



Cisco Nexus 3000 Series NX-OS Unicast Routing Command Reference

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Preface

This preface describes the audience, organization, and conventions of the *Cisco Nexus 3000 Series NX-OS Unicast Routing Command Reference*. It also provides information on how to obtain related documentation.

This preface includes the following sections:

- [Audience, page 15](#)
- [Document Conventions, page 15](#)
- [Related Documentation, page 16](#)
- [Obtaining Documentation and Submitting a Service Request, page 17](#)

Audience

This publication is for experienced network administrators who configure and maintain Cisco Nexus Series switches.

Document Conventions

Command descriptions use these conventions:

Convention	Description
boldface font	Commands and keywords are in boldface.
italic font	Arguments for which you supply values are in italics.
[]	Elements in square brackets are optional.
[x y z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Screen examples use these conventions:

<code>screen font</code>	Terminal sessions and information that the switch displays are in screen font.
boldface screen font	Information that you must enter is in boldface screen font.
<i>italic screen font</i>	Arguments for which you supply values are in italic screen font.
< >	Nonprinting characters, such as passwords, are in angle brackets.
[]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

This document uses the following conventions:



Note

Means reader *take note*. Notes contain helpful suggestions or references to material not covered in the manual.



Caution

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Related Documentation

Documentation for the Cisco Nexus 3000 Series Switch is available at the following URL:

http://www.cisco.com/en/US/products/ps11541/tsd_products_support_series_home.html

The documentation set is divided into the following categories:

Release Notes

The release notes are available at the following URL:

http://www.cisco.com/en/US/products/ps11541/prod_release_notes_list.html

Installation and Upgrade Guides

The installation and upgrade guides are available at the following URL:

http://www.cisco.com/en/US/products/ps11541/prod_installation_guides_list.html

Command References

The command references are available at the following URL:

http://www.cisco.com/en/US/products/ps11541/prod_command_reference_list.html

Technical References

The technical references are available at the following URL:

http://www.cisco.com/en/US/products/ps11541/prod_technical_reference_list.html

Configuration Guides

The configuration guides are available at the following URL:

http://www.cisco.com/en/US/products/ps11541/products_installation_and_configuration_guides_list.html

Error and System Messages

The system message reference guide is available at the following URL:

http://www.cisco.com/en/US/products/ps11541/products_system_message_guides_list.html

Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, please send your comments to nexus3k-docfeedback@cisco.com. We appreciate your feedback.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see *[What's New in Cisco Product Documentation](#)*.

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New and Changed Information

This chapter provides release-specific information for each new and changed feature in the *Cisco Nexus 3000 Series NX-OS Unicast Routing Command Reference*. The latest version of this document is available at the following Cisco website:

http://www.cisco.com/en/US/products/ps11541/tsd_products_support_series_home.html

To check for additional information about this Cisco NX-OS Release, see the *Cisco Nexus 3000 Series Switch Release Notes* available at the following Cisco website:

http://www.cisco.com/en/US/products/ps11541/prod_release_notes_list.html

Table 1 summarizes the new and changed features for Cisco NX-OS Releases 5.x and 6.x and tells you where they are documented.

Table 1 *New and Changed Information*

Feature	Description	Changed in Release	Where Documented
match ip address prefix-list	This command displays the message “invalid command.”	7.0(3)I2(1)	match ip address
BGP	Added the ability to configure the interval after which a BGP connection can reconnect.	6.0(2)U4(1)	reconnect-interval (BGP)
BGP	Added the ability to delay route deletion from the hardware.	6.0(2)U4(1)	route delete dampen interval
BGP	Added the ability to configure BGP prefix peering wait timers.	6.0(2)U4(1)	timers prefix-peer-wait
BGP	Added the ability to configure BGP to shrink ECMP groups in an accelerated way when a session goes down.	6.0(2)U4(1)	neighbor-down
BGP	Added the ability to configure a minimum route advertisement interval (MRAI) between the sending of BGP routing updates.	6.0(2)U4(1)	advertisement-interval (BGP)
BGP	Added the ability to advertise newly learned BGP routes (IPv4 and IPv6) only after these routes are confirmed by the Forwarding Information Base (FIB) and programmed in the hardware.	6.0(2)U4(1)	suppress-fib-pending

Table 1 **New and Changed Information**

Feature	Description	Changed in Release	Where Documented
BFD	Added support for BFD with IPv6	6.0(2)U4(1)	bfd interval ipv6 route ipv6 route static bfd bfd echo-rx-interval bfd slow-timer
BGP	Added support for RFC 5549	6.0(2)U4(1)	ip forward
Prefix Matching	Added support for masks for prefix lists.	6.0(2)U3(1)	ip prefix-list
ECMP Recovery	Added this feature.	6.0(2)U3(1)	hardware profile ecmp auto-recovery threshold
Policy-Based Routing	Added this feature.	6.0(2)U2(1)	feature pbr ip policy route-map
hardware profile ucast6 lpm-65-to-127-max-lim it command	Added this command to reserve unicast IPv6 entries of mask length 65 to 127 for the LPM table.	6.0(2)U2(1)	hardware profile ecmp auto-recovery threshold
hardware profile unicast enable-host-ecmp	Added new options to retain ARP and ND routes in the host table.	6.0(2)U2(1)	hardware profile unicast enable-host-ecmp
remove-private-as command	Added new options for the command to remove private AS numbers from the AS-path.	6.0(2)U2(1)	remove-private-as
Interface IP Address for ICMP Source IP Field command	Added the command to configure the interface IP address for the ICMP source IP field.	6.0(2)U2(1)	ip source
Disabling BGP Dampening with Redistribution command	Added the command to configure BGP dampening for redistributed routes.	6.0(2)U2(1)	dampen-igp-metric
eBGP Next Hop Unchanged command	Added the eBGP Next Hop Unchanged command.	6.0(2)U2(1)	set ip next-hop unchanged
BGP Additional Path commands	Added description for several new commands in support of BGP Additional Path features.	6.0(2)U1(1)	additional-paths receive additional-paths selection additional-paths send capability additional-paths receive capability additional-paths send set path-selection all advertise
Show bfd commands	Changed applicable mode from any mode to exec mode to comply with Release 6.0(2)U1(1) restrictions.	6.0(2)U1(1)	show bfd neighbors

Table 1 **New and Changed Information**

Feature	Description	Changed in Release	Where Documented
ECMP for host route	Added the ability to enable or disable ECMP separately for IPv4 host routes or IPv6 host routes.	5.0(3)U5(1d)	hardware profile ucast6 max-limit
ECMP Routing Hash	Added support for load-balancing hash for a specific flow.	5.0(3)U5(1)	hardware ecmp hash-offset show routing hash
AS Peer reflection	This feature was introduced.	5.0(3)U5(1)	disable-peer-as-check
BFD for static routes	This feature was introduced.	5.0(3)U4(1)	ip route static bfd
Syslog Thresholds for System Resources	This feature was introduced.	5.0(3)U3(2)	hardware profile unicast syslog-threshold ip arp syslog-threshold
BFD for OSPF	This feature was introduced.	5.0(3)U3(1)	bfd (OSPF)
IPv6 Support	This feature was introduced. Updated the hardware profile tcam region command.	5.0(3)U3(1)	address-family ipv6 unicast area filter-list (OSPFv3) hardware profile ecmp auto-recovery threshold ipv6 nd show ipv6 nd interface
Next Hop Self Support for BGP Route Reflector Clients	This feature was introduced.	5.0(3)U3(1)	set ip next-hop peer-address
Support for switched virtual interface (SVI) counters	This feature was introduced.	5.0(3)U3(1)	show interface vlan counter show vlan id counter
ECMP for host routes	This feature was introduced.	5.0(3)U2(2)	hardware profile ucast6 max-limit
Bidirectional Forwarding Detection (BFD) for the Border Gateway Protocol (BGP)	This feature was introduced.	5.0(3)U2(2)	bfd bfd echo-rx-interval bfd interval bfd ipv4 bfd optimize subinterfaces bfd slow-timer feature bfd ip redirects show bfd neighbors show running-config bfd show startup-config bfd

Table 1 **New and Changed Information**

Feature	Description	Changed in Release	Where Documented
IP Glean Throttle	This feature was introduced.	5.0(3)U2(1)	hardware ip glean throttle hardware ip glean throttle maximum hardware ip glean throttle syslog hardware ip glean throttle timeout
BGP multipath advertisements from different autonomous systems	The bestpath as-path multipath-relax (BGP) command was added.	5.0(3)U1(2)	bestpath all-paths-ecmp
Virtual forwarding and routing (VRF)	This feature was introduced. You can configure VRF, VRF-lite features, and the IP features for a VRF.	5.0(3)U1(1)	vrf vrf context (Layer 2) vrf context (Layer 3) vrf member
Unicast Routing	This feature was introduced. The following Layer 3 unicast routing features are supported in this release: <ul style="list-style-type: none"> • Internet Protocol version 4 (IPv4) • Open Shortest Path First version 2 (OSPFv2) • Enhanced Interior Gateway Routing Protocol (EIGRP) • Border Gateway Protocol (BGP) • Routing Information Protocol (RIP) • Unicast Routing Information Base (RIB) and Forwarding Information Base (FIB) • Hot Standby Router Protocol (HSRP) • Virtual Router Redundancy Protocol (VRRP) • Static routing • Layer 3 virtualization • Route Policy Manager • Object tracking You can also Unicast Reverse Path Forwarding (Unicast RPF) on an interface.	5.0(3)U1(1)	Unicast Routing Commands Unicast Routing Show Commands



Unicast Routing Commands

This chapter describes the Cisco NX-OS unicast routing commands available on Cisco Nexus 3000 Series switches.

additional-paths receive

To enable BGP additional paths for a prefix to be received from a capable peer, use the **additional-paths receive** command in address family configuration mode. To disable receiving additional-path capability for the address family, use the **no** form of this command.

additional-paths receive

no additional-paths receive

Syntax Description

This command has no arguments or keywords.

Command Default

Capability of receiving additional paths is disabled for address family.

Command Modes

Address family configuration (config-router-af)
VRF Neighbor address family configuration
Neighbor VPN address family configuration
Neighbor IPv6 labeled-unicast address-family configuration

Command History

Release	Modification
6.0(2)U1(1)	This command was introduced.

Usage Guidelines

The **additional-paths receive** command enables the additional path receive capability for an address family, after successful negotiation with a neighbor. The ability to send and receive additional paths is negotiated between two BGP neighbors during session establishment.

This command controls whether the local device can receive additional paths from all neighbors within an address family. This capability applies to all neighbors under the specified address family unless the capability is explicitly disabled with the **neighbor additional-paths receive disable** command, which overrides the configuration for the address family or template.

Use the **show ip bgp neighbors** command to display whether neighbors are capable of sending or receiving additional paths. Use the **show ip bgp** command with a network address to display the path selections, path IDs, and the capabilities for advertising and receiving additional paths.

Examples

In the following example, BGP negotiates with all neighbors in the IPv6 unicast address family to send and receive additional paths:

```
switch (config)# router bgp 65000
switch (config-router)# address-family ipv6 unicast
switch (config-router-af)# additional-paths send
switch (config-router-af)# additional-paths receive
```

In the following example, the send and receive capability of the neighbor overrides the receive-only capability of the address family:

```
switch (config)# router bgp 65000
switch (config-router)# address-family ipv6 unicast
switch (config-router-af)# additional-paths receive
switch (config-router-af)# additional-paths selection route-map add_path4
switch (config-router-af)# neighbor 2001:db8::1037
switch (config-router-neighbor)# address-family ipv6 unicast
switch (config-router-neighbor-af)# capability additional-paths send
switch (config-router-neighbor-af)# capability additional-paths receive
```

Related Commands

Command	Description
additional-paths send	Enables BGP additional paths for a prefix to be sent to a capable peer.
capability additional-paths receive	Configures the receive additional paths capability for the specified neighbor.
show ip bgp	Displays information about BGP networks, including path selections and path IDs.
show ip bgp neighbors	Displays information about the TCP and BGP connections to neighbors.

additional-paths selection

To enable additional paths selection capability for a prefix, use the **additional-paths selection** command in address family configuration mode. To disable configuring additional paths selection for a prefix, use the **no** form of this command.

additional-paths selection route-map *map-name*

no additional-paths selection route-map *map-name*

Syntax Description

This command has no arguments or keywords.

Command Default

Additional paths selection capability is disabled.

Command Modes

Address family configuration (config-router-af)
VRF address family configuration
VPN address family configuration
IPv6 labeled-unicast address-family configuration

Command History

Release	Modification
6.0(2)U1(1)	This command was introduced.

Usage Guidelines

Use the **additional-paths selection** command to enable additional paths selection mode for some or all prefixes. Specify an appropriate route map to calculate backup paths and to enable Prefix Independent Convergence (PIC) functionality. You can optionally configure the **set path-selection all advertise** command in the route map to advertise all.

Examples

The following example shows how to enable the selection of additional paths:

```
switch (config)# router bgp 65000
switch (config-router)# address-family ipv6 unicast
switch (config-router-af)# additional-paths receive
switch (config-router-af)# additional-paths selection route-map add_path4
switch (config-router-af)# neighbor 2001:DB8::1037!
switch (config-router-neighbor)# route-map add_path4 permit 10
switch (config-router-neighbor)# set path-selection all advertise
```

Related Commands	Command	Description
	set path-selection all advertise	Advertises all BGP paths as additional paths to peers if the receive capability is enabled.
	show ip bgp	Displays information about BGP networks, including path selections and path IDs.
	show ip bgp neighbors	Displays information about the TCP and BGP connections to neighbors.

additional-paths send

To enable BGP additional paths for a prefix to be sent to a capable peer, use the **additional-paths send** command in address family configuration mode. To disable the sending of additional-paths for the address family, use the **no** form of this command.

additional-paths send

no additional-paths send

Syntax Description

This command has no arguments or keywords.

Command Default

Capability of sending additional paths is disabled for address family.

Command Modes

Address family configuration (config-router-af)
VRF Neighbor address family configuration
Neighbor VPN address family configuration
Neighbor IPv6 labeled-unicast address-family configuration

Command History

Release	Modification
6.0(2)U1(1)	This command was introduced.

Usage Guidelines

The **additional-paths send** command enables the additional path send capability for an address family, after successful negotiation with a neighbor. The ability to send and receive additional paths is negotiated between two BGP neighbors during session establishment.

This command controls whether the local device can send additional paths to all neighbors within an address family. This capability applies to all neighbors under the specified address family unless the capability is explicitly disabled with the **capability additional-paths send disable** command, which overrides the configuration for the address family or template.

Use the **show ip bgp neighbors** command to display whether neighbors are capable of sending or receiving additional paths. Use the **show ip bgp** command with a network address to display the path selections, path IDs, and the capabilities for advertising and receiving additional paths.

Examples

In the following example, BGP negotiates with each neighbor in the IPv6 unicast address family to send and receive additional paths:

```
switch# configure terminal
switch (config)# router bgp 65000
switch (config-router)# address-family ipv6 unicast
switch (config-router-af)# additional-paths send
```

In the following example, the send and receive capability of the neighbor overrides the send-only capability of the address family:

```
switch# configure terminal
switch (config)# router bgp 65000
switch (config-router)# address-family ipv6 unicast
switch (config-router-af)# additional-paths send
switch (config-router-af)# additional-paths selection route-map add_path4
switch (config-router-af)# neighbor 2001:db8::1037
switch (config-router-neighbor)# address-family ipv6 unicast
switch (config-router-neighbor-af)# capability additional-paths send
switch (config-router-neighbor-af)# capability additional-paths receive
```

Related Commands

Command	Description
additional-paths receive	Enables BGP additional paths for a prefix to be received from a capable peer.
capability additional-paths send	Configures the send additional paths capability for the specified neighbor.
show ip bgp	Displays information about BGP networks, including path selections and path IDs.
show ip bgp neighbors	Displays information about the TCP and BGP connections to neighbors.

address (VRRP)

To add a single, primary IP address to a virtual router, use the **address** command. To remove an IP address from a virtual router, use the **no** form of this command.

```
address ip-address [secondary]

no address [ip-address [secondary]]
```

Syntax Description	<i>ip-address</i>	Virtual router address (IPv4). This address should be in the same subnet as the interface IP address.
	secondary	(Optional) Specifies a secondary virtual router address.

