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set aggressive-mode client-endpoint

To specify the Tunnel-Client-Endpoint attribute within an Internet Security Association Key Management Protocol (ISAKMP) peer configuration, use the **set aggressive-mode client-endpoint** command in ISAKMP policy configuration mode. To remove this attribute from your configuration, use the **no** form of this command.

set aggressive-mode client-endpoint *client-endpoint*
no set aggressive-mode client-endpoint *client-endpoint*

Syntax Description

client-endpoint	One of the following identification types of the initiator end of the tunnel: • ID_IPV4 (IPV4 address) • ID_FQDN (fully qualified domain name, for example "green.cisco.com") • ID_USER_FQDN (e-mail address) The ID type is translated to the corresponding ID type in Internet Key Exchange (IKE).

Command Default

The Tunnel-Client-Endpoint attribute is not defined.

Command Modes

ISAKMP policy configuration

Command History

Release	Modification
12.2(8)T	This command was introduced.
12.2(18)SXD	This command was integrated into Cisco IOS Release 12.2(18)SXD.
12.4(4)T	Support for IPv6 was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.

Usage Guidelines

Before you can use this command, you must enable the **crypto isakmp peer** command.

To initiate an IKE aggressive mode negotiation and specify the RADIUS Tunnel-Client-Endpoint attribute, the **set aggressive-mode client-endpoint** command, along with the **set aggressive-mode password** command, must be configured in the ISAKMP peer policy. The Tunnel-Client-Endpoint attribute will be communicated to the server by encoding it in the appropriate IKE identity payload.

Examples

The following example shows how to initiate aggressive mode using RADIUS tunnel attributes:

```
crypto isakmp peer address 10.4.4.1
 set aggressive-mode client-endpoint user-fqdn user@cisco.com
 set aggressive-mode password cisco123
```

Related Commands

Command	Description
crypto isakmp peer	Enables an IPSec peer for IKE querying of AAA for tunnel attributes in aggressive mode.
set aggressive-mode password	Specifies the Tunnel-Password attribute within an ISAKMP peer configuration.

set aggressive-mode password

To specify the Tunnel-Password attribute within an Internet Security Association Key Management Protocol (ISAKMP) peer configuration, use the **set aggressive-mode password** command in ISAKMP policy configuration mode. To remove this attribute from your configuration, use the **no** form of this command.

set aggressive-mode password *password*
no set aggressive-mode password *password*

Syntax Description

password	Password that is used to authenticate the peer to a remote server. The tunnel password is used as the Internet Key Exchange (IKE) preshared key.

Command Default

The Tunnel-Password attribute is not defined.

Command Modes

ISAKMP policy configuration

Command History

Release	Modification
12.2(8)T	This command was introduced.
12.2(18)SXD	This command was integrated into Cisco IOS Release 12.2(18)SXD.
12.3(2)T	This command was modified so that output shows that the preshared key is either encrypted or unencrypted.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

Before you can use this command, you must enable the **crypto isakmp peer** command.

To initiate an IKE aggressive mode negotiation, the **set aggressive-mode password**command, along with the **set aggressive-mode client-endpoint** command, must be configured in the ISAKMP peer policy. The Tunnel-Password attribute will be used as the IKE preshared key for the aggressive mode negotiation.

Output for the **set aggressive-mode password**command will show that the preshared key is either unencrypted or encrypted. An output example for an unencrypted preshared key would be as follows:

```
set aggressive-mode password test123
```

An output example for a type 6 encrypted preshared key would be as follows:

```
set aggressive-mode password 6 DV'P[aTVWWbcgKU]T\T\QhZAAB
```

Examples

The following example shows how to initiate aggressive mode using RADIUS tunnel attributes:

```
Router (config)# crypto isakmp peer address 10.4.4.1
Router (config-isakmp-peer)# set aggressive-mode client-endpoint user-fqdn user@cisco.com
Router (config-isakmp-peer)#
set aggressive-mode password cisco123
```

Related Commands

Command	Description
crypto isakmp peer	Enables an IPSec peer for IKE querying of AAA for tunnel attributes in aggressive mode.
set aggressive-mode client-endpoint	Specifies the Tunnel-Client-Endpoint attribute within an ISAKMP peer configuration.

set group

To set the Group Domain of Interpretation (GDOI) crypto map to the GDOI group that has already been defined, use the **set group** command in crypto map configuration mode. To remove the GDOI crypto map, use the **no** form of this command.

set group *group-name*
no set group *group-name*

Syntax Description

group-name	Name of the GDOI group.

Command Default

None

Command Modes

crypto map configuration

Command History

Release	Modification
12.4(6)T	This command was introduced.

Usage Guidelines

This command must be configured for the GDOI crypto map to be complete.

Note This crypto map is specifically a GDOI crypto map, that is, the crypto map must be named as a GDOI crypto map, as in this example: **crypto map test 10 gdoi**

Examples

The following example shows that the group name is "hsrp-group":

```
set group hsrp-group
```

Related Commands

Command	Description
crypto map	Enters crypto map configuration mode and creates or modifies a crypto map entry, creates a crypto profile that provides a template for configuration of dynamically created crypto maps, indicates that the key management mechanism is GDOI, or configures a client accounting list.

set identity

To set the identity to the crypto map, use the **set identity** command in crypto map configuration mode.

set identity *name*

Syntax Description

name	Identity used to permit or restrict access for a host to a crypto map.

Command Default

If this command is not enabled, the encrypted connection does not have any restrictions other than the IP address of the encrypting peer.

Command Modes

Crypto map configuration

Command History

Release	Modification
12.2(4)T	This command was introduced.
12.2(18)SXD	This command was integrated into Cisco IOS Release 12.2(18)SXD.
12.2(33)SRA	This command was integrated into Cisco IOS release 12.(33)SRA.

Usage Guidelines

Use the **set identity** command to set the identity to the configured crypto maps. When this command is applied, only the hosts that match a configuration listed within the *name* argument can use that crypto map.

Examples

The following example shows how to configure two IP Security (IPSec) crypto maps and apply the identity to each crypto map. That is, the identity is set to "to-bigbiz" for the first crypto map and "to-little-com" for the second crypto map.

```
! The following is an IPSec crypto map (part of IPSec configuration). It can be used only
! by peers that have been authenticated by DN and if the certificate belongs to BigBiz.
crypto map map-to-bigbiz 10 ipsec-isakmp
 set peer 172.21.114.196
 set transform-set my-transformset
 match address 124
 set identity to-bigbiz
!
crypto identity to-bigbiz
 dn ou=BigBiz
!
!
! This crypto map can be used only by peers that have been authenticated by hostname
! and if the certificate belongs to little.com.
crypto map map-to-little-com 10 ipsec-isakmp
 set peer 172.21.115.119
 set transform-set my-transformset
 match address 125
 identity to-little-com
!
crypto identity to-little-com
 fqdn little.com
```

Related Commands

Command	Description
crypto identity	Configures the identity of the router with a given list of DNs in the certificate of the router.
crypto map (global IPSec)	Creates or modifies a crypto map entry and enters the crypto map configuration mode.
crypto mib ipsec flowmib history failure size	Associates the identity of the router with the DN in the certificate of the router.
fqdn	Associates the identity of the router with the hostname that the peer used to authenticate itself.

set ip access-group

To check a preencrypted or postdecrypted packet against an access control list (ACL) without having to use the outside physical interface ACL, use the **set ip access-group** command in crypto map configuration mode. To disable the check, use the **no** form of this command.

set ip access-group {*access-list-numberaccess-list-name*} {**in** | **out**}
no set ip access-group {*access-list-numberaccess-list-name*} {**in** | **out**}

Syntax Description

access-list-number	Number of an access list. Values 100 through 199 are used for IP access lists (extended). The values 2000 through 2699 are used for expanded access lists (extended).
access-list-name	Name of an access list.
in	Sets access control for inbound clear-text packets (after decryption).
out	Sets access control for outbound clear-text packets (prior to encryption).

Command Default

No crypto map access ACLs are defined to filter clear-text packets going through the IPSec tunnel.

Command Modes

Crypto map configuration

Command History

Release	Modification
12.3(8)T	This command was introduced.

Usage Guidelines

The **set ip access-group** command is used after the crypto map has been configured.

Examples

The following example shows that a crypto map access ACL has been configured:

```
Router (config)# crypto map map vpn1 10
Router (config-crypto-map)# set ip access-group 151 in
```

Related Commands

Command	Description
crypto map	Assigns a previously defined crypto map set to an interface so that the interface can provide IPSec services.

set isakmp-profile

To set the Internet Security Association and Key Management Protocol (ISAKMP) profile name, use the **set isakmp-profile**command in crypto map configuration mode. To remove the ISAKMP profile name, use the **no** form of this command.

set isakmp-profile *profile-name*
no set isakmp-profile *profile-name*

Syntax Description

profile-name	Name of the ISAKMP profile.

Command Default

If the ISAKMP profile is not specified in the crypto map entry, the default is to the ISAKMP profile that is on the head. If there is no ISAKMP profile on the head, the default is "none."

Command Modes

Crypto map configuration

Command History

Release	Modification
12.2(15)T	This command was introduced.
12.2(18)SXD	This command was integrated into Cisco IOS Release 12.2(18)SXD.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command describes the ISAKMP profile to use when you start the Internet Key Exchange (IKE) exchange.

Before configuring an ISAKMP profile on a crypto map, you should set up the ISAKMP profile.

Examples

The following example shows that an ISAKMP profile has been configured on a crypto map:

```
crypto map vpnmap 10 ipsec-isakmp
 set isakmp-profile vpnprofile
```

Related Commands

Command	Description
crypto ipsec transform-set	Defines a transform set, which is an acceptable combination of security protocols and algorithms.
crypto map (global)	Creates or modifies a crypto map entry.

set nat demux

To enable L2TP--IPSec support for NAT or PAT Windows clients, use the **set nat demux**command in crypto map configuration mode. To disable L2TP--IPSec support, use the **no** form of this command.

set nat demux
no set nat demux

Syntax Description

This command has no arguments or keywords.

Command Default

With this command disabled, Windows clients lose connection when another Windows client establishes an IP Security (IPSec) protected Cisco IOS Layer 2 Tunneling Protocol (L2TP) tunnel to the same Cisco IOS L2TP Network Server (LNS) when there is a network address translation (NAT) or port address translation (PAT) server between the Windows clients and the LNS.

Command Modes

Crypto map configuration

Command History

Release	Modification
12.3(11)T4	This command was introduced.
12.4(1)	This command was integrated into Release 12.4(1).

Usage Guidelines

Use this command if you have an environment with IPSec enabled and consisting of an LNS, and a network address translation (NAT) or port address translation (PAT) server between the Windows clients and the LNS.

This command has been tested only with Windows 2000 L2TP/IPsec clients running hotfix 818043.

You must enter the **crypto map** command if you are using static crypto maps or the **crypto dynamic-map** command if you are using dynamic crypto maps before issuing the **set nat demux** command.

Note If you do not have IPSec enabled, or you do not have a NAT or PAT server, you can have multiple Windows clients connect to a LNS without this command enabled.

Examples

The following example shows how to enable L2TP--IPSec support for NAT or PAT Windows clients for a dynamic crypto map:

```
.
.
.
!Enable virtual private networking.
vpdn enable
! Default L2TP VPDN group
vpdn-group 1
!
!Enables the LNS to accept dial in requests; specifies L2TP as the tunneling
protocol; specifies the number of the virtual templates used to clone
virtual-access interfaces; specifies an alternate IP address for a VPDN tunnel
```

```
accept-dialin.
  protocol l2tp
  virtual-template 1
  source-ip 10.0.0.1
!
!Disables Layer 2 Tunneling Protocol (L2TP) tunnel authentication.
no l2tp tunnel authentication
!
!Defines an Internet Key Exchange (IKE) policy and assigns priority 1.
crypto isakmp policy 1
 encr 3des
 group 2
!
crypto isakmp policy 2
 encr 3des
 authentication pre-share
 group 2
!
!Defines a transform set.
crypto ipsec transform-set vpn esp-3des esp-md5-hmac
 mode transport
crypto mib ipsec flowmib history tunnel size 2
crypto mib ipsec flowmib history failure size 2
!
!Names the dynamic crypto map entry to create (or modify) and enters crypto map configuration
 mode.
crypto dynamic-map dyn_map 1
!Specifies which transform sets can be used with the crypto map entry
 set transform-set vpn
!Enables L2TP--IPSec support.
 set nat demux
.
.
.
```

Related Commands

Command	Description
crypto dynamic-map	Names the dynamic crypto map entry to create (or modify) and enters crypto map configuration mode.
crypto map	Names the static crypto map entry to create (or modify) and enters crypto map configuration mode.
show crypto dynamic-map	Displays information about dynamic crypto maps.
show crypto ipsec sa	Displays the settings used by current SAs.
show crypto map	Displays information about static crypto maps.

set peer (IPsec)

To specify an IP Security (IPsec) peer in a crypto map entry, use the **set peer** command in crypto map configuration mode. To remove an IPsec peer from a crypto map entry, use the **no** form of this command.

set peer {*host-name* [**dynamic**] [**default**] | *ip-address* [**default**]}
no set peer {*host-name* [**dynamic**] [**default**] | *ip-address* [**default**]}

Syntax Description

host-name	Specifies the IPsec peer by its hostname. This is the peer's hostname concatenated with its domain name (for example, myhost.example.com).
dynamic	(Optional) The hostname of the IPsec peer will be resolved via a domain name server (DNS) lookup right before the router establishes the IPsec tunnel.
default	(Optional) If there are multiple IPsec peers, designates that the first peer is the default peer.
ip-address	Specifies the IPsec peer by its IP address.

Command Default

No peer is defined.

Command Modes

Crypto map configuration (config-crypto-map)

Command History

Release	Modification
11.2	This command was introduced.
12.3(4)T	The **dynamic** keyword was added.
12.2(18)SXD	This command was integrated into Cisco IOS Release 12.2(18)SXD.
12.3(14)T	The **default** keyword was added.
12.2(33)SRA	The command was integrated into Cisco IOS Release 12.2(33)SRA

Usage Guidelines

Use this command to specify an IPsec peer for a crypto map.

This command is required for all static crypto maps. If you are defining a dynamic crypto map (with the **crypto dynamic-map** command), this command is not required, and in most cases is not used (because, in general, the peer is unknown).

For crypto map entries created with the **crypto map** *map-name seq-num* **ipsec-isakmp** command, you can specify multiple peers by repeating this command. The peer that packets are actually sent to is determined by the last peer that the router heard from (received either traffic or a negotiation request from) for a given data flow. If the attempt fails with the first peer, Internet Key Exchange (IKE) tries the next peer on the crypto map list.

For crypto map entries created with the **crypto map***map-name seq-num* **ipsec-manual** command , you can specify only one IPsec peer per crypto map. If you want to change the peer, you must first delete the old peer and then specify the new peer.

You can specify the remote IPsec peer by its hostname only if the hostname is mapped to the peer's IP address in a DNS or if you manually map the hostname to the IP address with the **ip host** command.

The dynamic Keyword

When specifying the hostname of a remote IPsec peer via the **set peer** command, you can also issue the **dynamic** keyword, which defers DNS resolution of the hostname until right before the IPsec tunnel has been established. Deferring resolution enables the Cisco IOS software to detect whether the IP address of the remote IPsec peer has changed. Thus, the software can contact the peer at the new IP address.

If the **dynamic** keyword is not issued, the hostname is resolved immediately after it is specified. So, the Cisco IOS software cannot detect an IP address change and, therefore, attempts to connect to the IP address that it previously resolved.

The default Keyword

If there are multiple peers and you specify the **default** keyword, the first peer is designated as the default peer.

If dead peer detection (DPD) detects a failure, the default peer is retried before there is an attempt to connect to the next peer in the peer list.

If the default peer is unresponsive, the next peer in the peer list becomes the new current peer. Future connections through the crypto map will try that peer.

Examples

The following example shows a crypto map configuration when IKE will be used to establish the security associations (SAs). In this example, an SA could be set up to either the IPsec peer at 10.0.0.1 or the peer at 10.0.0.2.

```
crypto map mymap 10 ipsec-isakmp
 match address 101
 set transform-set my_t_set1
 set peer 10.0.0.1
 set peer 10.0.0.2
```

The following example shows how to configure a router to perform real-time Domain Name System (DNS) resolution with a remote IPsec peer; that is, the hostname of peer is resolved via a DNS lookup right before the router establishes a connection (an IPsec tunnel) with the peer.

```
crypto map secure_b 10 ipsec-isakmp
  match address 140
  set peer b.cisco.com dynamic
  set transform-set xset
interface serial1
  ip address 10.30.0.1
  crypto map secure_b
access-list 140 permit ...
```

The following example shows that the first peer, at IP address 10.1.1.1, is the default peer:

```
crypto map tohub 1 ipsec-isakmp
 set peer 10.1.1.1 default
 set peer 10.2.2.2
```

The following example shows that the peer with the hostname user1 is the default peer.

```
crypto map tohub 2 ipsec-isakmp
 set peer user1 dynamic default
 set peer user2 dynamic
```

Related Commands

Command	Description
crypto dynamic-map	Creates a dynamic crypto map entry and enters the crypto map configuration command mode.
crypto map (global IPSec)	Creates or modifies a crypto map entry and enters the crypto map configuration mode.
crypto map (interface IPSec)	Applies a previously defined crypto map set to an interface.
crypto map local-address	Specifies and names an identifying interface to be used by the crypto map for IPsec traffic.
match address (IPSec)	Specifies an extended access list for a crypto map entry.
set pfs	Specifies that IPsec should ask for PFS when requesting new SAs for this crypto map entry, or that IPsec requires PFS when receiving requests for new SAs.
set security-association level per-host	Specifies that separate IPsec SAs should be requested for each source/destination host pair.
set security-association lifetime	Overrides (for a particular crypto map entry) the global lifetime value, which is used when negotiating IPsec SAs.
set session-key	Specifies the IPsec session keys within a crypto map entry.
set transform-set	Specifies which transform sets can be used with the crypto map entry.
show crypto map (IPSec)	Displays the crypto map configuration.

set pfs

To optionally specify that IP security (IPsec) requests the perfect forward secrecy (PFS) Diffie-Hellman (DH) prime modulus group identifier when requesting new security associations (SAs) for a crypto map entry or when IPsec requires PFS when receiving requests for new SAs, use the **set pfs** command in crypto m ap configuration mode. To specify that IPsec should not request PFS during the DH exchange, use the **no** form of this command.

set pfs {**group1** | **group2** | **group5** | **group14** | **group15** | **group16** | **group19** | **group20**}
no set pfs

Syntax Description

group1	Specifies the 768-bit DH identifier.
group2	Specifies the 1024-bit DH identifier.
group5	Specifies the 1536-bit DH identifier.
group14	Specifies the 2048-bit DH identifier.
group15	Specifies the 3072-bit DH identifier.
group16	Specifies the 4096-bit DH identifier.
group19	Specifies the 256-bit elliptic curve DH (ECDH) identifier.
group20	Specifies the 384-bit ECDH identifier.

Command Default

By default, PFS is not requested. If no group is specified with this command, the **group1** keyword is used as the default.

