threshold metric through track timer

threshold metric

To set a threshold metric, use the **threshold metric** command in tracking configuration mode. To remove the threshold metric value, use the **no** form of this command.

threshold metric {**up** *number* [**down** *number*]| **down** *number* [**up** *number*]}

no threshold metric

Syntax Description

up	Specifies the up threshold. The state is up if the scaled metric for that route is less than or equal to the up threshold.
number	Threshold value. The range is from 0 to 255. The up threshold default is 254, and the down threshold default is 255.
down	Specifies the down threshold. The state is down if the scaled metric for that route is greater than or equal to the down threshold.

Command Default

No threshold metric is set.

Command Modes

Tracking configuration (config-track)

Command History

Release	Modification
12.2(15)T	This command was introduced.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(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.
15.3(3)M	This command was integrated into Cisco IOS Release 15.3(3)M.
Cisco IOS XE 3.3SE	This command was implemented in Cisco IOS XE Release 3.3SE.

Usage Guidelines This command is available only for IP-route threshold metric objects tracked by the **track ip route metric threshold** command in global configuration mode.

The default up and down threshold values are 254 and 255, respectively. With these values, IP-route threshold tracking gives the same result as IP-route reachability tracking.

Examples In the following example, the tracking process is tracking the IP-route threshold metric. The threshold metric is set to 16 for the up threshold and to 20 for the down threshold. The delay period to communicate the changes of a down event of the tracked object to the client process is set to 20 seconds.

```
Router(config)# track 1 ip route 10.22.0.0/16 metric threshold
Router(config-track)# threshold metric up 16 down 20
Router(config-track)# delay down 20
```

Related Commands

Command	Description
track ip route	Tracks the state of IP routing and enters tracking configuration mode.

track

To configure an interface to be tracked where the Gateway Load Balancing Protocol (GLBP) weighting changes based on the state of the interface, use the **track** command in global configuration mode. To remove the tracking, use the **no** form of this command.

track *object-number* **interface** *type number* {**line-protocol**| **ip routing**}

no track *object-number* **interface** *type number* {**line-protocol**| **ip routing**}

Syntax Description

object-number	Object number in the range from 1 to 1000 representing the interface to be tracked.
interface *type number*	Interface type and number to be tracked.
line-protocol	Tracks whether the interface is up.
ip routing	Tracks whether IP routing is enabled, an IP address is configured on the interface, and the interface state is up, before reporting to GLBP that the interface is up.

Command Default   The state of the interfaces is not tracked.

Command Modes   Global configuration (config)

Command History

Release	Modification
12.2(14)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
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.
15.1(3)T	This command was modified. The valid range of the *object-number* argument increased to 1000.
15.1(1)S	This command was modified. The valid range for the *object-number* argument increased to 1000.

Release	Modification
12.2(50)SY	This command was modified. The valid range for the *object-number* argument increased to 1000.
Cisco IOS XE 3.3SE	This command was implemented in Cisco IOS XE Release 3.3SE.

Usage Guidelines

Use the **track** command in conjunction with the **glbp weighting** and **glbp weighting track** commands to configure parameters for an interface to be tracked. If a tracked interface on a GLBP router goes down, the weighting for that router is reduced. If the weighting falls below a specified minimum, the router will lose its ability to act as an active GLBP virtual forwarder.

As of Cisco IOS Release 15.1(3)T, 15.1(1)S and 12.2(50)SY, a maximum of 1000 objects can be tracked. Although 1000 tracked objects can be configured, each tracked object uses CPU resources. The amount of available CPU resources on a router is dependent upon variables such as traffic load and how other protocols are configured and run. The ability to use 1000 tracked objects is dependent upon the available CPU. Testing should be conducted on site to ensure that the service works under the specific site traffic conditions.

