SAF Commands send-lifetime through username SAF

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send-lifetime

To set the time period during which an authentication key on a key chain is valid to be sent, use the **send-lifetime** command in key chain key configuration mode. To revert to the default value, use the **no** form of this command.

send-lifetime *start-time* {**infinite***end-time* | **duration** *seconds*}
no send-lifetime *start-time* {**infinite***end-time* | **duration** *seconds*}

Syntax Description

start-time	Beginning time that the key specified by the **key** command is valid to be sent. The syntax can be either of the following: *hh* **:** *mm* **:** *ss* *Month date year* *hh* **:** *mm* **:** *ss* *date Month year* • *hh* --hours • *mm* --minutes • *ss* -- seconds • *Month* -- first three letters of the month • *date* -- date (1-31) • *year*-- year (four digits) The default start time and the earliest acceptable date is January 1, 1993.
infinite	Key is valid to be sent from the *start-time* value on.
end-time	Key is valid to be sent from the *start-time* value until the *end-time*value. The syntax is the same as that for the *start-time*value**.**The *end-time* value must be after the *start-time*value. The default end time is an infinite time period.
duration *seconds*	Length of time (in seconds) that the key is valid to be sent.

Command Default

Forever (the starting time is January 1, 1993, and the ending time is infinite)

Command Modes

Key chain key configuration (config-keychain-key)

Command History

Release	Modification
11.1	This command was introduced.
12.4(6)T	Support for IPv6 was added.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

Specify a *start-time* value and one of the following values: **infinite**, *end-time*, or **duration** *seconds*.

We recommend running Network Time Protocol (NTP) or some other time synchronization method if you intend to set lifetimes on keys.

If the last key expires, authentication will continue and an error message will be generated. To disable authentication, you must manually delete the last valid key.

Examples

The following example configures a key chain named chain1. The key named key1 will be accepted from 1:30 p.m. to 3:30 p.m. and be sent from 2:00 p.m. to 3:00 p.m. The key named key2 will be accepted from 2:30 p.m. to 4:30 p.m. and be sent from 3:00 p.m. to 4:00 p.m. The overlap allows for migration of keys or a discrepancy in the set time of the router. There is a 30-minute leeway on each side to handle time differences.

```
Router(config)# interface ethernet 0
Router(config-if)# ip rip authentication key-chain chain1
Router(config-if)# ip rip authentication mode md5
!
Router(config)# router rip
Router(config-router)# network 172.19.0.0
Router(config-router)# version 2
!
Router(config)# key chain chain1
Router(config-keychain)# key 1
Router(config-keychain-key)# key-string key1
Router(config-keychain-key)# accept-lifetime 13:30:00 Jan 25 1996 duration 7200
Router(config-keychain-key)# send-lifetime 14:00:00 Jan 25 1996 duration 3600
Router(config-keychain-key)# exit
Router(config-keychain)# key 2
Router(config-keychain-key)# key-string key2
Router(config-keychain-key)# accept-lifetime 14:30:00 Jan 25 1996 duration 7200
Router(config-keychain-key)# send-lifetime 15:00:00 Jan 25 1996 duration 3600
```

The following example configures a key chain named chain1 for EIGRP address-family. The key named key1 will be accepted from 1:30 p.m. to 3:30 p.m. and be sent from 2:00 p.m. to 3:00 p.m. The key named key2 will be accepted from 2:30 p.m. to 4:30 p.m. and be sent from 3:00 p.m. to 4:00 p.m. The overlap allows for migration of keys or a discrepancy in the set time of the router. There is a 30-minute leeway on each side to handle time differences.

```
Router(config)# eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# network 10.0.0.0
Router(config-router-af)# af-interface ethernet0/0
Router(config-router-af-interface)# authentication key-chain trees
Router(config-router-af-interface)# authentication mode md5
Router(config-router-af-interface)# exit
Router(config-router-af)# exit
Router(config-router)# exit
Router(config)# key chain chain1
Router(config-keychain)# key 1
Router(config-keychain-key)# key-string key1
Router(config-keychain-key)# accept-lifetime 13:30:00 Jan 25 1996 duration 7200
Router(config-keychain-key)# send-lifetime 14:00:00 Jan 25 1996 duration 3600
Router(config-keychain-key)# exit
Router(config-keychain)# key 2
Router(config-keychain-key)# key-string key2
Router(config-keychain-key)# accept-lifetime 14:30:00 Jan 25 1996 duration 7200
Router(config-keychain-key)# send-lifetime 15:00:00 Jan 25 1996 duration 3600
```

Related Commands

Command	Description
accept-lifetime	Sets the time period during which the authentication key on a key chain is received as valid.
key	Identifies an authentication key on a key chain.
key chain	Defines an authentication key chain needed to enable authentication for routing protocols.
key-string (authentication)	Specifies the authentication string for a key.
show key chain	Displays authentication key information.

service-family

To configure virtual routing and forwarding (VRF) metrics for a Cisco SAF service-family, use the **service-family** command in router configuration mode. To disable the service-family configuration, use the **no** form of this command.

service-family {**ipv4** | **ipv6**}[{**vrf** *vrfname*}]
autonomous-system *autonomous-system number*
no service-family {**ipv4** | **ipv6**}[{**vrf** *vrfname*}]
autonomous-system *autonomous-system number*

Syntax Description

ipv4	Specifies the IP Version 4 address family and enters service-family configuration mode.
ipv6	Specifies the IP Version 6 address family and enters service-family configuration mode.
vrf	(Optional) Specifies all virtual routing forwarding (VRF) instance tables or a specific VRF table for an IP address.
vrf-name	(Optional) Names a specific VRF table for an IPv4 address.
autonomous- system	Specifies the autonomous system.
autonomous-system-number	Specifies the autonomous system number.

Command Default

No service family configurations exist.

Command Modes

Router configuration (config-router)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was modified. The address-family configuration mode was added.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was modified. The address-family configuration mode was added.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.

Usage Guidelines

Use the **service-family** command to enter service-family configuration mode.

Note Using the **service-family ipv6** commands requires an IPv6-enabled SAF client, which currently does not exist.

Examples

The following example configures a service-family autonomous-system number 4533:

```
Router(config)# router eigrp virtual-name
Router(config-router)# service-family ipv4 autonomous-system 4533
```

Related Commands

Command	Description
exit-service-family	Exits service-family configuration mode.
router eigrp	Configures the EIGRP process.

service-family external-client listen

To configure a Cisco SAF External-Client TCP port, use the **service-family external-client listen**command in global configuration mode. To remove the associated external-client configuration, use the **no** form on this command.

service-family external-client listen {**ipv4** | **ipv6**} *tcp-port-number vrf-name*
no service-family external-client listen

Syntax Description

ipv4	Specifies the IP Version 4 address family.
ipv6	Specifies the IP Version 6 address family.
tcp-port-number	The TCP port number to listen on. Port numbers range between 1024 and 65536.
vrf-name	VRF name to listen on. Default is base.

Command Default

No external-client configurations exist.

Command Modes

Global configuration (config)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was modified. The address-family configuration mode was added.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was modified. The address-family configuration mode was added.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.
15.2(1)S	This command was deprecated in Cisco IOS Release 15.2(1)S and replaced by the service-routing xmcp listen command.
Cisco IOS XE Release 3.5S	This command was deprecated in Cisco IOS XE Release 3.5S and replaced by the service-routing xmcp listen command.
15.2(2)T	This command was deprecated in Cisco IOS Release 15.2(2)T and replaced by the service-routing xmcp listen command.

Usage Guidelines

Use the **service-family external-client listen**command to configure a TCP port on which the Cisco SAF Forwarder is to listen. The **no** form of this command removes all clients from the Cisco SAF network, the External-Client database, tears down all sockets, and removes the TCP listen socket.

Note Using the **service-family external-client listen ipv6** commands requires an IPv6-enabled SAF client, which currently does not exist.

