

**show cts credentials**

## Syntax Description

This command has no commands or keywords.

## Command Modes

Privileged EXEC (#) User EXEC (>)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Examples

The following example displays output:

```
Device# show cts credentials

CTS password is defined in keystore, device-id = r4
```

## Related Commands

| Command | Description |
|---|---|
| **cts credentials** | Specifies the TrustSec ID and password. |

# show cts environment-data

To display Cisco TrustSec environment data information, use the **show cts environment-data** command in privileged EXEC mode.

**show cts environment-data**

This command has no arguments and keywords.

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Examples

The following is sample output from the **show cts environment-data** command:

```
Device# enable
Device# show cts environment-data

TS Environment Data
====================
Current state = START
Last status = Failed
Environment data is empty
State Machine is running
Retry_timer (60 secs) is running
```

Output fields are self-explanatory.

## Related Commands

| Command | Description |
|---|---|
| **cts environment-data enable** | Enables the download of environment data. |
| **clear cts environment-data** | Clears environment data. |
| **debug cts environment-data** | Enables the debugging of Cisco TrustSec environment data operations. |

# show cts interface

To display Cisco TrustSec (CTS) configuration statistics for an interface(s), use the **show cts interface** command in EXEC or privileged EXEC mode.

**show cts interface** [**GigabitEthernet** *port* | **Vlan** *number* | **brief** | **summary**]

## Syntax Description

| | |
|---|---|
| *port* | (Optional) Gigabit Ethernet interface number. A verbose status output for this interface is returned. |
| *number* | (Optional) VLAN interface number from 1 to 4095. |
| **brief** | (Optional) Displays abbreviated status for all CTS interfaces. |
| **summary** | (Optional) Displays a tabular summary of all CTS interfaces with 4 or 5 key status fields for each interface. |

## Command Default

None

## Command Modes

EXEC (>)
Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

Use the **show cts interface** command without keywords to display verbose status for all CTS interfaces.

## Examples

The following example displays output without using a keyword (verbose status for all CTS interfaces):

```
Device# show cts interface

Global Dot1x feature is Disabled
 Interface GigabitEthernet0/1/0:
     CTS is enabled, mode:    MANUAL
     IFC state:               OPEN
     Interface Active for 00:00:18.232
     Authentication Status:   NOT APPLICABLE
         Peer identity:       "unknown"
         Peer's advertised capabilities: ""
     Authorization Status:    NOT APPLICABLE
     SAP Status:              NOT APPLICABLE
         Configured pairwise ciphers:
             gcm-encrypt
             null

         Replay protection:      enabled
         Replay protection mode: STRICT

         Selected cipher:
```

```
    Propagate SGT:           Enabled
    Cache Info:
        Cache applied to link : NONE

    Statistics:
        authc success:              0
        authc reject:               0
        authc failure:              0
        authc no response:          0
        authc logoff:               0
        sap success:                0
        sap fail:                   0
        authz success:              0
        authz fail:                 0
        port auth fail:             0
        Ingress:
            control frame bypassed: 0
            sap frame bypassed:     0
            esp packets:            0
            unknown sa:             0
            invalid sa:             0
            inverse binding failed: 0
            auth failed:            0
            replay error:           0
        Egress:
            control frame bypassed: 0
            esp packets:            0
            sgt filtered:           0
            sap frame bypassed:     0
            unknown sa dropped:     0
            unknown sa bypassed:    0
```

The following example displays output using the **brief** keyword:

```
Device# show cts interface brief

Global Dot1x feature is Disabled
 Interface GigabitEthernet0/1/0:
     CTS is enabled, mode:    MANUAL
     IFC state:               OPEN
     Interface Active for 00:00:40.386
     Authentication Status:   NOT APPLICABLE
         Peer identity:       "unknown"
         Peer's advertised capabilities: ""
     Authorization Status:    NOT APPLICABLE
     SAP Status:              NOT APPLICABLE
     Propagate SGT:           Enabled
     Cache Info:
         Cache applied to link : NONE
```

## Related Commands

| Command | Description |
|---|---|
| **cts manual** | Enables an interface for CTS. |
| **cts sxp enable** | Configures SXP on a network device. |
| **propagate sgt** | Enables Security Group Tag (SGT) propagation at Layer 2 on Cisco TrustSec Security (CTS) interfaces. |

# show cts policy-server

To display Cisco TrustSec policy-server information, use the **show cts policy-server** command in privileged EXEC mode.

**show cts policy-server** {**details** | **statistics** } {**active** | **all** *name*}

## Syntax Description

| | |
|---|---|
| **details** | Displays policy-server details. |
| **statistics** | Displays policy-server statistics. |
| **active** | Displays information about active policy servers. |
| **all** | Displays statistics information about all servers. |
| *name* | Policy-server name. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Examples

The following is sample output from the **show cts policy-server details all** command:

```
Device# enable
Device# show cts policy-server details all

Server Name   : ise_151
Server Status : Inactive
  IPv4 Address     : 10.1.1.1
  IPv4 Address     : 10.2.2.2
  IPv4 Address     : 10.2.2.3
  IPv6 Address     : 2001:db8::1
  IPv6 Address     : 2001:db8::3
  Domain-name      : www.cisco.ise.com
  Trustpoint       : trust_ise_151
  Port-num         : 9063
  Retransmit count : 3
  Timeout          : 15
  App Content type : JSON

Server Name   : ise_150
Server Status : Inactive
  IPv4 Address     : 10.64.69.151
  Trustpoint       : trust_ise_151
  Port-num         : 9063
  Retransmit count : 3
  Timeout          : 15
  App Content type : JSON
```

The following is sample output from the **show cts policy-server statistics all** command:

```
Device# show cts policy-server statistics all

Server Name  : ise_server_1
Server State : ALIVE
  Number of Request sent        : 7
  Number of Request sent fail   : 0
  Number of Response received   : 4
  Number of Response recv fail  : 3
    HTTP 200 OK                 : 4
    HTTP 400 BadReq             : 0
    HTTP 401 UnAuthorized Req   : 0
    HTTP 403 Req Forbidden      : 0
    HTTP 404 NotFound           : 0
    HTTP 408 ReqTimeout         : 0
    HTTP 415 UnSupported Media  : 0
    HTTP 500 ServerErr          : 0
    HTTP 501 Req NoSupport      : 0
    HTTP 503 Service Unavailable: 0
    TCP or TLS handshake error  : 3
    HTTP Other Error            : 0
```

The following is sample output from the **show cts policy-server statistics** *name* command:

```
Device# show cts policy-server statistics name ise_server_1

Server Name  : ise_server_1
Server State : ALIVE
  Number of Request sent        : 7
  Number of Request sent fail   : 0
  Number of Response received   : 4
  Number of Response recv fail  : 3
    HTTP 200 OK                 : 4
    HTTP 400 BadReq             : 0
    HTTP 401 UnAuthorized Req   : 0
    HTTP 403 Req Forbidden      : 0
    HTTP 404 NotFound           : 0
    HTTP 408 ReqTimeout         : 0
    HTTP 415 UnSupported Media  : 0
    HTTP 500 ServerErr          : 0
    HTTP 501 Req NoSupport      : 0
    HTTP 503 Service Unavailable: 0
    TCP or TLS handshake error  : 3
    HTTP Other Error            : 0
```

The following table explains the significant fields shown in the display:

***Table 1: show cts policy-server statistics Field Descriptions***

| Field | Description |
|---|---|
| HTTP 200 OK | Client request was accepted successfully. |
| HTTP 400 BadReq | Malformed request, or the request had invalid parameters. |
| HTTP 401 UnAuthorized Req | Proper credentials (username and password) to access a resource was not provided. |
| HTTP 403 Req Forbidden | Server refused to honor the client request. |

| Field | Description |
|---|---|
| HTTP 404 NotFound | Invalid URL. |
| HTTP 408 ReqTimeout | Request timed out. |
| HTTP 415 UnSupported Media | Server unable to process the requested content-type. |
| HTTP 500 ServerErr | Internal server error or exception. |
| TCP or TLS handshake error | IP unreachable or the Transport Layer Security (TLS) handshake failed due to invalid trust-point. |

## Related Commands

| Command | Description |
|---|---|
| **cts policy-server name** | Configures a Cisco TrustSec policy server and enters policy-server configuration mode. |
| **debug cts policy-server** | Enables Cisco TrustSec policy-server debugging. |

# show cts role-based counters

To display Security Group access control list (ACL) enforcement statistics, use the **show cts role-based counters** command in user EXEC or privileged EXEC mode.