Command Modes

Crypto map configuration (config-crypto-map)

Command History

Release	Modification
11.3 T	This command was introduced.
12.1(1.3)T	Support was added for DH group 5.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
12.4(20)T	Support for IPv6 was added.
Cisco IOS XE Release 2.2	Support was added for DH groups 14, 15, and 16 on the Cisco ASR 1000 series routers.

Release	Modification
12.4(22)T	Support for DH groups 14, 15, and 16 on the Cisco ASR 1000 series routers was integrated into Cisco IOS Release 12.4(22)T.
15.1(2)T	This command was modified. DH groups 19 and 20 were added in Cisco IOS Release 15.1(2)T.

Usage Guidelines

This command is available for **ipsec-isakmp** crypto map entries and dynamic crypto map entries for both IKEv1 and IKEv2.

During negotiation, this command causes IPsec to request PFS when requesting new security associations for the crypto map entry. The default (**group1**) is sent if the **set pfs** statement does not specify a group. If the peer initiates the negotiation and the local configuration specifies PFS, the remote peer must perform a PFS exchange or the negotiation will fail. If the local configuration does not specify a group, a default of **group1** will be assumed, and an offer of either **group1** or **group2** will be accepted. If the local configuration specifies **group2**, that group *must* be part of the offer of the peer or the negotiation will fail. If the local configuration does not specify PFS, it will accept any offer of PFS from the peer.

PFS adds another level of security; if one key is ever cracked by an attacker, then only the data sent with that key will be compromised. Without PFS, data sent with other keys could be compromised also.

With PFS, every time a new security association is negotiated, a new DH exchange occurs. (This exchange requires additional processing time.)

The 1024-bit DH prime modulus group, **group2**, provides more security than **group1** but requires more processing time than **group1**.

The group chosen must be strong enough (have enough bits) to protect the IPsec keys during negotiation. While there is some disagreement regarding how many bits are necessary in the DH group to protect a specific key size, it is generally agreed that **group14** is good protection for 128-bit keys, **group15** is good protection for 192-bit keys, and **group16** is good protection for 256-bit keys.

Note **group5** may be used for 128-bit keys, but **group14** is better.

The ISAKMP group and the IPsec PFS group should be the same if PFS is used. If PFS is not used, a group is not configured in the IPsec crypto map.

Examples

The following example specifies that PFS should be used whenever a new security association is negotiated for the crypto map mymap 10:

```
crypto map mymap 10 ipsec-isakmp
 set pfs group2
```

Related Commands

Command	Description
crypto dynamic-map	Creates a dynamic crypto map entry and enters the crypto map configuration command mode.

Command	Description
crypto map (global IPsec)	Creates or modifies a crypto map entry and enters the crypto map configuration mode.
crypto map (interface IPsec)	Applies a previously defined crypto map set to an interface.
crypto map local-address	Specifies and names an identifying interface to be used by the crypto map for IPsec traffic.
match address (IPsec)	Specifies an extended access list for a crypto map entry.
set peer (IPsec)	Specifies an IPsec peer in a crypto map entry.
set security-association level per-host	Specifies that separate IPsec security associations should be requested for each source/destination host pair.
set security-association lifetime	Overrides (for a particular crypto map entry) the global lifetime value, which is used when negotiating IPsec security associations.
set transform-set	Specifies which transform sets can be used with the crypto map entry.
show crypto map (IPsec)	Displays the crypto map configuration.

set platform software trace forwarding-manager alg

To set the platform software trace levels for the forwarding manager application layer gateway (ALG), use the **set platform software trace forwarding-manager alg** command in privileged EXEC mode.

set platform software trace forwarding-manager {**F0** | **F1** | **FP** | **R0** | **R1** | **RP**} {**active** | **standby**} **alg** {**debug** | **emergency** | **error** | **info** | **noise** | **notice** | **verbose** | **warning**}

Syntax Description

F0	Specifies slot 0 of the Embedded Service Processor (ESP).
F1	Specifies slot 1 of the ESP.
FP	Specifies the ESP.
R0	Specifies slot 0 of the Route Processor (RP).
R1	Specifies slot 1 of the RP.
RP	Specifies the RP.
active	Specifies the active instance of the processor.
standby	Specifies the standby instance of the processor.
debug	Sets debug messages for ALGs.
emergency	Sets emergency messages for ALGs.
error	Sets error messages for ALGs.
info	Sets informational messages for ALGs.
noise	Sets the maximum message level for ALGs.
notice	Sets notice messages for ALGs.
verbose	Sets detailed debug messages for ALGs.
warning	Sets warning messages for ALGs.

Command Default

Trace levels are not set.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Release 3.11S	This command was introduced.

Usage Guidelines

Use this command to troubleshoot platform-specific ALG issues.

Examples

The following is example shows how to set platform-specific debug messages for ALGs:

```
Device# set platform software trace forwarding-manager FP active alg debug
```

Related Commands

alg sip blacklist	Configures a dynamic SIP ALG blacklist for destinations.
alg sip processor	Configures the maximum number of backlog messages that wait for shared resources.
alg sip timer	Configures a timer that SIP ALG uses to manage SIP calls.

set reverse-route

To define a distance metric for each static route or to tag a reverse route injection (RRI)-created route, use the **set reverse-route** command in crypto map configuration or IPsec profile configuration mode. To delete the tag or distance metric, use the **no** form of this command.

set reverse-route[**distance** *number* | **tag** *tag-id* | **gateway** *next-hop*]
no set reverse-route[**distance** *number* | **tag** *tag-id* | **gateway** *next-hop*]

Syntax Description

distance *number*	(Optional) Defines a distance metric for each static route. The range is from 1 to 255.
tag *tag-id*	(Optional) Creates a route and tags it. The tag value can be used as a match value for controlling redistribution using route maps.
gateway *next-hop*	(Optional) Defines the next-hop IP address of the preferred gateway through which encrypted traffic can be routed.

Command Default

The distance metric is 1 and the tag is 0.

Command Modes

Crypto map configuration (config-crypto-map)

IPsec profile configuration (config-crypto-profile)

Command History

Release	Modification
12.4(15)T	This command was introduced. This command replaced the **reverse-route tag** command.
Cisco IOS XE Release 3.2S	This command was modified. The **gateway** *next-hop* keyword and argument pair was added.

Usage Guidelines

This command can be applied on a per-crypto map basis or to a virtual tunnel interface (VTI) in a reverse route injection configuration.

RRI provides a scalable mechanism to dynamically learn and advertise the IP address and subnets that belong to a remote site that connects through an IPsec VPN tunnel.

When enabled in an IPsec crypto map, RRI learns all the subnets from any network that is defined in the crypto access control list (ACL) as the destination network. The learned routes are installed into the local routing table as static routes that point to the encrypted interface. When the IPsec tunnel is torn down, the associated static routes are removed. These static routes may then be redistributed into other dynamic routing protocols so that they can be advertised to other parts of the network (usually by redistributing RRI routes into dynamic routing protocols on the core side).

The **set reverse-route** command provides a way to configure a server so that a dynamically learned route can take precedence over static routes. The static routes are used only in the absence of the dynamically learned route.

Inserting an RRI in the remote peer through a gateway that is configured in the crypto IPsec profile ensures that the traffic to the remote peer is always routed through the configured gateway.

If you configure the RRI gateway when there are no sessions, then no changes occur. A route to the remote peer is added only when a new security association (SA) becomes active.

To change to a new gateway when there are active sessions, you must delete the active sessions. You cannot add, delete, or change a gateway configuration when there are active sessions.

The gateway configuration scenarios with respect to sessions are exhibited irrespective of whether Front Virtual Routing and Forwarding (FVRF) has been configured.

Examples

The following example shows how to set the value of the metric distance for each dynamic route to 20 in a crypto map situation. The configuration is on an Easy VPN server.

```
crypto dynamic-map mode 1
 set security-association lifetime seconds 300
 set transform-set 3dessha
 set isakmp-profile profile2
 set reverse-route distance 20
 reverse-route
```

The following example shows how to set the value of the metric distance for each dynamic route to 20 for a VTI. The configuration is on an Easy VPN server.

```
crypto isakmp profile profile1
 keyring mykeyring
 match identity group examplegroup
 client authentication list authenlist
 isakmp authorization list autholist
 client configuration address respond
 virtual-template 1
crypto ipsec profile vi
 set transform-set 3dessha
 set reverse-route distance 20
 set reverse-route gateway 10.0.0.1
 set isakmp-profile profile1
!
interface Virtual-Template1 type tunnel
 ip unnumbered
 tunnel mode ipsec ipv4
 tunnel protection ipsec profile vi
```

Related Commands

Command	Description
debug crypto ipsec	Displays IPsec events.
reverse-route	Creates source proxy information for a crypto map entry.

set security-association dummy

To enable the generation and transmission of dummy packets for an IPsec traffic flow in a crypto map, use the **set security-association dummy** command in crypto map configuration mode. To disable this generation and transmission, use the **no** form of this command.

set security-association dummy {**pps** *rate* | **seconds** *seconds*}
no set security-association dummy

Syntax Description

pps *rate*	Packets per second rate. The range is 0 to 25.
seconds *seconds*	Delay, in seconds, between packets. The range is 1 to 3600.

Command Default

Generating and transmitting dummy packets is disabled.

Command Modes

Crypto map configuration (config-crypto-map)

Command History

Release	Modification
15.2(4)M3	This command was introduced.
Cisco IOS XE Release 3.10S	This command was integrated into Cisco IOS XE Release 3.10S.

Usage Guidelines

RFC 4303 specifies a method to hide packet data in an IPsec traffic flow by adding dummy packets to the flow. Use the **set security-association dummy** command to generate and transmit dummy packets to hide data in the IPsec traffic flow in a crypto map. The dummy packet is designated by setting the next header field in the Encapsulating Security Payload (ESP) packet to a value of 59. When a crypto engine receives such packets, it discards them.

Use the **pps** *rate* keyword/argument pair to specify a rate greater than one packet per second.

When using this command to generate dummy packets for a specific crypto map, dummy packets are generated for all flows created in the crypto map.

Examples

The following example generates dummy packets every five seconds in the traffic flow of a crypto map:

```
crypto map tohub 1 ipsec-isakmp
 set peer 10.1.1.1 default
 set peer 10.2.2.2
 set security-association dummy seconds 5
 set transform-set aes_sha2
 match address 101
```

Related Commands

Command	Description
crypto ipsec security-association dummy	Enables the generation and transmission of dummy packets in an IPsec traffic flow.

set security-association idle-time

To specify the maximum amount of time for which the current peer can be idle before the default peer is used, use the **set security-association idle-time** command in crypto map configuration mode. To disable this feature, use the **no** form of this command.

set security-association idle-time *seconds* [**default**]
no set security-association idle-time *seconds* [**default**]

Syntax Description

seconds	Number of seconds for which the current peer can be idle before the default peer is used. Although the command will accept values for *seconds* ranging from 60 to 86400 seconds, the configured value will be rounded up to the next multiple of 600 seconds (ten minutes).
default	(Optional) Specifies that the next connection is directed to the default peer. Default: If the **default** keyword is not specified and there is a connection timeout, the current peer remains unchanged.

Command Default

The default peer is not used if the current peer times out.

Command Modes

Crypto map configuration (config-crypto-map)

Command History

Release	Modification
12.3(14)T	This command was introduced.
12.2(33)SRA	The command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

This command is optional. Use this command if you want the default peer to be used if the current peer times out. If there is a timeout to the current peer, the connection to that peer is closed. The next time a connection is initiated, it is directed to the default peer specified in the **set peer** command.

The configured value for *seconds* is rounded up to the next multiple of 600 seconds (ten minutes), and the rounded value becomes the polling interval for peer idle detection. Because the idle condition must be observed in two successive pollings, the period of inactivity may last up to twice the polling period before the connection to the idle peer can be closed.

Examples

In the following example, if the current peer is idle for at least 750 seconds, the default peer 10.1.1.1 (which was specified in the **set peer**command) is used for the next attempted connection:

```
crypto map tohub 1 ipsec-isakmp
 set peer 10.1.1.1 default
 set peer 10.2.2.2
 set security-association idle-time 750 default
```

In this example, the configured value of 750 seconds will be rounded up to 1200 seconds (the next multiple of 600), which becomes the idle polling interval. The connection to the idle peer will be closed after two successive idle pollings, resulting in an inactivity period of between 1200 and 2400 seconds before the connection is closed.

Related Commands

Command	Description
set peer (IPSec)	Specifies an IPsec peer in a crypto map entry.

set security-association level per-host

To specify that separate IP Security security associations should be requested for each source/destination host pair, use the **set security-association level per-host** command in cryp to map configuration mode. To specify that one security association should be requested for each crypto map access list **permit** entry, use the **no** form of this command.

set security-association level per-host
no set security-association level per-host

Syntax Description

This command has no arguments or keywords.

Command Default

For a given crypto map, all traffic between two IPSec peers matching a single crypto map access list **permit** entry will share the same security association.

Command Modes

Crypto map configuration

Command History

Release	Modification
11.3 T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

This command is only available for **ipsec-isakmp** crypto map entries and is not supported for dynamic crypto map entries.

When you use this command, you need to specify that a separate security association should be used for each source/destination host pair.

Normally, within a given crypto map, IPSec will attempt to request security associations at the granularity specified by the access list entry. For example, if the access list entry permits IP protocol traffic between subnet A and subnet B, IPSec will attempt to request security associations between subnet A and subnet B (for any IP protocol), and unless finer-grained security associations are established (by a peer request), all IPSec-protected traffic between these two subnets would use the same security association.

This command causes IPSec to request separate security associations for each source/destination host pair. In this case, each host pairing (where one host was in subnet A and the other host was in subnet B) would cause IPSec to request a separate security association.

With this command, one security association would be requested to protect traffic between host A and host B, and a different security association would be requested to protect traffic between host A and host C.

The access list entry can specify local and remote subnets, or it can specify a host-and-subnet combination. If the access list entry specifies protocols and ports, these values are applied when establishing the unique security associations.

Use this command with care, as multiple streams between given subnets can rapidly consume system resources.

Examples

The following example shows what happens with an access list entry of **permit ip 10.1.1.0 0.0.0.255 10.2.2.0 0.0.0.255**and a per-host level:

- A packet from 10.1.1.1 to 10.2.2.1 will initiate a security association request, which would look like it originated via **permit ip host 10.1.1.1 host 10.2.2.1**.
- A packet from 10.1.1.1 to 10.2.2.2 will initiate a security association request, which would look like it originated via **permit ip host 10.1.1.1 host 10.2.2.2**.
- A packet from 10.1.1.2 to 10.2.2.1 will initiate a security association request, which would look like it originated via **permit ip host 10.1.1.2 host 10.2.2.1**

Without the per-host level, any of the above packets will initiate a single security association request originated via **permit ip 10.1.1.0 0.0.0.255 10.2.2.0 0.0.0.255**.

Related Commands

Command	Description
crypto dynamic-map	Creates a dynamic crypto map entry and enters the crypto map configuration command mode.
crypto map (global IPSec)	Creates or modifies a crypto map entry and enters the crypto map configuration mode.
crypto map (interface IPSec)	Applies a previously defined crypto map set to an interface.
crypto map local-address	Specifies and names an identifying interface to be used by the crypto map for IPSec traffic.
match address (IPSec)	Specifies an extended access list for a crypto map entry.
set peer (IPSec)	Specifies an IPSec peer in a crypto map entry.
set pfs	Specifies that IPSec should ask for PFS when requesting new security associations for this crypto map entry, or that IPSec requires PFS when receiving requests for new security associations.
set security-association lifetime	Overrides (for a particular crypto map entry) the global lifetime value, which is used when negotiating IPSec security associations.
set transform-set	Specifies which transform sets can be used with the crypto map entry.
show crypto map (IPSec)	Displays the crypto map configuration.

set security-association lifetime

To set the TEK lifetime for a specific crypto map entry or IPsec profile that is used when negotiating IPsec security associations (SAs), use the **set security-association lifetime** command in crypto map configuration mode or IPsec profile configuration mode. To reset a lifetime to the global value, use the **no** form of this command.

set security-association lifetime {**days** *number-of-days* | **kilobytes** {*number-of-kilobytes* | **disable**} | **seconds** *number-of-seconds*}
set security-association lifetime {**days** | **kilobytes** | **seconds**}

Syntax Description

days *number-of-days*	Lifetime in days. The range is 1 to 30.
kilobytes *number-of-kilobytes*	Volume of traffic (in kilobytes) that can pass between IPsec peers using an SA. The range is 2560 to 4294967295.
disable	Disables the SA rekey based on the traffic-volume lifetime.
seconds *number-of-seconds*	Lifetime in seconds. The range is 120 to 2592000. **Note** It is not recommended to use a lifetime value that is lower than 900 seconds in production routers.

Command Default

Global lifetime values are used.

Command Modes

Crypto map configuration (config-crypto-map)
IPsec profile configuration (ipsec-profile)

Command History

Release	Modification
11.3 T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
12.4(20)T	Support for IPv6 was added.
12.2(33)SXI	This command was modified. The **disable** keyword was added.
Cisco IOS XE Release 2.3	This command was integrated into Cisco IOS XE Release 2.3.
15.0(1)M	This command was modified. The **disable** keyword was added.
15.3(2)T	This command was modified. The **days** *number-of-days* keyword and argument pair was added, and the maximum value for the **seconds** *number-of-seconds* keyword and argument pair was extended from 86400 seconds to 2592000 seconds.

Release	Modification
Cisco IOS XE Release 3.9S	This command was integrated into Cisco IOS XE Release 3.9S.

Usage Guidelines

The TEK lifetime determines the lifetime of the SA. You enter this command on the key server (KS) or primary KS. This command sets the value for a specific crypto map entry or IPsec profile by overriding the global lifetime value. The SA and corresponding keys expire after the timed lifetime or traffic-volume lifetime is reached (whichever is first). This command is available only for **ipsec-isakmp** crypto map entries, dynamic crypto map entries, and IPsec profiles.

Note For Cisco Group Encrypted Transport (GET) VPN, you must use the command in IPsec profile configuration mode. This is because GET VPN uses the lifetime from the IPsec profile (not the crypto map).

If a specific crypto map entry or IPsec profile has lifetimes configured, when the router requests new SAs during SA negotiation, it specifies its crypto map or IPsec profile lifetime in the request to the peer; it uses this lifetime as the lifetime of the new SAs. When the router receives a negotiation request from a peer, it uses the smaller of the lifetimes proposed by the peer or by the locally configured lifetime.

A new SA is negotiated *before* the lifetime threshold of the existing SA is reached to ensure that a new SA is ready. The timed lifetime and the traffic volume lifetime each have a jitter mechanism to avoid SA rekey collisions. The new SA is negotiated either (30 plus a random number of) seconds before the **seconds** lifetime expires or when the traffic volume reaches (90 minus a random number of) the percent of the **kilobytes** lifetime (whichever occurs first).

SA rekey starts at 25 percent of the SA key's lifetime, which is earlier than the hard expiration, with a random jitter timing variation. During this time, the interval between SA soft and hard expiration should be more than 30 seconds but less than 200 seconds.

A lifetime change is not applied to existing SAs but is used in subsequent negotiations to establish SAs supported by this crypto map entry or IPsec profile. To enable the change sooner, you can clear all or part of the SA database by using the **clear crypto sa** command.

If no traffic has passed through the tunnel during the life of the SA, no new SA is negotiated when the lifetime expires. Instead, a new SA is negotiated only when IPsec sees a packet to be protected.