Use the **show eigrp service-family external-client** command to verify information on EIGRP external clients.

Examples

The following example configures an external-client TCP port number 4355 for the Cisco SAF Forwarder to listen on:

```
Router(config)# service-family external-client listen ipv4 4355
```

Related Commands

Command	Description
show eigrp service-family external-client	Displays information on Cisco SAF External Clients.

service-routing xmcp listen

To enable XMCP (Extensible Messaging Client Protocol) on a port and to configure parameters for accepting client connections, use the **service-routing xmcp listen** command in global configuration mode. To disable XMCP on a port, use the **no** form of this command.

service-routing xmcp listen [{**ipv4** | **ipv6**}] [{**transport tcp**}] [{**port** *port-number*}][{**vrf** *vrf-name*}]

Syntax Description

ipv4	(Optional) Allows connections from IPv4 clients only.
ipv6	(Optional) Allows connections from IPv6 clients only.
transport tcp	(Optional) Allows connections over TCP only. Specifying this keyword restricts clients to TCP only because UDP is unsupported; however, this configuration is implied even if it is not specified.
port *port-number*	(Optional) Specifies a TCP or UDP port number. The range is 1024 to 65536. If the **port** keyword is not specified, the port number defaults to 4788.
vrf *vrf-name*	(Optional) Allows connections within a specific VRF (virtual routing and forwarding) instance. If the **vrf** keyword is not specified, clients may connect only using the default IP routing table.

Command Default

XMCP is disabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
15.2(1)S	This command was introduced.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T.

Usage Guidelines

The **service-routing xmcp listen** command is used to configure a router to listen for XMCP client connections, optionally under a specific transport protocol.

If neither the **ipv4** nor the **ipv6** keyword is specified, clients are permitted to connect over either protocol.

Only a single **service-routing xmcp listen** command can be configured on a router. Once configured, you can only change this command by configuring the **no service-routing xmcp listen** command.

Examples

The following example configures XMCP with its default behavior, which is to accept IPv4 and IPv6 connections over TCP on port 4788:

```
Router(config)# service-routing xmcp listen
Router(config-xmcp)# end
```

The following example configures XMCP to accept only client connections using TCP over IPv6 on port 2100:

```
Router(config)# service-routing xmcp listen ipv6 transport tcp port 2100
Router(config-xmcp)# end
```

Related Commands

Command	Description
client (XMCP)	Defines properties for XMCP clients.
service-family external-client	Configures a Cisco SAF External-Client TCP port. This command is deprecated. It is replaced by the **routing xmcp listen** command.

sf-interface

To configure interface-specific commands for a Cisco SAF service family, use the **sf-interface** command in service-family configuration mode. To disable the service-family mode, use the **no** form on this command.

sf-interface {*interface-type interface-number* | **default**}
no sf-interface {*interface-type interface-number* | **default**}

Syntax Description

interface-type	Specifies the interface type.
interface-number	Specifies the interface number.
default	Specifies the service-family default interface configuration.

Command Modes

Service-family configuration (config-router-sf)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was modified. The address-family configuration mode was added.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was modified. The address-family configuration mode was added.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.

Usage Guidelines

Use the **sf-interface default**command to set the Cisco SAF default configuration for all interfaces on the router.

Use the **sf-interface** *interface-type interface-number*command to apply a Cisco SAF configuration to a specific interface. Any configuration using this command overrides the default configuration.

Examples

The following example places a router in service-family configuration mode and enables Ethernet interface 0/0, while disabling all other interfaces:

```
Router(config)# router eigrp virtual-name
Router(config-router)# service-family ipv4 autonomous-system 4533
Router(config-router-sf)# sf-interface default
Router(config-router-sf-interface)# shutdown
Router(config-router-sf-interface)# Ethernet 0/0
Router(config-router-sf-interface)# no shutdown
```

Related Commands

Command	Description
exit-service-family	Exits service-family configuration mode.
exit sf-interface	Exits service-family interface configuration mode.

Command	Description
router eigrp	Configures the EIGRP process.
service-family	Configures commands under service-family mode.
shutdown	Disables a service family on the interface.

show eigrp plugins

To display general information including the versions of the Enhanced Interior Gateway Routing Protocol (EIGRP) protocol features that are currently running, use the **show eigrp plugins** command in user EXEC or privileged EXEC mode.

show eigrp [**vrf** *name*] [*as-number*] **plugins** [*pluginname*] [**detailed**]

Syntax Description

vrf *-name*	(Obsolete) (Optional) Specifies a particular VPN routing and forwarding (VRF) instance name. **Note** This keyword and argument are obsolete and configuring them has no effect on the output displayed.
as-number	(Obsolete) (Optional) Autonomous system number. **Note** This argument is obsolete and configuring it has no effect on the output displayed.
plugin-name	(Optional) Name of an EIGRP plugin to display.
detailed	(Optional) Displays detailed information about EIGRP features.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
12.4(15)T	This command was introduced.
12.2(33)SXI	This command was integrated into Cisco IOS Release 12.2(33)SXI.
15.0(1)M	This command was modified. The **vrf** keyword, the *name*, and the *as-number*arguments were removed.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

Use the **show eigrp plugins** command in user EXEC or privileged EXEC mode to determine if a particular EIGRP feature is available in your Cisco IOS image. This command displays a summary of information about EIGRP service families and address families.

This command is useful when contacting Cisco technical support.

Examples

The following example shows how to display EIGRP plugin information:

```
Router# show eigrp plugins
EIGRP feature plugins:::
    eigrp-release      :   5.00.00 : Portable EIGRP Release
```

```
                    :  19.00.00 : Source Component Release(rel5)
igrp2               :   3.00.00 : Reliable Transport/Dual Database
bfd                 :   1.01.00 : BFD Platform Support
mtr                 :   1.00.01 : Multi-Topology Routing(MTR)
eigrp-pfr           :   1.00.01 : Performance Routing Support
ipv4-af             :   2.01.01 : Routing Protocol Support
ipv4-sf             :   1.01.00 : Service Distribution Support
external-client     :   1.02.00 : Service Distribution Client Support
ipv6-af             :   2.01.01 : Routing Protocol Support
ipv6-sf             :   1.01.00 : Service Distribution Support
snmp-agent          :   1.01.01 : SNMP/SNMPv2 Agent Support
```

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

Table 1: show eigrp plugins Field Descriptions

Field	Description
eigrp release	Displays the portable EIGRP release version.
igrp2	Displays the reliable transport and dual database version.
bfd	Displays the EIGRP-BFD feature version.
mtr	Displays the EIGRP multitopology routing (MTR) version.
eigrp-pfr	Displays the EIGRP performance routing feature version.
ipv4-af	Displays the EIGRP IPv4 routing protocol feature version.
ipv4-sf	Displays the EIGRP IPv4 service distribution feature version.
external-client	Displays the EIGRP service distribution client support feature version.
ipv6-af	Displays the EIGRP IPv6 routing protocol feature version.
ipv6-sf	Displays the EIGRP IPv6 service distribution feature version.
snmp-agent	Displays the EIGRP SNMP and SNMPv2 Agent Support version.

Related Commands

Command	Description
clear eigrp service-family	Clears entries from the EIGRP neighbor table.
show eigrp service-family external-client	Displays information about the EIGRP service-family external clients.
show eigrp service-family ipv4 topology	Displays information from the EIGRP IPv4 service-family topology table.
show eigrp service-family ipv6 topology	Displays information from the EIGRP IPv6 service-family topology table.
show eigrp tech-support	Generates a report of all EIGRP-related information.

show eigrp protocols

To display general information about Enhanced Interior Gateway Routing Protocol (EIGRP) protocols that are currently running, use the **show eigrp protocols** command in user EXEC or privileged EXEC mode.

show eigrp protocols [**vrf** *vrf-name*]

Syntax Description

vrf *vrf-name*	(Optional) Displays information about the specified VRF.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.