**show cts role-based counters** [**default** [**ipv4** | **ipv6**]] [ {**from** {*sgt-number* | **unknown**}[**ipv4** | **ipv6** | **to** | {*sgt-number* | **unknown**} | [**ipv4** | **ipv6**]]} ][**to** {*sgt-number* | **unknown**} [**ipv4** | **ipv6**]] [**ipv4** | **ipv6**]

## Syntax Description

| | |
|---|---|
| **default** | (Optional) Displays information about the default policy counters. |
| **from** | (Optional) Displays information about the source security group. |
| **ipv4** | (Optional) Displays information about security groups on IPv4 networks. |
| **ipv6** | (Optional) Displays information about security groups on IPv6 networks. |
| **to** | (Optional) Displays information about the destination security group. |
| *sgt-number* | (Optional) Security Group Tag number. Valid values are from 0 to 65533. |
| **unknown** | (Optional) Displays information about all source groups. |

## Command Modes

User EXEC (>)

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

## Usage Guidelines

Use the **clear cts role-based counters**command to reset all or a range of statistics.

Specify the source SGT with the **from** keyword and the destination SGT with the **to** keyword. All statistics are displayed when both the **from** and **to** keywords are omitted.

The **default** keyword displays the statistics of the default unicast policy. When neither **ipv4** nor **ipv6** keywords are specified, this command displays only IPv4 counters.

In Cisco TrustSec monitor mode, permitted traffic counters are displayed under the SW-Permitt label and the denied traffic counters are displayed under SW-Monitor label.

### Example

The following is sample output from the **show cts role-based counters**

```
Device# show cts role-based counters

Role-based IPv4 counters
From    To      SW-Denied  HW-Denied  SW-Permitt  HW-Permitt  SW-Monitor  HW-Monitor
12      24              0          0           0           0           0           0

12      77              0          0           5           0           0           0
```

The table below lists the significant fields shown in the display.

***Table 2: show cts role-based counters Field Descriptions***

| Field | Description |
|---|---|
| From | Source security group. |
| To | Destination security group. |
| SW-Permitt | Permitted traffic counters. |
| SW-Monitor | Denied traffic counters. |

## Related Commands

| Command | Description |
|---|---|
| **clear role-basedcounters** | Resets SGACL statistic counters. |
| **cts role-based** | Maps IP addresses, Layer 3 interfaces, and VRFs to SGTs. Enables Cisco TrustSec caching and SGACL enforcement. |

# show cts role-based permissions

To display the role-based (security group) access control permission list, use the **show cts role-based permissions** command in privileged EXEC mode.

**show cts role-based permissions** [**default** [**details** | **ipv4 [details]** | **ipv6 [details]**] | **from {** {*sgt* | **unknown** }[**ipv4** | **ipv6** | **to {** {*sgt* | **unknown**}[**details** | **ipv4 [details]** | **ipv6 [details]**]}}] | **ipv4** | **ipv6** | **platform** | **to** {*sgt* | **unknown**}[**ipv4** | **ipv6**]]

## Syntax Description

| | |
|---|---|
| **default** | (Optional) Displays information about the default permission list. |
| **details** | (Optional) Displays attached access control list (ACL) details. |
| **ipv4** | (Optional) Displays information about the IPv4 protocol. |
| **ipv6** | (Optional) Displays information about the IPv6 protocol. |
| **from** | (Optional) Displays information about the source group. |
| *sgt* | (Optional) Security Group Tag. Valid values are from 2 to 65519. |
| **to** | (Optional) Displays information about the destination group. |
| **unknown** | (Optional) Displays information about unknown source and destination groups. |
| **platform** | (Optional) Displays information about the platform. |

## Command Modes

Privileged EXE (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Usage Guidelines

This command displays the content of the SGACL permission matrix. You can specify the source security group tag (SGT) by using the **from** keyword and the destination SGT by using the **to** keyword. When both these keywords are specified RBACLs of a single cell are displayed. An entire column is displayed when only the **to** keyword is used. An entire row is displayed when the **from** keyword is used. The entire permission matrix is displayed when both the **from** and **to** keywords are omitted.

The command output is sorted by destination SGT as a primary key and the source SGT as a secondary key. SGACLs for each cell is displayed in the same order they are defined in the configuration or acquired from Cisco Identity Services Engine (ISE).

The **details** keyword is provided when a single cell is selected by specifying both **from** and **to** keywords. When the **details** keyword is specified the access control entries of SGACLs of a single cell are displayed.

The following is sample output from the **show role-based permissions** command:

```
Device# show cts role-based permissions
```

```
IPv4 Role-based permissions default (monitored):
default_sgacl-02
Permit IP-00
IPv4 Role-based permissions from group 305:sgt to group 306:dgt (monitored):
test_reg_tcp_permit-02
RBACL Monitor All for Dynamic Policies : TRUE
RBACL Monitor All for Configured Policies : FALSE
IPv4 Role-based permissions from group 6:SGT_6 to group 6:SGT_6 (configured):
  mon_1
IPv4 Role-based permissions from group 10 to group 11 (configured):
  mon_2
RBACL Monitor All for Dynamic Policies : FALSE
RBACL Monitor All for Configured Policies : FALSE
```

## Related Commands

| Command | Description |
|---|---|
| **cts role-based permissions** | Enables permissions from a source group to a destination group. |
| **cts role-based monitor** | Enables role-based access list monitoring. |

# show cts server-list

To display the list of HTTP and RADIUS servers available to Cisco TrustSec seed and nonseed devices, use the **show cts server-list** command in user EXEC or privileged EXEC mode.

**show cts server-list**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

User EXEC (>)

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |
| Cisco IOS XE Amsterdam 17.1.1 | The output of this command was modified to display the HTTP server address and status information. |
| Cisco IOS XE Amsterdam 17.2.1 | The output of this command was modified to display the IPv6 address of the HTTP servers. |

## Usage Guidelines

This command is useful for gathering Cisco TrustSec RADIUS server address and status information.

In Cisco IOS XE Gibraltar 17.1.1 and later releases, the output of this command displays HTTP server address and their status information.

In Cisco IOS XE Gibraltar 17.2.1 and later releases, the output of this command displays the IPv6 address along with the IPv4 address of HTTP servers.

## Examples

*Cisco IOS XE Amsterdam 17.2.1 and later releases*

The following sample output from the **show cts server-list** command displays IPv4 and IPv6 address of HTTP servers and their status information:

```
Device> show cts server-list

HTTP Server-list:
  Server Name  : cts_private_server_0
  Server State : ALIVE
  IPv4 Address     : 10.64.69.151
  IPv6 Address     : 2001:DB8:8086:6502::
  IPv6 Address     : 2001:db8::2
  IPv6 Address     : 2001:db8::402:99
  IPv6 Address     : 2001:DB8::802:16
  Domain-name      : ise-267.cisco.com
  Trustpoint       : cts_trustpoint_0

  Server Name  : cts_private_server_1
  Server State : ALIVE
  IPv4 Address     : 10.10.10.3
  IPv4 Address     : 10.10.10.2
  IPv6 Address     : 2001:db8::20
  IPv6 Address     : 2001:db8::21
```

```
  Domain-name      : www.ise.cisco.com
  Trustpoint       : cts_trustpoint_1
```

*Cisco IOS XE Amsterdam 17.1.1*

The following sample output from the **show cts server-list** command displays HTTP servers and their status information:

```
Device> show cts server-list

HTTP Server-list:
Server Name: Http_Server_1
Server Status: DEAD
    IPv4 Address: 10.78.105.148
    IPv6 Address: Not Supported
    Domain-name: http_server_1.ise.com
    Port: 9063


Server Name: Http_Server_2
Server Status: ALIVE
    IPv4 Address: 10.78.105.149
    IPv6 Address: Not Supported
    Domain-name: http_server_2.ise.com
    Status = ALIVE
```