Examples

In the following example, Fast Ethernet interface 0/0 tracks whether serial interfaces 2/0 and 3/0 are up. If either serial interface goes down, the GLBP weighting is reduced by the default value of 10. If both serial interfaces go down, the GLBP weighting will fall below the lower threshold and the router will no longer be an active forwarder. To resume its role as an active forwarder, the router must have both tracked interfaces back up, and the weighting must rise above the upper threshold.

```
Router(config)# track 1 interface serial 2/0 line-protocol
Router(config-track)# exit
Router(config)# track 2 interface serial 3/0 line-protocol
Router(config-track)# exit
Router(config)# interface FastEthernet 0/0
Router(config-if)# ip address 10.21.8.32 255.255.255.0
Router(config-if)# glbp 10 weighting 110 lower 95 upper 105
Router(config-if)# glbp 10 weighting track 1
Router(config-if)# glbp 10 weighting track 2
```

In the following example, Fast Ethernet interface 0/0 tracks whether serial interface 2/0 is enabled for IP routing, whether it is configured with an IP address, and whether the state of the interface is up. If serial interface 2/0 goes down, the GLBP weighting is reduced by a value of 20.

```
Router(config)# track 2 interface serial 2/0 ip routing
Router(config-track)# exit
Router(config)# interface FastEthernet 0/0
Router(config-if)# ip address 10.21.8.32 255.255.255.0
Router(config-if)# glbp 10 weighting 110 lower 95 upper 105
Router(config-if)# glbp 10 weighting track 2 decrement 20
```

Related Commands

Command	Description
glbp weighting	Specifies the initial weighting value of a GLBP gateway.
glbp weighting track	Specifies an object to be tracked that affects the weighting of a GLBP gateway.

track

track interface

To track an interface and to enter tracking configuration mode, use the **track interface** command in global configuration mode. To remove the tracking, use the **no** form of this command.

track *object-number* **interface** *type number* {**line-protocol**| **ip routing**| **ipv6 routing**}

no track *object-number* **interface** *type number* {**line-protocol**| **ip routing**| **ipv6 routing**}

Syntax Description

object-number	Object number that represents the interface to be tracked. The range is from 1 to 1000.
type number	Interface type and number to be tracked. No space is required between the values.
line-protocol	Tracks the state of the interface line protocol.
ip routing	Tracks whether IP routing is enabled, whether an IP address is configured on the interface, and whether the interface state is up before reporting to the tracking client that the interface is up.
ipv6 routing	Tracks whether IPv6 routing is enabled, whether an IPv6 address is configured on the interface, and whether the interface state is up before reporting to the tracking client that the interface is up.

Command Default   No interface is tracked.

Command Modes   Global configuration (config)

Command History

Release	Modification
12.2(15)T	This command was introduced.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.3(11)T	This command was enhanced to allow the tracking of an IP address on an interface that was acquired through DHCP or PPP IPCP.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(18)SXF	This command was introduced on the Supervisor Engine 720.

Release	Modification
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 integrated into Cisco IOS XE Release 2.1.
15.1(3)T	This command was modified. The valid range of the *object-number* argument increased to 1000.
15.1(1)S	This command was integrated into Cisco IOS Release 15.1(1)S.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
15.3(3)M	This command was modified. The **ipv6 routing** keyword was added.
Cisco IOS XE 3.3SE	This command was implemented in Cisco IOS XE Release 3.3SE.

Usage Guidelines

This command reports a state value to clients. A tracked IP or IPv6 routing object is considered up when the following criteria exist:

- IP or IPv6 routing is enabled and active on the interface.

- The state of the interface line protocol is up.

- The interface address is known. The address is configured or received through the Dynamic Host Configuration Protocol (DHCP) or IP Control Protocol (IPCP) negotiation.

Interface IP or IPv6 routing goes down when one of the following criteria exist:

- IP or IPv6 routing is disabled globally.

- The state of the interface line protocol is down.

- The interface address is unknown. The address is not configured or received through DHCP or IPCP negotiation.

A space is not required between the *type* and *number* values.

Tracking the IP or IPv6 routing state of an interface can be more useful in some situations than tracking the interface-line-protocol state, especially on interfaces for which IP addresses are negotiated. For example, on a serial interface that uses the Point-to-Point Protocol (PPP), the line protocol could be up, which means that Link Control Protocol negotiated successfully, but IP could be down, which means that IPCP negotiation failed.