Usage Guidelines

Use the **show eigrp protocols**command in user EXEC or privileged EXEC mode to see a summary of information on EIGRP IPv4 service families or address families.

Examples

The following example shows how to display general EIGRP information:

```
Router# show eigrp protocols
EIGRP-IPv4 Protocol for AS(10)
Metric weight K1=1, K2=0, K3=1, K4=0, K5=0
NSF-aware route hold timer is 240
Router-ID: 1.1.1.1
Topology : 0 (base)
Active Timer: 3 min
Distance: internal 90 external 170
Maximum path: 4
Maximum hopcount 100
Maximum metric variance 1
EIGRP-IPv4 Protocol for AS(5) VRF(red)
Metric weight K1=1, K2=0, K3=1, K4=0, K5=0
NSF-aware route hold timer is 240
Router-ID: 1.1.1.1
Topology : 0 (base)
Active Timer: 3 min
Distance: internal 90 external 170
Maximum path: 4
Maximum hopcount 100
Maximum metric variance 1
Total Prefix Count: 0
Total Redist Count: 0
```

The following example shows how to display general EIGRP information for VRF1:

```
Router# show eigrp protocols vrf vrf1
EIGRP-IPv4 Protocol for AS(5) VRF(vrf1)
Metric weight K1=1, K2=0, K3=1, K4=0, K5=0
NSF-aware route hold timer is 240
Router-ID: 1.1.1.1
Topology : 0 (base)
Active Timer: 3 min
Distance: internal 90 external 170
Maximum path: 4
Maximum hopcount 100
Maximum metric variance 1
Total Prefix Count: 0
Total Redist Count: 0
```

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

Table 2: show eigrp protocols Field Descriptions

Field	Description
EIGRP-IPv4 Protocol for AS(10)	EIGRP instance and AS number.
Metric weight	EIGRP metric calculations.
NSF-aware route hold timer	Route-hold timer value for an NSF-aware router.
Router-ID	Router ID.
Topology	Number of entries in the EIGRP topology table.
Active Timer	EIGRP routing active time limit.
Distance	Internal and external administrative distance.
Maximum path	Maximum number of parallel routes that EIGRP can support.
Maximum hop count	Maximum hop count (in decimal).
Maximum metric variance	Metric variance used to find feasible paths for a route.
EIGRP-IPv4 Protocol	EIGRP instance and AS number for VRF Red.
Total Prefix Count	The aggregate sum of the prefixes in an EIGRP instance topology table. It includes prefixes learned from all neighbors or from redistribution.
Total Redist Count	The number of prefixes redistributed into an EIGRP process.

Related Commands

Command	Description
clear eigrp service-family	Clears entries from the EIGRP neighbor table.
show eigrp service-family external-client	Displays information about the EIGRP service-family external clients.
show eigrp service-family ipv4 topology	Displays information from the EIGRP IPv4 service-family topology table.

Command	Description
show eigrp service-family ipv6 topology	Displays information from the EIGRP IPv6 service-family topology table.
show tech-support	Generates a report of all EIGRP-related information.

show eigrp service-family external-client

To display information about Cisco Service Advertisement Framework (Cisco SAF) external clients, use the **show eigrp service-family external-client**command in user EXEC or privileged EXEC mode.

```
show eigrp service-family external-client[{client-label}]
```

Syntax Description

client-label	(Optional) Displays detailed client information for the specified client label.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.
15.1(2)S	The command was modified. The output was revised to include additional information about the clients, such as basename and socket ID.
Cisco IOS XE Release 3.3S	The command was modified. The output was revised to include additional information about the clients, such as basename and socket ID.
15.1(3)S	The command was modified. The output was revised to remove the PID (Process ID) column.
15.2(1)S	This command was deprecated in Cisco IOS Release 15.2(1)S and replaced by the show service-routing xmcp clients command.
Cisco IOS XE Release 3.5S	This command was deprecated in Cisco IOS XE Release 3.5S and replaced by the show service-routing xmcp clients command.
15.2(2)T	This command was deprecated in Cisco IOS Release 15.2(2)T and replaced by the show service-routing xmcp clients command.

Usage Guidelines

Use the **show eigrp service-family external-client**command in user or privileged EXEC mode to see a summary of the information about Cisco SAF external clients that are currently registered with the Cisco SAF system.

Examples

The following is sample output from the **show eigrp service-family external-client**command if any clients are registered:

```
Router# show eigrp service-family external-client
SAF External Clients
```

```
example-using-basename (basename)
  Client  Socket   Keep  Address                                    Port  Tag
  Handle  FD       (ms)
  1       1     3268319  10.1.1.1                                  47519  @12
  2       2     3268347  192.168.100.101                           36997  @1
example-configured-but-no-clients-connected
  No connected clients
example-client-without-basename
  Client  Socket   Keep  Address                                    Port  Tag
  Handle  FD       (ms)
  3       3      208373  10.1.1.2                                  51294  --
```

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

Table 3: show eigrp service-family external-client Field Descriptions

Field	Description
Client Handle	Specifies the Cisco SAF internal client handle.
Socket FD (File Descriptor)	Specifies the socket API file descriptor for this Cisco SAF External Client.
Keep (ms)	Specifies the remaining keepalive time (in milliseconds) before the client will be disconnected if no further communications are received from the client.
Address	Specifies the IP address of the selected external client.
Port	Specifies the TCP port number of the selected external client.
Tag	Specifies the identifying tag provided by the client if the *client-label* argument was configured using the **basename** keyword. The **basename** keyword allows SAF external clients to uniquely identify themselves using the naming convention in the form of *client-label@tag* (where tag is a number from 1 to 50).

The following is sample output from the **show eigrp service-family external-client** *client-label*command if the specified client is registered:

```
Router# show eigrp service-family external-client example-using-basename@12
SAF External Client "example-using-basename" (basename)
  Listening on port 1024, keepalive time 3600000 ms
  VR(saf) SFv4 AS(1) Topology(base)
  Client  Socket   Keep  Address                                    Port  Tag
  Handle  FD       (ms)
  1       1     3322871  10.1.1.1                                  47519  @12
    Client name "thisistheclientnameweprovided"
    Page size 1, currently allowed to send 1
    Protocol version 1.0
    2 subscriptions
```

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

Table 4: show eigrp service-family external-client client-label Field Descriptions

Field	Description
Client name	Specifies the descriptive name provided by the client to identify itself.

Field	Description
Page size	Specifies the page size provided by the client and specifies the number of additional requests allowed to be sent at the time the **show** command is issued (between 0 and the number specified for Page size).
Protocol version	Specifies the version of the SAF External Client protocol being used by the client to communicate with the SAF forwarder.
subscriptions	Specifies the number of SAF subscriptions owned by the client. When the number of subscriptions is 0, this field displays “No subscriptions”.