Command Default	None
-----------------	------

Command Modes	VRRP configuration mode
---------------	-------------------------

Command History	Release	Modified
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

You can configure one virtual router IP address for a virtual router. If the configured IP address is the same as the interface IP address, this switch automatically owns the IP address. You can configure an IPv4 address only.

The master VRRP router drops the packets addressed to the virtual router's IP address because the virtual router is only intended as a next-hop router to forward packets. In NX-OS devices, some applications require that packets addressed to the virtual router's IP address be accepted and delivered. By using the **secondary** option to the virtual router IPv4 address, the VRRP router will accept these packets when it is the master.

This command requires the LAN Base Services license.

Examples This example shows how to configure a virtual router IP address:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# vrrp 250
switch(config-if-vrrp)# address 10.0.0.10
```

This example shows how to remove all the IP addresses (primary and secondary) using a single command:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# vrrp 250
```



```
switch(config-if-vrrp)# no address  
switch(config-if-vrrp)# show running-config interface ethernet 9/10
```

Related Commands

Command	Description
clear vrrp	Clears all the software counters for the specified virtual router.
show vrrp	Displays VRRP configuration information.
vrrp	Configures a VRRP group.

address-family ipv6 unicast

To enter IPv6 unicast address family mode, use the **address-family ipv6 unicast** command.

address-family ipv6 unicast

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Router configuration mode

Command History	Release	Modification
	5.0(3)U3(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how enter IPv6 unicast address family mode:

```
switch# configure terminal
switch(config)# router ospfv 1234
switch(config-router)# neighbor 2001:DB8:0:1::55 remote-as 64496
switch(config-router-neighbor)# address-family ipv6 unicast
switch(config-router-af)# next-hop-self
```

Related Commands	Command	Description
	area filter-list (OSPFv3)	Filters prefixes advertised in type 3 link-state advertisements (LSAs) between Open Shortest Path First (OSPF) areas of an Area Border Router (ABR).

address-family (BGP neighbor)

To enter the neighbor address family mode address-family mode and configure submode commands for the Border Gateway Protocol (BGP), use the **address-family** command. To disable the address family submode for configuring routing protocols, use the **no** form of this command.

address-family ipv4 { multicast | unicast }

no address-family ipv4 { multicast | unicast }

Syntax Description

ipv4	Specifies the IPv4 address family.
multicast	Specifies multicast address support.
unicast	Specifies unicast address support.

Command Default

This command has no default settings.

Command Modes

Neighbor configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **address-family** command to enter various address family configuration modes while configuring BGP routing. When you enter the **address-family** command from neighbor configuration mode, you enable the neighbor address family and enter the neighbor address family configuration mode. The prompt changes to `switch(config-router-neighbor-af)#`.

You must configure the address families if you are using route redistribution, load balancing, and other advanced features. IPv4 neighbor sessions support IPv4 unicast and multicast address families.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to activate IPv4 multicast for neighbor 192.0.2.1 and place the device in neighbor address family configuration mode for the IPv4 multicast address family:

```
switch# configure terminal
switch(config)# feature bgp
switch(config)# router bgp 64496
switch(config-router)# neighbor 192.0.2.1 remote-as 64496
switch(config-router-neighbor)# address-family ipv4 multicast
switch(config-router-neighbor-af)
```

Related Commands	Command	Description
	advertise-map	Configures BGP conditional advertisement.
	default-originate (BGP)	Configures a BGP routing process to distribute a default route.
	feature bgp	Enables BGP configuration.
	maximum-prefix	Controls how many prefixes can be received from a neighbor.
	route-reflector-client	Configures the router as a BGP route reflector.
	soft-reconfiguration inbound always	Configures the switch software to start storing BGP peer updates.
	suppress-inactive	Advertises only active routes to peer.

address-family (BGP router)

To enter the address family mode or a virtual routing and forwarding (VRF) address-family mode and configure submode commands for the Border Gateway Protocol (BGP), use the **address-family** command. To disable the address family submode for configuring routing protocols, use the **no** form of this command.

address-family ipv4 {multicast | unicast}

no address-family ipv4 {multicast | unicast}

Syntax Description	ipv4	Specifies the IPv4 address family.
	multicast	Specifies multicast address support.
	unicast	Specifies unicast address support.

Command Default	This command has no default settings.
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Command Modes	Router configuration mode VRF configuration mode
---------------	---

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Use the address-family command to enter various address family configuration modes while configuring BGP routing. When you enter the address-family command from router configuration mode, you enable the address family and enter global address family configuration mode. The prompt changes to <code>switch(config-router-af)#</code> .
------------------	--

You must configure the address families if you are using route redistribution, address aggregation, load balancing, and other advanced features. IPv4 neighbor sessions support IPv4 unicast and multicast address families.

This command requires the LAN Enterprise Services license.

Examples	This example shows how to place the router in global address family configuration mode for the IPv4 unicast address family:
----------	---

```
switch# configure terminal
switch(config)# feature bgp
switch(config)# router bgp 64496
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)#
```

Related Commands	Command	Description
	aggregate-address	Configures BGP summary addresses.
	client-to-client reflection	Configures route reflection.
	dampening	Configures route flap dampening.
	default-metric (BGP)	Configures the default metric for routes redistributed into BGP.
	distance (BGP)	Configures the administrative distance.
	feature bgp	Enables BGP configuration.
	maximum-paths (BGP)	Configures the maximum number of equal-cost paths.
	network	Configures an IP prefix to advertise.
	nexthop route-map	Configures route policy filtering for next hops.
	nexthop trigger-delay	Configures the BGP delay for triggering next-hop calculations.
	redistribute (BGP)	Configures route redistribution for BGP.
	suppress-inactive	Advertises active routes to a BGP peer.
	timers (BGP)	Configures the BGP timers.

address-family (EIGRP)

To configure an address family for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **address-family** command. To remove an address family, use the **no** form of this command.

address-family ipv4 unicast

no address-family ipv4 unicast

Syntax Description	<table> <tr> <td>ipv4</td><td>Specifies the IPv4 address family.</td></tr> <tr> <td>unicast</td><td>Specifies unicast address support.</td></tr> </table>	ipv4	Specifies the IPv4 address family.	unicast	Specifies unicast address support.														
ipv4	Specifies the IPv4 address family.																		
unicast	Specifies unicast address support.																		
Command Default	None																		
Command Modes	Router configuration mode Address family configuration mode																		
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr> </table>	Release	Modification	5.0(3)U1(1)	This command was introduced.														
Release	Modification																		
5.0(3)U1(1)	This command was introduced.																		
Usage Guidelines	This command requires the LAN Base Services license.																		
Examples	<p>This example shows how to set the IPv4 unicast address family for an EIGRP instance:</p> <pre> switch# configure terminal switch(config)# router eigrp 201 switch(config-router)# address-family ipv4 unicast switch(config-router)# </pre>																		
Related Commands	<table> <tr> <th>Command</th><th>Description</th></tr> <tr> <td>default-information</td><td>Controls the distribution of a default route.</td></tr> <tr> <td>default-metric</td><td>Configures the default metric for routes redistributed into EIGRP.</td></tr> <tr> <td>distance</td><td>Configures the administrative distance.</td></tr> <tr> <td>maximum-paths</td><td>Configures the maximum number of equal-cost paths.</td></tr> <tr> <td>redistribute</td><td>Configures route redistribution for EIGRP.</td></tr> <tr> <td>router-id</td><td>Configures the router ID.</td></tr> <tr> <td>show ip eigrp</td><td>Displays EIGRP information.</td></tr> <tr> <td>timers</td><td>Configures the EIGRP timers.</td></tr> </table>	Command	Description	default-information	Controls the distribution of a default route.	default-metric	Configures the default metric for routes redistributed into EIGRP.	distance	Configures the administrative distance.	maximum-paths	Configures the maximum number of equal-cost paths.	redistribute	Configures route redistribution for EIGRP.	router-id	Configures the router ID.	show ip eigrp	Displays EIGRP information.	timers	Configures the EIGRP timers.
Command	Description																		
default-information	Controls the distribution of a default route.																		
default-metric	Configures the default metric for routes redistributed into EIGRP.																		
distance	Configures the administrative distance.																		
maximum-paths	Configures the maximum number of equal-cost paths.																		
redistribute	Configures route redistribution for EIGRP.																		
router-id	Configures the router ID.																		
show ip eigrp	Displays EIGRP information.																		
timers	Configures the EIGRP timers.																		

address-family (RIP)

To configure an address family for the Routing Information Protocol (RIP), use the **address-family** command in router configuration mode.

address-family ipv4 unicast

Syntax Description

ipv4	Specifies the IPv4 address family.
unicast	Specifies unicast address support.

Command Default

This command has no default settings.

Command Modes

Router configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to set the IPv4 unicast address family for a RIP instance:

```
switch# configure terminal
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router)#
```

Related Commands

Command	Description
default-information	Controls the distribution of a default route.
default-metric	Configures the default metric for routes redistributed into RIP.
distance	Configures the administrative distance.
maximum-paths	Configures the maximum number of equal-cost paths.
redistribute	Configures route redistribution for RIP.
show ip rip	Displays a summary of RIP information for all RIP instances.
timers	Configures the RIP timers.

advertise-map (BGP)

To configure Border Gateway Protocol (BGP) conditional advertisement, use the **advertise-map** command. To remove BGP conditional advertisement, use the **no** form of this command.

advertise-map *adv-map* { **exist-map** *exist-rmap* | **non-exist-map** *nonexist-rmap* }

Syntax Description

adv-map	Route map with match statements that the route must pass before BGP passes the route to the next route map. The <i>adv-map</i> is a case-sensitive, alphanumeric string up to 63 characters.
exist-map <i>exist-rmap</i>	Specifies a route map with match statements for a prefix list. A prefix in the BGP table must match a prefix in the prefix list before BGP will advertise the route. The <i>exist-rmap</i> is a case-sensitive, alphanumeric string up to 63 characters.
non-exist-map <i>nonexist-rmap</i>	Specifies a route map with match statements for a prefix list. A prefix in the BGP table must not match a prefix in the prefix list before BGP will advertise the route. The <i>nonexist-rmap</i> is a case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

BGP neighbor address-family command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **advertise-map** command to conditionally advertise selected routes. The routes or prefixes that BGP conditionally advertises are defined in two route maps, the *adv-map* and an *exist-map* or *nonexist-map*. The *exist-map* or *nonexist-map* specifies the prefix that the BGP tracks. The *adv-map* specifies the prefix that BGP advertises to the specified neighbor when the condition is met.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure BGP conditional advertisement:

```
switch# configure terminal
switch(config)# router bgp 65536
switch(config-router)# neighbor 192.0.2.2 remote-as 65537
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# advertise-map advertise exist-map exist
switch(config-router-neighbor-af)# exit
switch(config-router-neighbor)# exit
switch(config-router)# exit
switch(config)# route-map advertise
switch(config-route-map)# match as-path pathList
switch(config-route-map)# exit
switch(config)# route-map exit
switch(config-route-map)# match ip address prefix-list plist
```

■ advertise-map (BGP)

```
switch(config-route-map)# exit  
switch(config)# ip prefix-list plist permit 209.165.201.0/27  
switch(config)#
```

Related Commands	Command	Description
	feature bgp	Enables BGP.
	neighbor	Configures a BGP peer.
	show ip bgp	Displays BGP configuration information.

advertisement-interval (BGP)

To specify the time interval between the advertisement of Border Gateway Protocol (BGP) routing updates, use the **advertisement-interval** command. To return to the default interval value of 1 second, use the **no** form of this command.

advertisement-interval *seconds*

no advertisement-interval [*seconds*]

Syntax Description

seconds

Number of seconds between announcements of new route updates.



Note

This interval does not apply to route withdrawal announcements, which must be made immediately.

The range is from 1 to 600 seconds.

Command Default

None

Command Modes

Address-family configuration mode

Command History

Release	Modified
6.0(2)U4(1)	This command was introduced.

Usage Guidelines

You can configure a minimum route advertisement interval (MRAI) between the sending of BGP routing updates by using the **advertisement-interval** command. Instead of announcing route updates as soon as they are triggered, BGP waits for the advertisement interval to expire before sending out the update. If there are other changes that happen during this interval, BGP can announce all these changes efficiently.

This delay timer is configured only for new route announcements and not for route withdrawal announcements. Route withdrawals must be announced immediately.

Examples

This example shows how to configure an update announcement delay timer:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# neighbor 192.0.2.0/8 remote-as route-map BGPpeers
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# advertisement-interval 300
```

Related Commands

Command	Description
address-family	Enters the address family configuration mode for BGP.

advertisement-interval (VRRP)

To specify the time interval between the advertisement packets that are being sent to other Virtual Router Redundancy Protocol (VRRP) routers in the same group, use the **advertisement-interval** command. To return to the default interval value of 1 second, use the **no** form of this command.

advertisement-interval *seconds*

no advertisement-interval [*seconds*]

Syntax Description	<i>seconds</i>	Number of seconds between advertisement frames being sent. For IPv4, the range is from 1 to 255 seconds.
---------------------------	----------------	--

Command Default	1 second
------------------------	----------

Command Modes	VRRP configuration mode
----------------------	-------------------------

Command History	Release	Modified
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	VRRP advertisements communicate the priority and state of the virtual router master. The advertisements are encapsulated in IP packets and are sent to the IPv4 multicast address that is assigned to the VRRP group.
-------------------------	---

VRRP uses a dedicated Internet Assigned Numbers Authority (IANA) standard multicast address (224.0.0.18) for VRRP advertisements. This addressing scheme minimizes the number of routers that must service the multicasts and allows test equipment to accurately identify VRRP packets on a segment. The IANA-assigned VRRP IP protocol number is 112.

This command does not require a license.

Examples	This example shows how to specify an advertisement interval of 200 seconds for VRRP group 250:
-----------------	--

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# vrrp 250
switch(config-if-vrrp)# advertisement-interval 200
switch(config-if-vrrp)#
```

Related Commands	Command	Description
	clear vrrp	Clears all the software counters for the specified virtual router.

Command	Description
show vrrp	Displays VRRP configuration information.
vrrp	Configures a VRRP group.

aggregate-address (BGP)

To create a summary address in a Border Gateway Protocol (BGP) routing table, use the **aggregate-address** command. To remove the summary address, use the **no** form of this command.

```
aggregate-address address/length [advertise-map map-name] [as-set] [attribute-map map-name]
[summary-only] [suppress-map map-name]

no aggregate-address address/length [advertise-map map-name] [as-set] [attribute-map
map-name] [summary-only] [suppress-map map-name]
```

Syntax Description

<i>address/length</i>	Aggregate IPv4 address and mask length. Valid value for <i>length</i> is 1 to 32.
advertise-map <i>map-name</i>	(Optional) Specifies the name of the route map used to select attribute information from specific routes.
as-set	(Optional) Generates the autonomous system set path information and community information from the contributing paths.
attribute-map <i>map-name</i>	(Optional) Specifies the name of the route map used to set the attribute information for specific routes. The <i>map-name</i> is an alphanumeric string up to 63 characters.
summary-only	(Optional) Filters all more-specific routes from updates.
suppress-map <i>map-name</i>	(Optional) Specifies the name of the route map used to conditionally filter more specific routes. The <i>map-name</i> is an alphanumeric string up to 63 characters.

Command Default

The atomic aggregate attribute is set automatically when an aggregate route is created with this command unless the **as-set** keyword is specified.

Command Modes

Address-family configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

You can implement aggregate routing in BGP either by redistributing an aggregate route into BGP, or by using the conditional aggregate routing feature.