The lifetime values are ignored for manually established SAs (using an **ipsec-manual** crypto map entry).

Shorter lifetimes discourage a successful key recovery attack, because the attacker has less data encrypted under the same key to work with. However, shorter lifetimes need more CPU processing time.

Note For any configured lifetime longer than 24 hours, when ESP is used and the encryption algorithm is not NULL (esp-null or implicitly NULL such as with esp-gcm), the encryption algorithm must be AES-CBC (esp-aes) or AES-GCM (esp-gcm) with an AES key of 128 bits or stronger.

You should use a timed lifetime rather than a traffic-volume lifetime, because a small traffic-volume lifetime causes frequent SA rekeys. High throughput of encryption or decryption traffic can cause intermittent packet drops. The minimum traffic-volume lifetime threshold of 2560 kilobytes is *not* recommended on SAs that protect a medium-to-high throughput data link.

Disabling the traffic-volume lifetime affects only the router on which it is configured. It does not affect peer router behavior or the current router's time-based rekey. You should disable the traffic-volume lifetime when using high bandwidth (such as with 10-Gigabit Ethernet). This reduces packet loss in high traffic environments by preventing frequent rekeys when the volume lifetimes are reached.

You can also disable the traffic-volume lifetime by entering the **crypto ipsec security-association lifetime kilobytes disable** command.

On Cisco ASR 1000 Series Aggregation Services Routers, the values specified for this command in the global configuration mode might not be overridden by the values specified for this command under the IPsec profile configuration mode, unless the **shut** and **no shut** commands are specified for the values under IPsec profile. If the values are not specified under IPsec profile, then global values are applied.

Examples

The following example shows how to set the timed lifetime for a specific crypto map entry named map1 to 2700 seconds (45 minutes):

```
Device> enable
Device# configure terminal
Device(config)# crypto map map1 10 ipsec-isakmp
Device(config-crypto-map)# set security-association lifetime seconds 2700
Device(config-crypto-map)# end
```

The following example shows how to disable the traffic-volume lifetime for a specific crypto map entry named map2:

```
Device> enable
Device# configure terminal
Device(config)# crypto map map1 10 ipsec-isakmp
Device(config-crypto-map)# set security-association lifetime kilobytes disable
Device(config-crypto-map)# end
```

The following example shows how to set the timed lifetime to 3 days for an IPsec profile named profile1:

```
Device> enable
Device# configure terminal
Device(config)# crypto ipsec profile profile1
Device(ipsec-profile)# set security-association lifetime days 3
Device(ipsec-profile)# end
```

Related Commands

Command	Description
crypto dynamic-map	Creates a dynamic crypto map entry.
crypto ipsec security-association lifetime	Changes global lifetime values used when negotiating SAs.
crypto map (global IPsec)	Creates or modifies a crypto map entry.
crypto map (interface IPsec)	Applies a previously defined crypto map set to an interface.
crypto map local-address	Specifies and names an identifying interface to be used by the crypto map for IPsec traffic.
match address (IPsec)	Specifies an extended access list for a crypto map entry.

Command	Description
set peer (IPsec)	Specifies an IPsec peer in a crypto map entry.
set pfs	Specifies that IPsec should ask for PFS when requesting new SAs for this crypto map entry, or that IPsec requires PFS when receiving requests for new SAs.
set security-association level per-host	Specifies that separate SAs should be requested for each source/destination host pair.
set transform-set	Specifies the transform sets that can be used with the crypto map entry.
show crypto map (IPsec)	Displays the crypto map configuration.

set security-association replay disable

To disable anti-replay checking for a particular crypto map, dynamic crypto map, or crypto profile, use the **set security-association replay disable**command in crypto map configuration or crypto profile configuration mode. To enable anti-replay checking, use the **no** form of this command.

set security-association replay disable
no set security-association replay disable

Syntax Description

This command has no arguments or keywords.

Command Default

Anti-replay checking is enabled.

Command Modes

Crypto map configuration
Crypto profile configuration

Command History

Release	Modification
12.3(14)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(18)SXF6	This command was integrated into Cisco IOS Release 12.2(18)SXF6.

Examples

The following example shows that anti-replay checking has been disabled for the crypto map named "mymap."

```
crypto map mymap 30
set security-association replay disable
```

Related Commands

Command	Description
set security-association replay window-size	Controls the SAs that are created using the policy specified by a particular crypto map, dynamic crypto map, or crypto profile.

set security-association replay window-size

To control the security associations (SAs) that are created using the policy specified by a particular crypto map, dynamic crypto map, or crypto profile, use the **set security-association replay window-size**command in crypto map configuration or crypto profile configuration mode. To reset the crypto map to follow the global configuration that was specified by the **crypto ipsec security-association replay window-size** command, use the **no** form of this command.

set security-association replay window-size [*N*]
no set security-association replay window-size

Syntax Description

N	(Optional) Size of the window. The value can be 64, 128, 256, 512, or 1024. This value sets the window size for a particular crypto map, dynamic crypto map, or crypto profile.

Command Default

Window size is not set.

Command Modes

Crypto map configuration
Crypto profile configuration

Command History

Release	Modification
12.3(14)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(18)SXF6	This command was integrated into Cisco IOS Release 12.2(18)SXF6.

Examples

The following example shows that the SA window size has been set to 256 for the crypto map named "mymap":

```
crypto map mymap 10
set security-association replay window-size 256
```

Related Commands

Command	Description
set security-association replay disable	Disables anti-replay checking for a particular crypto map, dynamic crypto map, or crypto profile.

set security-policy limit

To define an upper limit to the number of flows that can be created for an individual virtual access interface, use the **set security-policy limit** command in IPsec profile configuration mode. To remove the limitation, use the **no** form of this command.

set security-policy limit *maximum-limit*
no set security-policy limit

Syntax Description

maximum-limit	The number of security policy entries that can be negotiated with the peer. The range is from 0 to 50000.

Command Default

The upper limit to the number of flows that can be created for an individual virtual access interface is not defined.

Command Modes

IPsec profile configuration (config-crypto-profile)

Command History

Release	Modification
Cisco IOS XE Release 3.2S	This command was introduced.
15.2(1)T	This command was integrated into Cisco IOS Release 15.2(1)T.

Usage Guidelines

The behavior of the **set security-policy limit** command is disabled by default. Any change to the maximum limit is applied to the existing session. If the maximum limit is set to 0, then no new IPsec security associations (SAs) are created.

Note Beginning in Cisco IOS Release 15.2(1)T, you can modify the maximum limit by using the **ipsec flow-limit** command.

Examples

The following example shows how to limit the number of flows that can be created for an individual virtual access interface to 5:

```
crypto ipsec profile ipsec-profile-1
 set security-policy limit 5
```

Related Commands

Command	Description
crypto ipsec profile	Defines the IPsec parameters that are to be used for IPsec encryption between two IPsec routers and enters IPsec profile configuration mode.
crypto isakmp profile	Defines an ISAKMP profile and IPsec user sessions.
interface virtual-template	Creates a virtual template interface that can be configured and applied dynamically when virtual access interfaces are created.

Command	Description
ipsec flow-limit	Specifies the maximum number of IPsec SAs that an IKev2 DVTI session can have on an IKev2 responder.

set session-key

To manually specify the IP Security session keys within a crypto map entry, use the **set session-key**command in crypto map configuration mode. This command is available only for **ipsec-manual** crypto map entries. To remove IPSec session keys from a crypto map entry, use the **no** form of this command.

Authentication Header (AH) Protocol Syntax
set session-key {**inbound** | **outbound**} **ah** *spi hex-key-string*
no set session-key {**inbound** | **outbound**} **ah**

Encapsulation Security Protocol (ESP) Syntax
set session-key {**inbound** | **outbound**} **esp** *spi cipher hex-key-string*
authenticator *hex-key-string*
no set session-key {**inbound** | **outbound**} **esp**

Syntax Description

inbound	Sets the inbound IPSec session key. (You must set both inbound and outbound keys.)
outbound	Sets the outbound IPSec session key. (You must set both inbound and outbound keys.)
ah	Sets the IPSec session key for the AH protocol. Use when the crypto map entry's transform set includes an AH transform.
esp	Sets the IPSec session key for ESP. Use when the crypto map entry's transform set includes an ESP transform.
spi	Specifies the security parameter index (SPI), a number that is used to uniquely identify a security association. The SPI is an arbitrary number you assign in the range of 256 to 4,294,967,295 (FFFF FFFF). You can assign the same SPI to both directions and both protocols. However, not all peers have the same flexibility in SPI assignment. For a given destination address/protocol combination, unique SPI values must be used. The destination address is that of the router if inbound, the peer if outbound.
hex-key-string	Specifies the session key; enter in hexadecimal format. This is an arbitrary hexadecimal string of 8, 16, or 20 bytes. If the crypto map's transform set includes a DES algorithm, specify at least 8 bytes per key. If the crypto map's transform set includes an MD5 algorithm, specify at least 16 bytes per key. If the crypto map's transform set includes an SHA algorithm, specify 20 bytes per key. Keys longer than the above sizes are simply truncated.
cipher	Indicates that the key string is to be used with the ESP encryption transform.
authenticator	(Optional) Indicates that the key string is to be used with the ESP authentication transform. This argument is required only when the crypto map entry's transform set includes an ESP authentication transform.

Command Default

No session keys are defined by default.

Command Modes

Crypto map configuration

Command History

Release	Modification
11.3 T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

Use this command to define IPSec keys for security associations via **ipsec-manual** crypto map entries. (In the case of **ipsec-isakmp** crypto map entries, the security associations with their corresponding keys are automatically established via the IKE negotiation.)

If the crypto map's transform set includes an AH protocol, you must define IPSec keys for AH for both inbound and outbound traffic. If the crypto map's transform set includes an ESP encryption protocol, you must define IPSec keys for ESP encryption for both inbound and outbound traffic. If your transform set includes an ESP authentication protocol, you must define IPSec keys for ESP authentication for inbound and outbound traffic.

When you define multiple IPSec session keys within a single crypto map, you can assign the same security parameter index (SPI) number to all the keys. The SPI is used to identify the security association used with the crypto map. However, not all peers have the same flexibility in SPI assignment. You should coordinate SPI assignment with your peer's operator, making certain that the same SPI is not used more than once for the same destination address/protocol combination.

Security associations established via this command do not expire (unlike security associations established via IKE).

Session keys at one peer must match the session keys at the remote peer.

If you change a session key, the security association using the key will be deleted and reinitialized.

Examples

The following example shows a crypto map entry for manually established security associations. The transform set "t_set" includes only an AH protocol.

```
crypto ipsec transform-set t_set ah-sha-hmac
crypto map mymap 20 ipsec-manual
 match address 102
 set transform-set t_set
 set peer 10.0.0.21
 set session-key inbound ah 300 1111111111111111111111111111111111111111
 set session-key outbound ah 300 2222222222222222222222222222222222222222
```

The following example shows a crypto map entry for manually established security associations. The transform set "someset" includes both an AH and an ESP protocol, so session keys are configured for both AH and ESP for both inbound and outbound traffic. The transform set includes both encryption and authentication ESP transforms, so session keys are created for both using the **cipher** and **authenticator** keywords.

```
crypto ipsec transform-set someset ah-sha-hmac esp-des esp-sha-hmac
```

```
crypto map mymap 10 ipsec-manual
 match address 101
 set transform-set someset
 set peer 10.0.0.1
 set session-key inbound ah 300 9876543210987654321098765432109876543210
 set session-key outbound ah 300 fedcbafedcbafedcbafedcbafedcbafedcbafedc
 set session-key inbound esp 300 cipher 0123456789012345
  authenticator 00001111222233334444555566667777888899999
 set session-key outbound esp 300 cipher abcdefabcdefabcd
  authenticator 99998888777766665555444433332222111110000
```

Related Commands

Command	Description
crypto map (global IPSec)	Creates or modifies a crypto map entry and enters the crypto map configuration mode.
crypto map (interface IPSec)	Applies a previously defined crypto map set to an interface.
crypto map local-address	Specifies and names an identifying interface to be used by the crypto map for IPSec traffic.
match address (IPSec)	Specifies an extended access list for a crypto map entry.
set peer (IPSec)	Specifies an IPSec peer in a crypto map entry.
set transform-set	Specifies which transform sets can be used with the crypto map entry.
show crypto map (IPSec)	Displays the crypto map configuration.

set transform-set

To specify which transform sets can be used with the crypto map entry, use the **set transform-set**command in crypto map configuration mode. To remove all transform sets from a crypto map entry, use the **no** form of this command.

set transform-set *transform-set-name*
[*transform-set2...transform-set6*]
no set transform-set

Syntax Description

transform-set-name	Name of the transform set. For an **ipsec-manual** crypto map entry, you can specify only one transform set. For an **ipsec-isakmp** or dynamic crypto map entry, you can specify up to six transform sets.

Command Default

No transform sets are included by default.

Command Modes

Crypto map configuration

Command History

Release	Modification
11.3 T	This command was introduced.
12.4(4)T	Support for IPv6 was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.4(2)S	This command was implemented on the Cisco ASR 901 Series Aggregation Services Router.

Usage Guidelines

This command is required for all static and dynamic crypto map entries.

Use this command to specify which transform sets to include in a crypto map entry.

For an **ipsec-isakmp** crypto map entry, you can list multiple transform sets with this command. List the higher priority transform sets first.

If the local router initiates the negotiation, the transform sets are presented to the peer in the order specified in the crypto map entry. If the peer initiates the negotiation, the local router accepts the first transform set that matches one of the transform sets specified in the crypto map entry.

The first matching transform set that is found at both peers is used for the security association. If no match is found, IPSec will not establish a security association. The traffic will be dropped because there is no security association to protect the traffic.

For an **ipsec-manual** crypto map entry, you can specify only one transform set. If the transform set does not match the transform set at the remote peer's crypto map, the two peers will fail to correctly communicate because the peers are using different rules to process the traffic.

If you want to change the list of transform sets, re-specify the new list of transform sets to replace the old list. This change is only applied to crypto map entries that reference this transform set. The change will not be applied to existing security associations, but will be used in subsequent negotiations to establish new security associations. If you want the new settings to take effect sooner, you can clear all or part of the security association database by using the **clear crypto sa** command.

Any transform sets included in a crypto map must previously have been defined using the **crypto ipsec transform-set** command.

Examples

The following example defines two transform sets and specifies that they can both be used within a crypto map entry. (This example applies only when IKE is used to establish security associations. With crypto maps used for manually established security associations, only one transform set can be included in a given crypto map entry.)

```
crypto ipsec transform-set my_t_set1 esp-des esp-sha-hmac
crypto ipsec transform-set my_t_set2 ah-sha-hmac esp-des esp-sha-hmac
crypto map mymap 10 ipsec-isakmp
 match address 101
 set transform-set my_t_set1 my_t_set2
 set peer 10.0.0.1
 set peer 10.0.0.2
```

In this example, when traffic matches access list 101, the security association can use either transform set "my_t_set1" (first priority) or "my_t_set2" (second priority) depending on which transform set matches the remote peer's transform sets.

sgbp aaa authentication

To enable a Stack Group Bidding Protocol (SGBP) authentication list, use the **sgbp aaa authentication** command in global configuration mode. To disable the SGBP authentication list, use the **no** form of this command.

sgbp aaa authentication list *list-name*
no sgbp aaa authentication list *list-name*

Syntax Description

list *list-name*	Name of a list of methods of authentication to use.

Command Default

A SGBP authentication list is not enabled. You must use the same authentication, authorization and accounting (AAA) method list as PPP usersl.

Command Modes

Global configuration

Command History

Release	Modification
12.3(2)T	This command introduced.

Usage Guidelines

Use the **sgbp aaa authentication**command to create a list different from the AAA list that is used by PPP users.

Examples

The following example shows how to create the AAA list "SGBP" that is to be used by SGBP users:

```
Router(config)# sgbp aaa authentication list SGBP
```

Related Commands

Command	Description
aaa authentication ppp	Specifies one or more AAA authentication methods for use on serial interfaces that are running PPP.
aaa authentication sgbp	Specifies one or more AAA authentication methods for SGBP.
ppp authentication	Enables at least one PPP authentication protocol and to specifies the order in which the protocols are selected on the interface.

show (cs-server)

To display the public key infrastructure (PKI) certificate server configuration, use the **show** command in certificate server configuration mode.

show

Syntax Description

This command has no arguments or keywords.

Command Modes

Certificate server configuration (cs-server)

Command History

Release	Modification
12.3(4)T	This command was introduced.

Usage Guidelines

You must configure the **crypto pki server** command with the name of the certificate server in order to enter certificate server configuration mode and configure this command.

Related Commands

Command	Description
auto-rollover	Enables the automated CA certificate rollover functionality.
cdp-url	Specifies a CDP to be used in certificates that are issued by the certificate server.
crl (cs-server)	Specifies the CRL PKI CS.
crypto pki server	Enables a CS and enters certificate server configuration mode, or immediately generates shadow CA credentials
database archive	Specifies the CA certificate and CA key archive format--and the password--to encrypt this CA certificate and CA key archive file.
database level	Controls what type of data is stored in the certificate enrollment database.
database url	Specifies the location where database entries for the CS is stored or published.

Command	Description
database username	Specifies the requirement of a username or password to be issued when accessing the primary database location.
default (cs-server)	Resets the value of the CS configuration command to its default.
grant auto rollover	Enables automatic granting of certificate reenrollment requests for a Cisco IOS subordinate CA server or RA mode CA.
grant auto trustpoint	Specifies the CA trustpoint of another vendor from which the Cisco IOS certificate server automatically grants certificate enrollment requests.
grant none	Specifies all certificate requests to be rejected.
grant ra-auto	Specifies that all enrollment requests from an RA be granted automatically.
hash (cs-server)	Specifies the cryptographic hash function the Cisco IOS certificate server uses to sign certificates issued by the CA.
issuer-name	Specifies the DN as the CA issuer name for the CS.
lifetime (cs-server)	Specifies the lifetime of the CA or a certificate.
mode ra	Enters the PKI server into RA certificate server mode.
mode sub-cs	Enters the PKI server into sub-certificate server mode
redundancy (cs-server)	Specifies that the active CS is synchronized to the standby CS.
serial-number (cs-server)	Specifies whether the router serial number should be included in the certificate request.

Command	Description
shutdown (cs-server)	Allows a CS to be disabled without removing the configuration.

show (ca-trustpool)

To display the public key infrastructure (PKI) trustpool policy of the router, use the **show** command in ca-trustpool configuration mode.

show

Syntax Description

This command has no arguments or keywords.

Command Modes

Ca-trustpool configuration (ca-trustpool)

Command History

Release	Modification
15.2(2)T	This command was introduced.
15.1(1)SY	This command was integrated into Cisco IOS 15.1(1)SY.

Usage Guidelines

Before you can use this command, you must enable the **crypto pki trustpool policy** command, which enters ca-trustpool configuration mode.