Related Commands

Command	Description
clear eigrp service-family	Clears entries from the EIGRP neighbor table.
show eigrp service-family	Displays EIGRP IPv4 service-family information.
show eigrp service-family ipv4 topology	Displays information in the EIGRP IPv4 service-family topology table.
show eigrp service-family ipv6 topology	Displays information in the EIGRP IPv6 service-family topology table.
external-client	Configures a Cisco SAF Service Advertisement Framework (Cisco SAF) External Client.

show eigrp service-family ipv4 topology

To display topology information for an Enhanced Interior Gateway Routing Protocol (EIGRP) IPv4 service family, use the **show eigrp service-family ipv4 topology**command in user EXEC or privileged EXEC mode.

show eigrp service-family ipv4 [**vrf** *vrf-name*] *autonomous-system-number* **topology** [{*service-instance-number* | **active** | **all-links** | **detail-links** | **pending service-type** [{**connected** | **external** | **internal** | **local** | **redistributed** | **summary**}] | **summary** | **zero-successors**}]

Syntax Description

vrf	(Optional) Specifies all virtual routing forwarding (VRF) instance tables or a specific VRF table for an IP address.
vrf-name	(Optional) Names a specific VRF table for an IPv4 address.
autonomous-system-number	Specifies the autonomous-system number.
service-instance- number	(Optional) Displays detailed information about the specified service-instance number. Service-instance numbers display as service:subservice:instance.instance.instance.instance. Service-instance numbers can range from 1:1:0.0.0.1 to 65534:65534:FFFFFFFF.FFFFFFFF.FFFFFFFF.FFFFFFFE.
active	(Optional) Displays only active entries in the topology table.
all-links	(Optional) Displays all service sources (including non-feasible sources) in the topology table.
detail-links	(Optional) Specifies all links in the topology table.
pending	(Optional) Displays all active entries in the topology table that are waiting either for an update or reply from a neighbor.
service-type	(Optional) Specifies the service with the given type in the topology table.
connected	(Optional) Displays only connected services.
external	(Optional) Displays all external services.
internal	(Optional) Displays all internal services.
local	(Optional) Display all locally originated services.
redistributed	(Optional) Displays all redistributed services.
summary	(Optional) Displays all summary services.
summary	(Optional) Specifies a summary of the topology table.
zero-successors	(Optional) Displays only services in the topology table that have zero successors.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.

Usage Guidelines

Use the **show eigrp service-family ipv4 topology**command in user EXEC or privileged EXEC mode to see a summary of information on EIGRP IPv4 service-families services.

Examples

The following is sample output from the **show eigrp service-family ipv4 topology** command:

```
Router> enable
Router# show
 eigrp service-family ipv4 4453 topology
EIGRP-SFv4 Topology Table for process 4453
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply, r - Reply status
P 1:2:0.0.0.3, 2 successors, FD is 0
 via 10.16.80.28 (46251776/46226176), Ethernet0
 via 10.16.81.28 (46251776/46226176), Ethernet1
 via 10.16.80.31 (46277376/46251776), Serial0
P 4:5:0.0.0.6, 1 successors, FD is 37200
 via Connected, Ethernet1
 via 10.16.81.28 (307200/281600), Ethernet1S
 via 10.16.80.28 (307200/281600), Ethernet0
 via 10.16.80.31 (332800/307200), Serial0
```

The following is sample output from the **show eigrp service-family ipv4 topology** command for a specified service:

```
Router> enable
Router# show
 eigrp service-family ipv4 4453 topology 1:2:0.0.0.3
EIGRP-SFv4 VR(example) Topology Table entry for AS(4453)/ID(10.1.1.1)1:2:0.0.0.3
State is Passive, Query origin flag is 1, 1 Successor(s), FD is 409600
Service Description Blocks:
1:2:3.0.0.0.3 (Ethernet0/0), from 10.2.1.1, Send flag is 0x0
Composite metric is (409600/128256), Route is External
Vector metric:
 Minimum bandwidth is 10000 Kbit
 Total delay is 6000 microseconds
 Reliability is 255/255
 Load is 1/255
 Minimum MTU is 1500
 Hop count is 1
External data:
 Originating router is 10.89.245.1
 AS number of route is 0
 External protocol is Connected, external metric is 0
 Administrator tag is 0 (0x00000000)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply, r - Reply status
P 1:2:0.0.0.3, 2 successors, FD is 0
 via 10.16.80.28 (46251776/46226176), Ethernet0
```

```
 via 10.16.81.28 (46251776/46226176), Ethernet1
 via 10.16.80.31 (46277376/46251776), Serial0
P 4:5:0.0.0.6, 1 successors, FD is 37200
 via Connected, Ethernet1
 via 10.16.81.28 (307200/281600), Ethernet1S
 via 10.16.80.28 (307200/281600), Ethernet0
 via 10.16.80.31 (332800/307200), Serial0
```

The table below describes the significant fields shown in the **show eigrp service-family ipv4 topology**command output.

Table 5: show eigrp service-family ipv4 topology Field Descriptions

Field	Description
Codes	State of this topology table entry. Passive and Active refer to the EIGRP state with respect to this destination; Update, Query, and Reply refer to the type of packet that is being sent.
P	Passive--No EIGRP computations are being performed for this destination.
A	Active--EIGRP computations are being performed for this destination.
U	Update--Indicates that an update packet was sent to this destination.
Q	Query--Indicates that an query packet was sent to this destination.
R	Reply--Indicates that an reply packet was sent to this destination.
r	Reply status--A flag set after the service has sent a query and is waiting for a reply.
1:2.0.0.0.3	Service number.
successors	Number of successors. Corresponds to the number of next hops in the IP routing table. If “successors” is capitalized, then the route or next hop is in a transition state.
FD	Flexible distance--The best metric to reach the destination or the best metric that was known when the service went active.
via	IP address of the peer that told the service about this destination. The first n of these entries, where n is the number of successors, is the current successors. The remaining entries in the list are feasible successors. If “all-links” or “detailed-links” is specified, the feasible successors are followed by sources that are neither successors nor feasible successors.
(46251776/46226176)	Two EIGRP metric numbers. The first number represents the cost to the destination; the second number is the metric that this peer advertised.
Ethernet0	Indicates the interface from which this information was learned.

Related Commands

Command	Description
clear eigrp service-family	Clears entries from the EIGRP neighbor table.

Command	Description
show eigrp service-family	Displays information about Cisco SAF service-family Clients, External Clients, and subscriptions.
show eigrp service-family external-client	Displays information about the Cisco SAF service-family External Clients.
show eigrp service-family ipv6 topology	Displays information from the Cisco SAF IPv6 service-family topology table.

show eigrp service-family ipv6 topology

To display topology information for an Enhanced Interior Gateway Routing Protocol (EIGRP) IPv6 service family, use the **show eigrp service-family ipv6 topology**command in user EXEC or privileged EXEC mode.

show eigrp service-family ipv6 [**vrf** *vrf-name*] *autonomous-system-number* **topology** [{*service-instance-number* | **active** | **all-links** | **detail-links** | **pending service-type** [{**connected** | **external** | **internal** | **local** | **redistributed** | **summary**}] | **summary** | **zero-successors**}]

Syntax Description

vrf	(Optional) Specifies all virtual routing forwarding (VRF) instance tables or a specific VRF table for an IP address.
vrf-name	(Optional) Names a specific VRF table for an IPv6 address.
autonomous-system-number	Specifies the autonomous-system number.
service-instance- number	(Optional) Displays detailed information about the specified service-instance number. Service-instance numbers display as service:subservice:instance.instance.instance.instance. Service-instance numbers can range from 1:1:0.0.0.1 to 65534:65534:FFFFFFFF.FFFFFFFF.FFFFFFFF.FFFFFFFE.
active	(Optional) Displays only active entries in the topology table.
all-links	(Optional) Displays all service sources (including non-feasible sources) in the topology table.
detail-links	(Optional) Specifies all links in the topology table.
pending	(Optional) Displays all active entries in the topology table that are waiting for an update or reply from a neighbor.
service-type	(Optional) Specifies the service with the given type in the topology table.
connected	(Optional) Displays only connected services.
external	(Optional) Displays all external services.
internal	(Optional) Displays all internal services.
local	(Optional) Display all locally originated services.
redistributed	(Optional) Displays all redistributed services.
summary	(Optional) Displays all summary services.
summary	(Optional) Specifies a summary of the topology table.
zero-successors	(Optional) Displays only services in the topology table that have zero successors.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.

Usage Guidelines

Use the **show eigrp service-family ipv6 topology**command in user EXEC or privileged EXEC mode to see a summary of information on EIGRP IPv6 service-family topology services.

Note Using the **show eigrp service-family ipv6 topology**commands requires an IPv6-enabled SAF client, which currently does not exist.