Using the **aggregate-address** command with no keywords will create an aggregate entry in the BGP routing table if any more-specific BGP routes are available that fall within the specified range. (A longer prefix which matches the aggregate must exist in the RIB.) The aggregate route will be advertised as coming from your autonomous system and will have the atomic aggregate attribute set to show that information might be missing. (By default, the atomic aggregate attribute is set unless you specify the **as-set** keyword.)

Using the **as-set** keyword creates an aggregate entry using the same rules that the command follows without this keyword, but the path advertised for this route will be an AS_SET consisting of all elements contained in all paths that are being summarized. Do not use this form of the **aggregate-address** command when aggregating many paths, because this route must be continually withdrawn and updated as autonomous system path reachability information for the summarized routes changes.

Using the **summary-only** keyword not only creates the aggregate route (for example, 192.*.*.*) but also suppresses advertisements of more-specific routes to all neighbors. If you want to suppress only advertisements to certain neighbors, you may use the **neighbor distribute-list** command, with caution. If a more-specific route leaks out, all BGP routers will prefer that route over the less-specific aggregate you are generating (using longest-match routing).

Using the **suppress-map** keyword creates the aggregate route but suppresses advertisement of specified routes. You can use the match clauses of route maps to selectively suppress some more-specific routes of the aggregate and leave others unsuppressed. IP access lists and autonomous system path access lists match clauses are supported.

Using the **advertise-map** keyword selects specific routes that will be used to build different components of the aggregate route, such as AS_SET or community. This form of the **aggregate-address** command is useful when the components of an aggregate are in separate autonomous systems and you want to create an aggregate with AS_SET, and advertise it back to some of the same autonomous systems. You must remember to omit the specific autonomous system numbers from the AS_SET to prevent the aggregate from being dropped by the BGP loop detection mechanism at the receiving router. IP access lists and autonomous system path access lists match clauses are supported.

Using the **attribute-map** keyword allows attributes of the aggregate route to be changed. This form of the **aggregate-address** command is useful when one of the routes forming the AS_SET is configured with an attribute such as the community no-export attribute, which would prevent the aggregate route from being exported. An attribute map route map can be created to change the aggregate attributes.

This command requires the LAN Enterprise Services license.

Examples

AS-Set Example

This example shows how to create an aggregate BGP address in router configuration mode. The path advertised for this route will be an AS_SET consisting of all elements contained in all paths that are being summarized.

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# aggregate-address 10.0.0.0 255.0.0.0 as-set
switch(config-router)#
```

Summary-Only Example

This example shows how to create an aggregate BGP address in address family configuration mode and apply it to the multicast database (SAFI) under the IP Version 4 address family. Because the **summary-only** keyword is configured, more-specific routes are filtered from updates.

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# address-family ipv4 multicast
switch(config-router-af)# aggregate-address 10.0.0.0 255.0.0.0 summary-only
switch(config-router-af)#
```

Conditional Aggregation Example

This example shows how to create a route map called MAP-ONE to match on an as-path access list. The path advertised for this route will be an AS_SET consisting of elements contained in paths that are matched in the route map.

```
switch# configure terminal
switch(config)# ip as-path access-list 1 deny ^1234_
switch(config)# ip as-path access-list 1 permit .*
switch(config)# route-map MAP-ONE
switch(config-route-map)# match ip as-path 1
switch(config-route-map)# exit
switch(config)# router bgp 64496
switch(config-router)# address-family ipv4
switch(config-router-af)# aggregate-address 10.0.0.0 255.0.0.0 as-set advertise-map
MAP-ONE
switch(config-router-af)# end
switch(config-router-af)#
```

Related Commands

Command	Description
<code>route-map <i>map-name</i></code>	Creates a route map.

area authentication (OSPF)

To enable authentication for an Open Shortest Path First (OSPF) area, use the **area authentication** command. To remove authentication for an area, use the **no** form of this command.

area *area-id* **authentication** [**message-digest**]

no area *area-id* **authentication** [**message-digest**]

Syntax Description	<i>area-id</i>	Identifier for the OSPF area where you want to enable authentication. Specify as either a positive integer value or an IP address.
	message-digest	(Optional) Enables Message Digest 5 (MD5) authentication on the area specified by the <i>area-id</i> argument.

Command Default	No authentication
------------------------	-------------------

Command Modes	Router configuration mode
----------------------	---------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Use the area authentication command to configure the authentication mode for the entire OSPF area.
	The authentication type and authentication password must be the same for all OSPF devices in an area.
	Use the ip ospf authentication-key command in interface configuration mode to specify this password.
	If you enable MD5 authentication with the message-digest keyword, you must configure a password with the ip ospf message-digest-key command in interface configuration mode.
	This command requires the LAN Base Services license.

Examples	This example shows how to configure authentication for area 0 of OSPF routing process 201:
-----------------	--

```
switch# configure terminal
switch(config)# router ospf 201
switch(config-router)# area 0 authentication message-digest
switch(config-router)# interface ethernet 1/1
switch(config-if)# ip ospf area 0
switch(config-if)# ip ospf message-digest-key 10 md5 0 adcdefgh
switch(config-if)#
```

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	ip ospf authentication-key	Assigns a password for simple password authentication for OSPF.
	ip ospf message-digest-key	Assigns a password for OSPF MD5 authentication.
	show ip ospf interface	Displays OSPF interface-related information.

area default-cost (OSPF)

To specify a cost for the default summary route sent into an Open Shortest Path First (OSPF) stub or not-so-stubby area (NSSA), use the **area default-cost** command. To remove the assigned default route cost, use the **no** form of this command.

area *area-id* **default-cost** *cost*

no area *area-id* **default-cost** *cost*

Syntax Description	<i>area-id</i>	Identifier for the OSPF area where you want to configure the default cost. The area ID can be from 0 to 4294967295 or an IP address.
	<i>cost</i>	Cost for the default summary route used for a stub or NSSA. The range is from 0 to 16777215.

Command Default The summary route cost is based on the area border router that generated the summary route.

Command Modes Router configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines Use the **area default-cost** command on an Area Border Router (ABR) attached to a stub or NSSA to configure the metric for the summary default route generated by the ABR into the stub area.

This command requires the LAN Base Services license.

Examples This example shows how to set a default cost of 20 to stub network 192.0.2.0:

```
switch# configure terminal
switch(config)# router ospf 201
switch(config-router)# area 192.0.2.0 stub
switch(config-router)# area 192.0.2.0 default-cost 20
switch(config-router)#
```

Related Commands	Command	Description
	area stub	Defines an area as a stub area.
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	show ip ospf	Displays OSPF information.

area filter-list (OSPF)

To filter prefixes advertised in type 3 link-state advertisements (LSAs) between Open Shortest Path First (OSPF) areas of an Area Border Router (ABR), use the **area filter-list** command. To change or cancel the filter, use the **no** form of this command.

```
area area-id filter-list route-map map-name {in | out}

no area area-id filter-list route-map map-name {in | out}
```

Syntax Description

area-id	Identifier for the OSPF area where you want to configure filtering. Specify as either a positive integer value or an IP address.
route-map map-name	Specifies the name of a route map used as the filter policy. The <i>map-name</i> argument can be any alphanumeric string of up to 63 characters.
in	Filters networks sent to this area.
out	Filters networks sent from this area.

Command Default

None

Command Modes

Router configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **area filter-list** command to filter Type 3 LSAs. If you apply the route map with the **in** keyword, the route map filters all Type 3 LSAs originated by the ABR to this area, including Type 3 LSAs that originated as a result of the **area range** command in another area.

If you apply the route map with the **out** keyword, the route map filters all Type 3 LSAs that are advertised by the ABR to all other areas including Type 3 LSAs that originate locally as a result of the **area range** command configured in this area.

Cisco NX-OS implicitly denies any prefix that does not match an entry in the route map.

This command requires the LAN Base Services license.

Examples

This example shows how to filter prefixes that are sent from all other areas to area 1:

```
switch# configure terminal
switch(config)# router ospf 202
switch(config-router)# area 1 filter-list route-map FilterExternal in
switch(config-router)#
```

Related Commands	Command	Description
	area range	Consolidates and summarizes routes at an area boundary.
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	route-map	Defines the conditions for redistributing routes from one routing protocol into another.
	show ip ospf policy statistics area	Displays OSPF policy statistics for an area.

area filter-list (OSPFv3)

To filter prefixes that are advertised in type 3 link-state advertisements (LSAs) between Open Shortest Path First (OSPF) areas of an Area Border Router (ABR), use the **area filter-list** command. To change or cancel the filter, use the **no** form of this command.

```

area area-id filter-list route-map map-name {in | out}

no area area-id filter-list route-map map-name {in | out}

```

Syntax Description	area-id	Area ID as a numeric value or the IP address.
	route-map	Specifies the route map policy name.
	map-name	Route map name. A route map name can be any alphanumeric string up to 63 characters.
	in	Filters networks sent to this area.
	out	Filters networks sent from this area.

Defaults None

Command Modes Router configuration mode

Command History	Release	Modification
	5.0(3)U3(1)	This command was introduced.

Usage Guidelines

Use the **area filter-list** command to filter Type 3 LSAs. If you apply the route map with the **in** keyword, the route map filters all Type 3 LSAs that are originated by the ABR to this area, including Type 3 LSAs that originated as a result of the **area range** command in another area.

If you apply the route map with the **out** keyword, the route map filters all Type 3 LSAs that are advertised by the ABR to all other areas including Type 3 LSAs that originate locally as a result of the **area range** command configured in this area.

The Cisco NX-OS software implicitly denies any prefix that does not match an entry in the route map. This command requires the LAN Base Services license.

Examples

This example shows how to filter prefixes that are sent from all other areas to 0.0.0.10:

```

switch# configure terminal
switch(config)# router ospfv3 123
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# area 0.0.0.10 filter-list route-map LSA-Filter in
switch(config-router-af)#

```

This example shows how change or cancel the filter:

```
switch(config-router-af)# no area 0.0.0.10 filter-list route-map LSA-Filter in  
switch(config-router-af)#
```

Related Commands

Command	Description
address-family ipv6 unicast	Enters IPv6 unicast address family mode.

area nssa (OSPF)

To configure an area as an Open Shortest Path First (OSPF) not-so-stubby (NSSA) area, use the **area nssa** command. To remove the NSSA area, use the **no** form of this command.

```
area area-id nssa [default-information-originate [route-map map-name]] [no-redistribution]
[no-summary] [translate type7 [always | never] [suppress-fa]]
```

```
no area area-id nssa [default-information-originate [route-map map-name]] [no-redistribution]
[no-summary] [translate type7 [always | never] [suppress-fa]]
```

Syntax Description

area-id	Identifier for the OSPF NSSA area. The area ID can be from 0 to 4294967295 or an IP address.
default-information-originate	(Optional) Generates a Type 7 default into the NSSA area. This keyword takes effect only on NSSA area border router (ABR) or NSSA autonomous system border router (ASBR).
route-map <i>map-name</i>	(Optional) Filters the Type 7 default generation based on the route map. The <i>map-name</i> argument can be any alphanumeric string up to 63 characters.
no-redistribution	(Optional) Blocks redistributed link-state advertisements (LSAs) from entering this NSSA area. Use this keyword when the router is both an NSSA ASBR and an NSSA ABR and you want the redistribute command to import routes into the normal areas but not into the NSSA area.
no-summary	(Optional) Allows an area to be an NSSA area but not have summary routes injected into it.
translate type7	(Optional) Translates Type 7 LSAs to type 5 LSAs.
always	(Optional) Always translates LSAs.
never	(Optional) Never translates LSAs.
suppress-fa	(Optional) Suppresses the forwarding address in translated LSAs. The ABR uses 0.0.0.0 as the forwarding IPv4 address.

Command Default

None

Command Modes

Router configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **area nssa** command to create an NSSA area in an OSPF autonomous system. We recommend that you understand the network topology before configuring forwarding address suppression for translated LSAs. Suboptimal routing might result because there might be better paths to reach the destination's forwarding address.

This command requires the LAN Base Services license.

Examples

This example shows how to configure area 1 as an NSSA area:

```
switch# configure terminal
switch(config)# router ospf 10
switch(config-router)# area 1 nssa
switch(config-router)#
```

This example shows how to configure area 1 as an NSSA area and translate Type 7 LSAs from area 1 to Type 5 LSAs, but not place the Type 7 forwarding address into the Type 5 LSAs. (OSPF places 0.0.0.0 as the forwarding address in the Type 5 LSAs.)

```
switch# configure terminal
switch(config)# router ospf 2
switch(config-router)# area 1 nssa translate type7 suppress-fa
switch(config-router)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
redistribute	Redistributes routes learned from one routing protocol to another routing protocol domain.
show ip ospf	Displays OSPF information.

area range (OSPF)

To consolidate and summarize routes at an Open Shortest Path First (OSPF) area boundary, use the **area range** command. To disable this function, use the **no** form of this command.

```
area area-id range ip-prefix [not-advertise] [cost cost]

no area area-id range ip-prefix [not-advertise] [cost cost]
```

Syntax Description	area-id	Identifier for the OSPF area where you want to summarize routes. The area ID can be from 0 to 4294967295 or an IP address.
	cost	(Optional) Specifies the cost to use during shortest path first (SPF) calculation for the summarized route.
	cost-value	Cost value. The range is from 0 to 16777215.
	ip-prefix	IP prefix specified as IP address/subnet mask length (A.B.C.D/LEN).
	not-advertise	(Optional) Sets the address range status to DoNotAdvertise. The Type 3 summary LSA is suppressed, and the component networks remain hidden from other networks.

Command Default Disabled

Command Modes Router configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **area range** command only with Area Border Routers (ABRs) to consolidate or summarize routes for an area. The ABR advertises that a single summary route is advertised to other areas and condenses routing information at area boundaries.

You can configure OSPF to summarize addresses for many different sets of address ranges by configuring multiple **area range** commands.

This command requires the LAN Base Services license.

Examples

This example shows how to configure one summary route to be advertised by the ABR to other areas for all hosts on network 192.0.2.0:

```
switch# configure terminal
switch(config-if)# interface ethernet 1/2
switch(config-if)# ip address 192.0.2.201 255.255.255.0
switch(config-if)# ip ospf area 201
switch(config-router)# area 0 range 192.0.2.0 255.255.0.0
switch(config-router)#
```

Related Commands	Command	Description
	<code>copy running-config startup-config</code>	Saves the configuration changes to the startup configuration file.
	<code>show ip ospf</code>	Displays OSPF information.

area range (OSPFv3)

To consolidate and summarize routes at an Open Shortest Path First version 3 (OSPFv3) area boundary, use the **area range** command. To disable this function, use the **no** form of this command.

```
area area-id range ipv6-prefix [not-advertise] [cost cost]

no area area-id range ipv6-prefix [not-advertise] [cost cost]
```

Syntax Description

<i>area-id</i>	Identifier for the OSPFv3 area where you want to summarize routes. The area ID can be from 0 to 4294967295 or an IPv6 address.
cost	(Optional) Specifies the cost to use during shortest path first (SPF) calculation for the summarized route.
<i>cost-value</i>	Cost value. The range is from 0 to 16777215.
<i>ipv6-prefix</i>	IPv6 prefix specified as IPv6 address/subnet mask length (<i>A.B.C.D/LEN</i>).
not-advertise	(Optional) Sets the address range status to DoNotAdvertise. The Type 3 summary LSA is suppressed, and the component networks remain hidden from other networks.

Command Default

Disabled

Command Modes

Router configuration mode

Command History

Release	Modification
5.0(3)U3(1)	This command was introduced.

Usage Guidelines

Use the **area range** command only with Area Border Routers (ABRs) to consolidate or summarize routes for an area. The ABR advertises that a single summary route is advertised to other areas and condenses routing information at area boundaries.

You can configure OSPFv3 to summarize addresses for many different sets of address ranges by configuring multiple **area range** commands.

This command requires the LAN Base Services license.

Examples

This example shows how to configure one summary route to be advertised by the ABR to other areas for all hosts on network 2001:0DB8::/32:

```
switch# configure terminal
switch(config)# router ospfv3 201
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# ipv6 ospfv3 area 201
switch(config-router-af)# area 0 range 2001:0DB8::/32
switch(config-router)#
```

Related Commands	Command	Description
	<code>copy running-config startup-config</code>	Saves the configuration changes to the startup configuration file.
	<code>show ipv6 ospfv3</code>	Displays OSPFv3 information.

area stub (OSPF)

To define an area as an Open Shortest Path First (OSPF) stub area, use the **area stub** command. To remove the area, use the **no** form of this command.