*Prior to Cisco IOS XE Amsterdam 17.1.1*

The following example displays the Cisco TrustSec RADIUS server list:

```
Device> show cts server-list

CTS Server Radius Load Balance = DISABLED
Server Group Deadtime = 20 secs (default)
Global Server Liveness Automated Test Deadtime = 20 secs
Global Server Liveness Automated Test Idle Time = 60 mins
Global Server Liveness Automated Test = ENABLED (default)
Preferred list, 1 server(s):
 *Server: 10.0.1.6, port 1812, A-ID 1100E046659D4275B644BF946EFA49CD
          Status = ALIVE
          auto-test = TRUE, idle-time = 60 mins, deadtime = 20 secs
Installed list: ACSServerList1-0001, 1 server(s):
 *Server: 101.0.2.61, port 1812, A-ID 1100E046659D4275B644BF946EFA49CD
          Status = ALIVE
          auto-test = TRUE, idle-time = 60 mins, deadtime = 20 secs
```

## Related Commands

| Command | Description |
|---|---|
| **address ipv4 (config-radius-server)** | Configures the RADIUS server accounting and authentication parameters for PAC provisioning. |
| **pac key** | Specifies the PAC encryption key. |

# show cts sxp

To display Cisco TrustSec Security Group Tag (SGT) Exchange Protocol (CTS-SXP) connection or source IP-to-SGT mapping information, use the **show cts sxp** command in user EXEC or privileged EXEC mode.

**show cts sxp** {**connections** [**brief** | **vrf** *instance-name*] | **filter-group** [**detailed** | **global** | **listener** | **speaker** ] | **filter-list** *filter-list-name* | **sgt-map** [**brief** | **vrf** *instance-name*]} [**brief** | **vrf** *instance-name*]

## Syntax Description

| | |
|---|---|
| **connections** | Displays Cisco TrustSec SXP connections information. |
| **brief** | (Optional) Displays an abbreviation of the SXP information. |
| **vrf** *instance-name* | (Optional) Displays the SXP information for the specified Virtual Routing and Forwarding (VRF) instance name. |
| **filter-group** {**detailed \| global \| listener \| speaker** } | (Optional) Displays filter group information. |
| **filter-list** *filter-list-name* | (Optional) Displays filter list information. |
| **sgt-map** | (Optional) Displays the IP-to-SGT mappings received through SXP. |

## Command Default

None

## Command Modes

User EXEC (>)
Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.2 | This command was introduced. |

## Examples

The following example displays the SXP connections using the **brief** keyword:

```
Device# show cts sxp connection brief

 SXP              : Enabled
 Default Password : Set
 Default Source IP: Not Set
Connection retry open period: 10 secs
Reconcile period: 120 secs
Retry open timer is not running
------------------------------------------------------------------------------
Peer_IP          Source_IP        Conn Status       Duration
------------------------------------------------------------------------------
10.10.10.1          10.10.10.2          On               0:00:02:14 (dd:hr:mm:sec)
10.10.2.1          10.10.2.2          On               0:00:02:14 (dd:hr:mm:sec)
Total num of SXP Connections = 2
```

The following example displays the CTS-SXP connections:

```
Device# show cts sxp connections

 SXP              : Enabled
 Default Password : Set
 Default Source IP: Not Set
Connection retry open period: 10 secs
Reconcile period: 120 secs
Retry open timer is not running
----------------------------------------------
Peer IP          : 10.10.10.1
Source IP        : 10.10.10.2
Set up           : Peer
Conn status      : On
Connection mode  : SXP Listener
Connection inst# : 1
TCP conn fd      : 1
TCP conn password: not set (using default SXP password)
Duration since last state change: 0:00:01:25 (dd:hr:mm:sec)
----------------------------------------------
Peer IP          : 10.10.2.1
Source IP        : 10.10.2.2
Set up           : Peer
Conn status      : On
Connection mode  : SXP Listener
TCP conn fd      : 2
TCP conn password: not set (using default SXP password)
Duration since last state change: 0:00:01:25 (dd:hr:mm:sec)
Total num of SXP Connections = 2
```

The following example displays the CTS-SXP connections for a bi-directional connection when the device is both the speaker and listener:

```
Device# show cts sxp connections

SXP : Enabled
Highest Version Supported: 4
Default Password : Set
Default Source IP: Not Set
Connection retry open period: 120 secs
Reconcile period: 120 secs
Retry open timer is running
----------------------------------------------
Peer IP : 2.0.0.2
Source IP : 1.0.0.2
Conn status : On (Speaker) :: On (Listener)
Conn version : 4
Local mode : Both
Connection inst# : 1
TCP conn fd : 1(Speaker) 3(Listener)
TCP conn password: default SXP password
Duration since last state change: 1:03:38:03 (dd:hr:mm:sec) :: 0:00:00:46 (dd:hr:mm:sec)
```

The following example displays output from a CTS-SXP listener with a torn down connection to the SXP speaker. Source IP-to-SGT mappings are held for 120 seconds, the default value of the delete hold down timer.

```
Device# show cts sxp connections
```

```
 SXP              : Enabled
 Default Password : Set
 Default Source IP: Not Set
Connection retry open period: 10 secs
Reconcile period: 120 secs
Retry open timer is not running
----------------------------------------------
Peer IP          : 10.10.10.1
Source IP        : 10.10.10.2
Set up           : Peer
Conn status      : Delete_Hold_Down
Connection mode  : SXP Listener
Connection inst# : 1
TCP conn fd      : -1
TCP conn password: not set (using default SXP password)
Delete hold down timer is running
Duration since last state change: 0:00:00:16 (dd:hr:mm:sec)
----------------------------------------------
Peer IP          : 10.10.2.1
Source IP        : 10.10.2.2
Set up           : Peer
Conn status      : On
Connection inst# : 1
TCP conn fd      : 2
TCP conn password: not set (using default SXP password)
Duration since last state change: 0:00:05:49 (dd:hr:mm:sec)
Total num of SXP Connections = 2
```

## Related Commands

| Command | Description |
|---|---|
| **cts sxp connection peer** | Enters the Cisco TrustSec SXP peer IP address and specifies if a password is used for the peer connection |
| **cts sxp default password** | Configures the Cisco TrustSec SXP default password. |
| **cts sxp default source-ip** | Configures the Cisco TrustSec SXP source IPv4 address. |
| **cts sxp enable** | Enables Cisco TrustSec SXP on a device. |
| **cts sxp log** | Enables logging for IP-to-SGT binding changes. |
| **cts sxp reconciliation** | Changes the Cisco TrustSec SXP reconciliation period. |
| **cts sxp retry** | Changes the Cisco TrustSec SXP retry period timer. |

# show platform hardware fed switch active fwd-asic resource tcam utilization

To display CAM utilization information for ASIC, use the **show platform hardware fed switch active fwd-asic resource tcam utilization** command in privileged EXEC mode.

**show platform hardware fed switch active fwd-asic resource tcam utilization** [ *asic-number* ] [ *slice-id* ]

## Syntax Description

| | |
|---|---|
| **asic-number** | Displays the ASIC number. Valid values are from 0 to 7. |
| **slice-id** | Displays per slice usage. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