Examples

```
Router(config)# crypto pki trustpool policy
Router(ca-trustpool)# show

 Chain validation will stop at the first CA certificate in the pool
   Trustpool CA certificates will expire 12:58:31 PST Apr 5 2012
   Trustpool policy revocation order:      crl
   Certficate matching is disabled
   Policy Overrides:
```

Related Commands

Command	Description
cabundle url	Configures the URL from which the PKI trustpool CA bundle is downloaded.
chain-validation	Enables chain validation from the peer's certificate to the root CA certificate in the PKI trustpool.
crl	Specifes the CRL query and cache options for the PKI trustpool.
crypto pki trustpool import	Manually imports (downloads) the CA bundle into the PKI trustpool to update or replace the existing CA bundle.
crypto pki trustpool policy	Configures PKI trustpool policy parameters.

Command	Description
default	Resets the value of a ca-trustpool configuration command to its default.
match	Enables the use of certificate maps for the PKI trustpool.
ocsp	Specifies OCSP settings for the PKI trustpool.
revocation-check	Disables revocation checking when the PKI trustpool policy is being used.
show crypto pki trustpool	Displays the PKI trustpool certificates of the router and optionally shows the PKI trustpool policy.
source interface	Specifies the source interface to be used for CRL retrieval, OCSP status, or the downloading of a CA certificate bundle for the PKI trustpool.
storage	Specifies a file system location where PKI trustpool certificates are stored on the router.
vrf	Specifies the VRF instance to be used for CRL retrieval.

show aaa attributes

To display the mapping between an authentication, authorization, and accounting (AAA) attribute number and the corresponding AAA attribute name, use the **show aaa attributes** command in EXEC configuration mode.

show aaa attributes [**protocol radius**]

Syntax Description

protocol radius	(Optional) Displays the mapping between a RADIUS attribute and a AAA attribute name and number.

Command Modes

EXEC

Command History

Release	Modification
12.2(4)T	This command was introduced.
12.2(11)T	The **protocol radius**keyword was added.
12.3(14)T	T.38 fax relay call statistics were made available to Call Detail Records (CDRs) through Vendor-Specific Attributes (VSAs) and added to the call log.

Examples

The following example is sample output for the **show aaa attributes**command. In this example, all RADIUS attributes that have been enabled are displayed.

```
Router# show aaa attributes protocol radius
AAA ATTRIBUTE LIST:
    Type=1     Name=disc-cause-ext                Format=Enum
        Protocol:RADIUS
        Non-Standard  Type=195   Name=Ascend-Disconnect-Cau Format=Enum
        Cisco VSA     Type=1     Name=Cisco AVpair          Format=String
    Type=2     Name=Acct-Status-Type              Format=Enum
        Protocol:RADIUS
        IETF          Type=40    Name=Acct-Status-Type      Format=Enum
    Type=3     Name=acl                           Format=Ulong
        Protocol:RADIUS
        IETF          Type=11    Name=Filter-Id             Format=Binary
    Type=4     Name=addr                          Format=IPv4 Address
        Protocol:RADIUS
        IETF          Type=8     Name=Framed-IP-Address     Format=IPv4 Addre
    Type=5     Name=addr-pool                     Format=String
        Protocol:RADIUS
        Non-Standard  Type=218   Name=Ascend-IP-Pool        Format=Ulong
    Type=6     Name=asyncmap                      Format=Ulong
        Protocol:RADIUS
        Non-Standard  Type=212   Name=Ascend-Asyncmap       Format=Ulong
    Type=7     Name=Authentic                     Format=Enum
        Protocol:RADIUS
        IETF          Type=45    Name=Authentic             Format=Enum
    Type=8     Name=autocmd                       Format=String
```

The following example is sample output for the **show aaa attributes**command. In this example, all the T.38 fax relay statistics are displayed.

```
Router# show aaa attributes
!
 Type=485   Name=originating-line-info          Format=Ulong
    Type=486   Name=charge-number                  Format=String
    Type=487   Name=transmission-medium-req        Format=Ulong
    Type=488   Name=redirecting-number             Format=String
    Type=489   Name=backward-call-indicators       Format=String
    Type=490   Name=remote-media-udp-port          Format=Ulong
    Type=491   Name=remote-media-id                Format=String
    Type=492   Name=supp-svc-xfer-by               Format=String
    Type=493   Name=faxrelay-start-time            Format=String
    Type=494   Name=faxrelay-max-jit-buf-depth     Format=String
    Type=495   Name=faxrelay-jit-buf-ovflow        Format=String
    Type=496   Name=faxrelay-mr-hs-mod             Format=String
    Type=497   Name=faxrelay-init-hs-mod           Format=String
    Type=498   Name=faxrelay-num-pages             Format=String
    Type=499   Name=faxrelay-direction             Format=String
    Type=500   Name=faxrelay-ecm-in-use            Format=String
    Type=501   Name=faxrelay-encap-prot            Format=String
    Type=502   Name=faxrelay-nsf-country-code      Format=String
    Type=503   Name=faxrelay-nsf-manuf-code        Format=String
    Type=504   Name=faxrelay-fax-success           Format=String
    Type=505   Name=faxrelay-tx-packets            Format=String
    Type=506   Name=faxrelay-rx-packets            Format=String
```

The table below provides an alphabetical listing of the fields displayed in the output of the **show aaa attributes**command displaying T.38 statistics and a description of each field.

Table 1: show aaa attributes Field Descriptions

Field	Description
Format=Ulong	Format type is ULong.
Format=String	Format type is string.
Name=backward-call-indicators	Backward call indicator.
Name=charge-number	Charge number.
Name=faxrelay-direction	Direction of fax relay.
Name=faxrelay-ecm-in-use	Error correction mode in use for the fax relay.
Name=faxrelay-encap-prot	Encapsulation protocol for fax relay.
Name=faxrelay-fax-success	Fax relay success.
Name=faxrelay-init-hs-mod	Fax relay initial high-speed modulation.
Name=faxrelay-jit-buf-ovflow	Fax relay jitter buffer overflow.
Name=faxrelay-max-jit-buf-depth	Fax relay maximum jitter buffer depth.
Name=faxrelay-mr-hs-mod	Fax relay most recent high speed modulation.

Field	Description
Name=faxrelay-num-pages	Fax relay number of fax pages.
Name=faxrelay-nsf-country-code	Fax relay Nonstandard Facilities (NSF) country code.
Name=faxrelay-nsf-manuf-code	Fax relay NSF manufacturers code.
Name=faxrelay-rx-packets	Fax relay received packets
Name=faxrelay-start-time	Fax relay start time.
Name=faxrelay-tx-packets	Fax relay transmitted packets.
Name=originating-line-info	Originating line information.
Name=redirecting-number	Redirecting number.
Name=remote-media-id	Remote media ID.
Name=remote-media-udp-port	Remote media UDP port.
Name=supp-svc-xfer-by	Supplementary service transfer.
Name=transmission-medium-req	Transmission medium requirement.
Type=	Type of fax relay string.

Related Commands

Command	Description
debug voip aaa	Enables debugging messages for gateway authentication, authorization, and accounting (AAA) to be sent to the system console.

show aaa cache filterserver

To display the cache status, use the **show aaa cache filterserver** command in user EXEC or privileged EXEC mode.

show aaa cache filterserver {**acl** | **pending**}

Syntax Description

acl	Shows the contents of the access control cache at the last refresh.
pending	Shows the contents of the pending call cache, which references filters that have not received a response from the RADIUS server.

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

Release	Modification
12.2(13)T	This command was introduced.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.4T	The **acl** and **pending** keywords were added.
12.2(33)SRC	This command was integrated into Cisco IOS Release 12.2(33)SRC.

Usage Guidelines

The **show aaa cache filterserver** command shows how many times a particular filter has been referenced or refreshed. This function may be used in administration to determine which filters are actually being used.

Examples

The following is sample output for the **show aaa cache filterserver** command using the **acl** and **pending**keywords:

```
Router# show aaa cache filterserver acl
Filter     Server          Age Expires Refresh Access-Control-Lists
-------------------------------------------------------------------------------
aol        10.2.3.4          0    1440     100 ip in icmp drop
                                               ip out icmp drop
                                               ip out forward tcp dstip 10.2.3.4
msn        10.2.3.4        N/A   Never       2 ip in tcp drop
msn2       10.2.3.4        N/A   Never       2 ip in tcp drop
vone       10.2.3.4        N/A   Never       0 ip in tcp drop
```

The following is sample output for the **show aaa cache filterserver** command using the **pending** keyword:

```
Router# show aaa cache filterserver pending

AAA pending cache:
Filter Age Expires Refresh
-------------------------------------------------------------------------------
myfilter N/A Never N/A call 0x501802D8 (00000085)
```

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

Table 2: show aaa cache filterserver Field Descriptions

Field	Description
Filter	Filter name
Server	RADIUS server IP address
Age	When to expire a cache entry (in minutes)
Expires	Number of minutes in which a cache entry will expire
Refresh	Number of times a cache has been refreshed
Access-Control-Lists	Access control list (ACL) of the server

Related Commands

Command	Description
aaa authorization cache filterserver	Enables AAA authorization caches and the downloading of ACL configurations from a RADIUS filter server.

show aaa cache group

To display all the cache entries stored by the authentication, authorization, and accounting (AAA) cache, use the **show aaa cache group**command in privileged EXEC mode.

show aaa cache group *name* {**all** | **profile** *name*}

Syntax Description

name	Text string representing a cache server group.
all	Displays all server group profile details.
profile *name*	Displays the specified individual server group profile details.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(28)SB	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXI	This command was integrated into Cisco IOS Release 12.2(33)SXI.
12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T.
15.0(1)M	This command was integrated into Cisco IOS Release 15.0(1)M.
Cisco IOS XE Release 2.3	This command was integrated into Cisco IOS XE Release 2.3.

Usage Guidelines

Use the **show aaa cache group** command to display all cache entries for a specific group.

Examples

The following example shows how to display all cache entries for a group. The fields are self-explanatory.

```
Router# show aaa cache group sg1
-----------------------------------------------------------
 Entries in Profile dB SG1 for exact match
-----------------------------------------------------------
Profile: .*user*
Updated: 00:00:33
Parse User: Y
Authen User: Y
     6462F2F0 0 00000001 service-type(253) 4 2
     6462F304 0 00000001 Framed-Protocol(66) 4 1
     6462F318 0 00000009 policy-directive(339) 29 apply service internet_bronze
Profile: .*internet*
Updated: 00:00:33
Parse User: Y
Authen User: Y
     64630088 0 00000001 service-type(253) 4 5
     6463009C 0 00000009 ssg-service-info(350) 16 IBronze Internet
```

```
     646300B0 0 00000001 timeout(313) 4 90(5A)
------------------------------------------------------------
 Entries in Profile dB SG1 for regexp match
------------------------------------------------------------
Profile: .*internet*,
Updated: 00:00:33
Parse User: Y
Authen User: Y
     64630088 0 00000001 service-type(253) 4 5
     6463009C 0 00000009 ssg-service-info(350) 16 IBronze Internet
     646300B0 0 00000001 timeout(313) 4 90(5A)
Profile: .*user*,
Updated: 00:00:34
Parse User: Y
Authen User: Y
     6462F2F0 0 00000001 service-type(253) 4 2
     6462F304 0 00000001 Framed-Protocol(66) 4 1
     6462F318 0 00000009 policy-directive(339) 29 apply service internet_bronze
```

Related Commands

Command	Description
clear aaa cache group	Clears individual entries or all entries in the cache.
debug aaa cache group	Debugs the caching mechanism and ensures that entries are being cached from AAA server responses and are being found when queried.

show aaa common-criteria policy

To display the common criteria security policy details, use the **show aaa common-criteria policy** command in privileged EXEC mode.

show aaa common-criteria policy {**name** *policy-name* | **all**}

Syntax Description

name *policy-name*	Specifies the password security details for a specific policy.
all	Specifies the password security details for all configured policies.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.0(2)SE	This command was introduced.

Usage Guidelines

Use the **show aaa common-criteria policy** command to display the security policy details for a specific policy or for all configured policies.

Examples

The following is sample output from the **show aaa common-criteria policy** command:

```
Device# show aaa common-criteria policy name policy1

Policy name: policy1
Minimum length: 1
Maximum length: 64
Upper Count: 20
Lower Count: 20
Numeric Count: 5
Special Count: 2
Number of character changes 4
Valid forever. User tied to this policy will not expire.
```

The following is sample output from the **show aaa common-criteria policy all** command:

```
Device# show aaa common-criteria policy all
==========================================================

Policy name: policy1
Minimum length: 1
Maximum length: 64
Upper Count: 20
Lower Count: 20
Numeric Count: 5
Special Count: 2
Number of character changes 4
Valid forever. User tied to this policy will not expire.
==========================================================
Policy name: policy2
Minimum length: 1
```

```
Maximum length: 34
Upper Count: 10
Lower Count: 5
Numeric Count: 4
Special Count: 2
Number of character changes 4
Valid forever. User tied to this policy will not expire.
=========================================================
```

The following table describes the significant fields shown in the display.

Table 3: show aaa common-criteria policy all Field Descriptions

Field	Description
Policy name	Name of the configured security policy.
Minimum length	Minimum length of the password.
Maximum length	Maximum length of the password.
Upper Count	Number of uppercase characters.
Lower Count	Number of lowercase characters.
Numeric Count	Number of numeric characters.
Special Count	Number of special characters.
Number of character changes	Number of changed characters between old and new passwords.

Related Commands

Command	Description
aaa common-criteria policy	Configures an authentication, authorization, and accounting (AAA) common criteria security policy.
debug aaa common-criteria	Enables debugging for AAA common criteria password security policies.

show aaa dead-criteria

To display dead-criteria detection information for an authentication, authorization, and accounting (AAA) server, use the **show aaa dead-criteria** command in privileged EXEC mode.

show aaa dead-criteria {**security-protocol** *ip-address*} [**auth-port** *port-number*] [**acct-port** *port-number*][*server-group-name*]

Syntax Description

security-protocol	Security protocol of the specified AAA server. Currently, the only protocol that is supported is RADIUS.
ip-address	IP address of the specified AAA server.
auth-port	(Optional) Authentication port for the RADIUS server that was specified.
port-number	(Optional) Number of the authentication port. The default is 1645 (for a RADIUS server).
acct-port	(Optional) Accounting port for the RADIUS server that was specified.
port-number	(Optional) Number of the accounting port. The default is 1646 (for a RADIUS server).
server-group-name	(Optional) Server group with which the specified server is associated. The default is "radius" (for a RADIUS server).

Command Default

Currently, the *port-number* argument for the **auth-port** keyword and the *port-number* argument for the **acct-port** keyword default to 1645 and 1646, respectively. The default for the *server-group-name* argument is radius.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(6)	This command was introduced.
12.3(7)T	This command was integrated into Cisco IOS Release 12.3(7)T.

Usage Guidelines

Multiple RADIUS servers having the same IP address can be configured on a router. The **auth-port** and **acct-port** keywords are used to differentiate the servers. The dead-detect interval of a server that is associated with a specified server group can be obtained by using the **server-group-name** keyword. (The dead-detect interval and retransmit values of a RADIUS server are set on the basis of the server group to which the server belongs. The same server can be part of multiple server groups.)

Examples

The following example shows that dead-criteria-detection information has been requested for a RADIUS server at the IP address 172.19.192.80:

```
Router# show aaa dead-criteria radius 172.19.192.80 radius
RADIUS Server Dead Critieria:
```

```
============================
Server Details:
    Address : 172.19.192.80
    Auth Port : 1645
    Acct Port : 1646
Server Group : radius
Dead Criteria Details:
    Configured Retransmits : 62
    Configured Timeout : 27
    Estimated Outstanding Transactions: 5
    Dead Detect Time : 25s
    Computed Retransmit Tries: 22
    Statistics Gathered Since Last Successful Transaction
=====================================================
Max Computed Outstanding Transactions: 5
Max Computed Dead Detect Time: 25s
Max Computed Retransmits : 22
```

The "Max Computed Dead Detect Time" is displayed in seconds. The other fields shown in the display are self-explanatory.

Related Commands

Command	Description
debug aaa dead-criteria transactions	Displays AAA dead-criteria transaction values.
radius-server dead-criteria	Forces one or both of the criteria--used to mark a RADIUS server as dead--to be the indicated constant.
show aaa server-private	Displays the status of all private RADIUS servers.
show aaa servers	Displays information about the number of packets sent to and received from AAA servers.

show aaa local user lockout

To display a list of all locked-out users, use the **show aaa local user lockout**command in privileged EXEC mode.

show aaa local user lockout

Syntax Description

This command has no arguments or keywords.

Command Default

Names of locked-out users are not displayed.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(14)T	This command was introduced.

Usage Guidelines

This command can be used only by users having root privilege.

Examples

The following output of the **show aaa local user lockout** command illustrates that user1 is locked out:

```
Router# show aaa local user lockout
               Local-user          Lock time
               user1                  04:28:49 UTC Sat Jun 19 2004
The fields in the output example are self-explanatory.
```

Related Commands

Command	Description
aaa local authentication attempts max-fail	Specifies the maximum number of unsuccessful authentication attempts before a user is locked out.
clear aaa local user fail-attempts	Clears the unsuccessful login attempts of a user.
clear aaa local user lockout	Unlocks the locked-out user.

show aaa memory

To display the output of the AAA data structure memory tracing information, use the **show aaa memory** command in user EXEC or privileged EXEC mode.



Note The command may cause high load on the device.

show aaa memory [**detailed** [**component** [**line**]] | **stats** {**all** | **attr_list** | **cursor** | **event** | **request** | **summary**}]

Syntax Description

detailed	(Optional) Displays information about the status of various AAA data structures actively used by AAA clients and statistics of data structure usage.
component	(Optional) Displays information about a specified component.
line	(Optional) Displays the substring to match in the component name.
stats	(Optional) Displays data-structure memory statistics.
all	(Optional) Displays memory statistics.
attr_list	(Optional) Displays the attribute list usage statistics.
cursor	(Optional) Displays the cursor usage statistics.
event	(Optional) Displays the event usage statistics.
request	(Optional) Displays the request usage statistics.
summary	(Optional) Displays the data-structure usage summary.

Command Modes

User EXEC (>)
Privileged EXEC (#

Command History

Release	Modification
12.4(24)T	This command was introduced in a release earlier than IOS Release 12.4(24)T.
12.2(33)SXI	This command was integrated into a release earlier than Cisco IOS Release 12.2(33)SXI. The **stats** keyword is not supported in this release.
12.2(33)SRC	This command was integrated into a release earlier than Cisco IOS Release 12.2(33)SRC. The **stats** keyword is not supported in this release.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

Use the **show aaa memory** to display the status of various AAA data structures actively used by AAA clients and statistics of data structure usage.