```

area area-id stub [no-summary]

no area area-id stub [no-summary]

```

Syntax Description	<i>area-id</i>	Identifier for the OSPF stub area. The area ID can be from 0 to 4294967295 or an IP address.
	no-summary	(Optional) Prevents an Area Border Router (ABR) from sending summary link advertisements into the stub area.

Command Default	None
-----------------	------

Command Modes	Router configuration mode
---------------	---------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **area stub** command to configure all devices attached to the stub area. Use the **area default-cost** command on an area border router (ABR) attached to the stub area. The **area default-cost** command provides the metric for the summary default route generated by the ABR into the stub area.

To further reduce the number of link-state advertisements (LSAs) sent into a stub area, you can configure the **no-summary** keyword on the ABR to prevent it from sending Summary LSAs (Type 3 LSAs3) into the stub area.

This command requires the LAN Base Services license.

Examples

This example shows how to create stub area 33 in OSPF 209:

```

switch# configure terminal
switch(config)# router ospf 201
switch(config-router)# area 33 stub
switch(config-router)#

```

Related Commands	Command	Description
	area default-cost	Specifies a cost for the default summary route sent into a stub area.

Command	Description
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
show ip ospf	Displays OSPF information.

area virtual-link (OSPF)

To define an Open Shortest Path First (OSPF) virtual link, use the **area virtual-link** command. To remove a virtual link, use the **no** form of this command.

```
area area-id virtual-link router-id

no area area-id virtual-link router-id
```

Syntax Description	area-id	Identifier for the OSPF area assigned to the transit area for the virtual link. The area ID can be from 0 to 4294967295 or an IP address.
	router-id	Router ID associated with the virtual link neighbor. Specify as an IP address. The router ID appears in the show ip ospf neighbors display.

Command Default None

Command Modes Router configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **area virtual-link** command to establish a virtual link from a remote area to the backbone area. In OSPF, all areas must be connected to a backbone area. If the connection to the backbone is lost, it can be repaired by establishing a virtual link.

Use the **area virtual-link** command to enter the virtual link configuration mode where you can use the following commands:

- **authentication** [**key-chain** | **message-digest** | **null**]
- **authentication-key** [**0** | **3**] *key*
- **dead-interval** *seconds*
- **hello-interval** *seconds*
- **message-digest-key** *key-id md5 key*
- **retransmit-interval** *seconds*
- **transmit-delay** *seconds*

See each command for syntax and usage details.

You must configure both sides of a virtual link with the same area ID and the corresponding virtual link neighbor router ID. To see the router ID, use the **show ip ospf neighbors** command in any mode.


Note

You cannot configure a virtual link on a not-so-stubby (NSSA) area.

This command requires the LAN Base Services license.

Examples

This example shows how to establish a virtual link between two devices, A, and B, with default values for all optional parameters:

```
Device A:
switch# configure terminal
switch(config)# router ospf 1
switch(config-router)# router-id 192.0.2.2
switch(config-router)# area 1 virtual-link 192.0.2.1
switch(config-router-vlink)#
```

```
Device B:
switch# configure terminal
switch(config)# router ospf 209
switch(config-router)# router-id 192.0.2.1
switch(config-router)# area 1 virtual-link 192.0.2.2
switch(config-router-vlink)#
```

Related Commands

Command	Description
authentication (OSPF virtual link)	Enables authentication for an OSPF virtual link.
authentication-key (OSPF virtual link)	Assigns a password to be used by neighboring routers that are using the simple password authentication of OSPF.
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
dead-interval (OSPF virtual link)	Configures the dead interval for an OSPF virtual link.
hello-interval (OSPF virtual link)	Configures the hello interval for an OSPF virtual link.
message-digest-key (virtual link)	Enables OSPF MD5 authentication in an OSPF virtual link.
retransmit-interval (OSPF virtual link)	Configures the retransmit interval for an OSPF virtual link.
show ip ospf neighbors	Displays OSPF neighbor information.
show ip ospf virtual-link	Displays OSPF virtual link information.
transmit-delay (OSPF virtual link)	Configures the transmit delay for an OSPF virtual link.

authentication (HSRP)

To configure authentication for the Hot Standby Router Protocol (HSRP), use the **authentication** command. To disable authentication, use the **no** form of this command.

```
authentication { string | md5 { key-chain key-chain | key-string { 0 | 7 } text [timeout seconds] } |  
  text string }
```

```
no authentication { string | md5 { key-chain key-chain | key-string { 0 | 7 } text [timeout seconds] }  
  | text string }
```

Syntax Description

md5	Specifies the Message Digest 5 (MD5) authentication.
key-chain <i>key-chain</i>	Identifies a group of authentication keys.
key-string	Specifies the secret key for MD5 authentication.
0	Specifies a clear text string.
7	Specifies an encrypted string.
<i>text</i>	Secret key for MD5 authentication. The range is from 1 to 255 characters. We recommend that you use at least 16 characters.
timeout <i>seconds</i>	(Optional) Specifies the authentication timeout value. The range is from 0 to 32767.
text <i>string</i>	Specifies an authentication string. The range is from 1 to 255 characters. The default string is “cisco”.

Command Default

Disabled

Command Modes

HSRP configuration or HSRP template mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **authentication text** command to prevent misconfigured routers from participating in HSRP groups that they are not intended to participate in. The authentication string is sent unencrypted in all HSRP messages. The same authentication string must be configured on all routers in the same group to ensure interoperation. HSRP protocol packets that do not authenticate are ignored.



Caution

If you configure two routers with identical HSRP IP addresses but with different authentication strings, then neither router is aware of the duplication.

This command does not require a license.

Examples

This example shows how to configure an authentication string for HSRP group 2:

```
switch# configure terminal
switch(config)# interface ethernet 0/1
switch(config-if)# no switchport
switch(config-if)# ip address 10.0.0.1 255.255.255.0
switch(config-if)# hsrp 2
switch(config-if-hsrp)# priority 110
switch(config-if-hsrp)# preempt
switch(config-if-hsrp)# authentication text sanjose
switch(config-if-hsrp)# ip 10.0.0.3
switch(config-if-hsrp)# end
switch(config-if-hsrp)#
```

Related Commands

Command	Description
feature hsrp	Enables HSRP and enters HSRP configuration mode.
hsrp group	Creates an HSRP group.

authentication (OSPF virtual link)

To specify the authentication type for an Open Shortest Path First (OSPF) virtual link, use the **authentication** command. To remove the authentication type for a virtual link, use the **no** form of this command.

authentication [**key-chain** *key-name* | **message-digest** | **null**]

no authentication

Syntax Description	key-chain <i>key-name</i>	(Optional) Specifies the key-chain to use. The <i>key-name</i> argument can be any alphanumeric string up to 63 characters.
	message-digest	(Optional) Specifies to use message-digest authentication.
	null	(Optional) Specifies no authentication is used. Disables authentication if configured for an area.

Command Default	Defaults to password authentication if you configure authentication with none of the optional keywords.
-----------------	---

Command Modes	OSPF virtual link configuration mode
---------------	--------------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Use the **authentication** command in virtual link configuration mode to configure the authentication method used on the virtual link. Use the **message-digest** keyword to configure MD5 message digest authentication and use the **message-digest-key** command to complete this authentication configuration. Use the **key-chain** keyword to configure password authentication using key chains and use the **key chain** command to complete this authentication configuration. Use the **authentication** command with no keywords to configure a password for the virtual link, and use the **authentication-key** command to complete this authentication configuration.

This command requires the LAN Base Services license.

Examples This example shows how to enable message-digest authentication:

```
switch# configure terminal
switch(config)# router ospf 22
switch(config-router)# area 99 virtual-link 192.0.2.12
switch(config-router-vlink)# authentication message-digest
switch(config-router-vlink)# message-digest key 4 md5 0 abcd
```

Related Commands	Command	Description
	area authentication	Enables authentication for an OSPF area.
	authentication-key (OSPF virtual link)	Assigns a password to be used by neighboring routers that are using the password authentication of OSPF.
	key chain	Creates a key chain for managing authentication keys.
	message-digest-key (OSPF virtual link)	Enables OSPF MD5 authentication.

authentication (VRRP)

To configure an authentication for the Virtual Router Redundancy Protocol (VRRP), use the **authentication** command. To disable authentication, use the **no** form of this command.

authentication text *password*

no authentication [*text password*]

Syntax Description	text <i>password</i>	Specifies to use a simple text password of up to eight alphanumeric characters.
---------------------------	-----------------------------	---

Command Default	No authentication	
------------------------	-------------------	--

Command Modes	VRRP configuration mode	
----------------------	-------------------------	--

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command does not require a license.	
-------------------------	--	--

Examples	<p>This example shows how to configure md5 authentication for VRRP:</p> <pre>switch# configure terminal switch(config)# interface ethernet 2/1 switch(config-if)# no switchport switch(config-if)# vrrp 250 switch(config-if-vrrp)# authentication text mypasswd switch(config-if-vrrp)#</pre>	
-----------------	---	--

Related Commands	Command	Description
	clear vrrp	Clears all the software counters for the specified virtual router.
	show vrrp	Displays VRRP configuration information.
	vrrp	Configures a VRRP group.

authentication key-chain (EIGRP)

To enable authentication for the Enhanced Interior Gateway Routing Protocol (EIGRP) packets and to specify the set of keys that can be used on an interface, use the **authentication key-chain** command. To prevent authentication, use the **no** form of this command.

authentication key-chain *name-of-chain*

no authentication key-chain *name-of-chain*

Syntax Description

<i>name-of-chain</i>	Group of keys that are valid.
----------------------	-------------------------------

Command Default

No authentication is provided for EIGRP packets.

Command Modes

Router configuration mode
Address family configuration mode
Router VRF configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Set the authentication mode using the **authentication mode** command in VRF configuration mode. You must separately configure a key chain using the **key-chain** command to complete the authentication configuration for an interface.

This command requires the LAN Base Services license.

Examples

This example shows how to configure the interface to accept and send any key that belongs to the key-chain trees:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# vrf red
switch(config-router-vrf)# authentication key-chain trees
switch(config-router-vrf)#
```

Related Commands

Command	Description
authentication mode (EIGRP)	Sets the authentication mode for EIGRP in a VRF.
ip authentication key-chain eigrp	Enables authentication for EIGRP and specifies the set of keys that can be used on an interface.

Command	Description
key-chain	Creates a set of keys that can be used by an authentication method.
show ip eigrp	Displays EIGRP information.

authentication mode (EIGRP)

To specify the type of authentication used in the Enhanced Interior Gateway Routing Protocol (EIGRP) packets, use the **authentication mode** command. To remove authentication, use the **no** form of this command.

authentication mode md5

no authentication mode md5

Syntax Description	md5 Specifies Message Digest 5 (MD5) authentication.										
Command Default	None										
Command Modes	Router configuration mode Address family configuration mode VRF configuration mode										
Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr></table>	Release	Modification	5.0(3)U1(1)	This command was introduced.						
Release	Modification										
5.0(3)U1(1)	This command was introduced.										
Usage Guidelines	This command requires the LAN Base Services license.										
Examples	<p>This example shows how to configure the interface to use MD5 authentication:</p> <pre>switch# configure terminal switch(config)# router eigrp 209 switch(config-router)# vrf red switch(config-router-vrf)# authentication mode md5 switch(config-router-vrf)#</pre>										
Related Commands	<table><tr><th>Command</th><th>Description</th></tr><tr><td>authentication key-chain eigrp</td><td>Enables authentication for EIGRP and specifies the set of keys that can be used on an interface.</td></tr><tr><td>ip authentication mode eigrp</td><td>Configures the authentication mode for EIGRP on an interface.</td></tr><tr><td>key chain</td><td>Creates a set of keys that can be used by an authentication method.</td></tr><tr><td>show ip eigrp</td><td>Displays EIGRP information.</td></tr></table>	Command	Description	authentication key-chain eigrp	Enables authentication for EIGRP and specifies the set of keys that can be used on an interface.	ip authentication mode eigrp	Configures the authentication mode for EIGRP on an interface.	key chain	Creates a set of keys that can be used by an authentication method.	show ip eigrp	Displays EIGRP information.
Command	Description										
authentication key-chain eigrp	Enables authentication for EIGRP and specifies the set of keys that can be used on an interface.										
ip authentication mode eigrp	Configures the authentication mode for EIGRP on an interface.										
key chain	Creates a set of keys that can be used by an authentication method.										
show ip eigrp	Displays EIGRP information.										

authentication-key (OSPF virtual link)

To assign a password to be used by an Open Shortest Path First (OSPF) virtual link, use the **authentication-key** command. To remove a previously assigned OSPF password, use the **no** form of this command.

authentication-key [**0** | **3**] *password*

no authentication-key

Syntax Description	0	(Optional) Specifies an unencrypted authentication key.
	3	(Optional) Specifies a 3DES encrypted authentication key.
	<i>password</i>	Any continuous string of characters that can be entered from the keyboard up to 8 bytes.

Command Default Unencrypted password

Command Modes OSPF virtual link configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **authentication-key** command to configure the password for password authentication on an OSPF virtual link. All devices on the same virtual link must have the same password to be able to exchange OSPF information.

This command requires the LAN Base Services license.

Examples This example shows how to enable the authentication key with the string yourpass:

```
switch# configure terminal
switch(config)# router ospf 22
switch(config-router)# area 99 virtual-link 192.0.2.12
switch(config-router-vlink)# authentication
switch(config-router-vlink)# authentication-key yourpass
switch(config-router-vlink)#
```

Related Commands	Command	Description
	authentication (virtual link)	Enables authentication for an OSPF virtual link.

auto-cost (OSPF)

To control how Open Shortest Path First (OSPF) calculates default metrics for an interface, use the **auto-cost** command. To assign the default reference bandwidth of 40 Gb/s, use the **no** form of this command.

auto-cost reference-bandwidth *bandwidth* [Gbps | Mbps]

no auto-cost reference-bandwidth

Syntax Description

reference-bandwidth <i>bandwidth</i>	Sets the reference bandwidth used to calculate the default metrics for an interface. The range depends on whether you use the Gbps or MBps keywords.
Gbps	(Optional) Specifies the rate in Gbps (bandwidth). The range is from 1 to 4000; the default is 40.
Mbps	(Optional) Specifies the rate in Mbps (bandwidth). The range is from 1 to 4000000; the default is 40000.

Command Default

40 Gb/s. The bandwidth defaults to Gb/s if you do not specify the **Gbps** or **Mbps** keyword.

Command Modes

Router configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **auto-cost** command to set the reference bandwidth used by the OSPF cost-metric calculation. The value set by the **ip ospf cost** command overrides the cost that results from the **auto-cost** command. This command requires the LAN Base Services license.

Examples

This example shows how to set the reference bandwidth for all local interfaces in an OSPF instance:

```
switch# configure terminal
switch(config)# router ospf 201
switch(config-router)# auto-cost reference-bandwidth 10
switch(config-router)#
```

Related Commands

Command	Description
ip ospf cost	Explicitly specifies the cost of sending a packet on an interface.

autonomous-system

To configure the autonomous system (AS) number for an Enhanced Interior Gateway Routing Protocol (EIGRP) address family, use the **autonomous-system** command. To revert to default, use the **no** form of this command.

autonomous-system *as-number*

no autonomous-system [*as-number*]

Syntax Description

<i>as-number</i>	Autonomous system number. The range is from 1 to 65535.
------------------	---

Command Default

None

Command Modes

Address family configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **autonomous-system** command to set a common AS number for all EIGRP instances in an address family.