## Examples

The following is sample output from the **show platform hardware fed switch active fwd-asic resource tcam utilization** command:

```
Device# enable
Device# show platform hardware fed switch active fwd-asic resource tcam utilization

CAM Utilization for ASIC  [0]
 Table                  Subtype      Dir      Max     Used    %Used       V4       V6
MPLS    Other

----------------------------------------------------------------------------------------------

 Mac Address Table      EM           I       32768       25    0.08%        0        0
    0       25
 Mac Address Table      TCAM         I        1024       22    2.15%        0        0
    0       22
 L3 Multicast           EM           I        8192        0    0.00%        0        0
    0        0
 L3 Multicast           TCAM         I         512        9    1.76%        3        6
    0        0
 L2 Multicast           EM           I        8192        0    0.00%        0        0
    0        0
 L2 Multicast           TCAM         I         512       11    2.15%        3        8
    0        0
 IP Route Table         EM           I       24576       14    0.06%       13        0
    1        0
 IP Route Table         TCAM         I        8192       30    0.37%       11       16
    2        1
 QOS ACL                TCAM         IO       5120       85    1.66%       28       38
    0       19
                        TCAM         I                   45    0.88%       15       20
    0       10
                        TCAM         O                   40    0.78%       13       18
    0        9
```

```
Security ACL            TCAM         IO       5120      131    2.56%       26        60
   0       45
                        TCAM         I                   88    1.72%       12        36
   0       40
                        TCAM         O                   43    0.84%       14        24
   0        5
Netflow ACL             TCAM         I         256         6    2.34%        2         2
   0        2
PBR ACL                 TCAM         I        1024        36    3.52%       30         6
   0        0
Netflow ACL             TCAM         O         768         6    0.78%        2         2
   0        2
Flow SPAN ACL           TCAM         IO       1024        13    1.27%        3         6
   0        4
                        TCAM         I                    5    0.49%        1         2
   0        2
                        TCAM         O                    8    0.78%        2         4
   0        2
Control Plane           TCAM         I         512       290   56.64%      138       106
   0       46
Tunnel Termination      TCAM         I         512        22    4.30%        9        13
   0        0
Lisp Inst Mapping       TCAM         I        2048         2    0.10%        0         0
   0        2
Security Association    TCAM         I         256         4    1.56%        2         2
   0        0
CTS Cell Matrix/VPN
Label                   EM           O        8192         0    0.00%        0         0
   0        0
CTS Cell Matrix/VPN
Label                   TCAM         O         512         1    0.20%        0         0
   0        1
Client Table            EM           I        4096         0    0.00%        0         0
   0        0
Client Table            TCAM         I         256         0    0.00%        0         0
   0        0
Input Group LE          TCAM         I        1024         0    0.00%        0         0
   0        0
Output Group LE         TCAM         O        1024         0    0.00%        0         0
   0        0
Macsec SPD              TCAM         I         256         2    0.78%        0         0
   0        2
```

Output fields are self-explanatory.

## Related Commands

| Command | Description |
|---|---|
| **show platform hardware fed switch active fwd-asic resource tcam table** | Displays the current CAM table. |
| **show platform hardware fed switch active fwd-asic resource tcam usage** | Displays the current CAM usage. |

# show platform hardware fed switch active sgacl resource usage

To display Security Group access control list (SGACL) resource information for Application Specific Integrated Circuit (ASIC), use the **show platform hardware fed switch active sgacl resource usage** command in privileged EXEC mode.

**show platform hardware fed switch active sgacl resource usage**

## Syntax Description

| | |
|---|---|
| **usage** | Displays SGACL resource usage. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

## Examples

The following is a sample output from the **show platform hardware fed switch active sgacl resource usage** command:

```
Device# enable
Device# show platform hardware fed switch active sgacl resource usage

SGACL RESOURCE DETAILS ASIC :#0
================================
                                                    Percent     Thresholds
Hardware Resource               MAX      Used       Used    Upper     Lower
-------------------------------------------------------------------------------
  CTS Cell Matrix Config    :                                  80        70
  CTS Cell Matrix Entries   :   8192         0         0         Normal
  CTS Cell Overflow Entries :    512         1         0

  Policy Configuration      :                                  80        70
  Policy Entries            :    256         3         1         Normal

  DGT Config                :                                  80        70
  DGT Entries               :   4096         0         0         Normal

  Security ACL Configured   :                                  80        70
  Security ACL Entries      :   5120       131         2         Normal

                                Total     Percent
      SGACL TCAM Entries         Used      Used
      ------------------------------------------------------------------
      Output PRE SGACL      :        4        12
      Output SGACL          :        0         0
      Output SGACL DEFAULT  :        0         0
.
.
.
Device#
```

Output fields are self-explanatory.

# show platform software classification switch active F0 class-group-manager class-group client acl all

To display ACL class group ID, which is used to view Ternary Content Addressable Memory(TCAM) entry, use the **show platform software classification switch active F0 class-group-manager class-group client acl all** command in privileged EXEC mode.

**show platform software classification switch active F0 class-group-manager class-group client acl all**

## Syntax Description

| | |
|---|---|
| **class-group-manager** | Displays the class group manager. |
| **class-group** | Displays the class group. |
| **all** | Displays the ACL class group ID for all class groups. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

### Example

The following is a sample output from the **show platform software classification switch active F0 class-group-manager class-group client acl all** command:

```
Device#show platform software classification switch active F0 class-group-manager class-group
 client acl all

QFP classification class client all group

  class-group [ACL-GRP:273]
  class-group [ACL-GRP:529]
  class-group [ACL-GRP:801]
```

Output fields are self-explanatory.

## Related Commands

| Command | Description |
|---|---|
| **show platform software classification switch active F0 class-group-manager class-group client acl name** *class-group name* | Displays ACL class group information for the specified class group. |
| **show platform software classification switch active F0 class-group-manager class-group client acl** *class-group id* | Displays ACL class group information for the specified class group. |

# show platform software cts forwarding-manager switch active F0 port

To display CTS information for forwarding manager interfaces, use the **show platform software cts forwarding-manager switch active F0 port** command in privileged EXEC mode.

**show platform software cts forwarding-manager switch active F0 port**

## Syntax Description

| | |
|---|---|
| **F0** | Embedded service processor slot 0. |
| **port** | Displays the port CTS status. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