Examples

The following is sample output from the **show eigrp service-family ipv6 topology** command:

```
Router> enable
Router# show
 eigrp service-family ipv6 4453 topology
EIGRP-SFv4 Topology Table for process 4453
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply, r - Reply status
P 1:2:0.0.0.3, 2 successors, FD is 0
 via 10.16.80.28 (46251776/46226176), Ethernet0
 via 10.16.81.28 (46251776/46226176), Ethernet1
 via 10.16.80.31 (46277376/46251776), Serial0
P 4:5:0.0.0.6, 1 successors, FD is 37200
 via Connected, Ethernet1
 via 10.16.81.28 (307200/281600), Ethernet1S
 via 10.16.80.28 (307200/281600), Ethernet0
 via 10.16.80.31 (332800/307200), Serial0
```

The following is sample output from the **show eigrp service-family ipv6 topology** command for a specified service:

```
Router> enable
Router# show
 eigrp service-family ipv6 4453 topology 1:2:0.0.0.3
EIGRP-SFv4 VR(example) Topology Table entry for AS(4453)
State is Passive, Query origin flag is 1, 1 Successor(s), FD is 409600
Service Description Blocks:
1:2:3.0.0.0.3 (Ethernet0/0), from 10.2.1.1, Send flag is 0x0
Composite metric is (409600/128256), Route is External
Vector metric:
 Minimum bandwidth is 10000 Kbit
 Total delay is 6000 microseconds
 Reliability is 255/255
 Load is 1/255
 Minimum MTU is 1500
 Hop count is 1
External data:
 Originating router is 10.89.245.1
```

```
 AS number of route is 0
 External protocol is Connected, external metric is 0
 Administrator tag is 0 (0x00000000)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply, r - Reply status
P 1:2:0.0.0.3, 2 successors, FD is 0
 via 10.16.80.28 (46251776/46226176), Ethernet0
 via 10.16.81.28 (46251776/46226176), Ethernet1
 via 10.16.80.31 (46277376/46251776), Serial0
P 4:5:0.0.0.6, 1 successors, FD is 37200
 via Connected, Ethernet1
 via 10.16.81.28 (307200/281600), Ethernet1S
 via 10.16.80.28 (307200/281600), Ethernet0
 via 10.16.80.31 (332800/307200), Serial0
```

The table below describes the significant fields shown in the **show eigrp service-family ipv6 topology**command output.

Table 6: show eigrp service-family ipv6 topology Field Descriptions

Field	Description
Codes:	State of this topology table entry. Passive and Active refer to the EIGRP state with respect to this destination; Update, Query, and Reply refer to the type of packet that is being sent.
P	Passive--No EIGRP computations are being performed for this destination.
A	Active--EIGRP computations are being performed for this destination.
U	Update--Indicates that an update packet was sent to this destination.
Q	Query--Indicates that an query packet was sent to this destination.
R	Reply--Indicates that an reply packet was sent to this destination.
r	Reply status--A flag set after the service has sent a query and is waiting for a reply.
1:2.0.0.0.3	Service number.
successors	Number of successors. Corresponds to the number of next hops in the IP routing table. If “successors” is capitalized, then the route or next hop is in a transition state.
FD	Flexible distance--The best metric to reach the destination or the best metric that was known when the service went active.
via	IP address of the peer that told the service about this destination. The first n of these entries, where n is the number of successors, is the current successors. The remaining entries in the list are feasible successors. If “all-links” or “detailed-links” is specified, the feasible successors are followed by sources that are neither successors nor feasible successors.
(46251776/46226176)	Two EIGRP metric numbers. The first number represents the cost to the destination; the second number is the metric that this peer advertised.
Ethernet0	Indicates the interface from which this information was learned.

Related Commands

Command	Description
clear eigrp service-family	Clears entries from the EIGRP neighbor table.
show eigrp service-family	Displays information about Cisco SAF IPv4 service-family Clients, External Clients, and subscriptions.
show eigrp service-family external-client	Displays information about Cisco SAF service-family External Clients.
show eigrp service-family ipv4 topology	Displays information from Cisco SAF IPv4 service-family topology table.

show eigrp tech-support

To generate a report of the Enhanced Interior Gateway Routing Protocol (EIGRP) internal state information, use the **show eigrp tech-support** command in privileged EXEC mode.

show eigrp tech-support [**detailed**]

Syntax Description

detailed	(Optional) Displays detailed output.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SRE	This command was introduced.
15.0(1)M	This command was integrated into Cisco IOS Release 15.0(1)M.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.
15.1(3)S	This command was modified. The command output was modified to display relevant wide metric information.
Cisco IOS XE Release 3.4S	This command was modified. The command output was modified to display relevant wide metric information.
15.1(1)SY	This command was modified. The command output was modified to display relevant wide metric information.

Usage Guidelines

Use the **show eigrp tech-support** command in privileged EXEC mode to display various internal EIGRP states.

Note This command is useful for debugging and troubleshooting by Cisco technical support, but it is not intended for normal EIGRP administration tasks. This command should not be used without guidance from Cisco technical support.

Examples

The following is sample output from the **show eigrp tech-support detailed** command:

```
Device# show eigrp tech-support detailed

EIGRP feature plugins:::
    eigrp-release      :   8.00.00 : Portable EIGRP Release
                       :   3.00.21 : Source Component Release(dev8)
                                     + HMAC-SHA-256 Authentication
    parser             :   2.02.00 : EIGRP Parser Support
    igrp2              :   2.00.00 : Reliable Transport/Dual Database
                                     + Wide Metrics
```

```
    eigrp-nsf          :   2.00.00 : Platform Support
    bfd                :   1.01.00 : BFD Platform Support
    mtr                :   1.00.01 : Multi-Topology Routing(MTR)
    eigrp-pfr          :   1.00.01 : Performance Routing Support
                                     + IPv4 PFR
    EVN/vNets          :   1.00.00 : Easy Virtual Network (EVN/vNets)
                                     + IPv4 EVN/vNets
    ipv4-af            :   2.01.01 : Routing Protocol Support
    ipv4-sf            :   1.02.00 : Service Distribution Support
                                     + Dynamic Remote Neighbors
    ipv6-af            :   2.01.01 : Routing Protocol Support
                                     + IPv6 VRF
    ipv6-sf            :   2.01.00 : Service Distribution Support
                                     + Dynamic Remote Neighbors
                                     + IPv6 VRF
    vNets-parse        :   1.00.00 : EIGRP vNets Parse Support
    snmp-agent         :   1.01.01 : SNMP/SNMPv2 Agent Support
EIGRP Internal Process States

 procinfoQ:
   1: 0x1FC6EB4C vrid:0 afi:1 as:46    tableid:0 vrfid:0 tid:0 name:virtual-name
       topo_ddbQ(1) 0x1FCC478C tableid:0 name:base
       topo_ddbQ.count: 1
   procinfoQ.count: 1

     deadQ:

      ddbQ:
       1: 0x1FCC478C name:base
      ddbQ.count: 1
 ------------------------------------------------------------

EIGRP Memory Usage:

  EIGRP Memory                 In-use Asked-For/Allocated Count  Size  Cfg/Max
  ------------------------------------------------------------------------------
  EIGRP IP pdb            :      8216      8216/8268          1  8216   --/--
  EIGRP-Core: DDB         :      2440      2440/2492          1  2440   --/--
  EIGRP-Core: Dual Events :     30000     30000/30052         1 30000   --/--
  EIGRP-Core: IIDB        :       928       928/980           1   928   --/--
  EIGRP-Core: IIDB Scratc :        24        24/76            1    24   --/--
  EIGRP-Core: Peer Handle :        76        76/180           2    38   --/--
  EIGRP-Core: Peer Sub-To :        32        32/84            1    32   --/--
  EIGRP-Core: Topology II :       104       104/156           1   104   --/--
  EIGRP-IPv4: Proto Priva :        24        24/76            1    24   --/--
  EIGRP-IPv4: Protocol In :      3464      3464/3516          1  3464   --/--
  EIGRP-IPv4: VR-Router   :        32        32/84            1    32   --/--
  EIGRP-Parser: dBase Hdr :      1740      1740/2052          6   290   --/--
  EIGRP-v4: Work Entry    :        --      4260/4728         --    60   50/71
  EIGRP: Anchor entries   :        --      7404/10052        --    12  500/617
  EIGRP: Dummy thread ent :        --      8892/10052        --    36  200/247
  EIGRP: ExtData          :        --      1320/1708         --    24   50/55
  EIGRP: Input packet hea :        --      2304/3052         --    16  100/144
  EIGRP: Large packet buf :        --     57512/65588        --  8216  100/7
  EIGRP: List Large       :        --      1332/1552         --   148    5/9
  EIGRP: List Medium      :        --      1296/1604         --    72   10/18
  EIGRP: Max packet buffe :        --     49224/65588        -- 16408    5/3
  EIGRP: Medium packet bu :        --     64856/65588        --   536  100/121
  EIGRP: Packet descripto :        --      4260/4728         --    60   50/71
  EIGRP: Queue elements   :        --     11788/13640        --    28  200/421
  EIGRP: Small Pool       :        32       624/956           2    16   32/39
  EIGRP: Small packet buf :        --      4444/5052         --    44  100/101
  EIGRP: cmd handles      :        56        56/160           2    28   --/--
  EIGRP: mgd_timer        :      1600      1600/2640         20    80   --/--
```

```
  Total                   :     48768    268252/304704       42     --    --/--

  Total allocated: 0.290 Mb, 297 Kb, 304704 bytes
-------------------------------------------------------------

EIGRP-IPv4 VR(virtual-name) Address-Family Protocol for AS(46)
 {vrid:0 afi:1 as:46 mode:3 tableid:0 vrfid:0 tid:0 name:virtual-name }

          PIDs: Hello: (no process)  PDM: (no process)
     Router-ID: 10.4.9.87
       Threads: procinfo: 0x1FC72E58   ddb: 0x1FC73050
         workQ:
         iidbQ:
 passive_iidbQ:
         peerQ:
 unicast_peerQ:
      suspendQ:
      networkQ:
 RedistStructs: src:(0)default  distflag:0x4  ipdb->pdb->mask:0x4
                count: 1
      summaryQ:
  Socket Queue: %EIGRP(ERROR): invalid socket
   Input Queue: 0/2000/0/0 (current/max/highest/drops)
       GRS/NSF: enabled    hold-timer: 240
  Active Timer: 3 min
      Distance: internal 90 external 170
      Max Path: 4
  Max Hopcount: 100
      Variance: 1
     Rib-scale: 1
    Metric Ver: 32bit
 ---------------------------------------------------------------------
```