Examples

The following is sample output from the **show aaa memory detailed**command:

```
Router# show aaa memory detailed
AAA (accounting)             In-use Asked-For/Allocated Count  Size  Cfg/Max
  ------------------------------------------------------------------------------
  aaa_acct_rec            :        --        --/--            --    72   --/--
  aaa_acct_rec_node       :        --        --/--            --    24   --/--
  AAA (attribute)              In-use Asked-For/Allocated Count  Size  Cfg/Max
  ------------------------------------------------------------------------------
  aaa_attr                :        --        --/--            --    16   --/--
  aaa_attr_list           :        --        --/--            --    20   --/--
  AAA (database)               In-use Asked-For/Allocated Count  Size  Cfg/Max
  ------------------------------------------------------------------------------
  hash_elt                :        --        --/--            --    64   --/--
  aaa_acct_db             :        --        --/--            --   160   --/--
  aaa_db_elt_chunk        :       128     61568/912           2    64 2048/0
  aaa_uid_hash_table_str  :      4096      4096/4148          1  4096   --/--
  Total                   :      4224     65664/5060          3    --   --/--
  AAA (misc)                   In-use Asked-For/Allocated Count  Size  Cfg/Max
  ------------------------------------------------------------------------------
  aaa_interface           :        --        --/--            --   280   --/--
  aaa_idb_name            :        --        --/--            --   232   --/--
  aaa_general_db          :        --        --/--            --   644   --/--
  aaa_chunks              :        --         0/0             --    28  200/0
  aaa_interface_struct    :       560       560/664           2   280   --/--
  Total                   :       560       560/664           2    --   --/--
  RADIUS                       In-use Asked-For/Allocated Count  Size  Cfg/Max
  ------------------------------------------------------------------------------
  Total allocated: 0.004 Mb, 5 Kb, 5724 bytes
AAA Low Memory Statistics:

_____________________________
  Authentication low-memory threshold      : 3%
  Accounting low-memory threshold          : 2%
  AAA Unique ID Failure                    : 0
  Local server  Packet dropped             : 0
  CoA  Packet dropped                      : 0
  PoD  Packet dropped                      : 0
```

The following is sample output from the **show aaa memory stats all**command:

```
Router# show aaa memory stats all
AAA Memory trace summary:
-------------------------------------------------------------------------------------
TYPE           mallocs        frees        failures        active      max-usage
-------------------------------------------------------------------------------------
AAA_ATTR_L          41           40              0             1              6
AAA_CURSOR          88           88              0             0              2
AAA_EVENT            5            5              0             0              1
AAA_REQUES           2            2              0             0              1
-------------------------------------------------------------------------------------
AAA_ATTR_LIST data-structure active allocations trace:
-----------------------------------------------------------------
  Allocator-PC            AAA API                 Active Mallocs
-----------------------------------------------------------------
 0x01956360     aaa_attr_list_alloc                        1
-----------------------------------------------------------------
AAA_CURSOR data-structure active allocations trace:
-----------------------------------------------------------------
```

```
  Allocator-PC            AAA API                 Active Mallocs
-----------------------------------------------------------------
-----------------------------------------------------------------
AAA_EVENT data-structure active allocations trace:
-----------------------------------------------------------------
  Allocator-PC            AAA API                 Active Mallocs
-----------------------------------------------------------------
-----------------------------------------------------------------
AAA_REQUEST data-structure active allocations trace:
-----------------------------------------------------------------
  Allocator-PC            AAA API                 Active Mallocs
-----------------------------------------------------------------
-----------------------------------------------------------------
```

The table below describes the significant fields in the display.

Table 4: show aaa memory stats all Field Descriptions

Field	Description
TYPE	AAA data structure type.
mallocs	Total number of data structures allocated.
frees	Total number of data structures freed.
failures	Total number of data structure allocations failed.
active	Total number of actively used data structures.
max-usage	Maximum number of active allocations of data structure at any point.

The following is sample output from the **show aaa memory stats**with the **attr_list**keyword:

```
Router# show aaa memory stats attr_list
AAA_ATTR_LIST data-structure active allocations trace:
-----------------------------------------------------------------
  Allocator-PC            AAA API                 Active Mallocs
-----------------------------------------------------------------
 0x01956360     aaa_attr_list_alloc                        1
-----------------------------------------------------------------
```

The table below describes the significant fields in the display.

Table 5: show aaa memory stats attr_list Field Descriptions

Field	Description
Allocator-PC	AAA client that allocated a active data structure
AAA API	AAA API called by the client for an actively allocated data structure.
Active Mallocs	Number of active allocations from a client PC.

The following is sample output from the **show aaa memory stats cursor**command:

```
Router# show aaa memory stats cursor
AAA_CURSOR data-structure active allocations trace:
-----------------------------------------------------------------
```

```
  Allocator-PC            AAA API                 Active Mallocs
-----------------------------------------------------------------
```

The following is sample output from the **show aaa memory stats event**command:

```
Router# show aaa memory stats event
AAA_EVENT data-structure active allocations trace:
-----------------------------------------------------------------
  Allocator-PC            AAA API                 Active Mallocs
-----------------------------------------------------------------
-----------------------------------------------------------------
```

The following is sample output from the **show aaa memory stats request**command:

```
Router# show aaa memory stats request
AAA_REQUEST data-structure active allocations trace:
-----------------------------------------------------------------
  Allocator-PC            AAA API                 Active Mallocs
-----------------------------------------------------------------
-----------------------------------------------------------------
```

show aaa method-lists

To display all the named method lists defined in the authentication, authorization, and accounting (AAA) subsystem, use the **show aaa method-lists**command in user EXEC or privileged EXEC mode.

show aaa method-lists {**accounting** | **all** | **authentication** | **authorization**}

Syntax Description

accounting	Displays method lists defined for accounting services.
all	Displays method lists defined for all services.
authentication	Displays method lists defined for authentication services.
authorization	Displays method lists defined for authorization services.

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

Release	Modification
12.2(8)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Examples

The following example shows how to display method lists for the accounting services:

```
Router# show aaa method-lists accounting

acct queue=AAA_ML_ACCT_SHELL
name=Permanent None valid=TRUE id=0 Action=NOT_SET :state=ALIVE
acct queue=AAA_ML_ACCT_AUTH_PROXY
  name=default valid=TRUE id=0 Action=START STOP :state=DEAD : SERVER_GROUP tac+
acct queue=AAA_ML_ACCT_NET
  name=methodtest valid=TRUE id=BA000002 Action=START STOP :state=DEAD :
  name=tunnel valid=TRUE id=48000003 Action=START STOP :state=DEAD : SERVER_GROs
  name=session valid=TRUE id=5C000004 Action=START STOP :state=DEAD : SERVER_GRs
acct queue=AAA_ML_ACCT_CONN
acct queue=AAA_ML_ACCT_SYSTEM
  name= valid=TRUE id=82000005 Action=START STOP :state=DEAD : SERVER_GROUP rads
acct queue=AAA_ML_ACCT_RESOURCE
acct queue=AAA_ML_ACCT_RM
permanent lists
The table below describes the significant fields shown in the display.
```

Table 6: show aaa method-lists accounting Field Descriptions

Field	Description
acct queue	Specifies the type of service for which the method lists are defined.
name	Name of the method list for the specified AAA service.
valid	Identifies the validity of the method-lists.
id	A unique identifier for the specified AAA method list.
Action	Specifies the type of action to be performed on accounting records. One of the following types of actions is displayed: Start-stop, Stop-only or None.
state	Describes the current state of the AAA server. There are two possible states: • DEAD--Indicates that the server is currently presumed dead and, in the case of failovers, this server will be skipped unless it is the last server in the group. • ALIVE--Indicates that the server is currently considered alive and attempts will be made to communicate with it.
SERVER_GROUP	Name of the server group, RADIUS hosts or TACTACS+ hosts.

The following example shows how to display method lists for authentication services.

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

```
Router# show aaa method-lists authentication

authen queue=AAA_ML_AUTHEN_LOGIN
  name=default valid=TRUE id=0 :state=DEAD : SERVER_GROUP radius
authen queue=AAA_ML_AUTHEN_ENABLE
  name=default valid=TRUE id=0 :state=ALIVE : SERVER_GROUP tacacs+ ENABLE  NONE
authen queue=AAA_ML_AUTHEN_PPP
authen queue=AAA_ML_AUTHEN_SGBP
authen queue=AAA_ML_AUTHEN_ARAP
  name=default valid=TRUE id=0 :state=DEAD : SERVER_GROUP tacacs+
  name=MIS-access valid=TRUE id=FF000006 :state=DEAD : SERVER_GROUP tacacs+
authen queue=AAA_ML_AUTHEN_DOT1X
  name=default valid=TRUE id=0 :state=DEAD : SERVER_GROUP radius
authen queue=AAA_ML_AUTHEN_EAPOUDP
  name=default valid=TRUE id=0 :state=ALIVE : ENABLE  SERVER_GROUP radius
authen queue=AAA_ML_AUTHEN_8021X
permanent lists
  name=Permanent Enable None valid=TRUE id=0 :state=ALIVE : ENABLE  NONE
  name=Permanent Enable valid=TRUE id=0 :state=ALIVE : ENABLE
  name=Permanent None valid=TRUE id=0 :state=ALIVE : NONE
  name=Permanent Local valid=TRUE id=0 :state=ALIVE : LOCAL
```

The following example shows how to display method lists for authorization services. The table below describes the significant fields shown in the display.

```
Router# show aaa method-lists authorization

author queue=AAA_ML_AUTHOR_SHELL
author queue=AAA_ML_AUTHOR_NET
  name=method1 valid=TRUE id=12000001 :state=ALIVE : NONE
```

```
  name=mygroup valid=TRUE id=6D000007 :state=ALIVE : SERVER_GROUP radius LOCAL
  name=list11 valid=TRUE id=6C000009 :state=DEAD : SERVER_GROUP radius
author queue=AAA_ML_AUTHOR_CONN
  name=default valid=TRUE id=0 :state=ALIVE : SERVER_GROUP tacacs+
author queue=AAA_ML_AUTHOR_IPMOBILE
author queue=AAA_ML_AUTHOR_RM
author queue=AAA_ML_AUTHOR_CONFIG
author queue=AAA_ML_AUTHOR_AUTH_PROXY
  name=default valid=TRUE id=0 :state=ALIVE : SERVER_GROUP tacacs+
author queue=AAA_ML_AUTHOR_PREAUTH
author queue=AAA_ML_AUTHOR_FLTSV
  name=default valid=TRUE id=0 :state=DEAD : SERVER_GROUP grp1
name=group valid=TRUE id=48000008 :state=ALIVE : SERVER_GROUP tacacs+ NONE
permanent lists
  name=local-list valid=TRUE id=0 :state=ALIVE : LOCAL
```

The following example shows how to display method lists for all the services. The table below describes the significant fields shown in the display.

```
Router# show aaa method-lists all

authen queue=AAA_ML_AUTHEN_LOGIN
  name=default valid=TRUE id=0 :state=ALIVE : SERVER_GROUP tacacs+
authen queue=AAA_ML_AUTHEN_ENABLE
  name=default valid=TRUE id=0 :state=ALIVE : SERVER_GROUP tacacs+ ENABLE  NONE
authen queue=AAA_ML_AUTHEN_PPP
authen queue=AAA_ML_AUTHEN_SGBP
authen queue=AAA_ML_AUTHEN_ARAP
  name=default valid=TRUE id=0 :state=ALIVE : SERVER_GROUP tacacs+
  name=MIS-access valid=TRUE id=FF000006 :state=ALIVE : SERVER_GROUP tacacs+
authen queue=AAA_ML_AUTHEN_DOT1X
  name=default valid=TRUE id=0 :state=DEAD : SERVER_GROUP radius
authen queue=AAA_ML_AUTHEN_EAPOUDP
  name=default valid=TRUE id=0 :state=ALIVE : ENABLE  SERVER_GROUP radius
authen queue=AAA_ML_AUTHEN_8021X
permanent lists
  name=Permanent Enable None valid=TRUE id=0 :state=ALIVE : ENABLE  NONE
  name=Permanent Enable valid=TRUE id=0 :state=ALIVE : ENABLE
  name=Permanent None valid=TRUE id=0 :state=ALIVE : NONE
  name=Permanent Local valid=TRUE id=0 :state=ALIVE : LOCAL
author queue=AAA_ML_AUTHOR_SHELL
author queue=AAA_ML_AUTHOR_NET
  name=method1 valid=TRUE id=12000001 :state=ALIVE : NONE
  name=mygroup valid=TRUE id=6D000007 :state=ALIVE : SERVER_GROUP radius LOCAL
  name=list11 valid=TRUE id=6C000009 :state=DEAD : SERVER_GROUP radius
author queue=AAA_ML_AUTHOR_CONN
  name=default valid=TRUE id=0 :state=ALIVE : SERVER_GROUP tacacs+
author queue=AAA_ML_AUTHOR_IPMOBILE
author queue=AAA_ML_AUTHOR_RM
author queue=AAA_ML_AUTHOR_CONFIG
author queue=AAA_ML_AUTHOR_AUTH_PROXY
  name=default valid=TRUE id=0 :state=ALIVE : SERVER_GROUP tacacs+
author queue=AAA_ML_AUTHOR_PREAUTH
author queue=AAA_ML_AUTHOR_FLTSV
  name=default valid=TRUE id=0 :state=DEAD : SERVER_GROUP grp1
name=group valid=TRUE id=48000008 :state=ALIVE : SERVER_GROUP tacacs+ NONE
permanent lists
  name=local-list valid=TRUE id=0 :state=ALIVE : LOCAL
acct queue=AAA_ML_ACCT_SHELL
acct queue=AAA_ML_ACCT_AUTH_PROXY
  name=default valid=TRUE id=0 Action=START STOP :state=ALIVE : SERVER_GROUP ta+
acct queue=AAA_ML_ACCT_NET
  name=methodtest valid=TRUE id=BA000002 Action=START STOP :state=DEAD :
```

```
  name=tunnel valid=TRUE id=48000003 Action=START STOP :state=DEAD : SERVER_GROs
  name=session valid=TRUE id=5C000004 Action=START STOP :state=DEAD : SERVER_GRs
acct queue=AAA_ML_ACCT_CONN
acct queue=AAA_ML_ACCT_SYSTEM
  name= valid=TRUE id=82000005 Action=START STOP :state=DEAD : SERVER_GROUP rads
acct queue=AAA_ML_ACCT_RESOURCE
acct queue=AAA_ML_ACCT_RM
permanent lists
  name=Permanent None valid=TRUE id=0 Action=NOT_SET :state=ALIVE
```

Related Commands

Command	Description
aaa accounting	Enables AAA accounting of requested services for billing or security purposes when you use RADIUS or TACACS+.
aaa authentication arap	Enables a AAA authentication method for ARA.
aaa authorization	Sets parameters that restricts user access to a network.

show aaa service-profiles

To display the service profiles downloaded and stored by an authentication, authorization, and accounting (AAA) session, use the **show aaa service-profiles**command in user EXEC or privileged EXEC mode.

show aaa service-profiles

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

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

Examples

The following is sample output from the **show aaa service-profiles**command. The field description is self-explantory.

```
Router# show aaa service-profiles
Service Name: example.com
```

Related Commands

Command	Description
aaa service-profiles	Configures the service profile parameters for a AAA session.

show aaa servers

To display the status and number of packets that are sent to and received from all public and private authentication, authorization, and accounting (AAA) RADIUS servers as interpreted by the AAA Server MIB, use the **show aaa servers** command in user EXEC or privileged EXEC mode.

show aaa servers [**private** | **public**]

Syntax Description

private	(Optional) Displays private AAA servers only, which are also displayed by the AAA Server MIB.
public	(Optional) Displays public AAA servers only, which are also displayed by the AAA Server MIB.

Command Modes

User EXEC (>)
privileged EXEC (#)

Command History

Release	Modification
12.2(6)T	This command was introduced.
12.3(7)T	This command was integrated into Cisco IOS Release 12.3(7)T.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
15.1(1)S	This command was modified. Support for private RADIUS servers in CISCO-AAA-SERVER-MIB was added.
15.1(4)M	This command was modified. Support for private RADIUS servers in CISCO-AAA-SERVER-MIB was added.
15.2(4)S1	This command was modified. Support for displaying the estimated outstanding and throttled transactions (access and accounting) in the command output was added.

Usage Guidelines

Only RADIUS servers are supported by the **show aaa servers** command.

The command displays information about packets sent and received for all AAA transaction types--authentication, authorization, and accounting.

Examples

The following is sample output from the **show aaa servers private** command. Only the first four lines of the display pertain to the status of private RADIUS servers, and the output fields in this part of the display are described in the table below.

```
Router# show aaa servers private

RADIUS: id 24, priority 1, host 172.31.164.120, auth-port 1645, acct-port 1646
     State: current UP, duration 375742s, previous duration 0s
     Dead: total time 0s, count 0
     Quarantined: No
     Authen: request 5, timeouts 1, failover 0, retransmission 1
             Response: accept 4, reject 0, challenge 0
             Response: unexpected 0, server error 0, incorrect 0, time 14ms
```

```
        Transaction: success 4, failure 0
        Throttled: transaction 0, timeout 0, failure 0
Author: request 0, timeouts 0, failover 0, retransmission 0
        Response: accept 0, reject 0, challenge 0
        Response: unexpected 0, server error 0, incorrect 0, time 0ms
        Transaction: success 0, failure 0
        Throttled: transaction 0, timeout 0, failure 0
Account: request 5, timeouts 0, failover 0, retransmission 0
        Request: start 3, interim 0, stop 2
        Response: start 3, interim 0, stop 2
        Response: unexpected 0, server error 0, incorrect 0, time 12ms
        Transaction: success 5, failure 0
        Throttled: transaction 0, timeout 0, failure 0
Elapsed time since counters last cleared: 4d8h22m
Estimated Outstanding Access Transactions: 0
Estimated Outstanding Accounting Transactions: 0
Estimated Throttled Access Transactions: 0
Estimated Throttled Accounting Transactions: 0
Maximum Throttled Transactions: access 0, accounting 0
Requests per minute past 24 hours:
        high - 8 hours, 22 minutes ago: 0
        low  - 8 hours, 22 minutes ago: 0
        average: 0
```

The table below describes the significant fields in the display.

Table 7: show aaa servers Field Descriptions

Field	Description
id	A unique identifier for all AAA servers defined on the router.
priority	Order of use for servers within a group.
host	IP address of the private RADIUS server host.
auth-port	UDP destination port on the AAA server that is used for authentication and authorization requests. The default value is 1645.
acct-port	UDP destination port on the AAA server that is used for accounting requests. The default value is 1646.
State	Describes the current state of the AAA server; the duration, in seconds, that the server has been in that state; and the duration, in seconds, that the server was in the previous state. The following states are possible: • DEAD--Indicates that the server is currently down and, in the case of failovers, this server will be omitted unless it is the last server in the group. • duration--Indicates the amount of time the server is assumed to be in the current state, either UP or DEAD. • previous duration--Indicates the amount of time the server was considered to be in the previous state. • UP--Indicates that the server is currently considered alive and attempts will be made to communicate with it.

Field	Description
Dead	Indicates the number of times that this server has been marked dead, and the cumulative amount of time, in seconds, that it spent in that state.

Authen	Provides information about authentication packets that were sent to and received from the server, and authentication transactions that were successful or that failed. The following information may be reported in this field:
	• request--Number of authentication requests that were sent to the AAA server.
	• timeouts--Number of timeouts (no responses) that were observed when a transmission was sent to this server.
	• Response--Provides statistics about responses that were observed from this server and includes the following reports:
	  • unexpected--Number of unexpected responses. A response is considered unexpected when it is received after the timeout period for the packet has expired. This may happen if the link to the server is severely congested, for example. An unexpected response can also be produced when a server generates a response for no apparent reason.
	  • server error--Number of server errors. This category is a “catchall” for error packets that do not fall into one of the previous categories.
	  • incorrect--Number of incorrect responses. A response is considered incorrect if it is of the wrong format than the one expected by the protocol. This frequently happens when an incorrect server key is configured on the router.
	  • time--Time (in milliseconds) taken to respond to an authentication packets.
	• Transaction: These fields provide information about authentication, authorization, and accounting transactions related to the server. A transaction is defined as a request for authentication, authorization, or accounting information that is sent by the AAA module, or by an AAA client (such as PPP) to an AAA protocol (RADIUS or TACACS+), which may involve multiple packet transmissions and retransmissions. Transactions may require packet retransmissions to one or more servers in a single server group, to verify success or failure. Success or failure is reported to AAA by the RADIUS and TACACS+ protocols as follows
	  • success--Incremented when a transaction is successful.
	  • failure--Incremented when a transaction fails; for example, packet retransmissions to another server in the server group failed or did not succeed. A negative response to an Access-Request, such as Access-Reject, is considered to be a successful transaction.