### Example

The following is a sample output from the **show platform software cts forwarding-manager switch active F0 port** command:

```
Device#show platform software cts forwarding-manager switch active F0 port

Forwarding Manager Interfaces CTS Information

Name                            ID     CTS Enable  Trusted   Propagate   SGT value
-------------------------------------------------------------------------------------
GigabitEthernet1/0/1            77         0          0          0           0
GigabitEthernet1/0/3            79         0          0          0           0
GigabitEthernet1/0/4            80         0          0          0           0
GigabitEthernet1/0/5            81         0          0          0           0
GigabitEthernet1/0/6            82         0          0          0           0
GigabitEthernet1/0/7            83         0          0          0           0
GigabitEthernet1/0/8            84         0          0          0           0
GigabitEthernet1/0/9            85         0          0          0           0
GigabitEthernet1/0/10           86         0          0          0           0
GigabitEthernet1/0/11           87         0          0          0           0
GigabitEthernet1/0/12           88         0          0          0           0
GigabitEthernet1/0/13           89         0          0          0           0
GigabitEthernet1/0/14           90         0          0          0           0
GigabitEthernet1/0/15           91         0          0          0           0
GigabitEthernet1/0/16           92         0          0          0           0
GigabitEthernet1/0/17           93         0          0          0           0
GigabitEthernet1/0/18           94         0          0          0           0
GigabitEthernet1/0/19           95         0          0          0           0
GigabitEthernet1/0/20           96         0          0          0           0
GigabitEthernet1/0/21           97         0          0          0           0
GigabitEthernet1/0/22           98         0          0          0           0
GigabitEthernet1/0/23           99         0          0          0           0
GigabitEthernet1/0/24          100         0          0          0           0
GigabitEthernet1/0/25          101         0          0          0           0
GigabitEthernet1/0/26          102         0          0          0           0
```

```
GigabitEthernet1/0/27          103         0          0          0          0
GigabitEthernet1/0/28          104         0          0          0          0
GigabitEthernet1/0/29          105         0          0          0          0
GigabitEthernet1/0/30          106         0          0          0          0
GigabitEthernet1/0/31          107         0          0          0          0
GigabitEthernet1/0/32          108         0          0          0          0
GigabitEthernet1/0/33          109         0          0          0          0
GigabitEthernet1/0/34          110         0          0          0          0
GigabitEthernet1/0/35          111         0          0          0          0
GigabitEthernet1/0/36          112         0          0          0          0
GigabitEthernet1/0/37          113         0          0          0          0
GigabitEthernet1/0/38          114         0          0          0          0
GigabitEthernet1/0/39          115         0          0          0          0
GigabitEthernet1/0/40          116         0          0          0          0
GigabitEthernet1/0/41          117         0          0          0          0

Forwarding Manager Interfaces CTS Information

Name                            ID     CTS Enable  Trusted   Propagate   SGT value
-------------------------------------------------------------------------------------
GigabitEthernet1/0/42          118         0          0          0          0
GigabitEthernet1/0/43          119         0          0          0          0
GigabitEthernet1/0/44          120         0          0          0          0
GigabitEthernet1/0/45          121         0          0          0          0
GigabitEthernet1/0/46          122         0          0          0          0
GigabitEthernet1/0/47          123         0          0          0          0
GigabitEthernet1/1/1           125         0          0          0          0
GigabitEthernet1/1/2           126         0          0          0          0
GigabitEthernet1/1/3           127         0          0          0          0
GigabitEthernet1/1/4           128         0          0          0          0
TenGigabitEthernet1/1/1        129         0          0          0          0
TenGigabitEthernet1/1/2        130         0          0          0          0
TenGigabitEthernet1/1/3        131         0          0          0          0
TenGigabitEthernet1/1/4        132         0          0          0          0
TenGigabitEthernet1/1/5        133         0          0          0          0
TenGigabitEthernet1/1/6        134         0          0          0          0
TenGigabitEthernet1/1/7        135         0          0          0          0
TenGigabitEthernet1/1/8        136         0          0          0          0
FortyGigabitEthernet1/1/1      137         0          0          0          0
FortyGigabitEthernet1/1/2      138         0          0          0          0
TwentyFiveGigE1/1/1            139         0          0          0          0
TwentyFiveGigE1/1/2            140         0          0          0          0
AppGigabitEthernet1/0/1        141         0          0          0          0
GigabitEthernet2/0/1           142         1          0          0          0
GigabitEthernet2/0/2           143         0          0          0          0
GigabitEthernet2/0/3           144         0          0          0          0
GigabitEthernet2/0/4           145         0          0          0          0
GigabitEthernet2/0/5           146         0          0          0          0
GigabitEthernet2/0/6           147         0          0          0          0
GigabitEthernet2/0/7           148         0          0          0          0
GigabitEthernet2/0/8           149         0          0          0          0
GigabitEthernet2/0/9           150         0          0          0          0
GigabitEthernet2/0/10          151         0          0          0          0
GigabitEthernet2/0/11          152         0          0          0          0
GigabitEthernet2/0/12          153         0          0          0          0
GigabitEthernet2/0/13          154         0          0          0          0
GigabitEthernet2/0/14          155         0          0          0          0
GigabitEthernet2/0/15          156         0          0          0          0
GigabitEthernet2/0/16          157         0          0          0          0
GigabitEthernet2/0/17          158         0          0          0          0

Forwarding Manager Interfaces CTS Information
```

```
Name                              ID     CTS Enable  Trusted   Propagate   SGT value
-------------------------------------------------------------------------------------
GigabitEthernet2/0/18            159          0          0          0           0
GigabitEthernet2/0/19            160          0          0          0           0
GigabitEthernet2/0/20            161          0          0          0           0
GigabitEthernet2/0/21            162          0          0          0           0
GigabitEthernet2/0/22            163          0          0          0           0
GigabitEthernet2/0/23            164          0          0          0           0
GigabitEthernet2/0/24            165          0          0          0           0
GigabitEthernet2/0/25            166          0          0          0           0
GigabitEthernet2/0/26            167          0          0          0           0
GigabitEthernet2/0/27            168          0          0          0           0
GigabitEthernet2/0/28            169          0          0          0           0
GigabitEthernet2/0/29            170          0          0          0           0
GigabitEthernet2/0/30            171          0          0          0           0
GigabitEthernet2/0/31            172          0          0          0           0
GigabitEthernet2/0/32            173          0          0          0           0
GigabitEthernet2/0/33            174          0          0          0           0
GigabitEthernet2/0/34            175          0          0          0           0
GigabitEthernet2/0/35            176          0          0          0           0
GigabitEthernet2/0/36            177          0          0          0           0
GigabitEthernet2/0/37            178          0          0          0           0
GigabitEthernet2/0/38            179          0          0          0           0
GigabitEthernet2/0/39            180          0          0          0           0
GigabitEthernet2/0/40            181          0          0          0           0
GigabitEthernet2/0/41            182          0          0          0           0
GigabitEthernet2/0/42            183          0          0          0           0
GigabitEthernet2/0/43            184          0          0          0           0
GigabitEthernet2/0/44            185          0          0          0           0
GigabitEthernet2/0/45            186          0          0          0           0
GigabitEthernet2/0/46            187          0          0          0           0
GigabitEthernet2/0/47            188          0          0          0           0
GigabitEthernet2/1/1             190          0          0          0           0
GigabitEthernet2/1/2             191          0          0          0           0
GigabitEthernet2/1/3             192          0          0          0           0
GigabitEthernet2/1/4             193          0          0          0           0
TenGigabitEthernet2/1/1          194          0          0          0           0
TenGigabitEthernet2/1/2          195          0          0          0           0
TenGigabitEthernet2/1/3          196          0          0          0           0
TenGigabitEthernet2/1/4          197          0          0          0           0
TenGigabitEthernet2/1/5          198          0          0          0           0
TenGigabitEthernet2/1/6          199          0          0          0           0


Forwarding Manager Interfaces CTS Information

Name                              ID     CTS Enable  Trusted   Propagate   SGT value
-------------------------------------------------------------------------------------
TenGigabitEthernet2/1/7          200          0          0          0           0
TenGigabitEthernet2/1/8          201          0          0          0           0
FortyGigabitEthernet2/1/1        202          0          0          0           0
FortyGigabitEthernet2/1/2        203          0          0          0           0
TwentyFiveGigE2/1/1              204          0          0          0           0
TwentyFiveGigE2/1/2              205          0          0          0           0
AppGigabitEthernet2/0/1          206          0          0          0           0
GigabitEthernet1/0/2             213          0          0          0           0
```

The following table explains the significant fields shown in the output:

***Table 3: show platform software cts forwarding-manager switch active F0 port Field Descriptions***

| Field | Description |
|---|---|

| | |
|---|---|
| Name | The name of the interface. |
| ID | The interface ID. |
| CTS Enable | The status of CTS. |
| Trusted | The trusted status of the interface. |
| Propagate | The propagation status of the interface. |
| SGT value | The value of SGT. |

# show platform software cts forwarding-manager switch active F0

To display Security Group Tag (SGT) binding table, use the **show platform software cts forwarding-manager switch active F0** command in privileged EXEC mode.

**show platform software cts forwarding-manager switch active F0**

## Syntax Description

| | |
|---|---|
| **F0** | Selects embedded service processor slot 0. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

### Example

The following is a sample output from the **show platform software cts forwarding-manager switch active F0** command:

```
Device#show platform software cts forwarding-manager switch active F0

SGT Binding Table

Number of bindings: 1

2.2.2.2/32
SGT Src: 2
SGT Dst: 2


SGT Binding Table
```

Output fields are self-explanatory.

## Related Commands

| Command | Description |
|---|---|
| **show platform software cts forwarding-manager switch active F0 port** | Displays the port CTS status. |
| **show platform software cts forwarding-manager switch active F0 permissions** | Displays the SGACL permissions. |

# show platform software cts forwarding-manager switch active F0 permissions

To display Security group access control lists (SGACLs) permissions, use the **show platform software cts forwarding-manager switch active F0 permissions** command in privileged EXEC mode.

**show platform software cts forwarding-manager switch active F0 permissions**

## Syntax Description

| | |
|---|---|
| **F0** | Selects embedded service processor slot 0. |
| **permissions** | Displays SGACL permissions. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

### Example

The following is sample output from the **show platform software cts forwarding-manager switch active F0 permissions** command:

```
Device#show platform software cts forwarding-manager switch active F0 permissions

Forwarding Manager CTS permissions Information

  sgt       dgt     ACL Group Name


   4         2      V4SGACL7100

 65535     65535    V4SGACL8100

 65535     65535    V6SGACL9100
```

The following table explains the significant fields shown in the output:

*Table 4: show platform software cts forwarding-manager switch active F0 permissions Field Descriptions*

| Field | Description |
|---|---|
| sgt | The source group tag. |
| dgt | The destination group tag. |

| | |
|---|---|
| ACL Group Name | The name of the ACL group. |

# show platform software fed switch active acl counters hardware | inc SGACL

To display counters from the forwarding engine driver, use the **show platform software fed switch active acl counters hardware | inc SGACL** command in privileged EXEC mode.

