



## CHAPTER 44

# Configuring Enhanced Object Tracking

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This chapter describes how to configure enhanced object tracking on the Catalyst 3750-E or 3560-E switch. This feature provides a more complete alternative to the Hot Standby Routing Protocol (HSRP) tracking mechanism, which allows you to track the line-protocol state of an interface. If the line protocol state of an interface goes down, the HSRP priority of the interface is reduced and another HSRP device with a higher priority becomes active. The enhanced object tracking feature separates the tracking mechanism from HSRP and creates a separate, standalone tracking process that can be used by processes other than HSRP. This allows tracking other objects in addition to the interface line-protocol state. A client process, such as HSRP, can register an interest in tracking objects and request notification when the tracked object changes state. This feature increases the availability and speed of recovery of a routing system and decreases outages and outage duration.

Unless otherwise noted, the term *switch*

For more information about enhanced object tracking and the commands used to configure it, see this URL:

[http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products\\_feature\\_guide09186a00801541be.html](http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_feature_guide09186a00801541be.html)

The chapter includes these sections:

- [Understanding Enhanced Object Tracking, page 44-1](#)
- [Configuring Enhanced Object Tracking Features, page 44-2](#)
- [Monitoring Enhanced Object Tracking, page 44-12](#)

## Understanding Enhanced Object Tracking

You can also track a combination of objects in a list by using either a weight threshold or a percentage threshold to measure the state of the list. You can combine objects using Boolean logic. A tracked list with a Boolean “AND” function requires that each object in the list be in an up state for the tracked object to be up. A tracked list with a Boolean “OR” function needs only one object in the list to be in the up state for the tracked object to be up.

# Configuring Enhanced Object Tracking Features

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## Default Configuration

## Tracking Interface Line-Protocol or IP Routing State

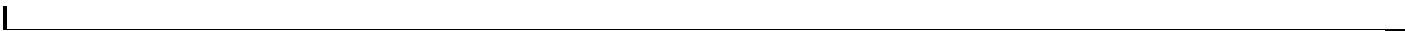
You can track either the interface line protocol state or the interface IP routing state. When you track the IP routing state, these three conditions are required for the object to be up:

- IP routing must be enabled and active on the interface.
- The interface line-protocol state must be up.
- The interface IP address must be known.

If all three of these conditions are not met, the IP routing state is down.

Beginning in privileged EXEC mode, follow these steps to track the line-protocol state or IP routing state of an interface:

	Command	Purpose
Step 1	<b>configure terminal</b>	
Step 2	<b>track</b> <i>object-number</i> <i>interface-id</i> <b>line-protocol</b>	<b>interface</b>
Step 3	<b>delay</b> { <b>up</b> <b>[down</b> ]   [                            ]            }	(Optional) Specify a period of time in seconds to delay communicating state changes of a tracked object. The range is from 1 to 180 seconds.
Step 4	<b>exit</b>	
Step 5		<ul style="list-style-type: none"> <li>•</li> <li>•</li> </ul>



	Command	Purpose
Step 6		
Step 7		
Step 8	<b>show track</b>	Verify that the specified objects are being tracked.
Step 9		

This example configures the tracking of an interface line-protocol state and verifies the configuration:

```
Switch(config)# track 33 interface gigabitethernet 1/0/1 line-protocol
Switch(config-track)# end
Switch# show track 33
Track 33
  Interface GigabitEthernet1/0/1 line-protocol
  Line protocol is Down (hw down)
    1 change, last change 00:18:28
```

## Configuring a Tracked List

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## Configuring a Tracked List with a Boolean Expression

*down* *up*

<b>and or</b>	<b>list boolean</b>	<p><b>boolean</b>—Specify the state of the tracked list based on a Boolean calculation.</p> <ul style="list-style-type: none"> <li>—Specify that the list is up if all objects are up or down if one or more objects are down.</li> <li>—Specify that the list is up if one object is up or down if all objects are down.</li> </ul>
<b>object</b>	<b>not</b>	<p><b>not</b></p> <p><b>Note</b></p>
Step 4		
Step 5		
Step 6		
Step 7		

*track-number*

```

track 4 list boolean and
      object 1
      object 2 not
exit
    
```