Author	The fields in this category are similar to those in the Authen: fields. An important difference, however, is that because authorization information is carried in authentication packets for the RADIUS protocol, these fields are not incremented when using RADIUS.
Account	The fields in this category are similar to those in the Authen: fields, but provide accounting transaction and packet statistics.
Elapsed time since counters last cleared	Displays the time in days, hours, and minutes that have passed since the counters were last cleared.

Note In case of Intelligent Services Gateway (ISG), the estimated outstanding accounting transactions will take some time to become zero. This is because there is a constant churn in the interim accounting requests.

The fields in the output of the **show aaa servers**command are mapped to Simple Network Management Protocol (SNMP) objects in the Cisco AAA-SERVER-MIB and are used in SNMP reporting. The first line of the sample output of the **show aaa servers**command (RADIUS: id 24, priority 1, host 172.31.164.120, auth-port 1645, acct-port 1646) is mapped to the Cisco AAA-SERVER-MIB as follows:

- id maps to casIndex
- priority maps to casPriority
- host maps to casAddress
- auth-port maps to casAuthenPort
- acct-port maps to casAcctPort

Mapping the following set of objects listed in the Cisco AAA-SERVER-MIB map to fields displayed by the **show aaa servers** command is more straightforward. For example, the casAuthenRequests field corresponds to the Authen: request portion of the report, casAuthenRequestTimeouts corresponds to the Authen: timeouts portion of the report, and so on.

- casAuthenRequests
- casAuthenRequestTimeouts
- casAuthenUnexpectedResponses
- casAuthenServerErrorResponses
- casAuthenIncorrectResponses
- casAuthenResponseTime
- casAuthenTransactionSuccesses
- casAuthenTransactionFailures
- casAuthorRequests
- casAuthorRequestTimeouts
- casAuthorUnexpectedResponses
- casAuthorServerErrorResponses
- casAuthorIncorrectResponses
- casAuthorResponseTime
- casAuthorTransactionSuccesses
- casAuthorTransactionFailures

- casAcctRequests
- casAcctRequestTimeouts
- casAcctUnexpectedResponses
- casAcctServerErrorResponses
- casAcctIncorrectResponses
- casAcctResponseTime
- casAcctTransactionSuccesses
- casAcctTransactionFailures
- casState
- casCurrentStateDuration
- casPreviousStateDuration
- casTotalDeadTime
- casDeadCount

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

Related Commands

Command	Description
radius-server dead-criteria	Forces one or both of the criteria--used to mark a RADIUS server as dead--to be the indicated constant.
server-private	Associates a particular private RADIUS server with a defined server group.

show aaa subscriber profile

To display all the subscriber profiles under the specified namestring in the authentication, authorization, and accounting (AAA) subsystem, use the **show aaa subscriber profile**command in user EXEC or privileged EXEC mode.

show aaa subscriber profile *profile-name*

Syntax Description

profile-name	The AAA subscriber profile name.

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

Release	Modification
12.2(8)T	This command was introduced.
12.2(31)SB1	This command was integrated into Cisco IOS Release 12.2(31)SB1.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

This command display all the subscriber profile CLIs under the specified namestring. If no namestring is specified, all the subscriber profiles in the subscriber profile database will be displayed.

Examples

The following example shows how to display subscriber profile information:

```
Router# show aaa subscriber profile db

-----------------------------------------------------------
 Entries in Profile dB subscribers for exact match
-----------------------------------------------------------
Profile: prof1
Updated: 00:00:55
Parse User: N
Authen User: N
Query Count: 4
     6897DBDC 0 0000000A service-name(381) 8 service1, service none, protocol ne
-----------------------------------------------------------
 Entries in Profile dB subscribers for regexp match
-----------------------------------------------------------
No entries found for regexp match
The table below describes the significant fields shown in the display.
```

Table 8: show aaa subscriber profile Descriptions

Field	Description
Profile	Indicates the subscriber profile specified.
Updated	Time elapsed since profile last updated.

Field	Description
Parse User	Identifies this entry as a regexp.
Authen User	Identifies if entry matches require authentication.
Query Count	Usage Counters. Indicates the number of times Profile dB successfully found an entry when queried for.

Related Commands

Command	Description
aaa authorization subscriber-service	Configures local subscriber profiles which are used after the existing methods are exhausted.
subscriber profile	Configures service-related information under a particular subscriber profile.

show aaa user

To display attributes related to an authentication, authorization, and accounting (AAA) session, use the **show aaa user**command in privileged EXEC mode.

show aaa user {**all***unique-id*}

Syntax Description

all	Displays information about all users of which AAA currently has knowledge.
unique-id	Displays information about this user only.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(4)T	This command was introduced.
12.2(31)ZV1	This command was modified to display the user name first and then the accounting data and was implemented on the Cisco 10000 series router for the PRE3.
Cisco IOS XE Release 2.4	This command was integrated into Cisco IOS XE Release 2.4.

Usage Guidelines

When a user logs into a Cisco router and uses AAA, a unique ID is assigned to the session. Throughout the life of the session, various attributes that are related to the session are collected and stored internally within a AAA database. These attributes can include the IP address of the user, the protocol being used to access the router (such as PPP or Serial Line Internet Protocol [SLIP]), the speed of the connection, and the number of packets or bytes that are received or transmitted.

The output of this command:

- Provides a snapshot of various subdatabases that are associated with a AAA unique ID. Some of the more important ones are listed in the table below.
- Shows various AAA call events that are associated with a particular session. For example, when a session comes up, the events generally recorded are CALL START, NET UP, and IP Control Protocol UP (IPCP UP).
- Provides a snapshot of the dynamic attributes that are associated with a particular session. (Dynamic attributes are those that keep changing values throughout the life of the session.) Some of the more important ones are listed in the table below.

The unique ID of a session can be obtained from the output of the **show aaa sessions** command.

Note This command does not provide information for all users who are logged into a device, but only for those who have been authenticated or authorized using AAA or only for those whose sessions are being accounted for by the AAA module.

Note When you use the **all** keyword, a large amount of output may be produced, depending on the number of users who are logged into the device at any time.

Examples

The following example shows that information is requested for all users:

```
Router# show aaa user all
```

The following example shows that information is requested for user 5:

```
Router# show aaa user 5
```

The following is sample output from the **show aaa user** command. The session information displayed is for a PPP over Ethernet over Ethernet (PPPoEoE) session.

```
Router# show aaa user 3
Load for five secs: 0%/0%; one minute: 0%; five minutes: 0%
Time source is hardware calendar, *20:32:49.199 PST Wed Dec 17
2003
  Unique id 3 is currently in use.
  Accounting:
    log=0x20C201
    Events recorded :
      CALL START
      NET UP
      IPCP_PASS
      INTERIM START
      VPDN NET UP
  update method(s) :
    NONE
  update interval = 0
  Outstanding Stop Records : 0
  Dynamic attribute list:
    63CCF138 0 00000001 connect-progress(30) 4 LAN Ses Up
    63CCF14C 0 00000001 pre-session-time(239) 4 3(3)
    63CCF160 0 00000001 nas-tx-speed(337) 4 102400000(61A8000)
    63CCF174 0 00000001 nas-rx-speed(33) 4 102400000(61A8000)
    63CCF188 0 00000001 elapsed_time(296) 4 2205(89D)
    63CCF19C 0 00000001 bytes_in(97) 4 6072(17B8)
    63CCF1B0 0 00000001 bytes_out(223) 4 6072(17B8)
    63CCF1C4 0 00000001 pre-bytes-in(235) 4 86(56)
    63CCF1D8 0 00000001 pre-bytes-out(236) 4 90(5A)
    63CCF1EC 0 00000001 paks_in(98) 4 434(1B2)
    63CCF244 0 00000001 paks_out(224) 4 434(1B2)
    63CCF258 0 00000001 pre-paks-in(237) 4 7(7)
    63CCF26C 0 00000001 pre-paks-out(238) 4 9(9)
  No data for type EXEC
  No data for type CONN
  NET: Username=peer1
    Session Id=00000003 Unique Id=00000003
    Start Sent=1 Stop Only=N
    stop_has_been_sent=N
    Method List=63B4A10C : Name = default
    Attribute list:
    63CCF138 0 00000001 session-id(293) 4 3(3)
    63CCF14C 0 00000001 Framed-Protocol(62) 4 PPP
    63CCF160 0 00000001 protocol(241) 4 ip
    63CCF174 0 00000001 addr(5) 4 70.0.0.1
```

```
  No data for type CMD
  No data for type SYSTEM
  No data for type RM CALL
  No data for type RM VPDN
  No data for type AUTH PROXY
  No data for type IPSEC-TUNNEL
  No data for type RESOURCE
  No data for type 10
  No data for type CALL
Debg: No data available
Radi: 641AACAC
Interface:
  TTY Num = -1
  Stop Received = 0
  Byte/Packet Counts till Call Start:
    Start Bytes In = 106      Start Bytes Out = 168
    Start Paks    In = 3      Start Paks  Out = 4
  Byte/Packet Counts till Service Up:
    Pre Bytes In = 192      Pre Bytes Out = 258
    Pre Paks  In = 10      Pre Paks  Out = 13
  Cumulative Byte/Packet Counts :
    Bytes In = 6264      Bytes Out = 6330
    Paks  In = 444      Paks  Out = 447
  StartTime = 19:56:01 PST Dec 17 2003
  AuthenTime = 19:56:04 PST Dec 17 2003
  Component = PPoE
Authen: service=PPP type=CHAP method=RADIUS
Kerb: No data available
Meth: No data available
Preauth: No Preauth data.
General:
  Unique Id = 00000003
  Session Id = 00000003
  Attribute List:
    63CCF180 0 00000001 port-type(156) 4 PPP over Ethernet
    63CCF194 0 00000009 interface(152) 7 0/0/0/0
PerU: No data available
```

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

Table 9: show aaa user Field Descriptions

Field	Description
EXEC	Exec-Accounting database.
NET	Network Accounting database.
CMD	Command Accounting database.
Pre Bytes In	Bytes that were received before the call was authenticated.
Pre Bytes Out	Bytes that were transmitted before the call was authenticated.
Pre Paks In	Packets that were received before the call was authenticated.
Pre Paks Out	Packets that were transmitted before the call was authenticated.
Bytes In	Bytes that were received after the call was authenticated.
Bytes Out	Bytes that were transmitted after the call was authenticated.

Field	Description
Paks In	Packets that were received after the call was authenticated.
Paks Out	Packets that were transmitted after the call was authenticated.
Authen	Authentication database.
General	General database.
PerU	Per-User database.

Related Commands

Command	Description
show aaa sessions	Displays information about AAA sessions as seen in the AAA Session MIB.

show access-group mode interface

To display the Access Contol List (ACL) configuration on a Layer 2 interface, use the **show access-group mode interface**command in privileged EXEC mode.

show access-group mode interface [*interface interface-number*]

Syntax Description

type	(Optional) Interface type; valid values are **fastethernet**, **gigabitethernet**, **tengigabitethernet**, and **port-channel**
number	(Optional) Interface number.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SXH	This command was introduced.

Usage Guidelines

The valid values for the port number depend on the chassis used.

Examples

This example shows how to display the ACL configuration mode on Fast Ethernet interface 6/1:

```
Router# show access-group mode interface fastethernet 6/1
Interface FastEthernet6/1:
   Access group mode is: merge
Router#
```

Related Commands

Command	Description
access-group mode	Specifies the override modes and the nonoverride modes.

show access-lists compiled

To display a table showing Turbo Access Control Lists (ACLs), use the show access-lists compiled command in user EXEC or privileged EXEC mode.

show access-lists compiled

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.0(6)S	This command was introduced.
12.1(1)E	This command was introduced for Cisco 7200 series routers.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.1(4)E	This command was implemented on the Cisco 7100 series routers.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.2	This command was integrated into Cisco IOS XE Release 2.2.

Usage Guidelines

This command is used to display the status and condition of the Turbo ACL tables associated with each access list. The Turbo ACL feature processes access lists more expediently, providing faster functionality for routers equipped with the feature. The Turbo ACL feature compiles the ACLs into a set of lookup tables, while maintaining the first match requirements. Packet headers are used to access these tables in a small, fixed number of lookups, independently of the existing number of ACL entries. The memory usage is displayed for each table; large and complex access lists may require substantial amounts of memory. If the memory usage is greater than the memory available, you can disable the Turbo ACL feature so that memory exhaustion does not occur, but the acceleration of the access lists is not then enabled.

Examples

The following is partial sample output from the show access-lists compiled command:

```
Router# show access-lists compiled
Compiled ACL statistics:
12 ACLs loaded, 12 compiled tables
 ACL         State      Tables  Entries  Config  Fragment  Redundant  Memory
1           Operational    1        2        1         0          0      1Kb
2           Operational    1        3        2         0          0      1Kb
3           Operational    1        4        3         0          0      1Kb
```

```
4           Operational    1        3        2         0          0      1Kb
5           Operational    1        5        4         0          0      1Kb
9           Operational    1        3        2         0          0      1Kb
20          Operational    1        9        8         0          0      1Kb
21          Operational    1        5        4         0          0      1Kb
101         Operational    1       15        9         7          2      1Kb
102         Operational    1       13        6         6          0      1Kb
120         Operational    1        2        1         0          0      1Kb
199         Operational    1        4        3         0          0      1Kb
First level lookup tables:
Block      Use              Rows       Columns   Memory used
  0   TOS/Protocol            6/16     12/16      66048
  1   IP Source (MS)         10/16     12/16      66048
  2   IP Source (LS)         27/32     12/16      132096
  3   IP Dest (MS)            3/16     12/16      66048
  4   IP Dest (LS)            9/16     12/16      66048
  5   TCP/UDP Src Port        1/16     12/16      66048
  6   TCP/UDP Dest Port       3/16     12/16      66048
  7   TCP Flags/Fragment      3/16     12/16      66048
```

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

Table 10: show access-lists compiled Field Descriptions

Field	Description
State	Describes the state of each Turbo ACL table. Operational--The access list has been compiled by the Turbo ACL feature, and matching to this access list is performed through the Turbo ACL tables at high speed. Other possible values in the State field are as follows: • Unsuitable--The access list is not suitable for compiling, perhaps because it has time-range enabled entries, evaluate references, or dynamic entries. • Deleted--No entries are in this access list. • Building--The access list is being compiled. Depending on the size and complexity of the list, and the load on the router, the building process may take a few seconds. • Out of memory--An access list cannot be compiled because the router has exhausted its memory.
Entries	Number of ACL entries being used for the compilation. This number is effectively (Config + Fragment - Redundant).
Config	Number of ACL lines from the configuration itself.
Fragment	In order to handle IP fragments for entries that have Layer 4 information in them (for example, TCP port numbers), TurboACL generates extra ACL entries that match only IP fragments. These are used in the compilation, but do not appear in the configuration.
Redundant	Number of entries that are covered by an earlier entry, and therefore are redundant. These entries are not used in the compilation. Redundant entries come mainly from two sources; the config itself might contain redundant entries, often as a result of a poorly maintained, large ACL. More typically, when TurboACL adds extra entries for IP fragments, often these entries are redundant because other added fragment entries cover them.

Related Commands

Command	Description
access-list compiled	Enables the Turbo ACL feature.
access-list (extended)	Provides extended access lists that allow more detailed access lists.
access-list (standard)	Creates a standard access list.
clear access-list counters	Clears the counters of an access list.
clear access-temp	Manually clears a temporary access list entry from a dynamic access list.
ip access-list	Defines an IP access list by name.
show ip access-lists	Displays the contents of all current IP access lists.

show access-lists

To display the contents of current access lists, use the **show access-lists** command in user EXEC or privileged EXEC mode.

show access-lists [*access-list-numberaccess-list-name*]

Syntax Description

access-list-number	(Optional) Number of the access list to display. The system displays all access lists by default.
access-list-name	(Optional) Name of the IP access list to display.

Command Default

The system displays all access lists.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.0(6)S	The output was modified to identify the compiled ACLs.
12.1(1)E	This command was implemented on the Cisco 7200 series.
12.1(5)T	The command output was modified to identify compiled ACLs.
12.1(4)E	This command was implemented on the Cisco 7100 series.
12.2(2)T	The command output was modified to show information for IPv6 access lists.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

The show access-lists command is used to display the current ACLs operating in the router. Each access list is flagged using the Compiled indication if it is operating as an accelerated ACL.

The display also shows how many packets have been matched against each entry in the ACLs, enabling the user to monitor the particular packets that have been permitted or denied. This command also indicates whether the access list is running as a compiled access list.

Examples

The following is sample output from the **show access-lists** command when access list 101 is specified:

```
Router# show access-lists 101
Extended IP access list 101
```

```
    permit tcp host 198.92.32.130 any established (4304 matches) check=5
    permit udp host 198.92.32.130 any eq domain (129 matches)
    permit icmp host 198.92.32.130 any
    permit tcp host 198.92.32.130 host 171.69.2.141 gt 1023
    permit tcp host 198.92.32.130 host 171.69.2.135 eq smtp (2 matches)
    permit tcp host 198.92.32.130 host 198.92.30.32 eq smtp
    permit tcp host 198.92.32.130 host 171.69.108.33 eq smtp
    permit udp host 198.92.32.130 host 171.68.225.190 eq syslog
    permit udp host 198.92.32.130 host 171.68.225.126 eq syslog
    deny   ip 150.136.0.0 0.0.255.255 224.0.0.0 15.255.255.255
    deny   ip 171.68.0.0 0.1.255.255 224.0.0.0 15.255.255.255 (2 matches) check=1
    deny   ip 172.24.24.0 0.0.1.255 224.0.0.0 15.255.255.255
    deny   ip 192.82.152.0 0.0.0.255 224.0.0.0 15.255.255.255
    deny   ip 192.122.173.0 0.0.0.255 224.0.0.0 15.255.255.255
    deny   ip 192.122.174.0 0.0.0.255 224.0.0.0 15.255.255.255
    deny   ip 192.135.239.0 0.0.0.255 224.0.0.0 15.255.255.255
    deny   ip 192.135.240.0 0.0.7.255 224.0.0.0 15.255.255.255
    deny   ip 192.135.248.0 0.0.3.255 224.0.0.0 15.255.255.255
```

An access list counter counts how many packets are allowed by each line of the access list. This number is displayed as the number of matches. Check denotes how many times a packet was compared to the access list but did not match.

The following is sample output from the show access-lists command when the Turbo Access Control List (ACL) feature is configured on all of the following access lists.