**show platform software fed switch active acl counters hardware | inc SGACL**

## Syntax Description

| | |
|---|---|
| **counters** | Displays counter information. |
| **hardware** | Displays hardware counters. |
| **include** | Includes lines that match the specified string. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

### Example

The following is a sample output from the **show platform software fed switch active acl counters hardware | inc SGACL** command:

```
Device# show platform software fed switch active acl counters hardware | inc SGACL

Egress IPv4 SGACL Drop           (0x3f000061):          0 frames
Egress IPv6 SGACL Drop           (0x13000062):          0 frames
Egress IPv4 SGACL Test Cell Drop (0xd2000063):          0 frames
Egress IPv6 SGACL Test Cell Drop (0x40000064):          0 frames
Egress IPv4 Pre SGACL Forward    (0x2c000067):          0 frames
```

# show platform software fed switch active acl usage

To display Security Group access control lists (SGACLs) usage, use the **show platform software fed switch active acl usage** command in privileged EXEC mode.

**show platform software fed switch active acl usage**

## Syntax Description

| | |
|---|---|
| **usage** | Displays ACL usage. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

### Example

The following is sample output from the **show platform software fed switch active acl usage** command:

```
Device# show platform software fed switch active acl usage
#########################################################
########                              ##################
#######      Printing Usage Infos      #################
########                              ##################
#########################################################
#####  ACE Software VMR max:196608 used:282
#########################################################
=============================================================================================================
Feature Type            ACL Type        Dir             Name                    Entries
Used
SGACL                   IPV4            Egress          V4SGACL7100             2

=============================================================================================================
Feature Type            ACL Type        Dir             Name                    Entries
Used
SGACL_CATCHALL          IPV4            Egress          V4SGACL8100             1

=============================================================================================================
Feature Type            ACL Type        Dir             Name                    Entries
Used
SGACL_CATCHALL          IPV6            Egress          V6SGACL9100             1

=============================================================================================================
```

Output fields are self-explanatory.

# show platform software fed switch active ifm mappings

**show platform software fed switch active ifm mappings**

## Syntax Description

| | |
|---|---|
| **ifm** | Displays interface manager information. |
| **mappings** | Displays interface to hardware mapping information. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

### Example

The following is a sample output from the **show platform software fed switch active ifm mappings** command:

```
Device#show platform software fed switch active ifm mappings

Interface               IF_ID    Inst Asic Core Port SubPort Mac  Cntx LPN  GPN  Type
Active
GigabitEthernet3/0/1    0xa        1   0   1    0      0      26   6    1    193  NIF  Y
GigabitEthernet3/0/2    0xb        1   0   1    1      0      6    7    2    194  NIF  Y
GigabitEthernet3/0/3    0xc        1   0   1    2      0      28   8    3    195  NIF  Y
GigabitEthernet3/0/4    0xd        1   0   1    3      0      27   9    4    196  NIF  Y
GigabitEthernet3/0/5    0xe        1   0   1    4      0      30   10   5    197  NIF  Y
GigabitEthernet3/0/6    0xf        1   0   1    5      0      29   11   6    198  NIF  Y
GigabitEthernet3/0/7    0x10       1   0   1    6      0      32   12   7    199  NIF  Y
GigabitEthernet3/0/8    0x11       1   0   1    7      0      31   13   8    200  NIF  Y
GigabitEthernet3/0/9    0x12       1   0   1    8      0      19   14   9    201  NIF  Y
GigabitEthernet3/0/10   0x13       1   0   1    9      0      5    15   10   202  NIF  Y
GigabitEthernet3/0/11   0x14       1   0   1    10     0      21   16   11   203  NIF  Y
GigabitEthernet3/0/12   0x15       1   0   1    11     0      20   17   12   204  NIF  Y
GigabitEthernet3/0/13   0x16       1   0   1    12     0      23   18   13   205  NIF  Y
GigabitEthernet3/0/14   0x17       1   0   1    13     0      22   19   14   206  NIF  Y
GigabitEthernet3/0/15   0x18       1   0   1    14     0      25   20   15   207  NIF  Y
GigabitEthernet3/0/16   0x19       1   0   1    15     0      24   21   16   208  NIF  Y
GigabitEthernet3/0/17   0x1a       1   0   1    16     0      12   22   17   209  NIF  Y
GigabitEthernet3/0/18   0x1b       1   0   1    17     0      4    23   18   210  NIF  Y
GigabitEthernet3/0/19   0x1c       1   0   1    18     0      14   24   19   211  NIF  Y
GigabitEthernet3/0/20   0x1d       1   0   1    19     0      13   25   20   212  NIF  Y
GigabitEthernet3/0/21   0x1e       1   0   1    20     0      16   26   21   213  NIF  Y
GigabitEthernet3/0/22   0x1f       1   0   1    21     0      15   27   22   214  NIF  Y
GigabitEthernet3/0/23   0x20       1   0   1    22     0      18   28   23   215  NIF  Y
GigabitEthernet3/0/24   0x21       1   0   1    23     0      17   29   24   216  NIF  Y
GigabitEthernet3/0/25   0x22       0   0   0    24     0      26   6    25   217  NIF  Y
GigabitEthernet3/0/26   0x23       0   0   0    25     0      6    7    26   218  NIF  Y
GigabitEthernet3/0/27   0x24       0   0   0    26     0      28   8    27   219  NIF  Y
GigabitEthernet3/0/28   0x25       0   0   0    27     0      27   9    28   220  NIF  Y
GigabitEthernet3/0/29   0x26       0   0   0    28     0      30   10   29   221  NIF  Y
GigabitEthernet3/0/30   0x27       0   0   0    29     0      29   11   30   222  NIF  Y
GigabitEthernet3/0/31   0x28       0   0   0    30     0      32   12   31   223  NIF  Y
GigabitEthernet3/0/32   0x29       0   0   0    31     0      31   13   32   224  NIF  Y
GigabitEthernet3/0/33   0x2a       0   0   0    32     0      19   14   33   225  NIF  Y
GigabitEthernet3/0/34   0x2b       0   0   0    33     0      5    15   34   226  NIF  Y
GigabitEthernet3/0/35   0x2c       0   0   0    34     0      21   16   35   227  NIF  Y
```

```
GigabitEthernet3/0/36      0x2d       0    0    0     35     0       20    17    36    228   NIF   Y
GigabitEthernet3/0/37      0x2e       0    0    0     36     0       23    18    37    229   NIF   Y
GigabitEthernet3/0/38      0x2f       0    0    0     37     0       22    19    38    230   NIF   Y
GigabitEthernet3/0/39      0x30       0    0    0     38     0       25    20    39    231   NIF   Y
GigabitEthernet3/0/40      0x31       0    0    0     39     0       24    21    40    232   NIF   Y
GigabitEthernet3/0/41      0x32       0    0    0     40     0       12    22    41    233   NIF   Y
GigabitEthernet3/0/42      0x33       0    0    0     41     0       4     23    42    234   NIF   Y
GigabitEthernet3/0/43      0x34       0    0    0     42     0       14    24    43    235   NIF   Y
GigabitEthernet3/0/44      0x35       0    0    0     43     0       13    25    44    236   NIF   Y
GigabitEthernet3/0/45      0x36       0    0    0     44     0       16    26    45    237   NIF   Y
GigabitEthernet3/0/46      0x37       0    0    0     45     0       15    27    46    238   NIF   Y
GigabitEthernet3/0/47      0x38       0    0    0     46     0       18    28    47    239   NIF   Y
GigabitEthernet3/0/48      0xd8       0    0    0     47     0       17    29    48    240   NIF   Y
GigabitEthernet3/1/1       0x3a       1    0    1     48     0       3     4     49    241   NIF   N
GigabitEthernet3/1/2       0x3b       1    0    1     49     0       2     5     50    242   NIF   N
GigabitEthernet3/1/3       0x3c       0    0    0     50     0       3     4     51    243   NIF   N
GigabitEthernet3/1/4       0x3d       0    0    0     51     0       2     5     52    244   NIF   N
TenGigabitEthernet3/1/1    0x3e       1    0    1     52     0       3     3     53    245   NIF   N
TenGigabitEthernet3/1/2    0x3f       1    0    1     53     0       2     2     54    246   NIF   N
TenGigabitEthernet3/1/3    0x40       1    0    1     54     0       1     1     55    247   NIF   N
TenGigabitEthernet3/1/4    0x41       1    0    1     55     0       0     0     56    248   NIF   N
TenGigabitEthernet3/1/5    0x42       0    0    0     56     0       3     3     57    249   NIF   N
TenGigabitEthernet3/1/6    0x43       0    0    0     57     0       2     2     58    250   NIF   N
TenGigabitEthernet3/1/7    0x44       0    0    0     58     0       1     1     59    251   NIF   N
TenGigabitEthernet3/1/8    0x45       0    0    0     59     0       0     0     60    252   NIF   N
FortyGigabitEthernet3/1/1  0x46       1    0    1     60     0       0     0     61    253   NIF   N
FortyGigabitEthernet3/1/2  0x47       0    0    0     61     0       0     0     62    254   NIF   N
TwentyFiveGigE3/1/1        0x48       1    0    1     62     0       0     0     63    255   NIF   N
TwentyFiveGigE3/1/2        0x49       0    0    0     63     0       0     0     64    256   NIF   N
AppGigabitEthernet3/0/1    0x4a       1    0    1     24     0       11    30    65    257   NIF   Y
```