The **track interface** command supports the tracking of an interface with an IP or IPv6 address acquired through any of the following methods:

- Conventional IP address configuration

- PPP/IPCP

- DHCP

- Unnumbered interface

Examples

In the following example, the tracking process is configured to track the IP-routing capability of serial interface 1/0:

```
Router(config)# track 1 interface serial1/0 ip routing
Router(config-track)#
```

In the following example, the tracking process is configured to track the IPv6-routing capability of a GigabitEthernet interface 1/0/0:

```
Router(config)# track 1 interface GigabitEthernet 1/0/0 ipv6 routing
Router(config-track)#
```

Related Commands

Command	Description
show track	Displays HSRP tracking information.

track ip route

To track the state of an IP route and to enter tracking configuration mode, use the **track ip route** command in global configuration mode. To remove the tracking, use the **no** form of this command.

track *object-number* {**ip**| **ipv6**} **route** *address*/*prefix-length* {**reachability**| **metric threshold**}

no track *object-number* {**ip**| **ipv6**} **route** *address*/*prefix-length* {**reachability**| **metric threshold**}

Syntax Description

object-number	Object number that represents the object to be tracked. The range is from 1 to 1000.
ip	Tracks an IP route.
ipv6	Tracks an IPv6 route.
address	IP or IPv6 subnet address to the route that is being tracked.
/prefix-length	Number of bits in the address prefix. A forward slash (/) is required.
reachability	Tracks whether the route is reachable.
metric threshold	Tracks the threshold metric. The default up threshold is 254, and the default down threshold is 255.

Command Default

The route to the subnet address is not tracked.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(15)T	This command was introduced.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(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.

Release	Modification
15.1(3)T	This command was modified. The valid range of the *object-number* argument increased to 1000.
15.1(1)S	This command was integrated into Cisco IOS Release 15.1(1)S.
12.2(50)SY	This command was integrated into Cisco IOS Release 12.2(50)SY.
15.3(3)M	This command was modified. The **ipv6** keyword was added.
Cisco IOS XE 3.3SE	This command was implemented in Cisco IOS XE Release 3.3SE.

Usage Guidelines

A tracked IP-route or IPv6-route object is considered up and reachable when a routing-table entry exists for the route and the route is not inaccessible.

To provide a common interface for tracking clients, route metric values are normalized to the range of 0 to 255, where 0 is connected and 255 is inaccessible. The resulting value is compared against threshold values to determine the tracking state as follows:

• State is up if the scaled metric for the route is less than or equal to the up threshold.

• State is down if the scaled metric for the route is greater than or equal to the down threshold.

The tracking process uses a per-protocol configurable resolution value to convert the real metric to the scaled metric. The metric value communicated to clients is always such that a lower metric value is better than a higher metric value.

Use the **threshold metric** tracking configuration command to specify a threshold metric.

As of Cisco IOS Release 15.1(3)T, 15.1(1)S, and 12.2(50)SY, a maximum of 1000 objects can be tracked. Although 1000 tracked objects can be configured, each tracked object uses CPU resources. The amount of available CPU resources on a router depends on variables such as traffic load and how other protocols are configured and run. The ability to use 1000 tracked objects depends on available CPU resources. Testing should be conducted to ensure that the service works under the specific site-traffic conditions.

Examples

In the following example, the tracking process is configured to track the reachability of 10.22.0.0/16:

```
Router(config)# track 1 ip route 10.22.0.0/16 reachability
```

In the following example, the tracking process is configured to track the threshold metric using the default threshold metric values:

```
Router(config)# track 1 ip route 10.22.0.0/16 metric threshold
```

In the following example, the tracking process is configured to track the threshold metric using the default threshold metric values for an IPv6 route:

```
Router(config)# track 2 ipv6 route 2001:DB8:0:ABCD::1/10 metric threshold
```

Related Commands

Command	Description
show track	Displays HSRP tracking information.
threshold metric	Sets a threshold metric.

track resolution

To specify resolution parameters for a tracked object, use the **track resolution** command in global configuration mode. To disable this functionality, use the **no** form of this command.

track resolution {**ip route**| **ipv6 route** | {**bgp**| **eigrp**| **isis**| **ospf**| **static**}| *resolution-value*}

no track resolution {**ip route**| **ipv6 route** | {**bgp**| **eigrp**| **isis**| **ospf**| **static**}| *resolution-value*}

Syntax Description

ip route	IP route for metric resolution for a specified track. The keywords and arguments are as follows:
	• **bgp** —BGP routing protocol. The *resolution-value* argument has a range from 256 to 40000000.
	• **eigrp** —EIGRP routing protocol. The *resolution-value* argument has a range from 256 to 40000000.
	• **isis** —ISIS routing protocol. The *resolution-value* argument has a range from 1 to 1000.
	• **ospf** —OSPF routing protocol. The *resolution-value* argument has a range from 1 to 1562.
	• **static** —Static route. The *resolution-value* argument has a range from 1 to 100000.