Note The permit and deny information displayed by the show access-lists command may not be in the same order as that entered using the access-list command.

```
Router# show access-lists
Standard IP access list 1 (Compiled)
    deny   any
Standard IP access list 2 (Compiled)
    deny   192.168.0.0, wildcard bits 0.0.0.255
    permit any
Standard IP access list 3 (Compiled)
    deny   0.0.0.0
    deny   192.168.0.1, wildcard bits 0.0.0.255
    permit any
Standard IP access list 4 (Compiled)
    permit 0.0.0.0
    permit 192.168.0.2, wildcard bits 0.0.0.255
```

The following is sample output from the **show access-lists** command that shows information for IPv6 access lists when IPv6 is configured on the network:

```
Router# show access-lists
IPv6 access list list2
     deny ipv6 FEC0:0:0:2::/64 any sequence 10
     permit ipv6 any any sequence 20
```

Related Commands

Command	Description
access-list (IP extended)	Defines an extended IP access list.
access-list (IP standard)	Defines a standard IP access list.

Command	Description
clear access-list counters	Clears the counters of an access list.
clear access-template	Clears a temporary access list entry from a dynamic access list manually.
ip access-list	Defines an IP access list by name.
show ip access-lists	Displays the contents of all current IP access lists.
show ipv6 access-list	Displays the contents of all current IPv6 access lists.

show access-session fqdn

To display the FQDN configurations, use the **show access-session fqdn** command in EXEC mode.

show access-session fqdn {**passthru-domain-list** | **list-domain** *list-domain* | **fqdn-maps**}

Syntax Description

passthru-domain-list	Displays the lists of domains for the access session.
list-domain *list-domain*	Displays all the domains in the list.
fqdn-maps	Displays mapping of FQDN ACL to the domain name list.

Command Default

None

Command Modes

User EXEC

Privileged EXEC

Command History

Release	Modification
	This command was introduced.

This example shows how to display the lists of domains for the access session:

```
# sh access-sess fqdn passthru-domain-list
Domain-name-lists
----------------------------
abc
```

This example shows how to display the domains in the list for the access session:

```
# sh access-sess fqdn  list-domain abc
Domain's associated with the list
----------------------------------------
abc
google
```

show accounting

The **show accounting** command is replaced by the **show aaa user**command. See the **show aaa user** command for more information.

show appfw

To display application firewall policy information, use the **show appfw**command in user EXEC or privileged EXEC mode.

show appfw {**configuration** | **dns** [**cache** [**policy** *policy-name*]] | **name** *appfw-name*}

Syntax Description

configuration	Displays configuration information for configured policies.
dns	Displays IP addresses resolved by the Domain Name System (DNS) server of the applicable instant messenger application.
cache	(Optional) Displays IP addresses related to the DNS server.
policy	(Optional) Displays information for the specified policy.
policy-name	Name of the policy.
name	Displays information about the specified application firewall.
appfw-name	Name of an application firewall.

Command Default

If no policies are specified, information for all policies is displayed.

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

Release	Modification
12.3(14)T	This command was introduced.
12.4(4)T	This command was modified. The **dns** and **cache**keywords were added to support instant messenger traffic inspection.
12.4(24)T	This command was modified in a release earlier than Cisco IOS Release 12.4(24)T. The **name** keyword and *appfw-name* argument were added.

Usage Guidelines

Use this command to display information regarding the application firewall policy configuration or the IP addresses of the DNS cache.

Use the **show appfw** command in conjunction with the **show ip inspect config** command to display the complete firewall configuration.

If you do not specify a policy using the **policy** *policy-name* option, the IP addresses gathered for all DNS names and policies are displayed.

Examples

This following output for the **show appfw configuration** command displays the configuration for the inspection rule "mypolicy," which is applied to all incoming HTTP traffic on FastEthernet interface 0/0. In this example, all available HTTP inspection parameters have been defined.

```
Router# show appfw configuration

Application Firewall Rule configuration
  Application Policy name mypolicy
    Application http
      strict-http action allow alarm
      content-length minimum 0 maximum 1 action allow alarm
      content-type-verification match-req-rsp action allow alarm
      max-header-length request length 1 response length 1 action allow alarm
      max-uri-length 1 action allow alarm
      port-misuse default action allow alarm
      request-method rfc default action allow alarm
      request-method extension default action allow alarm
      transfer-encoding default action allow alarm
```

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

Table 11: show appfw configuration Field Descriptions

Field	Description
Application Policy name	Name of the application policy.
strict-http action allow alarm	Allows HTTP messages to pass through the firewall.
content-length minimum 0 maximum 1 action allow alarm	Allows HTTP traffic having the maximum message size of 1 to pass through the firewall.
content-type-verification match-req-rsp action allow alarm	Allows HTTP traffic after verifying the content type of the HTTP response against the accept field of the HTTP request.
max-header-length request length 1 response length 1 action allow alarm	Allows the alarm to pass through the firewall if both the maximum header length request and the response is 1.
max-uri-length 1 action allow alarm	Allows HTTP traffic if the uniform resource identifier (URI) length in the request message is 1.
port-misuse default action allow alarm	Allows HTTP traffic through the firewall for all the default applications in the HTTP message.
request-method rfc default action allow alarm	Allows HTTP traffic for RFC 2616 supported methods.
request-method extension default action allow alarm	Allows HTTP traffic for all the extension methods.
transfer-encoding default action allow alarm	Allows HTTP traffic for all types of transfer encoded messages.

Related Commands

Command	Description
show ip inspect config	Displays firewall configuration and session information.

show ase

Note Effective with Cisco IOS Release 12.4(24), the **show ase** command is not available in Cisco IOS software.

To display the Automatic Signature Extraction (ASE) run-time status or detected signatures, use the **show ase** command in privileged EXEC mode.

show ase [**dispersion-table** *num-entries-to-display* | **prevalence-table** *num-entries-to-display* | **signatures** | **special-case-table** *num-entries-to-display* | **statistics**]

Syntax Description

dispersion-table	(Optional) Displays the dispersion table.
num-entries-to-display	(Optional) The number of table entries to be displayed. The range is from 0 to 4294967295.
prevalence-table	(Optional) Displays the prevalence table.
signatures	(Optional) Displays the detected ASE signatures.
special-case-table	(Optional) Displays the special case table.
statistics	(Optional) Displays the address description table staistics.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(15)T	This command was introduced.
12.4(24)	This command was removed.

Usage Guidelines

Use the **show ase** command without any keywords to display the run-time status. Use the **show ase**command with the **signatures** keyword to display the detected ASE signatures.

This command is used on the Cisco 1800, 2800, and 7200 series routers, Cisco 7301 router, and Integrated Services Routers (ISRs) as ASE sensors.

Examples

The following example output displays the ASE run-time status:

Note The ASE collector must be started in order for the ASE run-time status information to be displayed.

```
Router# show ase
ASE Information:
```

```
Collector IP: 10.10.10.3
TIDP Group  : 10
Status      : Online
Packets inspected: 1105071
Address Dispersion Threshold: 20
Prevalence Threshold: 10
Sampling set to: 1 in 64
Address Dispersion Inactivity Timer: 3600s
Prevalence Table Refresh Time: 60s
```

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

Table 12: show ase Field Descriptions

Field	Description
Collector IP	The IP address of the ASE collector.
TIDP Group	Threat Information Distribution Protocol (TIDP) group used for exchange between the ASE sensor and ASE collector.
Status	The four states are: • **Connected** --The ASE sensor has connected with the ASE collector, but it has not completed initialization. • **Enabled** --The ASE feature is enabled in global configuration mode, but the ASE sensor has not connected with the ASE collector. • **Not Enabled** --The ASE feature is not enabled in global configuration mode. • **Online** --The ASE is ready for inspecting traffic.
Packets inspected	Total number of packets inspected on this ASE collector.
Address Dispersion Threshold	Number of IP address occurrences that are permitted by the ASE sensor before this signature is considered an anomaly. **Note** The Address Dispersion Threshold is configured on the ASE collector. This information is shown on the ASE sensor (this router) for informational purposes.
Prevalence Threshold	The number of signature occurrences that are permitted before this signature is considered an anomaly. The default threshold is 10 seconds.
Sampling set to	A sampling value that sets the chance for which a signature is being inspected. For example, 1 in 64 is less than 1 in 32 chances.
Address Dispersion Inactivity Timer	Number of seconds that a signature does not occur. After this interval elapses, the signature is purged from the Address Dispersion table.
Prevalence Table Refresh Time	Number of seconds that the ASE sensor has before it clears the occurrence table. If a signature does not occur for the Prevalence Threshold during a refresh, then the Prevalence Threshold is not considered.

The following example output displays the detected ASE signatures:

```
Router# show ase signature
Automatic Signature Extraction Detected Signatures
==================================================
Signature Hash: 0x1E4A2076AAEA19B1, Offset: 54, Dest Port: TCP 135,
Signature: 05 00 00 03 10 00 00 00 F0 00 10 00 01 00 00 00 B8 00 00 00 00 00 03 00 01 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00
Signature Hash: 0x24EC60FB1CF9A800, Offset: 72, Dest Port: TCP 445,
Signature: 00 00 00 00 00 00 00 00 00 00 00 00 FF FE 00 00 00 00 00 62 00 02 50 43 20 4E
45 54 57 4F 52 4B 20 50 52 4F 47 52 41 4D
Signature Hash: 0x0B0275535FFF480C, Offset: 54, Dest Port: TCP 445,
Signature: 00 00 00 85 FF 53 4D 42 72 00 00 00 00 18 53 C8 00 00 00 00 00 00 00 00 00 00
00 00 00 00 FF FE 00 00 00 00 00 62 00 02
```

Related Commands

Command	Description
ase collector	Enters the ASE collector server IP address so that the ASE sensor has IP connectivity to the ASE collector.
ase group	Identifies the TIDP group number for the ASE feature.
ase enable	Enables the ASE feature on a specified interface.
ase signature extraction	Enables the ASE feature globally on the router.
clear ase signature	Clears ASE signatures that were detected on the router.
debug ase	Provides error, log, messaging, reporting, status, and timer information.

show audit

To display the contents of an audit file, use the **show audit**command in privileged EXEC mode.

show audit [**filestat**]

Syntax Description

filestat	(Optional) Displays the rollover counter for the circular buffer and the number of messages that are received. The rollover counter, which indicates the number of times circular buffer has been overwritten, is reset when the audit filesize is changed (via the **audit filesize** command).

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(18)S	This command was introduced.
12.0(27)S	This feature was integrated into Cisco IOS Release 12.0(27)S.
12.2(25)S	The **filestat** keyword was added.
12.2(27)SBC	This command was integrated into Cisco IOS Release 12.2(27)SBC.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

The audit file is a fixed file size in the disk file system. The audit file contains syslog messages (also known as hashes), which monitor changes that are made to your router. A separate hash is maintained for each of the following areas: running version, running configuration, startup configuration, file system, and hardware configuration. The **show audit**command will display any changes that are made to any of these areas.

Note Audit logs are enabled by default and cannot be disabled.

Examples

The following example is sample output from the **show audit** command:

```
Router# show audit
```

*Sep 14 18:37:31.535:%AUDIT-1-RUN_VERSION:Hash:

24D98B13B87D106E7E6A7E5D1B3CE0AD User:

```
*Sep 14 18:37:31.583:%AUDIT-1-RUN_CONFIG:Hash:
4AC2D776AA6FCA8FD7653CEB8969B695 User:
*Sep 14 18:37:31.595:%AUDIT-1-STARTUP_CONFIG:Hash:
95DD497B1BB61AB33A629124CBFEC0FC User:
*Sep 14 18:37:32.107:%AUDIT-1-FILESYSTEM:Hash:
```

```
330E7111F2B526F0B850C24ED5774EDE User:
*Sep 14 18:37:32.107:%AUDIT-1-HARDWARE_CONFIG:Hash:
32F66463DDA802CC9171AF6386663D20 User:
```

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

Table 13: show audit Field Descriptions

Field	Description
`AUDIT-1-RUN_VERSION:Hash: 24D98B13B87D106E7E6A7E5D1B3CE0AD User:`	Running version, which is a hash of the information that is provided in the output of the **show version** command: running version, ROM information, BOOTLDR information, system image file, system and processor information, and configuration register contents.
`AUDIT-1-RUN_CONFIG:Hash: 4AC2D776AA6FCA8FD7653CEB8969B695 User:`	Running configuration, which is a hash of the running configuration.
`AUDIT-1-STARTUP_CONFIG:Hash: 95DD497B1BB61AB33A629124CBFEC0FC User:`	Startup configuration, which is a hash of the contents of the files on NVRAM, which includes the startup-config, private-config, underlying-config, and persistent-data.
`AUDIT-1-FILESYSTEM:Hash: 330E7111F2B526F0B850C24ED5774EDE User:`	File system, which is a hash of the dir information on all of the flash file systems, which includes bootflash and any other flash file systems on the router.
`AUDIT-1-HARDWARE_CONFIG:Hash:32F66463DDA802CC9171AF6386663D20 User:`	Hardware configuration, which is a hash of platform-specific information that is generally provided in the output of the **show diag**command.

Related Commands

Command	Description
audit filesize	Changes the size of the audit file.
audit interval	Changes the time interval that is used for calculating hashes.

show authentication interface

To display information about the Auth Manager for a given interface, use the **show authentication interface**command in privileged EXEC mode.

show authentication interface *type number*

Syntax Description

type	Interface type. For more information, use the question mark (?) online help function.
number	Interface number. For more information about the numbering syntax for your networking device, use the question mark (?) online help function.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SXI	This command was introduced.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T.

Usage Guidelines

Use the **show authentication interface** command to display information about the Auth Manager for a given interface.

Examples

The following is sample output from the **show authentication interface** command:

```
Switch# show authentication interface g1/0/23
Client list:
  MAC Address     Domain   Status         Handle      Interface
  000e.84af.59bd  DATA     Authz Success  0xE0000000  GigabitEthernet1/0/23
Available methods list:
  Handle  Priority  Name
  3        0        dot1x
Runnable methods list:
  Handle  Priority  Name
  3        0        dot1x
```

The table below describes the significant fields shown in the display. Other fields are self-explanatory.

Table 14: show authentication interface Field Descriptions

Field	Description
MAC Address	The MAC address of the client.
Domain	The domain of the client--either DATA or voice.

Field	Description
Status	The status of the authentication session. The possible values are: • Authc Failed--an authentication method has run for this session and authentication failed. • Authc Success--an authentication method has run for this session and authentication was successful. • Authz Failed--a feature has failed and the session has terminated. • Authz Success--all features have been applied to the session and the session is active. • Idle--this session has been initialized but no authentication methods have run. This is an intermediate state. • No methods--no authentication method has provided a result for this session. • Running--an authentication method is running for this session.
Interface	The type and number of the authentication interface.
Available methods list	Summary information for the authentication methods available on the interface.
Runnable methods list	Summary information for the authentication methods that can run on the interface.

Related Commands

Command	Description
show authentication registrations	Displays information about the authentication methods that are registered with the Auth Manager.
show authentication sessions	Displays information about the current Auth Manager sessions.

show authentication registrations

To display information about the authentication methods that are registered with the Auth Manager, use the **show authentication registrations**command in privileged EXEC mode.

show authentication registrations

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SXI	This command was introduced.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T.

Usage Guidelines

Use the **show authentication re gistrations** command to display information about all methods registered with the Auth Manager.

Examples

The following is sample output for the show authentication registrations command:

```
Switch# show authentication registrations
Auth Methods registered with the Auth Manager:
   Handle   Priority   Name
     3         0       dot1x
     2         1       mab
     1         2       webauth
```

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

Table 15: show authentication registrations Field Descriptions

Field	Description
Priority	The priority of the method. If the priority for authentication methods has not been configured with the **authentication priority** command, then the default priority is displayed. The default from highest to lowest is dot1x, mab, and webauth.
Name	The name of the authentication method. The values can be dot1x, mab, or webauth.

Related Commands

Command	Description
show authentication interface	Displays information about the Auth Manager for a given interface.
show authentication sessions	Displays information about current Auth Manager sessions.

show authentication sessions

To display information about current Auth Manager sessions, use the **show authentication sessions** command in privileged EXEC mode.

Note Effective with Cisco IOS Release 12.2(33)SXI, the **show dot1x** command is supplemented by the **show authentication sessions** command. The **show dot1x** command is reserved for displaying output specific to the use of the 802.1X authentication method. The **show authentication sessions** command displays information for all authentication methods and authorization features.

Cisco IOS XE Release 3SE and Later Releases
show authentication sessions [[**database**] | [**handle** *handle-number* | **interface** *type number* | **mac** *mac-address* | **method** *method-name* [**interface** *type number*] | **session-id** *session-id*]] [**details**]

All Other Releases
show authentication sessions [**handle** *handle-number* | **interface** *type number* | **mac** *mac-address* | **method** *method-name* **interface** *type number* | **session-id** *session-id*]

Syntax Description

database	(Optional) Displays session data stored in the session database. This keyword allows you to see information like the VLAN ID, which is not cached internally. A warning message displays if data stored in the session database does not match the internally cached data.
handle *handle-id*	(Optional) Specifies the particular handle for which to display Auth Manager information.
interface *type number*	(Optional) Specifies a particular interface type and number for which Auth Manager information is to be displayed. To display the valid keywords and arguments for interfaces, use the question mark (?) online help function.
mac *mac-address*	(Optional) Specifies the particular MAC address for which you want to display information.
method *method-name*	(Optional) Specifies the particular authentication method for which to display Auth Manager information. Valid methods are one of the following: • **dot1x**—IEEE 802.1X authentication method. • **mab**—MAC authentication bypass (MAB) method. • **webauth**—Web authentication method. If you specify a method, you can also specify an interface.

session-id *session-id*	(Optional) Specifies the particular session for which to display Auth Manager information.
details	(Optional) Displays detailed information for each session instead of displaying a single-line summary for sessions.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SXH	Support for this command was introduced.
12.2(33)SXI	This command was changed to add the **handle** *handle* keyword and argument and add information to the output.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T.
Cisco IOS XE Release 3.2SE	This command was modified. The **database** and **details** keywords were added.

Usage Guidelines

Use the **show authentication sessions** command to display information about all current Auth Manager sessions. To display information about specific Auth Manager sessions, use one or more of the keywords.