This command requires the LAN Base Services license.

Examples

This example shows how to set an AS number for EIGRP for IPv4 unicast:

```
switch# configure terminal
switch(config)# router eigrp 201
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# autonomous-system 64496
switch(config-router-af)#
```

Related Commands

Command	Description
address-family (EIGRP)	Enters the address family configuration mode for EIGRP.

bestpath (BGP)

To change the default best-path selection algorithm, use the **bestpath** command. To return the Border Gateway Protocol (BGP) routing process to the default operation, use the **no** form of this command.

```
bestpath {always-compare-med | compare-routerid | {med {missing-as-worst |  
non-deterministic} }
```

```
no bestpath {always-compare-med | compare-routerid | {med {missing-as-worst |  
non-deterministic} }
```

Syntax Description	always-compare-med	Compares the Multi-Exit Discriminator (MED) on paths from a different autonomous system (AS).
	compare-routerid	Configures a BGP routing process to compare identical routes received from different external peers during the best path selection process and to select the route with the lowest router ID as the best path.
	med missing-as-worst	Assigns the value of infinity to received routes that do not carry the MED attribute, making these routes the least desirable.
	med non-deterministic	Specifies that the best-MED path among paths is not picked from the same AS.

Command Default

The default settings are as follows:

med missing-as-worst: A value of 0 is assigned to the missing MED

med non-deterministic: Disabled

Command Modes

Router BGP configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Before you use this command, ensure that BGP is enabled on the switch by using the **feature bgp** command.

To enable the comparison of the MED for paths from neighbors in different autonomous systems, use the **bgp always-compare-med** command.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to change the default best-path selection algorithm to compare the MED on paths from different autonomous systems:

```
switch# configure terminal  
switch(config)# router bgp 64496  
switch(config-router)# bestpath always-compare-med
```

switch(config-router)#

Related Commands

Command	Description
feature bgp	Enables BGP globally.
show ip bgp	Displays information about BGP routes.
show running-config bgp	Displays the running configuration for BGP for IPv4 networks.

bestpath all-paths-ecmp

To change the default best-path selection algorithm and treat all paths as ECMP paths, use the **bestpath** command. To return the Border Gateway Protocol (BGP) routing process to the default operation, use the **no** form of this command.

bestpath all-paths-ecmp

no bestpath all-paths-ecmp

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes Address Family configuration mode

Command History	Release	Modification
	6.0(2)U4(1)	This command was introduced.

Usage Guidelines Before you use this command, ensure that BGP is enabled on the switch by using the **feature bgp** command.

Examples This example shows how to treat all paths as ECMP paths during bestpath calculation:

```
switch# configure terminal
switch(config)# router bgp 100
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# bestpath all-paths-ecmp
```

Related Commands	Command	Description
	feature bgp	Enables BGP globally.
	show ip bgp	Displays information about BGP routes.
	show running-config bgp	Displays the running configuration for BGP for IPv4 networks.

bestpath as-path multipath-relax (BGP)

To configure a Border Gateway Protocol (BGP) routing process to consider the different autonomous system (AS) paths and load balance multiple paths during best path route selection, use the **bestpath as-path multipath-relax** command. To return the BGP routing process to the default operation, use the **no** form of this command.

bestpath as-path multipath-relax

no bestpath as-path multipath-relax

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes Router BGP configuration mode
VRF configuration mode

Command History	Release	Modification
	5.0(3)U1(2)	This command was introduced.

Usage Guidelines Before you use this command, ensure that BGP is enabled on the switch by using the **feature bgp** command.

This command requires the LAN Enterprise Services license.

Examples This example shows how to configure multipath load sharing on paths from different autonomous systems in router mode:

```
switch# configure terminal
switch(config)# router bgp 120
switch(config-router)# bestpath as-path multipath-relax
switch(config-router)#
```

Related Commands	Command	Description
	feature bgp	Enables BGP globally.
	show ip bgp	Displays information about BGP routes.
	show running-config bgp	Displays the running configuration for BGP for IPv4 networks.

bfd

To enable Bidirectional Forwarding Detection (BFD) for the Border Gateway Protocol (BGP), use the **bfd** command. To disable BFD for a protocol, use the **no** form of this command.

bfd

no bfd

Syntax Description This command has no arguments or keywords.

Command Default BFD is not enabled on the protocol.

Command Modes Neighbor configuration mode

Command History	Release	Modification
	5.0(3)U2(2)	This command was introduced.

Usage Guidelines You can configure protocols to use BFD for failure detection. To enable BFD for all neighbors, enter the **bfd** command in router configuration mode or in neighbor configuration mode for the Border Gateway Protocol (BGP). BFD is supported on the following interfaces:

- Layer 3 physical interface and subinterface
- Layer 3 port-channel and subinterface
- Switch virtual interface (SVI)

Examples This example shows how to enable BFD for all BGP neighbors:

```
switch# configure terminal
switch(config)# router bgp 1.1
switch(config-router)# neighbor 192.0.2.1 remote-as 1.0
switch(config-router-neighbor)# bfd
switch(config-router-neighbor)#
```

Related Commands	Command	Description
	feature bfd	Enables the BFD feature.
	show running-config bfd	Displays the running configuration information for BFD.

bfd (OSPF)

To enable Bidirectional Forwarding Detection (BFD) on all Open Shortest Path First (OSPF) interfaces, use the **bfd** command. To disable the BFD on the configuration OSPF interfaces, use the **no** form of this command.

bfd

no bfd

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Router configuration mode

Command History

Release	Modification
5.0(3)U3(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples

This example shows how to enable BFD on all OSPF interfaces:

```
switch# configure terminal
switch(config)# router ospf 12
switch(config-router)# bfd
switch(config-router)#
```

This example shows how to disable BFD on all OSPF interfaces:

```
switch(config)# router ospf 12
switch(config-router)# no bfd
switch(config-router)#
```

Related Commands

Command	Description
router-id	Sets the OSPF process router ID.

bfd echo-rx-interval

To enable Bidirectional Forwarding Detection (BFD) echo mode and configure the interval, use the **bfd echo-rx-interval** command. To disable BFD echo mode, use the **no** form of this command.

bfd [ipv4 | ipv6] echo-rx-interval interval

no bfd [ipv4 | ipv6] echo-rx-interval

Syntax Description	ipv4	(Optional) Configures the BFD echo interval for an IPv4 address.
	ipv6	(Optional) Configures the BFD echo interval for an IPv6 address.
	<i>interval</i>	Specifies the BFD session echo rx interval. The configurable time period for the <i>milliseconds</i> argument is from 50 to 999 milliseconds.

Command Default	Enabled
-----------------	---------

Command Modes	Interface configuration mode
---------------	------------------------------

Command History	Release	Modification
	6.0(2)U4(1)	The ipv6 and echo-rx-interval options were introduced.
	5.0(3)U2(2)	This command was introduced.

Usage Guidelines	When echo mode is enabled, the required minimum receive interval value is taken from the BFD slow-timer setting.
------------------	--

**Note**

Before using BFD echo mode, you must disable the sending of Internet Control Message Protocol (ICMP) redirect messages by using the **no ip redirects** command.

Use the **no bfd echo** command to stop sending echo packets and signify that the device is unwilling to forward echo packets that are received from BFD neighbors. The RequiredMinEchoRx BFD session parameter is set to zero when echo mode is disabled.

This command does not require a license.

Examples	This example shows how to configure echo mode between BFD neighbors.
----------	--

```
switch# configure terminal
switch(config)# interface Ethernet 1/1
switch(config-if)# bfd ipv6 echo-rx-interval 500
switch(config-if)#
```

This example shows that the BFD session neighbor is up and using BFD echo mode. The relevant command output is shown in bold in the output.

bfd echo-rx-interval

```

switch# show bfd neighbors details
OurAddr      NeighAddr    LD/RD  RH/RS    Holddown(mult)State    Int
192.0.1.2    192.0.1.1    1/6    Up        0 (3 )    Up        Fa0/1
Session state is Up and using echo function with 250 ms interval
Local Diag: 0, Demand mode: 0, Poll bit: 0, Authentication: None
MinTxInt: 50000 us, MinRxInt: 2000000 us, Multiplier: 3
Received MinRxInt: 2000000 us, Received Multiplier: 3
Holddown (hits): 6000 ms (0), Hello (hits): 2000 ms (442)
Rx Count: 422, Rx Interval (ms) min/max/avg: 65/1744/253 last: 946 ms ago
Tx Count: 442, Tx Interval (ms) min/max/avg: 1799/1799/1799 last: 833 ms ago
Registered protocols:  bgp
Uptime: 0 days 0 hrs 1 mins 46 secs
Last packet: Version: 1          - Diagnostic: 0
                State bit: Up      - Demand bit: 0
                Poll bit: 0        - Final bit: 0
                Multiplier: 3      - Length: 24
                My Discr.: 1090519041 - Your Discr.: 1090520944
                Min tx interval: 250000 - Min rx interval: 2000000
                Min Echo interval: 250000 - Authentication bit: 0
Hosting LC: 1, Down reason: None, Reason not-hosted: None
switch#

```

Related Commands

Command	Description
feature bfd	Enables the BFD feature.
bfd interval	Configures the BFD session parameters.
bfd slow-timer	Configures the BFD RequiredminEchoRx interval.
ip redirects	Enables the sending of ICMP redirect messages if the Cisco NX-OS software is forced to resend a packet through the same interface on which it was received.
show running-config bfd	Displays the running configuration information for BFD.

bfd interval

To configure the Bidirectional Forwarding Detection (BFD) session parameters, use the **bfd interval** command. To return to the default setting, use the **no** form of this command.

bfd [ipv4 | ipv6] interval *mintx* *min_rx* *msec* *multiplier* *value*

no bfd [ipv4 | ipv6] interval *mintx* *min_rx* *msec* *multiplier* *value*

Syntax Description	
ipv4	(Optional) Configures BFD session parameters for the IPv4 address.
ipv6	(Optional) Configures BFD session parameters for the IPv6 address.
<i>mintx</i>	Rate at which BFD control packets will be sent to BFD neighbors. The configurable time period for the <i>milliseconds</i> argument is from 50 to 999 milliseconds.
min_rx msec	Specifies the rate at which BFD control packets will be expected to be received from BFD neighbors. The configurable time period for the <i>msec</i> argument is from 50 to 999 milliseconds.
multiplier value	Specifies the number of consecutive BFD control packets that must be missed from a BFD neighbor before BFD declares that the neighbor is unavailable and the BFD neighbor is informed of the failure. The configurable value range for the <i>value</i> argument is from 3 to 50.

Command Default

BFD interval: 250 milliseconds
min_rx: 250 milliseconds
multiplier: 3

Command Modes

Global configuration mode
Interface configuration mode

Command History	Release	Modification
	6.0(2)U4(1)	The IPv6 option was introduced.
	5.0(3)U2(2)	This command was introduced.

Usage Guidelines

BFD session parameters configured at the interface level take precedence over the globally configured BFD session parameters. This command is applicable for SVIs also.

This command does not require a license.

Examples

This example shows how to set the BFD session parameters for an IPv4 address over the Ethernet interface 1/3:

```
switch# configure terminal
switch(config)# interface ethernet 1/3
```

```
switch(config-if)# bfd ipv4 interval 350 min_rx 320 multiplier 5
switch(config-if)#
```

This example shows how to set the BFD session parameters for an IPv6 address over the Ethernet interface 1/3:

```
switch# configure terminal
switch(config)# interface ethernet 1/3
switch(config-if)# bfd ipv6 interval 50 min_rx 50 multiplier 3
switch(config-if)#
```

Related Commands

Command	Description
feature bfd	Enables the BFD feature.
show bfd neighbors	Displays information about BFD neighbors.
show running-config bfd	Displays the running configuration information for BFD.

bfd ipv4

To enable Bidirectional Forwarding Detection (BFD) on a per-interface basis, use the **bfd ipv4** command. To disable BFD on the interface, use the **no** form of this command.

bfd ipv4

no bfd ipv4

Syntax Description This command has no arguments or keywords.

Command Default BFD is enabled by default on the interface (when it is configured by an application).

Command Modes Interface configuration mode

Command History	Release	Modification
	5.0(3)U2(2)	This command was introduced.

Usage Guidelines This command is used to explicitly disable BFD on a per-interface basis.

Examples This example shows how to enable BFD on an interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/1
switch(config-if)# bfd ipv4
switch(config-if)#
```

This example shows how to disable BFD on an interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/1
switch(config-if)# no bfd ipv4
switch(config-if)#
```

Related Commands	Command	Description
	feature bfd	Enables BFD on the switch.
	show running-config bfd	Displays the running configuration information for BFD.

bfd optimize subinterfaces

To optimize subinterfaces on a physical interface for Bidirectional Forwarding Detection (BFD), use the **bfd optimize subinterfaces** command. To return to the default setting, use the **no** form of this command.

bfd optimize subinterfaces

no bfd optimize subinterfaces

Syntax Description This command has no arguments or keywords.

Command Default Disabled

Command Modes Interface configuration mode

Command History	Release	Modification
	5.0(3)U2(2)	This command was introduced.

Usage Guidelines You can optimize subinterfaces because BFD creates sessions for all configured subinterfaces. BFD sets the subinterface with the lowest configured VLAN ID as the master subinterface and that subinterface uses the BFD session parameters of the parent interface. The remaining subinterfaces use the slow timer. If the master subinterface session detects an error, BFD marks all subinterfaces on that physical interface as down.

This command does not require a license.

Examples This example shows how to enable subinterface optimization:

```
switch# configure terminal
switch(config)# interface Ethernet 1/1
switch(config-if)# bfd optimize subinterfaces
switch(config-if)#
```

Related Commands	Command	Description
	feature bfd	Enables the BFD feature.
	show running-config bfd	Displays the running configuration information for BFD.

bfd slow-timer

To configure the Bidirectional Forwarding Detection (BFD) slow timer value, use the **bfd slow-timer** command. To return to the default setting, use the **no** form of this command.

bfd [ipv4 | ipv6] slow-timer *milliseconds*

no bfd [ipv4 | ipv6] slow-timer *milliseconds*

Syntax Description	ipv4	(Optional) Configures the BFD slow timer value for an IPv4 address.
	ipv6	(Optional) Configures the BFD slow timer value for an IPv6 address.
	<i>milliseconds</i>	BFD slow timer value, in milliseconds. The range is from 1000 to 30000.

Command Default	The default BFD slow timer value is 2000 milliseconds.
-----------------	--

Command Modes	Global configuration mode Interface configuration mode
---------------	---

Command History	Release	Modification
	6.0(2)U4(1)	The ipv6 option was introduced.
	5.0(3)U2(2)	This command was introduced.