## Configuring a Tracked List with a Weight Threshold

<b>configure terminal</b>		
<b>track</b> <b>list threshold</b> <b>weight</b>		<b>threshold</b> <b>weight</b>
<b>object</b> <b>weight</b> <i>weight-number</i>		<i>weight-number</i>
<i>number</i> <i>number  </i> <i>number</i>		<i>number</i> <i>number</i> <i>number</i> <i>number</i>
<i>seconds</i> <i>seconds</i> <i>seconds</i> <i>seconds</i>		
<i>object-number</i>		

```
object 1 weight 15
object 2 weight 20
object 3 weight 30
threshold weight up 30 down 10
exit
```

down 10

## Configuring a Tracked List with a Percentage Threshold

Command	Purpose
Step 1	
Step 2	<ul style="list-style-type: none"><li data-bbox="646 716 662 737">•</li><li data-bbox="646 758 662 779">•</li></ul>
Step 3	<b>Note</b>
Step 4	<ul style="list-style-type: none"><li data-bbox="646 942 662 963">•</li><li data-bbox="646 984 662 1005">•</li></ul>
Step 5	
Step 6	
Step 7	
Step 8	

## Configuring HSRP Object Tracking

Command	Purpose
Step 1	
Step 2	
<b>routing}   ip route</b> <i>ip-address/prefix-length</i>	<p data-bbox="769 569 932 598"><i>object-number</i></p> <p data-bbox="899 617 1029 646"><i>interface-id</i></p> <p data-bbox="886 737 1154 766"><i>ip-address/prefix-length</i></p> <p data-bbox="732 989 748 1010">-</p> <p data-bbox="732 1062 748 1083">-</p> <p data-bbox="732 1136 748 1157">-</p> <p data-bbox="719 1451 1511 1514">which HSRP is being enabled. The range is 0 to 255; the default is 0. If there is only one HSRP group, you do not need to enter a group number.</p> <p data-bbox="719 1528 1511 1650">(Optional on all but one interface) —Specify the virtual IP address of the hot standby router interface. You must enter the virtual IP address for at least one of the interfaces; it can be learned on the other interfaces.</p> <p data-bbox="719 1671 1495 1755">(Optional) —Specify that the IP address is a secondary hot standby router interface. If this keyword is omitted, the configured address is the primary IP address.</p>

<b>standby</b>	<b>track</b>	
<b>decrement</b>		<i>group-number</i>
<i>priority-decrement</i>		<i>object-number</i>
		<i>priority-decrement</i>

## Configuring Other Tracking Characteristics

- - - track ip route metric threshold**
    - track resolution**
    - track timer**
  - show track**





```
Latest operation return code: over threshold
Latest RTT (milliseconds) 4
Tracked by:
  HSRP Ethernet0/1 3
```

```
Switch(config)# track 3 500 reachability
Switch(config)# end
Switch# show track 3
Track 3
  Response Time Reporter 1 reachability
  Reachability is Up
    1 change, last change 00:00:47
  Latest operation return code: over threshold
  Latest RTT (milliseconds) 4
  Tracked by:
    HSRP Ethernet0/1 3
```

## Configuring Static Routing Support

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Step 1

Step 2

Step 3

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## Configuring a Primary Interface

	Command	Purpose
Step 1		
Step 2		

	Command	Purpose
Step 3		
Step 4	secondary]	
Step 5	exit	

	Command	Purpose
Step 1	configure terminal	
Step 2	interface	
Step 3	description	
Step 4	ip dhcp client route track	
Step 5	ip address dhcp	
Step 6	exit	

## Configuring a Cisco IP SLAs Monitoring Agent and Track Object

Step 1	configure terminal	
Step 2	ip sla	
Step 3	icmp-echo source- ipaddr source-interface	
Step 4	timeout	
Step 5	frequency	
	threshold	
	exit	
	ip sla schedule                      life forever                      start-time pending now after                      ageout recurring	
Step 9	track                      rtr state reachability	
Step 10		

Step 11

Step 12

## Configuring a Routing Policy and Default Route

Step 1

Step 2

Step 3

*sequence-number*

match ip address {

set ip next-hop dynamic dhcp

set interface

exit

ip local policy route-map

ip route

permanent | track

track

end

show ip route track table

copy running-config startup-config

For configuration examples, see this URL:

[http://www.cisco.com/en/US/docs/ios/12\\_3/12\\_3x/12\\_3xe/feature/guide/dbackupx.html](http://www.cisco.com/en/US/docs/ios/12_3/12_3x/12_3xe/feature/guide/dbackupx.html)

## Monitoring Enhanced Object Tracking