Related Commands

Command	Description
show eigrp plugins	Displays general information including the versions of the EIGRP protocol features currently running.

show service-routing capabilities-manager

To display information about registered capabilities, use the **show service-routing capabilities-manager** command in user EXEC or privileged EXEC mode.

```
show service-routing capabilities-manager
```

Syntax Description

group *value*	(Optional) Specifies a group type; 1 (Hardware) or 2 (Software).
local	(Optional) Provides registered capabilities information for only the local router.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.1(3)S	This command was introduced.
Cisco IOS XE Release 3.4S	This command was integrated into Cisco IOS XE Release 3.4S.

Examples

The following example shows how to display information about all registered capabilities and groups 1 (Hardware) and 2 (Software):

```
Router# show service-routing capabilities-manager

Router# show service-routing capabilities-manager

Service-Routing Capabilities Manager
====================================
Registered Capabilities
=======================
Group/ID: HARDWARE/1
Service: 100:1:31343134.34333137.32000000.0
Originator: 1.1.1.1
Capability Data:
<Capabilities>
<Group Name="HARDWARE">
  <Capability Name="HostName">
    <Value>R100</Value>
  </Capability>
  <Capability Name="Platform">
    <Value>Solaris Unix (Sparc) processor</Value>
  </Capability>
  <Capability Name="MainMemorySize">
    <Value>63682Kbytes</Value>
  </Capability>
</Group>
</Capabilities>


Group/ID: SOFTWARE/2
Service: 100:2:31343134.34333137.32000000.0
Originator: 1.1.1.1
Capability Data:
<Capabilities>
```

```
<Group Name="SOFTWARE">
  <Capability Name="HostName">
    <Value>R100</Value>
  </Capability>
  <Capability Name="Software">
    <Value>Cisco IOS Software</Value>
  </Capability>
  <Capability Name="Image">
    <Value> Solaris Software (UNIX-ADVENTERPRISE-M)</Value>
  </Capability>
  <Capability Name="Version">
    <Value> Experimental Version 15.1(20110404:193816) </Value>
  </Capability>
  <Capability Name="ipmulticast">
    <Value>Subsystem Loaded</Value>
</Capability>
  <Capability Name="eigrp_ipv4">
    <Value>Subsystem Loaded</Value>
  </Capability>
  <Capability Name="eigrp_ipv6">
    <Value>Subsystem Loaded</Value>
  </Capability>
  <Capability Name="ospf">
    <Value>Subsystem Loaded</Value>
  </Capability>
  <Capability Name="ospfv3">
    <Value>Subsystem Loaded</Value>
  </Capability>
  <Capability Name="isis">
    <Value>Subsystem Loaded</Value>
  </Capability>
  <Capability Name="isis_ipv6">
    <Value>Subsystem Loaded</Value>
  </Capability>
  <Capability Name="bgp_ipv4">
    <Value>Subsystem Loaded</Value>
  </Capability>
  <Capability Name="bgp_ipv6">
    <Value>Subsystem Loaded</Value>
  </Capability>
  <Capability Name="fh_fd_ipsla">
    <Value>Subsystem Loaded</Value>
  </Capability>
  <Capability Name="service_routing">
    <Value>Subsystem Loaded</Value>
  </Capability>
</Group>
</Capabilities>
```

The following example shows how to display information for only the local router and for only group 1 (Hardware):

```
Router# show service-routing capabilities-manager group 1 local

Service-Routing Capabilities Manager
====================================

Registered Capabilities
=======================

Group/ID: HARDWARE/1
Service: 100:1:31343134.34333137.32000000.0
Originator: 1.1.1.1
```

```
Capability Data:
<Capabilities>
<Group Name="HARDWARE">
  <Capability Name="HostName">
    <Value>R100</Value>
  </Capability>
  <Capability Name="Platform">
    <Value>Solaris Unix (Sparc) processor</Value>
  </Capability>
  <Capability Name="MainMemorySize">
    <Value>63682Kbytes</Value>
  </Capability>
</Group>
</Capabilities>
```

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

Table 7: show service-routing capabilities-manager Field Descriptions

Field	Description
Group/ID	Specifies either group 1 (Hardware) or 2 (Software).
Service	Specifies the Capabilities Manager service identifier.
Originator	Specifies the originator of the service.
Capability Name	Specifies the name of the capability.

Related Commands

Command	Description
show service-routing plugins capman	Displays Capabilities Manager plugin information.
show service-routing capabilities-manager internal	Displays information about Capabilities Manager.

show service-routing capabilities-manager internal

To display information about Capabilities Manager, use the **show service-routing capabilities-manager internal** command in user EXEC or privileged EXEC mode.

```
show service-routing capabilities-manager internal
```

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.1(3)S	This command was introduced.
Cisco IOS XE Release 3.4S	This command was integrated into Cisco IOS XE Release 3.4S.

Usage Guidelines

Use the **show service-routing capabilities-manager internal** command in user or privileged EXEC mode to see a summary of the information about Cisco SAF external clients that are currently registered with the Cisco SAF system.

Examples

The following is sample output from the **show service-routing capabilities-manager internal** command.

```
Router# show service-routing capabilities-manager internal
Service-Routing Capabilities Manager
====================================
Major Version: 1  Minor Version: 0  Edit Version: 0
Reachability: 2.2.2.2:0
Local Instance GUID: 31343134-3433-3137-3200-000000000000
```

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

Table 8: show service-routing capabilities-manager internal Field Descriptions

Field	Description
Major Version	Specifies the Capabilities Manager major version.
Minor Version	Specifies the Capabilities Manager minor version.
Reachability	Specifies the Capabilities Manager reachability information.
Local Instance GUID	Specifies the instance number used by local Capabilities Manager services.