The following table explains the significant fields shown in the output:

***Table 5: show platform software fed switch active ifm mappings Field Descriptions***

| Field | Description |
|---|---|
| Interface | The name of the interface. |
| IF_ID | The interface ID. |
| Inst | The instance ID. |
| Asic | The ASIC number. |
| Core | The core number. |
| Port | The port number of the interface. |
| SubPort | The number of subports. |
| MAC | The MAC address. |
| LPN | The local port number inside ASIC. |
| GPN | The global system number inside switch. |
| Type | The type of interface. |
| Active | The interface status (active/inactive). |

# show platform software fed switch active ip route

To display IP route information, use the **show platform software fed switch active ip route** command in privileged EXEC mode.

**show platform software fed switch active ip route**

## Syntax Description

| | |
|---|---|
| **ip** | Accepts IP commands. |
| **route** | Displays IPv4 Forwarding Information Base (FIB) details. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

### Example

The following is sample output from the **show platform software fed switch active ip route** command:

```
Device# show platform software fed switch active ip route
vrf   dest                                      htm            flags   SGT   DGID MPLS
 Last-modified            SecsSinceHit
---   ----                                      ---            -----   ---   ---- ----
 ------------------------ ------------
2     0.0.0.0/0                                 0x78f2fd3488a8 0x0     0     0
 2023/03/14 06:38:18.684           1
2     127.0.0.0/8                               0x78f2fd351508 0x0     0     0
 2023/03/14 06:38:18.687           1
2     255.255.255.255/32                        0x78f2fd34ebd8 0x0     0     0
 2023/03/14 06:38:18.686           1
2     240.0.0.0/4                               0x78f2fd350828 0x0     0     0
 2023/03/14 06:38:18.686           1
2     0.0.0.0/32                                0x78f2fd34cd88 0x0     0     0
 2023/03/14 06:38:18.685           1
2     0.0.0.0/8                                 0x78f2fd350e98 0x0     0     0
 2023/03/14 06:38:18.686           1
0     0.0.0.0/0                                 0x78f2fd345388 0x0     0     0
 2023/03/14 06:39:09.383         352
0     9.24.0.0/32                               0x78f2fd33e1c8 0x0     0     0
 2023/03/14 06:38:38.930           1
0     9.24.0.1/32                               0x78f2fd33a5e8 0x0     0     0
 2023/03/14 06:39:09.390           5
0     127.0.0.0/8                               0x78f2fd3501b8 0x0     0     0
 2023/03/14 06:38:18.686           1
0     255.255.255.255/32                        0x78f2fd34c478 0x0     0     0
 2023/03/14 06:38:18.685           1
0     2.2.2.2/32                                0x78f2fd3568e8 0x0     2     1
 2023/03/14 06:39:09.383           1
0     9.24.255.255/32                           0x78f2fd344838 0x0     0     0
 2023/03/14 06:38:38.931           1
0     10.64.69.164/32                           0x78f2fd33fac8 0x0     0     0
 2023/03/14 06:39:09.383           1
0     10.77.128.69/32                           0x78f2fd3420a8 0x0     0     0
 2023/03/14 06:39:09.383           1
0     240.0.0.0/4                               0x78f2fd34f4d8 0x0     0     0
```

```
 2023/03/14 06:38:18.686            1
0     10.106.26.249/32                              0x78f2fd3399a8 0x0     0      0
 2023/03/14 06:39:09.383            1
0     0.0.0.0/32                                    0x78f2fd34a768 0x0     0      0
 2023/03/14 06:38:18.685            1
0     9.24.23.30/32                                 0x78f2fd1f2078 0x0     0      0
 2023/03/14 06:38:38.930           24
0     9.24.0.0/16                                   0x78f2fd33af48 0x0     0      0
 2023/03/14 06:38:38.930            1
0     0.0.0.0/8                                     0x78f2fd34fb48 0x0     0      0
 2023/03/14 06:38:18.686            1
```

The following table explains the significant fields shown in the output:

***Table 6: show platform software fed switch active ip route Field Descriptions***

| Field | Description |
|---|---|
| vrf | The VRF ID. |
| dest | The destination address. |
| htm | The hash table manager object pointer for IP route. |
| SGT | The security group tag. |
| DGID | The destination tag ID. |

# show platform software fed switch active sgacl detail

To display global enforcement status along with policy and count information, use the **show platform software fed switch active sgacl detail** command in privileged EXEC mode.

**show platform software fed switch active sgacl detail**

## Syntax Description

| | |
|---|---|
| **sgacl** | Displays SGACL hardware information. |
| **detail** | Displays detailed SGACL information. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

### Example

The following is a sample output from the **show platform software fed switch active sgacl detail** command:

```
Device# show platform software fed switch active sgacl detail
Global Enforcement: Off

*Refcnt: for the non-SGACL feature
=================================== DGID Table ===================================
SGT/Refcnt          DGT        DGID         test_cell monitor   permitted      denied
==================================================================================
*/3                   2           1
```

The following table explains the significant fields shown in the output:

***Table 7: show platform software fed switch active sgacl detail Field Descriptions***

| Field | Description |
|---|---|
| SGT/Refcnt | The security group tag/reinforcement. |
| DGT | The destination tag. |
| DGID | The destination tag ID. |

# show platform software fed switch active sgacl port

To display Layer 2 interface configuration settings for all interfaces, use the **show platform software fed switch active sgacl port** command in privileged EXEC mode.

**show platform software fed switch active sgacl port**

## Syntax Description

| | |
|---|---|
| **sgacl** | Displays Security Group access control lists (SGACLs) hardware information. |
| **port** | Specifies port configuration. |