Usage Guidelines	Use the bfd slow-timer command to configure how fast a BFD session comes up. This value also sets the RequiredMinRx (or min_rx) value when echo mode is enabled. This command does not require a license.
------------------	---

Examples	This example shows that the BFD slow timer value is configured to 14,000 milliseconds:
----------	--

```
switch(config)# bfd ipv6 slow-timer 14000
```

This example shows that the BFD slow timer value of 14,000 milliseconds has been implemented. The values for the MinTxInt and MinRxInt will correspond to the configured value for the BFD slow timer. The relevant command output is shown in bold.

```
switch# show bfd neighbors details
OurAddr      NeighAddr    LD/RD  RH/RS    Holdown(mult)  State    Int
192.0.10.1   192.0.10.2   1/1    Up        0    (3 )    Up      Eth1/1
Session is UP and using echo function with 250 ms interval
Local Diag: 0, Demand mode: 0, Poll bit: 0
MinTxInt: 14000, MinRxInt: 14000, Multiplier: 3
Received MinRxInt: 10000, Received Multiplier: 3
Holdown (hits): 3600(0), Hello (hits): 1200(418)
Rx Count: 422, Rx Interval (ms) min/max/avg: 1/1480/1087 last: 112 ms ago
Tx Count: 420, Tx Interval (ms) min/max/avg: 1/2088/1090 last: 872 ms ago
Registered protocols: OSPF
```

```
Uptime: 00:07:37
Last packet: Version: 1           - Diagnostic: 0
                State bit: Up      - Demand bit: 0
                Poll bit: 0         - Final bit: 0
                Multiplier: 3       - Length: 24
                My Discr.: 1        - Your Discr.: 1
                Min tx interval: 14000 - Min rx interval: 14000
                Min Echo interval: 4000

switch#
```

Related Commands	Command	Description
	bfd echo	Enables BFD echo mode.
	feature bfd	Enables the BFD feature.
	show running-config bfd	Displays the running configuration information for BFD.

capability additional-paths receive

To configure the receive additional paths capability for the specified neighbor, use the **capability additional-paths receive** command in neighbor address family configuration mode or peer policy template configuration mode. To disable the capability of receiving additional paths, use the **no** form of this command.

capability additional-paths receive [disable]

no capability additional-paths receive [disable]

Syntax Description	disable (Optional) Overrides any address family configuration that enables receiving additional paths.
---------------------------	---

Command Default	Capability of receiving additional paths is disabled.
------------------------	---

Command Modes	Neighbor address family configuration (config-router-af) VRF Neighbor address family configuration Neighbor VPN address family configuration Neighbor IPv6 labeled-unicast address-family configuration Peer policy template configuration (config-router-ptmp)
----------------------	---

Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>6.0(2)U1(1)</td><td>This command was introduced.</td></tr></table>	Release	Modification	6.0(2)U1(1)	This command was introduced.
Release	Modification				
6.0(2)U1(1)	This command was introduced.				

Usage Guidelines	Use the capability additional-paths receive command to selectively enable or disable the additional paths receive capability negotiation for a particular neighbor. The ability to send and receive additional paths is negotiated between two BGP neighbors during session establishment.
-------------------------	---

To advertise additional paths, you also need to:

- Configure the **additional-paths receive** command in global address-family configuration mode.
- Advertise the paths (other than best-path) by using the **set path-selection** command.

Use the **capability additional-paths receive disable** command to override template or address family configurations that enable receiving additional paths.

Use the **show ip bgp neighbors** command to display whether neighbors are capable of sending or receiving additional paths.

Any changes to this command take effect only after the next session is established and does not cause the tear down of any currently established sessions. You must restart any currently established BGP sessions for the new configuration to take effect. Use the **clear bgp** command to restart sessions.

Examples

In the following example, additional paths can be sent and received for the specified neighbor:

```
switch# configure terminal
switch (config)# router bgp 65000
switch (config-router)# neighbor 2001:db8::1037
switch (config-router-neighbor)# address-family ipv6 unicast
switch (config-router-neighbor-af)# capability additional-paths send
switch (config-router-neighbor-af)# capability additional-paths receive
```

In the following example, additional paths can be sent and received for the address family, but the specified neighbor is disabled from sending or receiving additional paths:

```
switch# configure terminal
switch (config)# router bgp 65000
switch (config-router)# address-family ipv6 unicast
switch (config-router-af)# additional-paths send
switch (config-router-af)# additional-paths receive
switch (config-router-af)# additional-paths selection route-map add_path4
switch (config-router-af)# neighbor 2001:db8::1037
switch (config-router-neighbor)# address-family ipv6 unicast
switch (config-router-neighbor-af)# capability additional-paths send disable
switch (config-router-neighbor-af)# capability additional-paths receive disable
```

In the following example, the send and receive capability of the neighbor overrides the receive-only capability of the address family:

```
switch# configure terminal
switch (config)# router bgp 65000
switch (config-router)# address-family ipv6 unicast
switch (config-router-af)# additional-paths receive
switch (config-router-af)# additional-paths selection route-map add_path4
switch (config-router-af)# neighbor 2001:db8::1037
switch (config-router-neighbor)# address-family ipv6 unicast
switch (config-router-neighbor-af)# capability additional-paths send
switch (config-router-neighbor-af)# capability additional-paths receive
```

In the following example, additional paths can be sent and received by a neighbor using the specified template:

```
switch# configure terminal
switch (config)# router bgp 65000
switch (config-router)# template peer-policy rr-client-pt1
switch (config-router-ptmp)# capability additional-paths send
switch (config-router-ptmp)# capability additional-paths receive
```

Related Commands

Command	Description
additional-paths receive	Enables BGP additional paths for a prefix to be received from a capable peer.
set path-selection all advertise	Advertises all BGP paths as additional paths to peers if the receive capability is enabled.
show ip bgp	Displays information about BGP networks, including path selections and path IDs.
show ip bgp neighbors	Displays information about the TCP and BGP connections of neighbors.

capability additional-paths send

To configure the send additional paths capability for the specified neighbor, use the **capability additional-paths send** command in neighbor address family configuration mode or peer policy template configuration mode. To disable the capability of sending additional paths, use the **no** form of the command.

capability additional-paths send [disable]

no capability additional-paths send [disable]

Syntax Description	disable (Optional) Overrides any address family configuration that enables sending additional paths.
---------------------------	---

Command Default	Capability of sending additional paths is disabled.
------------------------	---

Command Modes	Neighbor address family configuration (config-router-af) VRF Neighbor address family configuration Neighbor VPN address family configuration Neighbor IPv6 labeled-unicast address-family configuration Peer policy template configuration (config-router-ptmp)
----------------------	---

Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>6.0(2)U1(1)</td><td>This command was introduced.</td></tr></table>	Release	Modification	6.0(2)U1(1)	This command was introduced.
Release	Modification				
6.0(2)U1(1)	This command was introduced.				

Usage Guidelines	Use the capability additional-paths send command to selectively enable or disable the additional paths send capability negotiation for a particular neighbor. The ability to send and receive additional paths is negotiated between two BGP neighbors during session establishment.
-------------------------	---

To advertise additional-paths, you also need to:

- Configure the **additional-path send** command in global address-family configuration mode.
- Advertise the paths (other than best-path) by using the **set path-selection** command.

Use the **capability additional-paths send disable** command to override template or address family configurations that enable the sending of additional paths.

Use the **show ip bgp neighbors** command to display whether neighbors are capable of sending or receiving additional paths.

Any changes to this command take effect only after the next session is established and do not cause any currently established sessions to be torn down. You must restart any currently established BGP sessions for the new configuration to take effect. Use the **clear bgp** command to restart sessions.

Examples

In the following example, additional paths can be sent and received by the specified neighbor:

```
switch# configure terminal
switch (config)# router bgp 65000
switch (config-router)# neighbor 2001:db8::1037
switch (config-router-neighbor)# address-family ipv6 unicast
switch (config-router-neighbor-af)# capability additional-paths send
switch (config-router-neighbor-af)# capability additional-paths receive
```

In the following example, additional paths can be sent and received for the address family, but the specified neighbor is disabled from sending or receiving additional paths:

```
switch# configure terminal
switch (config)# router bgp 65000
switch (config-router)# address-family ipv6 unicast
switch (config-router-af)# additional-paths send
switch (config-router-af)# additional-paths receive
switch (config-router-af)# additional-paths selection route-map add_path4
switch (config-router-af)# neighbor 2001:db8::1037
switch (config-router-neighbor)# address-family ipv6 unicast
switch (config-router-neighbor-af)# capability additional-paths send disable
switch (config-router-neighbor-af)# capability additional-paths receive disable
```

In the following example, the send and receive capability of the neighbor overrides the send-only capability of the address family:

```
switch# configure terminal
switch (config)# router bgp 65000
switch (config-router)# address-family ipv6 unicast
switch (config-router-af)# additional-paths send
switch (config-router-af)# additional-paths selection route-map add_path4
switch (config-router-af)# neighbor 2001:db8::1037
switch (config-router-neighbor)# address-family ipv6 unicast
switch (config-router-neighbor-af)# capability additional-paths send
switch (config-router-neighbor-af)# capability additional-paths receive
```

In the following example, additional paths can be sent and received by a neighbor using the specified template:

```
switch# configure terminal
switch (config)# router bgp 65000
switch (config-router)# template peer-policy rr-client-pt1
switch (config-router-ptmp)# capability additional-paths send
switch (config-router-ptmp)# capability additional-paths receive
```

Related Commands

Command	Description
additional-paths send	Enables BGP additional paths for a prefix to be sent to a capable peer.
set path-selection all advertise	Advertises all BGP paths as additional paths to peers if the receive capability is enabled.
show ip bgp	Displays information about BGP neighbors, including path selections and path IDs.
show ip bgp neighbors	Displays information about the TCP and BGP connections to neighbors.

clear bgp

To clear Border Gateway Protocol (BGP) routes from the BGP table, use the **clear bgp** command.

```
clear bgp {ipv4 {multicast | unicast} | all} {neighbor | * | as-number | peer-template name |  
prefix} [vrf vrf-name]
```

Syntax Description	ipv4	Clears the BGP information for the IPv4 address family.
	multicast	Clears BGP information for the multicast address family.
	unicast	Clears BGP information for the unicast address family.
	all	Clears the BGP information for all address families.
	<i>neighbor</i>	Network address. The format is A.B.C.D for IPv4.
	*	Clears all neighbors.
	<i>as-number</i>	Autonomous system number. The range is from 1 to 65535.
	peer-template <i>name</i>	Specifies a BGP peer template. The name can be any case-sensitive, alphanumeric string up to 63 characters.
	<i>prefix</i>	Prefix from the selected address family. The format is A.B.C.D/length for IPv4.
	vrf <i>vrf-name</i>	(Optional) Specifies a particular virtual routing and forwarding (VRF) context name or all VRF instances. The VRF name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Enterprise Services license.

Examples This example shows how to clear all BGP entries:

```
switch# clear bgp all *
```

Related Commands	Command	Description
	show bgp	Displays BGP routes.

clear bgp dampening

To clear Border Gateway Protocol (BGP) route flap dampening information, use the **clear bgp dampening** command.

```
clear bgp {ipv4 {unicast | multicast} | all} dampening [neighbor | prefix] [vrf vrf-name | all | default | management]
```

Syntax Description	ipv4	Clears BGP information for the IPv4 address family.
	unicast	Clears BGP information for the unicast address family.
	multicast	Clears BGP information for the multicast address family.
	all	Clears BGP information for all address families.
	neighbor	(Optional) Neighbor from the selected address family. The format is A.B.C.D for IPv4.
	prefix	(Optional) Prefix from the selected address family. The format is A.B.C.D/length for IPv4.
	vrf vrf-name	(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name can be any case-sensitive, alphanumeric string up to 32 characters.
	all	(Optional) Clears BGP information from all VRFs.
	default	(Optional) Clears BGP information from the default VRF.
	management	(Optional) Clears BGP information from the management VRF.

Command Default	None
-----------------	------

Command Modes	Any command mode
---------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	<p>This example shows how to clear BGP route flap dampening information:</p> <pre>switch# clear bgp all dampening</pre>
----------	---

Related Commands

Command	Description
show ip bgp dampening	Displays BGP dampening information.

clear bgp flap-statistics

To clear Border Gateway Protocol (BGP) route flap statistics, use the **clear bgp flap-statistics** command.

```
clear bgp {ipv4 {multicast | unicast} | all} flap-statistics [neighbor | prefix] [vrf vrf-name | all | default | management]
```

Syntax Description	ipv4	Clears BGP information for the IPv4 address family.
	unicast	Clears BGP information for the unicast address family.
	multicast	Clears BGP information for the multicast address family.
	all	Clears BGP information for all address families.
	neighbor	(Optional) Neighbor from the selected address family. The format is A.B.C.D for IPv4.
	prefix	(Optional) Prefix from the selected address family. The format is A.B.C.D/length for IPv4.
	vrf vrf-name	(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name can be any case-sensitive, alphanumeric string up to 32 characters.
	all	(Optional) Clears BGP information from all VRFs.
	default	(Optional) Clears BGP information from the default VRF.
	management	(Optional) Clears BGP information from the management VRF.

Command Default	None
-----------------	------

Command Modes	Any command mode
---------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	<p>This example shows how to clear BGP route flap statistics:</p> <pre>switch# clear bgp ipv4 multicast flap-statistics</pre>
----------	---

Related Commands

Command	Description
show ip bgp flap-statistics	Displays BGP flap statistics.

clear bgp policy statistics aggregate-address

To clear policy statistics for the Border Gateway Protocol (BGP) topology table, use the **clear bgp policy statistics aggregate-address** command.

clear bgp policy statistics aggregate-address *prefix* {**advertise-map** | **suppress-map**}

Syntax Description	<i>prefix</i>	Summary address. The format is <i>x.x.x.x</i> or <i>x.x.x.x/length</i> . The range is from 1 to 32.
	advertise-map	Clears policy statistics for the advertise policy.
	suppress-map	Clears policy statistics for the suppress policy.

Command Default	None
-----------------	------

Command Modes	Any command mode
---------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	This example shows how to clear policy statistics for an aggregate address: switch# clear bgp policy statistics aggregate-address 192.0.2.0/8
----------	---

Related Commands	Command	Description
	show bgp policy statistics	Displays BGP policy statistics.

clear bgp policy statistics dampening

To clear policy statistics for the Border Gateway Protocol (BGP) dampening, use the **clear bgp policy statistics dampening** command.

clear bgp policy statistics dampening

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	This example shows how to clear policy statistics for dampening: switch# clear bgp policy statistics dampening
-----------------	--

Related Commands	Command	Description
	show bgp policy statistics	Displays BGP policy statistics.

clear bgp policy statistics neighbor

To clear policy statistics for the Border Gateway Protocol (BGP) neighbor, use the **clear bgp policy statistics neighbor** command.

```
clear bgp policy statistics neighbor prefix [default-originate | {filter-list | prefix-list | route-map} {in | out}]
```

Syntax Description	<i>prefix</i>	Neighbor address. The format is x.x.x.x.
	default-originate	(Optional) Clears policy statistics for the default originate policy.
	filter-list	Clears policy statistics for the neighbor filter list.
	prefix-list	Clears policy statistics for the neighbor prefix list.
	route-map	Clears policy statistics for the neighbor route map.
	in	(Optional) Clears inbound policy statistics.
	out	(Optional) Clears outbound policy statistics.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Enterprise Services license.

Examples This example shows how to clear policy statistics for an aggregate address:
`switch# clear bgp policy statistics neighbor 192.0.2.1 filter-list in`

Related Commands	Command	Description
	show bgp policy statistics	Displays BGP policy statistics.

clear bgp policy statistics redistribute

To clear policy statistics for the Border Gateway Protocol (BGP) topology table, use the **clear bgp policy statistics redistribute** command.

```
clear bgp policy statistics redistribute {direct | eigrp id | ospf id | rip id | static} [vrf {vrf-name
| all | default | management}]
```

Syntax Description		
direct		Clears policy statistics for directly connected routes only.
eigrp		Clears policy statistics for Enhanced Interior Gateway Routing Protocol (EIGRP).
ospf		Clears policy statistics for the Open Shortest Path First (OSPF) protocol.
rip		Clears policy statistics for the Routing Information Protocol (RIP).
static		Clears policy statistics for IP static routes.
<i>id</i>		For the eigrp keyword, an EIGRP instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the ospf keyword, an OSPF instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf <i>vrf-name</i>		Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name is an alphanumeric string of up to 32 characters.
all		(Optional) Specifies the “all” VRF instance.
default		(Optional) Specifies the default VRF.
management		(Optional) Specifies the management VRF.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Enterprise Services license.