Related Commands

Command	Description
show service-routing plugins capman	Displays Capabilities Manager plugin information.

Command	Description
show service-routing capabilities-manager	Displays information about registered capabilities.

show service-routing plugins capman

To display Capabilities Manager plugin information, use the **show service-routing plugins capman** command in user EXEC or privileged EXEC mode.

```
show service-routing plugins capman [{detail}]
```

Syntax Description

detail	Not implemented. This keyword will be implemented in a future release.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.1(3)S	This command was introduced.
Cisco IOS XE Release 3.4S	This command was integrated into Cisco IOS XE Release 3.4S.

Usage Guidelines

Use the **show service-routing plugins capman** command in user or privileged EXEC mode to determine if SAF and Capabilities Manager are available. When Capabilities Manager is available, the version is also displayed.

Examples

The following example shows how to display Capabilities Manager plugin information:

```
Router# show service-routing plugins capman
Service-Routing feature plugins:::
   capman      :   1.00.00 : Cisco Capabilities Manager
```

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

Table 9: show service-routing plugins capman Field Descriptions

Field	Description
capman	Specifies the Capabilities Manager version.
Cisco Capabilities Manager	Specifies when Capabilities Manager is available on the router.

Related Commands

Command	Description
show service-routing capabilities-manager internal	Displays information about Capabilities Manager.
show service-routing capabilities-manager	Displays information about registered capabilities.

show service-routing xmcp clients

To display information about connected XMCP (Extensible Messaging Client Protocol) clients, use the **show service-routing xmcp clients** command in user EXEC or privileged EXEC mode.

```
show service-routing xmcp clients [{ ip-addresshandle}] [{detail}]
```

Syntax Description

ip-address	(Optional) IPv4 or IPv6 IP address of a single client to display.
handle	(Optional) Handle of a single client to display. A handle is a number assigned dynamically by XMCP. The number range is 1 to 1023, and is displayed in the Handle field of the display.
detail	(Optional) Displays additional information about XMCP clients.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
15.2(1)S	This command was introduced.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T.

Usage Guidelines

The **show service-routing xmcp clients** command is used to display detailed information about currently connected XMCP clients. Include an IP address to show a single client. Include the **detail** keyword to display additional information.

Examples

The following is sample output from the **show service-routing xmcp clients** command:

```
Router# show service-routing xmcp clients

XMCP Clients
Codes: A - Authenticated, T - TCP

    Handle Address                                  Port  Keepalive
AT  1      10.1.1.1                                 47519    24/30
    Client name: UCM/CM_ccmbeijing/NodeId=1/8.5.1.10000-26
 23     2001:0DB8:E123:1000:3615:9EFF:FE0B:AFA4   3478  3120/3600
    Client name: CapMan Viewer/glmatthe-mac.example.com/Mac OS X 10.6.6 (10J567)
```

The following is sample output from the **show service-routing xmcp clients detail** command:

```
Router# show service-routing xmcp clients detail

XMCP Clients
Codes: A - Authenticated, T - TCP

    Handle Address                                  Port  Keepalive
AT  1      10.1.1.2                                 47532    22/30
```

```
   Client name: UCM/CM_ccmbeijing/NodeId=1/8.5.1.10000-26
XMCP version: 1.0
Page-size: 5 (11/5 requests enqueued/awaiting response)
   Username: CUCM_CLIENT
   Socket FD: 1
   Domain: 100
   Nonce: lifetime 51/800 seconds
23     2001:0DB8:E123:1000:3615:9EFF:FE0B:AFA4   3478  3120/3600
   Client name: CapMan Viewer/glmatthe-mac.example.com/Mac OS X 10.6.6 (10J567)
XMCP version: 2.0
   Page-size: 3 (0/2 requests enqueued/awaiting response)
   Socket FD: 2
   Domain: 123
   Nonce: none
```

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

Table 10: show service-routing xmcp clients Field Descriptions

Field	Description
Codes	Indicates properties of the client. Valid codes are: • A, indicates that the client is authenticated • T, indicates that the client is connected over TCP
Handle	The service-routing client handle associated with this client.
Address	The IPv4 or IPv6 IP address from which the client has connected.
Port	The port number from which the client has connected.
Keepalive	Shows the current and maximum value of the keepalive timer associated with this client session. The timer is reset to its maximum value each time a packet is received from the client. If the keepalive reaches zero, the client session will be terminated.
Client name	Descriptive string provided by the client to identify itself.
XMCP version	Version of the XMCP protocol being used by the client.
Page-size	Maximum number of simultaneous requests that can be sent and are awaiting a response from the client.
requests enqueued/awaiting	Number of requests currently waiting to be sent and number of requests that have been sent to the client but are awaiting a response.
Username	Username in use for client authentication.
Socket FD	Internal file descriptor used to identify the socket associated with this session.
Domain	Service-routing domain with which this client is associated.
Nonce	Whether nonces are enabled for this session, and if so, the current and maximum duration (lifetime in seconds) for which a given nonce will remain valid.

Related Commands

Command	Description
service-routing xmcp listen	Defines a port on which XMCP clients can connect.

show service-routing xmcp server

To display information about the XMCP (Extensible Messaging Client Protocol) server status, use the **show service-routing xmcp server** command in user EXEC or privileged EXEC mode.

```
show  service-routing xmcp server
```

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
15.2(1)S	This command was introduced.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T.

Usage Guidelines

The **show service-routing xmcp server** command displays an overview of the XMCP server configuration and status. For more detailed information about individual XMCP client sessions, use the **show service-routing xmcp clients** command.

Examples

The following is sample output from the **show service-routing xmcp server** command:

```
Router# show service-routing xmcp server

XMCP Server listening on port 4788
  Socket descriptors: 0 (TCP/IPv4), 1 (TCP/IPv6)
  Connected clients: 1 unauthenticated, 2 total
  Maximum clients: 5 unauthenticated, 10 total
  Allow-lists: "v4nacl" (IPv4), "naclv6" (IPv6)
  Clients configured:
    Username "a", 1 client(s) connected
    Unauthenticated, 1 client(s) connected
```

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

Table 11: show service-routing xmcp server Field Descriptions

Field	Description
XMCP Server listening on port 4758	Indicates that the XMCP server is enabled, and displays the port number and name of the VRF (virtual routing and forwarding) instance (if any) with which the server is associated.
Socket descriptors	Internal socket descriptor numbers for the listen ports associated with the XMCP server.

Field	Description
Connected clients	Number of current unauthenticated client sessions and total number of all current client sessions.
Maximum clients	Client limits as defined by the **max-clients** command.
Allow-lists	Access-lists restricting clients, as defined by the **allow-list** command.
Clients configured	List of configured client authentication options as defined by the client username and client unauthenticated commands, and the number of current client sessions using each authentication.

Related Commands

Command	Description
client (XMCP)	Defines the properties of XMCP clients.
max-clients	Limits the number of concurrent XMCP client sessions.
service-routing xmcp listen	Defines a port on which XMCP clients can connect.
show service-routing xmcp clients	Displays currently connected XMCP clients.

split-horizon (EIGRP)

To enable Enhanced Interior Gateway Routing Protocol (EIGRP) split-horizon, use the **split-horizon** command in address-family interface configuration mode or service-family interface configuration mode. To disable EIGRP split-horizon, use the **no** form of this command.

split-horizon
no split-horizon

Syntax Description

This command has no arguments or keywords.

Command Default

EIGRP split-horizon is enabled by default. However, for ATM interfaces and subinterfaces **split-horizon** is disabled by default.