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

### Example

The following is a sample output from the **show platform software fed switch active sgacl port** command:

```
Device# show platform software fed switch active sgacl port

Port            Status     Port-SGT  Trust  Propagate  IngressCache EgressCache
-------------------------------------------------------------------------------
Gi3/0/1        Disabled        0     No      No          No          No
Gi3/0/2        Disabled        0     No      No          No          No
Gi3/0/3        Disabled        0     No      No          No          No
Gi3/0/4        Disabled        0     No      No          No          No
Gi3/0/5        Disabled        0     No      No          No          No
Gi3/0/6        Disabled        0     No      No          No          No
Gi3/0/7        Disabled        0     No      No          No          No
Gi3/0/8        Disabled        0     No      No          No          No
Gi3/0/9        Disabled        0     No      No          No          No
Gi3/0/10       Disabled        0     No      No          No          No
Gi3/0/11       Disabled        0     No      No          No          No
Gi3/0/12       Disabled        0     No      No          No          No
Gi3/0/13       Disabled        0     No      No          No          No
Gi3/0/14       Disabled        0     No      No          No          No
Gi3/0/15       Disabled        0     No      No          No          No
Gi3/0/16       Disabled        0     No      No          No          No
Gi3/0/17       Disabled        0     No      No          No          No
Gi3/0/18       Disabled        0     No      No          No          No
Gi3/0/19       Disabled        0     No      No          No          No
Gi3/0/20       Disabled        0     No      No          No          No
Gi3/0/21       Disabled        0     No      No          No          No
Gi3/0/22       Disabled        0     No      No          No          No
Gi3/0/23       Disabled        0     No      No          No          No
Gi3/0/24       Disabled        0     No      No          No          No
Gi3/0/25       Disabled        0     No      No          No          No
Gi3/0/26       Disabled        0     No      No          No          No
Gi3/0/27       Disabled        0     No      No          No          No
Gi3/0/28       Disabled        0     No      No          No          No
Gi3/0/29       Disabled        0     No      No          No          No
Gi3/0/30       Disabled        0     No      No          No          No
Gi3/0/31       Disabled        0     No      No          No          No
Gi3/0/32       Disabled        0     No      No          No          No
Gi3/0/33       Disabled        0     No      No          No          No
Gi3/0/34       Disabled        0     No      No          No          No
```

```
Gi3/0/35        Disabled        0      No       No          No          No
Gi3/0/36        Disabled        0      No       No          No          No
Gi3/0/37        Disabled        0      No       No          No          No
Gi3/0/38        Disabled        0      No       No          No          No
Gi3/0/39        Disabled        0      No       No          No          No
Gi3/0/40        Disabled        0      No       No          No          No
Gi3/0/41        Disabled        0      No       No          No          No
Gi3/0/42        Disabled        0      No       No          No          No
Gi3/0/43        Disabled        0      No       No          No          No
Gi3/0/44        Disabled        0      No       No          No          No
Gi3/0/45        Disabled        0      No       No          No          No
Gi3/0/46        Disabled        0      No       No          No          No
Gi3/0/47        Disabled        0      No       No          No          No
Gi3/0/48        Disabled        0      No       No          No          No
Gi3/1/1         Disabled        0      No       No          No          No
Gi3/1/2         Disabled        0      No       No          No          No
Gi3/1/3         Disabled        0      No       No          No          No
Gi3/1/4         Disabled        0      No       No          No          No
Te3/1/1         Disabled        0      No       No          No          No
Te3/1/2         Disabled        0      No       No          No          No
Te3/1/3         Disabled        0      No       No          No          No
Te3/1/4         Disabled        0      No       No          No          No
Te3/1/5         Disabled        0      No       No          No          No
Te3/1/6         Disabled        0      No       No          No          No
Te3/1/7         Disabled        0      No       No          No          No
Te3/1/8         Disabled        0      No       No          No          No
Fo3/1/1         Disabled        0      No       No          No          No
Fo3/1/2         Disabled        0      No       No          No          No
Tw3/1/1         Disabled        0      No       No          No          No
Tw3/1/2         Disabled        0      No       No          No          No
Ap3/0/1         Disabled        0      No       No          No          No
```

Output fields are self-explanatory.

# show platform software fed switch active sgacl vlan

To display global enforcement status on VLANs, use the **show platform software fed switch active sgacl vlan** command in privileged EXEC mode.

**show platform software fed switch active sgacl vlan**

## Syntax Description

| | |
|---|---|
| **sgacl** | Displays SGACL hardware information. |
| **vlan** | Specifies VLAN configuration. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

### Example

The following is a sample output from the **show platform software fed switch active sgacl vlan** command:

```
Device# show platform software fed switch active sgacl vlan

Enforcement enabled:
vlan0
vlan1
vlan2
vlan10
vlan102
vlan192
vlan200
```

# show platform software status control-processor brief

To display brief information about CPU and memory, use the **show platform software status control-processor brief** command in privileged EXEC mode.

**show platform software status control-processor brief**

## Syntax Description

| | |
|---|---|
| **status** | Displays system status. |
| **control-processor** | Displays control processor status. |
| **brief** | Displays brief status. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

### Example

The following is a sample output from the **show platform software status control-processor brief** command:

```
Device# show platform software status control-processor brief

Load Average
 Slot  Status  1-Min  5-Min 15-Min
3-RP0 Healthy   0.03   0.07   0.04

Memory (kB)
 Slot  Status    Total     Used (Pct)     Free (Pct) Committed (Pct)
3-RP0 Healthy  7745656  4178292 (54%)  3567364 (46%)   4755060 (61%)

CPU Utilization
 Slot  CPU   User System   Nice   Idle    IRQ   SIRQ IOwait
3-RP0    0   0.50   0.40   0.00  99.10   0.00   0.00   0.00
         1   0.90   0.50   0.00  98.59   0.00   0.00   0.00
         2   0.40   0.40   0.00  99.20   0.00   0.00   0.00
         3   0.80   0.30   0.00  98.90   0.00   0.00   0.00
         4   0.60   0.30   0.00  99.09   0.00   0.00   0.00
         5   0.70   0.30   0.00  99.00   0.00   0.00   0.00
         6   1.20   0.30   0.00  98.50   0.00   0.00   0.00
         7   0.59   0.39   0.00  99.00   0.00   0.00   0.00
```

Output fields are self-explanatory.

# show monitor capture <name> buffer

To display the contents of a monitor capture buffer or a capture point, use the **show monitor capture buffer** *name* **buffer** command in privileged EXEC mode.

**show monitor capture** *name* **buffer**

## Syntax Description

| | |
|---|---|
| **buffer** | Displays the contents of the specified capture buffer. |
| *name* | Represents the name of the capture buffer. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Fuji 16.9.1 | This command was introduced. |

The following is sample output from the **show monitor capture***name***buffer** command:

```
Device# enable
Device# show monitor capture NewCapture buffer

Starting the packet display ........ Press Ctrl + Shift + 6 to exit

1 0.000000 10.4.1.117 -> 10.5.1.108 ICMP 124 Echo (ping) reply id=0x0008, seq=44279/63404,
 ttl=127
2 0.108862 10.4.1.113 -> 10.5.1.109 ICMP 124 Echo (ping) reply id=0x0008, seq=26717/23912,
 ttl=127
3 0.110106 10.4.1.119 -> 10.5.1.102 ICMP 124 Echo (ping) reply id=0x0008, seq=28341/46446,
 ttl=127
```

Output fields are self-explanatory.

# timeout (CTS)

To configure the response timeout in seconds, use the **timeout** command in policy-server configuration mode. To go back to the default response timeout, use the **no** form of this command.

**timeout** *seconds*
**no timeout**

## Syntax Description

| | |
|---|---|
| *seconds* | Timeout in seconds. Valid values are from 1 to 60. |

## Command Default

The default is 5.

## Command Modes

Policy-server configuration (config-policy-server)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Examples

The following example shows how to change the policy-server timeout:

```
Device# enable
Device# configure terminal
Device(config)# policy-server name ise_server_2
Device(config-policy-server)# timeout 8
```

## Related Commands

| Command | Description |
|---|---|
| **cts policy-server name** | Configures the name of a policy server and enters policy-server configuration mode. |

# tls server-trustpoint

Configures the Transport Layer Security (TLS) trustpoint, use the **tls server-trustpoint** command in policy-server configuration mode. To remove the TLS trustpoint, use the **no** form of this command.

**tls server-trustpoint** *name*
**no tls server-trustpoint**

## Syntax Description

| | |
|---|---|
| *name* | Trustpoint name. |

## Command Default

TLS is configured.

## Command Modes

Policy-server configuration (config-policy-server)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.1.1 | This command was introduced. |

## Usage Guidelines

TLS is used by a network device to connect to the Cisco Identity Services Engine (ISE). The device uses a make or break approach to the TLS connection establishment, and there is no persistent TLS connection between the device and Cisco ISE. After the TLS connection is established, the device can use this connection to submit multiple REST API calls to specific uniform resource locators (URLs). After all the REST requests are processed, the server terminates the connection through a TCP-FIN message. For new REST API calls, a new connection must be established with the server.

If an invalid trustpoint is configured, the TLS handshake will fail and server is marked as dead.

## Examples

The following example shows how to configure a TLS trustpoint:

```
Device# enable
Device# configure terminal
Device(config)# policy-server name ise_server_2
Device(config-policy-server)# tls server-trustpoint ise_trust
```

## Related Commands

| Command | Description |
|---|---|
| **cts policy-server name** | Configures the name of a policy server and enters policy-server configuration mode. |