Examples This example shows how to clear policy statistics for RIP:

```
switch# clear bgp policy statistics redistribute rip 201
```

clear bgp policy statistics redistribute

Related Commands

Command	Description
show bgp policy statistics	Displays BGP policy statistics.

clear forwarding route

To clear forwarding information, use the **clear forwarding route** command.

clear forwarding {ip | ipv4} route [* | *prefix*] [**vrf** *vrf-name*]

Syntax Description	ip	Clears an IPv4 route.
	ipv4	Clears an IPv4 route.
	*	(Optional) Clears all routes.
	<i>prefix</i>	(Optional) IPv4 prefix. The IPv4 format is x.x.x.x/length.
	vrf <i>vrf-name</i>	(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command does not require a license.
-------------------------	--

Examples	This example shows how to clear a route from the FIB:
	switch# clear forwarding ip route 10.0.0.1/8

Related Commands	Command	Description
	show forwarding	Displays the forwarding information.

clear forwarding inconsistency

To clear the Layer 3 inconsistency checker for the Forwarding Information Base (FIB), use the **clear forwarding inconsistency** command.

clear forwarding inconsistency

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to clear the Layer 3 inconsistency checker for all modules:
switch# **clear forwarding inconsistency module all**

Related Commands	Command	Description
	show forwarding inconsistency	Displays information about the FIB inconsistencies.
	test forwarding inconsistency	Triggers the forwarding inconsistency checker.

clear ip adjacency statistics

To clear adjacency statistics, use the **clear ip adjacency statistics** command.

clear ip adjacency statistics

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command does not require a license.
-------------------------	--

Examples	This example shows how to clear the adjacency statistics: switch# clear ip adjacency statistics
-----------------	---

Related Commands	Command	Description
	show ip adjacency	Displays adjacency information.

clear ip arp

To clear the Address Resolution Protocol (ARP) information, use the **clear ip arp** command.

```
clear ip arp [ip-addr | ethernet slot/port[.sub_if] | loopback if_number | port-channel
number[.sub_if_number]] [force-delete | statistics] [vrf vrf-name | all | default | management]
```

Syntax Description	<i>ip-addr</i>	(Optional) IPv4 source address. The format is x.x.x.x.
	ethernet <i>slot/port</i>	(Optional) Specifies the Ethernet interface and the slot number and port number. The slot number is from 1 to 255, and the port number is from 1 to 128.
	<i>sub_if</i>	(Optional) Specifies the Ethernet subinterface port number. The range is from 1 to 48.
	loopback <i>if_number</i>	(Optional) Specifies the loopback interface. The loopback interface number is from 0 to 1023.
	port-channel <i>number</i>	(Optional) Specifies the EtherChannel interface and EtherChannel number. The range is from 1 to 4096.
	<i>sub_if-number</i>	(Optional) Subinterface number. The range is from 1 to 4093.
	force-delete	(Optional) Clears the entries from the ARP table without a refresh.
	statistics	(Optional) Clears ARP statistics.
	vrf <i>vrf-name</i>	(Optional) Specifies the virtual routing and forwarding (VRF) context name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
	all	(Optional) Clears the ARP information from all VRF entries.
	default	(Optional) Clears the ARP information from the default VRF.
	management	(Optional) Clears the ARP information from the management VRF.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to clear the ARP table:
switch# **clear ip arp**

Related Commands

Command	Description
show ip arp	Displays information about ARP.

clear ip bgp

To clear Border Gateway Protocol (BGP) routes from the BGP table, use the **clear ip bgp** command.

```
clear ip bgp {ipv4 {unicast | multicast} | all} {neighbor | * | as-number | peer-template name |
prefix} [vrf vrf-name | all | default | management]
```

Syntax Description	ipv4	(Optional) Clears BGP information for the IPv4 address family.
	unicast	Clears BGP information for the unicast address family.
	multicast	Clears BGP information for the multicast address family.
	all	Clears the BGP information for all address families.
	neighbor	Network address. The format is A.B.C.D for IPv4.
	*	Clears all BGP routes.
	as-number	Autonomous system (AS) number. The range is from 1 to 65535.
	peer-template name	Specifies a BGP peer template. The name can be any case-sensitive, alphanumeric string up to 63 characters.
	prefix	Prefix from the selected address family. The format is A.B.C.D/length for IPv4.
	vrf vrf-name	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance. The VRF name can be any case-sensitive, alphanumeric string up to 32 characters.
	all	(Optional) Clears the BGP information from all VRF entries.
	default	(Optional) Clears the BGP information from the default VRF.
	management	(Optional) Clears the BGP information from the management VRF.

Command Default	None
-----------------	------

Command Modes	Any command mode
---------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	This example shows how to clear all BGP entries for the IPv4 address family: switch# clear ip bgp *
----------	---

Related Commands	Command	Description
	show ip bgp	Displays entries in the BGP table.

clear ip bgp dampening

To clear Border Gateway Protocol (BGP) route flap dampening information, use the **clear ip bgp dampening** command.

```
clear ip bgp [ipv4 { unicast | multicast } | all] dampening [neighbor | prefix] [vrf vrf-name | all | default | management]
```

Syntax Description	ipv4	(Optional) Clears BGP information for the IPv4 address family.
	unicast	(Optional) Clears BGP information for the unicast address family.
	multicast	(Optional) Clears BGP information for the multicast address family.
	all	(Optional) Clears the BGP information for all address families.
	neighbor	(Optional) Neighbor from the selected address family. The format is A.B.C.D for IPv4.
	prefix	(Optional) Prefix from the selected address family. The format is A.B.C.D/length for IPv4.
	vrf vrf-name	(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name can be any case-sensitive, alphanumeric string up to 32 characters.
	all	(Optional) Clears the BGP information from all VRF entries.
	default	(Optional) Clears the BGP information from the default VRF.
	management	(Optional) Clears the BGP information from the management VRF.

Command Default	None
-----------------	------

Command Modes	Any command mode
---------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	<p>This example shows how to clear BGP route flap dampening information:</p> <pre>switch# clear ip bgp dampening</pre>
----------	--

Related Commands

Command	Description
show ip bgp dampening	Displays BGP dampening information.

clear ip bgp flap-statistics

To clear Border Gateway Protocol (BGP) route flap statistics, use the **clear ip bgp flap-statistics** command.

clear ip bgp flap-statistics [*neighbor* | *prefix*] [**vrf** *vrf-name* | **all** | **default** | **management**]

Syntax Description	<i>neighbor</i>	(Optional) Neighbor from the selected address family. The format is A.B.C.D for IPv4.
	<i>prefix</i>	(Optional) Prefix from the selected address family. The format is A.B.C.D/length for IPv4.
	vrf <i>vrf-name</i>	(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name can be any case-sensitive, alphanumeric string up to 32 characters.
	all	(Optional) Clears the BGP information from all VRF entries.
	default	(Optional) Clears the BGP information from the default VRF.
	management	(Optional) Clears the BGP information from the management VRF.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Enterprise Services license.

Examples This example shows how to clear BGP route flap statistics:

```
switch# clear ip bgp flap-statistics
```

Related Commands	Command	Description
	show ip bgp flap-statistics	Displays BGP flap statistics.

clear ip eigrp accounting

To clear the prefix accounting information for the Enhanced Interior Gateway Routing Protocol (EIGRP) processes, use the **clear ip eigrp accounting** command.

clear ip eigrp accounting [**vrf** {*vrf-name* | **all** | **default** | **management**}]

Syntax Description	vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
	all	(Optional) Clears the EIGRP accounting information from all VRF instances.
	default	(Optional) Clears the EIGRP accounting information from the default VRF.
	management	(Optional) Clears the EIGRP accounting information from the management VRF.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Base Services license.

Examples This example shows how to clear the EIGRP accounting information:

```
switch# clear ip eigrp accounting
```

Related Commands	Command	Description
	show ip eigrp accounting	Displays prefix accounting information for the EIGRP processes.

clear ip eigrp neighbors

To remove and reestablish the Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor entries from the appropriate table, use the **clear ip eigrp neighbors** command.

clear ip eigrp neighbors [*** | *ip-address* | **ethernet** *slot/port* | **loopback** *if_number* | **port-channel** *number*] [**soft**] [**vrf** {*vrf-name* | **all** | **default** | **management**}]

Syntax Description	<i>*</i>	(Optional) Clears all neighbors.
	<i>ip-address</i>	(Optional) Address of the neighbor.
	ethernet <i>slot/port</i>	(Optional) Clears the Ethernet interface from the neighbor table. The slot number is from 1 to 255, and the port number is from 1 to 128.
	loopback <i>if_number</i>	(Optional) Clears the loopback interface from the neighbor table. The loopback interface number is from 0 to 1023.
	port-channel <i>number</i>	(Optional) Clears the EtherChannel interface and EtherChannel number from the neighbor table. The range is from 1 to 4096.
	soft	(Optional) Specifies soft reset for the neighbors.
	vrf <i>vrf-name</i>	(Optional) Specifies a virtual routing and forwarding (VRF) instance. The VRF name is an alphanumeric string of up to 32 characters.
	all	(Optional) Clears the EIGRP neighbor information from all VRF instances.
	default	(Optional) Clears the EIGRP neighbor information from the default VRF.
	management	(Optional) Clears the EIGRP neighbor information from the management VRF.

Command Default When no autonomous system number, interface, or VRF instance is specified, all EIGRP neighbor entries are cleared from the table.

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Base Services license.

Examples This example shows how to clear all EIGRP entries for neighbors on Ethernet interface 2/1:

```
switch# clear ip eigrp neighbors ethernet 2/1 vrf *
```

Related Commands

Command	Description
show ip eigrp interfaces	Displays information about interfaces configured for EIGRP.
show ip eigrp neighbors	Displays the neighbors discovered by EIGRP.

clear ip eigrp redistribution

To clear redistribution information for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **clear ip eigrp redistribution** command.

clear ip eigrp redistribution [**vrf** {*vrf-name* | **all** | **default** | **management**}]

Syntax Description	<div> <div>vrf <i>vrf-name</i></div> <div>(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name is a case-sensitive, alphanumeric string of up to 32 characters.</div> </div> <div> <div>all</div> <div>(Optional) Clears the redistribution information from all VRF instances.</div> </div> <div> <div>default</div> <div>(Optional) Clears the redistribution information from the default VRF.</div> </div> <div> <div>management</div> <div>(Optional) Clears the redistribution information from the management VRF.</div> </div>	
Command Default	None	
Command Modes	Any command mode	
Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.
Usage Guidelines	This command requires the LAN Base Services license.	
Examples	<p>This example shows how to clear redistribution information:</p> <pre>switch# clear ip eigrp redistribution</pre>	
Related Commands	Command	Description
	feature eigrp	Enables the EIGRP feature.

clear ip eigrp traffic

To clear the Enhanced Interior Gateway Routing Protocol (EIGRP) traffic statistics, use the **clear ip eigrp traffic** command.

clear ip eigrp traffic [*vrf* {*vrf-name* | **all** | **default** | **management**}]

Syntax Description	vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters.
	all	(Optional) Clears the traffic statistics from all VRF instances.
	default	(Optional) Clears the traffic statistics from the default VRF.
	management	(Optional) Clears the traffic statistics from the management VRF.

Command Default	This command clears information for the default VRF if no VRF is specified.
------------------------	---

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Base Services license.
-------------------------	--

Examples	This example shows how to clear the EIGRP traffic statistics: switch# clear ip eigrp traffic
-----------------	--

Related Commands	Command	Description
	show ip eigrp traffic	Displays the number of EIGRP packets sent and received.

clear ip interface statistics

To clear IP interface statistics, use the **clear ip interface statistics** command.

clear ip interface statistics

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to clear the IP interface statistics:
switch# **clear ip interface statistics**

Related Commands	Command	Description
	show ip interface	Displays IP interface information.

clear ip ospf neighbor

To clear neighbor statistics and reset adjacencies for Open Shortest Path First (OSPF), use the **clear ip ospf neighbor** command.

clear ip ospf [*instance-tag*] **neighbor** { * | *neighbor-id* | *interface-type number* | **loopback** *number* | **port-channel** *number* } [**vrf** *vrf-name*]

Syntax Description	
<i>instance-tag</i>	(Optional) Instance tag. Specify as an alphanumeric string of up to 20 characters.
*	Clears all neighbors.
<i>neighbor-id</i>	Neighbor ID (as an IP address) of the neighbor to clear.
<i>interface-type number</i>	Interface from which to clear all neighbors.
loopback <i>number</i>	Clears all neighbors on a loopback interface.
port-channel <i>number</i>	Clears all neighbors on a port-channel interface.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the OSPF virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be any alphanumeric string of up to 32 characters, except “default” and “all”.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines Use the **clear ip ospf neighbor** command to clear neighbor information from the **show ip ospf neighbor** command. Use the *instance-tag* argument to clear the neighbor details from one OSPF instance. If you do not use the *instance-tag* argument, Cisco NX-OS clears the neighbor details from all OSPF instances. Use the **show ip ospf neighbor** command to find the neighbor ID.

This command requires the LAN Base Services license.

Examples This example shows how to clear all OSPF neighbor details for neighbor 192.0.2.1 for instance tag 201:

```
switch# clear ip ospf 201 neighbor 192.0.2.1
```

This example shows how to clear all OSPF neighbor details for all OSPF instances:

```
switch# clear ip ospf neighbor *
```

This example shows how to clear all OSPF neighbor details for all neighbors on Ethernet interface 1/2 for OSPF instance 202:

■

clear ip ospf neighbor

```
switch# clear ip ospf 202 neighbor ethernet 1/2
```

Related Commands

Command	Description
show ip ospf neighbor	Displays details for OSPF neighbors including the neighbor ID.

clear ip ospf policy statistics

To clear policy statistics for Open Shortest Path First (OSPF), use the **clear ip ospf policy statistics** command.

```
clear ip ospf [instance-tag] policy statistics {area area-id filter-list {in | out} | redistribute {bgp
autonomous-system | direct | eigrp id | ospf id | rip id | static}} [vrf vrf-name]
```

Syntax Description	
<i>instance-tag</i>	(Optional) Instance tag. Specify as an alphanumeric string of up to 20 characters.
area	Clears policy statistics for an area.
<i>area-id</i>	Area ID as an integer or IP address.
filter-list	Specifies the policy statistics for filtered prefixes between OSPF areas.
in	Filters prefixes sent into this OSPF area.
out	Filters prefixes sent from this OSPF area.
redistribution	Clears OSPF route redistribution statistics.
bgp <i>autonomous-system</i>	Specifies the autonomous system number for the Border Gateway Protocol. Specify the autonomous system number as <i>x.y</i> , where the range is from 1 to 65535 for both <i>x</i> and <i>y</i> , or as a single integer, where the range is from 1 to 65535.
direct	Specifies directly connected routes.
eigrp <i>id</i>	Specifies the autonomous system number for the Enhanced Interior Gateway Protocol. Specify the <i>id</i> argument as any case-sensitive, alphanumeric string.
ospf <i>id</i>	Specifies the Open Shortest Path First version 2 instance. Specify the <i>id</i> argument as any case-sensitive, alphanumeric string.
rip <i>id</i>	Specifies the Routing Information Protocol instance. Specify the <i>id</i> argument as any case-sensitive, alphanumeric string.
static	Specifies static routes.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the OSPF virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be any alphanumeric string of up to 32 characters, except “default” and “all”.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **clear ip ospf statistics** command to learn the policy statistics shown in the **show ip ospf policy statistics** command. Use the *instance-tag* argument to clear the policy statistics from one OSPF instance. If you do not specify the instance tag, Cisco NX-OS clears the policy statistics from all OSPF instances. Use the **show ip ospf policy statistics** command to view the statistics that you are clearing.

This command requires the LAN Base Services license.