Examples

The following example shows how to display all authentication sessions on the switch:

```
Device# show authentication sessions

Interface  MAC Address     Method   Domain   Status         Session ID
Gi1/48     0015.63b0.f676  dot1x    DATA     Authz Success  0A3462B1000000102983C05C
Gi1/5      000f.23c4.a401  mab      DATA     Authz Success  0A3462B10000000D24F80B58
Gi1/5      0014.bf5d.d26d  dot1x    DATA     Authz Success  0A3462B10000000E29811B94
```

The following example shows how to display all authentication sessions on an interface:

```
Device# show authentication sessions interface GigabitEthernet3/0/2 details

            Interface:  GigabitEthernet3/0/2
               IIF-ID:  0x1055240000001F6
          MAC Address:  0010.0010.0001
         IPv6 Address:  Unknown
         IPv4 Address:  192.0.2.1
            User-Name:  auto601
               Status:  Authorized
               Domain:  DATA
       Oper host mode:  single-host
     Oper control dir:  both
      Session timeout:  N/A
    Common Session ID:  AC14FC0A0000101200E28D62
      Acct Session ID:  Unknown
               Handle:  0xDB003227
       Current Policy:  dot1x_dvlan_reauth_hm

Local Policies:
             Template: CRITICAL_VLAN (priority 150)
           Vlan Group:  Vlan: 130
```

```
Method status list:
       Method           State
       dot1x            Authc Failed
```

The following example shows how to display the authentication session for a specified session ID:

```
Device# show authentication sessions session-id 0B0101C70000004F2ED55218

            Interface:  GigabitEthernet9/2
          MAC Address:  0000.0000.0011
           IP Address:  192.0.2.254
             Username:  johndoe
               Status:  Authz Success
               Domain:  DATA
       Oper host mode:  multi-host
     Oper control dir:  both
        Authorized By:  Critical Auth
          Vlan policy:  N/A
      Session timeout:  N/A
         Idle timeout:  N/A
    Common Session ID:  0B0101C70000004F2ED55218
      Acct Session ID:  0x00000003
               Handle:  0x91000001
Runnable methods list:
       Method   State
       mab      Authc Success
       dot1x    Not run
```

The following examples show how to display all clients authorized by the specified authentication method:

```
Device# show authentication sessions method mab

No Auth Manager contexts match supplied criteria

Device# show authentication sessions method dot1x

Interface  MAC Address     Domain   Status         Session ID
Gi9/2      0000.0000.0011  DATA     Authz Success  0B0101C70000004F2ED55218
```

The table below describes the significant fields shown in the displays.

Table 16: show authentication sessions Field Descriptions

Field	Description
Interface	The type and number of the authentication interface.
MAC Address	The MAC address of the client.
Domain	The name of the domain, either DATA or VOICE.

Field	Description
Status	The status of the authentication session. The possible values are: • Authc Failed—An authentication method has run for this session and authentication failed. • Authc Success—An authentication method has run for this session and authentication was successful. • Authz Failed—A feature has failed and the session has terminated. • Authz Success—All features have been applied to the session and the session is active. • Idle—This session has been initialized but no authentication methods have run. This is an intermediate state. • No methods—No authentication method has provided a result for this session. • Running—An authentication method is running for this session.
Handle	The context handle.
State	The operating states for the reported authentication sessions. The possible values are: • Not run—The method has not run for this session. • Running—The method is running for this session. • Failed over—The method has failed and the next method is expected to provide a result. • Success—The method has provided a successful authentication result for the session. • Authc Failed—The method has provided a failed authentication result for the session.

Related Commands

Command	Description
show access-sessions	Displays information about session aware networking sessions.
show authentication registrations	Displays information about the authentication methods that are registered with the Auth Manager.
show authentication statistics	Displays statistics for Auth Manager sessions.
show dot1x	Displays details for an identity profile specific to the use of the 802.1X authentication method.

show auto secure config

To display AutoSecure configurations, use the **show auto secure config**command in privileged EXEC mode.

show auto secure config

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(1)	This command was introduced.
12.3(15)	Autosecure disables the configuration of the autosec_iana_reserved_block, autosec_private_block, or autosec_complete_bogon access control lists (acls), and application-to-edge interfaces. Output for these acls is no longer shown in the show output.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.

Examples

The following sample output from the **show auto secure config** command shows what has been enabled and disabled via the **auto secure** command:

```
Router# show auto secure config
no service finger
no service pad
no service udp-small-servers
no service tcp-small-servers
service password-encryption
service tcp-keepalives-in
service tcp-keepalives-out
no cdp run
no ip bootp server
no ip http server
no ip finger
no ip source-route
no ip gratuitous-arps
no ip identd
security passwords min-length 6
security authentication failure rate 10 log
enable secret 5 $1$CZ6G$GkGOnHdNJCO3CjNHHyTUA.
aaa new-model
aaa authentication login local_auth local
line console 0
 login authentication local_auth
 exec-timeout 5 0
 transport output telnet
line aux 0
 login authentication local_auth
 exec-timeout 10 0
 transport output telnet
line vty 0 4
 login authentication local_auth
 transport input telnet
```

```
ip domain-name cisco.com
crypto key generate rsa general-keys modulus 1024
ip ssh time-out 60
ip ssh authentication-retries 2
line vty 0 4
 transport input ssh telnet
service timestamps debug datetime localtime show-timezone msec
service timestamps log datetime localtime show-timezone msec
logging facility local2
logging trap debugging
service sequence-numbers
logging console critical
logging buffered
interface FastEthernet0/1
 no ip redirects
 no ip proxy-arp
 no ip unreachables
 no ip directed-broadcast
 no ip mask-reply
 no mop enabled
!
interface FastEthernet1/0
 no ip redirects
 no ip proxy-arp
 no ip unreachables
 no ip directed-broadcast
 no ip mask-reply
 no mop enabled
!
interface FastEthernet1/1
 no ip redirects
 no ip proxy-arp
 no ip unreachables
 no ip directed-broadcast
 no ip mask-reply
 no mop enabled
!
interface FastEthernet0/0
 no ip redirects
 no ip proxy-arp
 no ip unreachables
 no ip directed-broadcast
 no ip mask-reply
 no mop enabled
!
ip cef
interface FastEthernet0/0
 ip verify unicast reverse-path
ip inspect audit-trail
ip inspect dns-timeout 7
ip inspect tcp idle-time 14400
ip inspect udp idle-time 1800
ip inspect name autosec_inspect cuseeme timeout 3600
ip inspect name autosec_inspect ftp timeout 3600
ip inspect name autosec_inspect http timeout 3600
ip inspect name autosec_inspect rcmd timeout 3600
ip inspect name autosec_inspect realaudio timeout 3600
ip inspect name autosec_inspect smtp timeout 3600
ip inspect name autosec_inspect tftp timeout 30
ip inspect name autosec_inspect udp timeout 15
ip inspect name autosec_inspect tcp timeout 3600
access-list 100 deny ip any any
interface FastEthernet0/0
```

```
ip inspect autosec_inspect out
ip access-group 100 in
```

Related Commands

Command	Description
auto secure	Secures the management and forwarding planes of the router.

show call admission statistics

To monitor the global Call Admission Control (CAC) configuration parameters and the behavior of CAC, use the **show call admission statistics**command in user EXEC or privileged EXEC mode.

show call admission statistics

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.3(8)T	This command was introduced.
12.2(18)SXD1	This command was integrated into Cisco IOS Release 12.2(18)SXD1.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Examples

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

```
Router# show call admission statistics

Total Call admission charges: 0, limit 25
Total calls rejected 12, accepted 51
Load metric: charge 0, unscaled 0
```

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

Table 17: show call admission statistics Field Descriptions

Field	Description
Total call admission charges	Percentage of system resources being charged to the system. If you configured a resource limit, SA requests are dropped when this field is equal to that limit.
limit	Maximum allowed number of total call admission charges. Valid values are 0 to 100000.
Total calls rejected	Number of SA requests that were not accepted.
accepted	Number of SA requests that were accepted.
unscaled	Not related to IKE. This value always is 0.

Related Commands

Command	Description
call admission limit	Instructs IKE to drop calls when a specified percentage of system resources are being consumed.
crypto call admission limit	Specifies the maximum number of IKE SA requests allowed before IKE begins rejecting new IKE SA requests.

show class-map type inspect

To display Layer 3 and Layer 4 or Layer 7 (application-specific) inspect type class maps and their matching criteria, use the **show class-map type inspect** command in privileged EXEC mode.

show class-map type inspect [*protocol-name*] [*class-map-name*]

Syntax Description

protocol-name	(Optional) Layer 7 application-specific class map. The supported protocols are as follows: • **aol** --America Online Instant Messenger (IM) • **edonkey** --eDonkey peer-to-peer (P2P) • **fasttrack** --FastTrack traffic P2P • **gnutella** --Gnutella Version 2 traffic P2P • **h323** --H323 protocol • **http** --HTTP • **icq** --I Seek You (ICQ) IM • **imap** --Internet Message Access Protocol (IMAP) • **kazaa2** --Kazaa Version 2 P2P • **msnmsgr** --MSN Messenger IM protocol • **pop3** --Post Office Protocol, Version 3 (POP 3) • **sip** --SMDS Interface Protocol (SIP) • **smtp** --Simple Mail Transfer Protocol (SMTP) • **sunrpc** --SUN Remote Procedure Call (SUNRPC) • **winmsgr** --Windows IM • **ymsgr** --Yahoo IM
class-map-name	(Optional) Name of the inspect type class map. The name can be a maximum of 40 alphanumeric characters.

Command Default

Information for all inspect type class maps is displayed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.4(9)T	This command was modified. The following keywords were added: **edonkey**, **fasttrack**, **gnutella**, **kazaa2**, **aol**, **msnmsgr**, **ymsgr**.

Release	Modification
12.4(20)T	This command was modified. The following keywords were added: **icq**and **winmsgr**.
Cisco IOS XE Release 2.1	This command was modified. It was integrated into Cisco IOS XE Release 2.1. The *protocol-name*argument is not supported.

Usage Guidelines

Use the **show class-map type inspect**command to display class maps for a particular inspect type class map.

Examples

The following is sample output from the **show class-map type inspect** command with all class maps:

```
Router# show class-map type inspect
Class Map type inspect match-all classe0 (id 7)
   Match access-group  34
 Class Map type inspect match-all c1 (id 5)
   Match access-group  101
   Match protocol http
 Class Map type inspect match-all class1 (id 1)
   Match none
```

The following is sample output from the **show class-map type inspect** with the class map classe0 specified:

```
Router# show class-map type inspect classe0
 Class Map type inspect match-all classe0 (id 7)
   Match access-group  34
```

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

Table 18: show class-map type inspect Field Descriptions

Field	Description
Class Map	Inspect type class maps being displayed. Output is displayed for each configured class map. The choice for implementing class matches (for example, match-all) appears next to the traffic class.
Match	Match criteria specified for the class map. For inspect type class maps without any protocols specified, the criteria are **access-group**, **class-map**, **protocol**, and **user-group**. For inspect type class maps with protocols specified, the criteria are **no**and **service**.

Related Commands

Command	Description
show class-map type port-filter	Displays port-filter class maps and their matching criteria.

show class-map type urlfilter

To display URL filter class maps and their matching criteria, use the **show class-map type urlfilter** command in privileged EXEC mode.

show class-map type urlfilter [**trend** | **n2h2** | **websense**] [*class-map-name*]

Syntax Description

trend	(Optional) Specifies Trend Micro class maps.
n2h2	(Optional) Specifies SmartFilter class maps.
websense	(Optional) Specifies Websense class maps.
class-map-name	(Optional) Name of the URL filter class map.

Command Default

Information for all local URL filter class maps is displayed.

Command Modes

Privileged EXEC (#)

Command History

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

Usage Guidelines

Use the **show class-map type urlfilter**command to display all local URL filter class maps and their matching criteria. To display class maps for a particular URL filtering server type--Trend Micro, SmartFilter or Websense--include the appropriate keyword. To display the matching criteria for a particular class map, specify the class map name.

Examples

The following is sample output from the **show class-map type urlfilter**command when three local URL filtering class maps have been configured:

```
Router# show class-map type urlfilter

 Class Map type urlfilter match-any untrusted-domain-class (id 1)
  Match server-domain urlf-glob untrusted-domain-param

 Class Map type urlfilter match-any trusted-domain-class (id 2)
  Match server-domain urlf-glob trusted-domain-param

 Class Map type urlfilter match-any keyword-class (id 4)
  Match url-keyword urlf-glob keyword-param
```

The following is sample output from the **show class-map type urlfilter trend**command when one Trend Micro URL filtering class map has been configured:

```
Router# show class-map type urlfilter trend
 Class Map type urlfilter trend match-any drop-category (id 3)
  Match url category Adult-Mature-Content
```

```
  Match url category Gambling
  Match url category Personals-Dating
```

The following is sample output from the **show class-map type urlfilter websense**command:

```
Router# show class-map type urlfilter websense
 Class Map type urlfilter websense match-any websense-map (id 5)
  Match server-response any
```

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

Table 19: show class-map type urlfilter Field Descriptions

Field	Description
Class Map	URL filtering class map being displayed. Output is displayed for each configured class map of the type of URL filtering specified--**trend**, **n2h2**, or **websense**. The default URL filtering type is **local**. The choice for implementing class matches (for example, match-any) appears next to the traffic class.
Match	Match criteria specified for the class map. For local URL filtering class maps, the criteria are **server-domain urlf-glob** parameter maps and the **url-keyword urlf-glob** parameter map. For Trend-Micro URL filtering class maps, the criteria are **url-category** and **url-reputation**. For SmartFilter and Websense class maps, the match criterion is **server-response any**.

show clock detail

To display the clock details for Cisco IOS public key infrastructure (PKI), use the **show clock detail** command in EXEC mode.

show clock detail

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Command History

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

Examples

The following example is sample output for the **show clock detail** command:

```
Router # show clock detail
07:07:35.514 IST Sun Jun 3 2018
Time source is user configuration
```

show content-scan

Note Effective with Cisco IOS Release 15.4(2)T, the **show content-scan** command is replaced by the **show cws** command. See the **show cws** command for more information.

To display content scan information, use the **show content-scan** command in user EXEC or privileged EXEC mode.

show content-scan {**session** {**active** [**detail** | **egress-vrf** *vrf-number* | **ingress-vrf** *vrf-number* | **ip-addr** *ip-address* [**all**]] | **history** *sessions*} | **statistics** [**all** | **detailed** | **failures** | **memory-usage**] | **summary**}

Syntax Description

session	Displays content-scan session information.
active	Displays active sessions.
detail	(Optional) Displays content-scan session details.
egress-vrf	(Optional) Displays information about the virtual routing and forwarding (VRF) instance at the egress interface.
vrf-number	(Optional) Egress or ingress VRF ID. Valid values are from 0 to 1024.
igress-vrf	(Optional) Displays information about the VRF instance at the ingress interface.
ip-addr *ip-address*	(Optional) Displays information about the specified IP address.
all	(Optional) Displays information about all sessions.
history	Displays information about terminated sessions.
sessions	Number of sessions. Valid values are from 1 to 512.
statistics	Displays statistics of the content scanned.
detailed	(Optional) Displays detailed statistics of the content scanned.
failures	(Optional) Displays content-scan failure statistics.
memory-usage	(Optional) Displays content-scan memory usage statistics.
summary	Displays a summary of the content scan information.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
15.2(1)T1	This command was introduced.
15.2(4)M	This command was modified. The **detailed**, **failures**, and **memory-usage** keywords were added.
15.4(1)T	This command was modified. The **detail**, **egress-vrf**, **ingress-vrf**, **ip-addr**, and **all** keywords and the *vrf-number* and *ip-address* arguments were added.
15.4(2)T	This command was replaced by the **show cws** command.

Usage Guidelines

Cloud Web Security provides content scanning of HTTP and secure HTTP (HTTPS) traffic and malware protection services to web traffic. The content-scanning process redirects client web traffic to the cloud web security servers. These servers scan the web traffic content and allow or block traffic based on compliance with the configured policies and thus protect clients from malware. Content scanning is enabled on an Internet-facing WAN interface to protect the web traffic that goes out. Use the **show content-scan** command to view content-scan information.

The **show content-scan session history** command displays information about a maximum of 512 terminated sessions.

Examples

The following is sample output from the **show content-scan session history** command:

```
Device# show content-scan session history 6

 Protocol  Source             Destination           Bytes         URI                 Time

 HTTP      192.168.100.2:1347 209.165.201.104:80    (102:45)       www.google.com
00:01:13
 HTTP      192.168.100.2:1326 209.165.201.106:80    (206:11431)    www.google.com
00:12:55
 HTTP      192.168.100.2:1324 209.165.201.105:80    (206:11449)    www.google.com
00:15:20
 HTTP      192.168.100.2:1318 209.165.201.105:80    (206:11449)    www.google.com
00:17:43
 HTTP      192.168.100.2:1316 209.165.201.104:80    (206:11449)    www.google.com
00:20:04
 HTTP      192.168.100.2:1315 10.254.145.107:80     (575:1547)     alert.scansafe.net
00:21:32
```

The following table describes the significant fields shown in the display.

Table 20: show content-scan session history Field Descriptions

Field	Description
Protocol	Protocol used for content scanning.
Source	IP address of the source with the port number.
Destination	IP address of the destination with the port number.
URI	Uniform Resource Identifier (URI) that identifies a name or a resource on the Internet.

Field	Description
Time	Duration of time when a session was terminated.

The following is sample output from the **show content-scan statistics** command:

```
Device# show content-scan statistics

 Current HTTP sessions: 3
 Current HTTPS sessions: 0
 Total HTTP sessions: 11
 Total HTTPS sessions: 0
 White-listed sessions: 0
 Time of last reset: 00:01:58
```

The following table describes the fields shown in the display.

Table 21: show content-scan statistics Field Descriptions

Field	Description
Current HTTP sessions	Number of current HTTP sessions.
Current HTTPS sessions	Number of current secure HTTP (HTTPS) sessions.
Total HTTP sessions	Total number of HTTP sessions.
Total HTTPS sessions	Total number of HTTPS sessions.
White-listed sessions	Number of sessions that are on the allowed list. An allowed list is an approved list of entities that are provided a particular privilege, service, mobility, access, or recognition. Allowed listing means to grant access.
Time of last reset	Duration of time since sessions were last reset.

The following is sample output from the **show content-scan statistics failures** command:

```
Device# show content-scan statistics failures

Reset during proxy Mode:                0
HTTPS reconnect failures:               0
Buffer enqueue failures:                0
Buffer length exceeded:                 0
Particle coalesce failures:             0
L4F failures:                           0
Lookup failures:                        0
Memory failures:                        0
Tower unreachable:                      0
Resets sent:                            0
```

The following table describes the significant fields shown in the display.

Table 22: show content-scan statistics failures Field Descriptions

Field	Description
Reset during proxy Mode	Reset messages that are received when content scan is in proxy mode.
HTTPS reconnect failures	Connection failures while reconnecting to HTTPS.
Buffer enqueue failures	Buffering queue failures. When a packet fails to reach its destination, the packet is buffered in a queue for a retry. This queue to which packets are buffered can fail, and this failure is added to the statistics.
Buffer length exceeded	Packets that exceed the buffer length.
Particle coalesce failures	Packet defragmentation failures. When content scan receives packet fragments, these fragments are joined together or coalesced, and any failures during the coalescing are added to the statistics.
L4F failures	Layer 4 Forwarding (L4F) failures. When content scan and L4F is out of sync with each other, the statistics are incremented. **Note** We recommend that you inform TAC, if this counter increments rapidly.
Lookup failures	Content-scan entry lookup failures. During normal packet flows, content scan entries are checked at certain points. When such a lookup fails (when it was not expected to fail), it is added to the statistics.
Memory failures	Memory failures in the content scan subsystem (can be malloc, chunk_malloc, list, and so on).
Tower unreachable	Content-scan tower unreachable during packet flows.
Resets sent	Packet processing errors. During packet processing, if errors are encountered, reset messages are sent to end hosts.

The following sample output from the **show content-scan session active egress-vrf** command:

```
Device# show content-scan session active egress-vrf 1

Protocol      Source          Destination     Bytes             Time
HTTP [0]:     10.1.1.1:25176   10.2.2.1:80    (262:10495)       00:00:00
        URI: 10.2.2.1
        Username/usergroup(s): /
```

Related Commands

Command	Description
content-scan out	Enables content scanning on an egress interface.
debug content-scan	Enables content-scan debugging.