Command Modes

Address-family interface configuration (config-router-af-interface) Service-family interface configuration (config-router-sf-interface)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.

Usage Guidelines

The split-horizon rule prohibits a router from advertising a route through an interface that the router itself uses to reach the destination. The following are general rules for EIGRP split-horizon:

- Split-horizon behavior is turned on by default.
- When you change the EIGRP split-horizon setting on an interface, all adjacencies with EIGRP neighbors reachable over that interface are reset.
- Split-horizon should typically be disabled only on non-broadcast multi-access interfaces.
- The EIGRP split-horizon behavior is not controlled or influenced by the **ip split-horizon** command.

To configure split-horizon for an EIGRP address family, use the **split-horizon**command in address-family interface configuration mode.

To configure split-horizon for an EIGRP service family, use the **split-horizon**command in service-family interface configuration mode.

Examples

The following example disables EIGRP split-horizon for serial interface 3/0 in address-family 5400:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 5400
```

```
Router(config-router-af)# af-interface serial3/0
Router(config-router-af-interface)# no split-horizon
```

The following example disables EIGRP split-horizon for serial interface 3/0 in service-family 5400:

```
Router(config)# router eigrp virtual-name
Router(config-router)# service-family ipv4 autonomous-system 5400
Router(config-router-sf)# sf-interface serial3/0
Router(config-router-sf-interface)# no split-horizon
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
af-interface	Enters address-family interface configuration mode to configure interface-specific EIGRP commands.
router eigrp	Configures the EIGRP address-family process.
service-family ipv4	Configures commands under service-family configuration mode.
sf-interface	Configures interface-specific commands under service-family configuration mode.

timers graceful-restart purge-time

To set the graceful-restart purge-time timer to determine how long a nonstop forwarding (NSF)-aware router that is running the Enhanced Interior Gateway Routing Protocol (EIGRP) must hold routes for an inactive peer, use the **timers graceful-restart purge-time** command in router configuration, address family configuration, or service-family configuration mode. To return the graceful-restart purge-time timer to the default value, use the **no** form of this command.

timers graceful-restart purge-time *seconds*
no timers graceful-restart purge-time

Syntax Description

seconds	Time, in seconds, for which EIGRP must hold routes for an inactive peer. The range is from 20 to 300. The default is 240.

Command Default

The default graceful-restart purge-time timer is 240 seconds.

Command Modes

Router configuration (config-router)

Address family configuration (config-router-af)

Service-family configuration (config-router-sf)

Command History

Release	Modification
15.0(1)M	This command was introduced. This command replaces the **timers nsf route-hold** command.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.
Cisco IOS XE Release 3.6S	This command was modified. Support for IPv6 and IPv6 VPN Routing and Forwarding (VRF) was added.
15.2(2)S	This command was modified. Support for IPv6 and IPv6 VRF was added.
15.2(1)E	This command was integrated into Cisco IOS Release 15.2(1)E.

Usage Guidelines

The graceful-restart purge-time timer sets the maximum period of time for which the NSF-aware router must hold known routes for an NSF-capable neighbor during a switchover operation or a well-known failure condition. The graceful-restart purge-time timer is configurable so that you can tune network performance and avoid undesired effects, such as null routes if the switchover operation takes too much time. When this timer expires, the NSF-aware router scans the topology table and discards any stale routes, allowing EIGRP peers to find alternate routes instead of waiting during a long switchover operation.

Note The **timers nsf signal** command is supported only on platforms that support High Availability.

Examples

The following example shows how to set the graceful-restart purge-time timer to 60 seconds for an NSF-aware IPv4 address family:

```
Device(config)# router eigrp virtual-name
Device(config-router)# address-family ipv4 autonomous-system 1
Device(config-router-af)# timers graceful-restart purge-time 60
```

The following example shows how to set the graceful-restart purge-time timer to 300 seconds for an NSF-aware-service family configuration:

```
Device(config)# router eigrp virtual-name
Device(config-router)# service-family ipv4 autonomous-system 4533
Device(config-router-sf)# timers graceful-restart purge-time 300
```

The following example shows how to set the graceful-restart purge-time timer to 200 seconds for an NSF-aware IPv6 address family configuration:

```
Device(config)# router eigrp e1
Device(config-router)# address-family ipv6 autonomous-system 4
Device(config-router-af)# timers graceful-restart purge-time 300
```

Related Commands

Command	Description
debug eigrp address-family ipv6 notifications	Displays information about EIGRP address family IPv6 event notifications.
debug eigrp nsf	Displays notifications and information about NSF events for an EIGRP routing process.
debug ip eigrp notifications	Displays EIGRP events and notifications in the console of the router.
nsf (EIGRP)	Enables EIGRP NSF or EIGRP IPv6 NSF on an NSF-capable router.
show eigrp neighbors	Displays the neighbors discovered by EIGRP.
show ip protocols	Displays the parameters and the current state of the active routing protocol process.
show ipv6 protocols	Displays the parameters and the current state of the active IPv6 routing protocol process.
timers nsf converge	Sets the maximum time that the restarting router must wait for the end-of-table notification from an NSF-capable or NSF-aware peer.
timers nsf signal	Sets the maximum time for the initial restart period.

topology

To configure topology-specific commands for an Enhanced Interior Gateway Routing Protocol (EIGRP) service family, use the **topology**command in service-family interface configuration mode. To disable the service-family topology configuration mode, use the **no** form of this command.

topology base
no topology base

Syntax Description

base	Configures the base topology.

Command Modes

Service-family configuration (config-router-sf)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.

Usage Guidelines

Use the **topology**command to configure Cisco SAF for multitopology networks.

Note In Cisco IOS Release 15.0(1)M, only the base topology is supported.

Use the **show eigrp service-family ipv4 topology**command to verify the topology base configuration.

Examples

The following example configures the base topology:

```
Router(config)# router eigrp virtual-name
Router(config-router)# service-family ipv4 autonomous-system 4533
Router(config-router-sf)# sf-interface default
Router(config-router-sf-interface)# no shutdown
Router(config-router-sf-interface)# exit
-sf-interface
Router(config-router-sf)# topology base
```

Related Commands

Command	Description
exit-service-family	Exits service-family configuration mode.
exit sf-interface	Exits service-family interface configuration mode.

Command	Description
router eigrp	Configures the EIGRP process.
sf-interface	Configures interface-specific commands under the service-family interface configuration mode.
show eigrp service-family ipv4 topology	Displays information on EIGRP service-family IPv4 topologies.
shutdown	Disables service family on the interface.

username (SAF)

To configure username for a Cisco SAF External-Client, use the **username**command in external-client label configuration mode. To negate the username, use the **no** form of this command.

username *name*
no username *name*

Syntax Description

name	Specifies the name for the external client between 1 and 64 characters.

Command Modes

External-client label configuration (config-external-client-mode)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.
15.2(1)S	This command was deprecated in Cisco IOS Release 15.2(1)S and replaced by the client (xmcp) command.
Cisco IOS XE Release 3.5S	This command was deprecated in Cisco IOS XE Release 3.5S and replaced by the client (xmcp) command.
15.2(2)T	This command was deprecated in Cisco IOS Release 15.2(2)T and replaced by the client (xmcp) command.

Usage Guidelines

Use the **username**command to configure Cisco SAF External Clients. Entering a new username value overwrites the old value, but the new value will only take affect after the Cisco SAF External Client re-registers.

Use the **show eigrp service-family ipv4 external-client**command to verify the Cisco SAF External Client configuration.

Examples

The following example configures a Cisco SAF External Client named example:

```
Router(config)# service-family external-client listen ipv4 2444
Router(config-external-client)# external-client
 example
Router(config-external-client-mode)# username
 example
```

Related Commands

Command	Description
external-client	Configures Cisco SAF External Clients.

Command	Description
service-family external-client listen	Configures Cisco SAF External Client listen TCP ports.
show eigrp service-family ipv4 external-client	Displays information on Cisco SAF External Clients.