ipv6 route	IPv6 route for metric resolution for a specified track. The keywords and arguments are as follows: • **bgp** —BGP routing protocol. The *resolution-value* argument has a range from 256 to 40000000. The default value is 2560. • **eigrp** —EIGRP routing protocol. The *resolution-value* argument has a range from 256 to 40000000. The default value is 2560. • **isis** —ISIS routing protocol. The *resolution-value* argument has a range from 1 to 1000. The default value is 10. • **ospf** —OSPF routing protocol. The *resolution-value* argument has a range from 1 to 1562. The default value is 1. • **static** —Static route. The *resolution-value* argument has a range from 1 to 100000. The default value is 10.

Command Default   The default threshold metric values are used.

Command Modes   Global configuration (config)

Command History

Release	Modification
12.3(8)T	This command was introduced.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
15.3(3)M	This command was modified. The **ipv6 route** keyword was added.
Cisco IOS XE 3.3SE	This command was implemented in Cisco IOS XE Release 3.3SE.

Usage Guidelines   The **track ip route** command causes tracking of a route in the routing table. If a route exists in the table, the metric value is converted into a number in the range of 0 to 255. The metric resolution for the specified routing protocol is used to do the conversion. There are default values for metric resolution, but the **track resolution** command can be used to change them.

Examples   In the following example, the EIGRP routing protocol has a resolution value of 280.

```
Router(config)# track resolution ip route eigrp 280
```

Related Commands

Command	Description
show track	Displays tracking information.
threshold percentage	Specifies a threshold percentage for a tracked list.
threshold weight	Specifies a threshold weight for a tracked list.
track list threshold percentage	Specifies a percentage threshold for a tracked list.
track list threshold weight	Specifies a weight threshold for a tracked list.

track timer

To specify the interval that a tracking process polls a tracked object, use the **track timer** command in global configuration mode. To reset to the default polling interval, use the **no** form of this command.

track timer {**application**| **interface**| **ip** | {**route**| **sla**}| **ipv6 route**| **list**| **stub-object**} {*seconds*| **msec** *milliseconds*}

no track timer {**application**| **interface**| **ip** | {**route**| **sla**}| **ipv6 route**| **list**| **stub-object**} {*seconds*| **msec** *milliseconds*}

Syntax Description

application	Tracks the mobile IP application polling timer.
interface	Tracks the specified interface.
ip	Tracks the specified IP protocol.
route	Tracks the route polling timer.
sla	Tracks the route polling timer.
ipv6 route	Tracks the specified IPv6 protocol.
list	Tracks the boolean list polling timer.
stub-object	Tracks the Embedded Event Manager (EEM) stub polling timer.
seconds	Polling interval, in seconds. The range is from 1 to 3000. The default for interface polling is 1 second, and the default for IP-route polling is 15 seconds.
msec *milliseconds*	Specifies the polling interval in milliseconds. The range is 500 to 5000. All polling frequencies can be configured down to 500 milliseconds, overriding the minimum 1 second interval configured previously.

Command Default

If you do not use the **track timer** command to specify a polling interval, a tracked object will be tracked at the default polling interval, as described in the table below:

Object	Default Polling Interval (seconds)
Application	5
Interface	1

Object	Default Polling Interval (seconds)
IP route	15
IP SLA	5
IPv6 route	15
List	1
Stub-object	1

Command Modes   Global configuration (config)

Command History

Release	Modification
12.2(15)T	This command was introduced.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SRE	This command was modified. The **list** and **sla** keywords were added.
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.
15.0(1)M	This command was modified. The **application** and **msec** keywords and the *milliseconds* argument were added.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.
15.3(3)M	This command was modified. The **ipv6** keyword was added.
Cisco IOS XE 3.3SE	This command was implemented in Cisco IOS XE Release 3.3SE.

Examples   In the following example, the tracking process polls the tracked interface every 3 seconds:

```
Router# configure terminal
Router(config)# track timer interface 3
```

In the following example, the tracking process polls the tracked IPv6 route every 5 seconds:

```
Router# configure terminal
Router(config)# track timer ipv6 route 5
```