Examples

This example shows how to clear all OSPF policy statistics for area 99 inbound filtered routes for OSPF 201:

```
switch# clear ip ospf 201 policy statistics area 99 filter-list in
```

This example shows how to clear all OSPF policy statistics for all BGP redistributed routes for OSPF 202:

```
switch# clear ip ospf 202 policy statistics redistribute bgp
```

Related Commands

Command	Description
show ip ospf policy statistics	Displays details for OSPF policies.

clear ip ospf redistribution

To clear redistribution information for Open Shortest Path First (OSPF), use the **clear ip ospf redistribution** command.

clear ip ospf redistribution [**vrf** {*vrf-name* | **all** | **default** | **management**}]

Syntax Description	vrf <i>vrf-name</i>	(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name is a case-sensitive, alphanumeric string of up to 32 characters.
	all	(Optional) Specifies the “all” VRF instance.
	default	(Optional) Specifies the default VRF.
	management	(Optional) Specifies the management VRF.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Base Services license.
-------------------------	--

Examples	This example shows how to clear redistribution information:
	switch# clear ip ospf redistribution

Related Commands	Command	Description
	feature ospf	Enables the OSPF feature.

clear ip ospf statistics

To clear Open Shortest Path First (OSPF) event statistics, use the **clear ip ospf statistics** command.

```
clear ip ospf [instance-tag] statistics [vrf vrf-name]
```

Syntax Description	<i>instance-tag</i>	(Optional) Instance tag. Specify as an alphanumeric string of up to 20 characters.
	vrf <i>vrf-name</i>	(Optional) Specifies the name of the OSPF virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be any alphanumeric string of up to 32 characters, except “default” and “all”.

Command Default	None
-----------------	------

Command Modes	Any command mode
---------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Use the clear ip ospf statistics command to clear the event statistics from one or more OSPF instances. If you do not specify the <i>instance-tag</i> argument, Cisco NX-OS clears statistics from all OSPF instances. Use the show ip ospf statistics command to view the statistics that you are clearing. This command requires the LAN Base Services license.
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Examples	This example shows how to clear all OSPF event statistics: switch# clear ip ospf statistics
----------	---

Related Commands	Command	Description
	show ip ospf statistics	Displays event statistics for OSPF.

clear ip ospf traffic

To clear Open Shortest Path First (OSPF) traffic statistics, use the **clear ip ospf traffic** command.

clear ip ospf [*instance-tag*] **traffic** [*interface*] [**vrf** *vrf-name*]

Syntax Description	<i>instance-tag</i>	(Optional) Instance tag. Specify as an alphanumeric string of up to 20 characters.
	<i>interface</i>	(Optional) Interface to clear traffic statistics for. Use the ? option to see the interface options.
	vrf <i>vrf-name</i>	(Optional) Specifies the name of the OSPF virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be any alphanumeric string of up to 32 characters, except “default” and “all”.

Command Default	None
-----------------	------

Command Modes	Any command mode
---------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	<p>Use the clear ip ospf traffic command to clear the traffic statistics from one or more OSPF instances. If you do not specify the <i>instance-tag</i> argument, Cisco NX-OS clears traffic statistics from all OSPF instances. Use the show ip ospf traffic statistics command to view the statistics that you are clearing.</p> <p>This command requires the LAN Base Services license.</p>
------------------	--

Examples	<p>This example shows how to clear OSPF traffic statistics for OSPF 100:</p> <pre>switch# clear ip ospf 100 traffic</pre>
----------	---

Related Commands	Command	Description
	show ip ospf traffic statistics	Displays OSPF traffic statistics.

clear ip rip policy statistics redistribute

To clear policy statistics for routes redistributed into the Routing Information Protocol (RIP) topology table, use the **clear ip rip policy statistics redistribute** command in any mode.

clear ip rip policy statistics redistribute { **bgp** *id* | **direct** | **eigrp** *id* | **ospf** *id* | **static** } [**vrf** *vrf-name*]

Syntax Description	bgp	Clears policy statistics for the Border Gateway Protocol (BGP).
	direct	Clears policy statistics for directly connected routes only.
	eigrp	Clears policy statistics for the Enhanced Interior Gateway Routing Protocol (EIGRP).
	ospf	Clears policy statistics for the Open Shortest Path First (OSPF) protocol.
	static	Clears policy statistics for IP static routes.
	<i>id</i>	For the bgp keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the eigrp keyword, an EIGRP instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the ospf keyword, an OSPF instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
	vrf <i>vrf-name</i>	(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name can be a maximum of 32 alphanumeric characters and is case sensitive.

Command Default This command has no default settings.

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to clear policy statistics for EIGRP:

```
switch# clear ip rip policy statistics redistribute eigrp 201
```


Related Commands

Command	Description
show ip rip policy statistics	Displays policy statistics for RIP.

clear ip rip statistics

To clear the Routing Information Protocol (RIP) statistics, use the **clear ip rip statistics** command in any mode.

```
clear ip rip statistics [interface type instance] [vrf vrf-name]
```

Syntax Description	interface type instance	(Optional) Specifies the interface to clear topology entries.
	vrf vrf-name	(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name can be up to 32 alphanumeric characters.

Command Default	This command has no default settings.
-----------------	---------------------------------------

Command Modes	Any command mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command does not require a license.
------------------	--

Examples	This example shows how to clear all RIP statistics: switch# clear ip rip statistics
----------	---

Related Commands	Command	Description
	show rip statistics	Displays database and interface entry information for the RIP process.

clear ip route

To clear individual routes from the unicast Routing Information Base (RIB), use the **clear ip route** command.

clear ip route [*** | *addr* | *prefix*]] [**vrf** *vrf-name*]

Syntax Description

<i>*</i>	(Optional) Clears all routes.
<i>addr</i>	(Optional) Clears this route. The format is x.x.x.x.
<i>addr</i>	(Optional) Clears this prefix. The format is x.x.x.x/length.
vrf <i>vrf-name</i>	(Optional) Specifies the virtual routing and forwarding (VRF) context name. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **clear ip route** command to clear individual routes from the route table.



Caution

The *** keyword is severely disruptive to routing.

This command does not require a license.

Examples

This example shows how to clear the individual route:

```
switch(config)# clear ip route 192.0.2.1
```

Related Commands

Command	Description
show ip route	Displays entries in the route table.

clear ip traffic

To clear IP traffic information, use the **clear ip traffic** command.

clear ip traffic

Syntax Description	This command has no arguments or keywords.	
Command Default	None	
Command Modes	Any command mode	
Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.
Usage Guidelines	This command does not require a license.	
Examples	This example shows how to clear the IP traffic information:	
	switch# clear ip traffic	
Related Commands	Command	Description
	show ip traffic	Displays IP traffic information.

clear sockets statistics

To clear the socket statistics, use the **clear sockets statistics** command.

clear sockets statistics [**all** | **raw** | **tcp** | **udp**]

Syntax Description	all	(Optional) Clears all the socket statistics.
	raw	(Optional) Clears the socket statistic for the raw IPv4 protocols.
	tcp	(Optional) Clears the socket statistic for the TCP IPv4 protocols.
	udp	(Optional) Clears the socket statistic for the UDP IPv4 protocols.

Command Default	None
-----------------	------

Command Modes	Any command mode
---------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command does not require a license.
------------------	--

Examples	This example shows how to clear the TCP socket statistics:
----------	--

```
switch# clear sockets statistics tcp
```

Related Commands	Command	Description
	show sockets statistics	Displays information about the socket statistics.
	show sockets client	Displays information about the socket client information.
	show sockets connection	Displays information about the socket connection.

clear vrrp

To clear the Virtual Router Redundancy Protocol (VRRP) statistics, use the **clear vrrp** command.

```
clear vrrp vr id interface { ethernet slot/port | port-channel number[.sub_if_number]}
```

Syntax Description	vr id	Clears VRRP statistics in a VRRP group on an interface. The range is from 1 to 255.
	interface	Specifies the interface whose statistics need to be cleared.
	ethernet slot/port	Clears VRRP statistics on the Ethernet interface. The slot number is from 1 to 255, and the port number is from 1 to 128.
	port-channel number	Clears VRRP statistics on the EtherChannel interface. The EtherChannel number is from 1 to 4096.
	sub_if-number	(Optional) Subinterface number. The range is from 1 to 4093.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to clear VRRP statistics from a specific Ethernet interface:

```
switch# clear vrrp vr 1 interface ethernet 1/5
switch#
```

Related Commands	Command	Description
	feature vrrp	Enables the VRRP feature.

client-to-client reflection

To enable or restore route reflection from a Border Gateway Protocol (BGP) route reflector to clients, use the **client-to-client reflection** command. To disable client-to-client route reflection, use the **no** form of this command.

client-to-client reflection

no client-to-client reflection

Syntax Description

This command has no arguments or keywords.

Command Default

Client-to-client route reflection is enabled by default; when a route reflector is configured, the route reflector reflects routes from a client to other clients.

Command Modes

Router address-family configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

By default, the clients of a route reflector are not required to be fully meshed and the routes from a client are reflected to other clients. However, if the clients are fully meshed, route reflection is not required. In this case, use the **no client-to-client reflection** command to disable client-to-client reflection.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure a router as a route reflector:

```
switch# configure terminal
switch(config)# router bgp 50000
switch(config-router)# address-family ipv4 multicast
switch(config-router-af)# client-to-client reflection
switch(config-router-af)#
```

Related Commands

Command	Description
address-family (BGP router)	Places the router in address family configuration mode for configuring routing sessions that use standard IPv4 address prefixes.
show ip bgp	Displays entries in the BGP routing table.

confederation

To configure the confederation parameters for the Border Gateway Protocol (BGP), use the **confederation** command.

confederation { **identifier** | **peers** } *as-number*

Syntax Description	identifier	Sets the routing domain confederation autonomous system (AS) number.
	peers	Sets the peer AS numbers for a BGP confederation.
	<i>as-number</i>	Autonomous system number. The AS number can be a 16-bit integer or a 32-bit integer in the form of <higher 16-bit decimal number>.<lower 16-bit decimal number>.
Command Default	None	
Command Modes	Router configuration mode Router VRF mode	
Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.
Usage Guidelines	This command requires the LAN Enterprise Services license.	
Examples	<p>This example shows how to configure the confederation identifier:</p> <pre>switch# configure terminal switch(config)# router bgp 65536.33 switch(config-router)# confederation identifier 65536.33 switch(config-router)#</pre>	
Related Commands	Command	Description
	show bgp	Displays information about BGP.

dampen-igp-metric

To configure dampening of IGP metric-related changes for redistributed routes, use the **dampen-igp-metric** command. To disable the function, use the **no** form of this command.

dampen-igp-metric *seconds*

no dampen-igp-metric

Syntax Description	<i>seconds</i>	Specifies the time interval in seconds. The range is from 20 to 3600. The default value is 600 seconds.
--------------------	----------------	---

Command Default	Disabled.
-----------------	-----------

Command Modes	Address family configuration mode
---------------	-----------------------------------

Command History	Release	Modification
	6.0(2)U2(1)	This command was introduced.

Usage Guidelines	The dampen-igp-metric command affects how BGP handles IGP metric changes reported for redistributed routes. BGP dampens these changes by processing them in a batched fashion with a 10 minute delay. This command allows the user to adjust that delay or remove it altogether for quicker response to these changes.
------------------	---

Examples	This example shows how to set a dampening interval of 100 for redistributed routes:
----------	---

```
switch# configure terminal
switch(config)# router bgp 100
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# dampen-igp-metric 100
switch(config-router-af)#
```

Related Commands	Command	Description
	default-metric (BGP)	Sets the default metrics for routes redistributed into BGP.

dampening (BGP)

To enable Border Gateway Protocol (BGP) route dampening or change various BGP route dampening factors, use the **dampening** command. To disable the function or restore the default values, use the **no** form of this command.

```
dampening [half-life | route-map name]  
  
no dampening [half-life | route-map name]
```

Syntax Description	<i>half-life</i>	(Optional) Time (in minutes) after which a penalty is decreased. Once the route has been assigned a penalty, the penalty is decreased by half after the half-life period (which is 15 minutes by default). The process of reducing the penalty happens every 5 seconds. The range of the half-life period is 1 to 45 minutes. The default is 15 minutes.
	route-map <i>name</i>	(Optional) Name of the route map that controls where BGP route dampening is enabled. The name argument can be any alphanumeric string of up to 63 characters.

Command Default	Disabled.
-----------------	-----------

Command Modes	Address family configuration mode Router configuration mode
---------------	--

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	If this command is used with no arguments, it enables BGP route dampening. This command requires the LAN Enterprise Services license.
------------------	--

Examples	This example shows how to set the half life to 30 minutes: switch# configure terminal switch(config)# router bgp 64496 switch(config-router)# dampening 30 switch(config-router)#
----------	--

Related Commands	Command	Description
	address-family (BGP router)	Configures BGP.
	clear ip bgp dampening	Clears BGP route flap dampening information.
	clear ip bgp flap-statistics	Clears BGP route flap statistics.
	show ip bgp dampening	Displays BGP dampening information.

dead-interval (OSPF virtual link)

To set the interval during which at least one hello packet must be received from a neighbor on an Open Shortest Path First (OSPF) virtual link before the router declares that neighbor as down, use the **dead-interval** command. To restore the default, use the **no** form of this command.

dead-interval *seconds*

no dead-interval

Syntax Description	<i>seconds</i>	Interval (in seconds) during which the router must receive at least one hello packet from a neighbor or that neighbor is removed from the peer list and does not participate in routing. The range is from 1 to 65535. The value must be the same for all nodes on the virtual link.
--------------------	----------------	--

Command Default	40 seconds
-----------------	------------

Command Modes	Virtual link configuration mode
---------------	---------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	The dead interval advertised in OSPF hello packets must be the same for all networking devices on the virtual link. The default value for <i>seconds</i> is four times the interval set by the hello-interval command.
	You can configure a shorter dead interval (<i>seconds</i>) to detect a down neighbor faster and improve convergence. A shorter dead interval may lead to virtual link instability by incorrectly declaring a slow neighbor as down.
	Use the show ip ospf virtual-links command to verify the dead interval.
	This command requires the LAN Base Services license.

Examples	This example shows how to configure the OSPF dead interval to 20 seconds:
	switch# configure terminal
	switch(config)# ospf 201
	switch(config-router)# area 99 virtual-link 192.0.2.4
	switch(config-router-vlink)# dead-interval 20
	switch(config-router-vlink)#

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	hello-interval (OSPF virtual link)	Configures the interval between hello packets that Cisco NX-OS sends on the virtual link.
	show ip ospf virtual-link	Displays OSPF virtual link information.

default-information originate (EIGRP)

To generate a default route into the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **default-information originate** command. To disable this feature, use the **no** form of this command.

```
default-information originate [always] [route-map map-name]

no default-information originate
```

Syntax Description

always	(Optional) Generates the default route if the route is not in the EIGRP routing information base.
route-map map-name	(Optional) Generates the default route only if the route is permitted by the route map. The map name is an alphanumeric string of up to 63 characters.

Command Default

Disabled

Command Modes

Address-family configuration mode
Router configuration mode
Router VRF configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command requires the LAN Base Services license.

Examples

This example shows how to originate a default route (0.0.0.0/0) to all routes that pass the Condition route map:

```
switch# configure terminal
switch(config)# router eigrp 201
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# default-information originate route-map Condition
switch(config-router-af)#
```

Related Commands

Command	Description
address-family	Enters address-family configuration mode.
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
default-metric	Sets the metric for routes redistributed into EIGRP.

Command	Description
redistribute	Redistributes routes from other routing protocols into EIGRP.
show ip eigrp	Displays EIGRP information.

default-information originate (OSPF)

To generate a default external route into an Open Shortest Path First (OSPF) routing domain, use the **default-information originate** command. To disable this feature, use the **no** form of this command.

```
default-information originate [always] [route-map map-name]

no default-information originate [always] [route-map map-name]
```


Syntax Description	always	(Optional) Specifies to always advertise the default route regardless of whether the route table has a default route.
	route-map <i>map-name</i>	(Optional) Specifies to advertise the default route if the route map is satisfied. The <i>map-name</i> argument can be any alphanumeric string up to 63 characters.

Command Default Advertises the default route if the route is in the route table.

Command Modes Router configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines Use the **route-map** keyword to filter redistributed routes so that Cisco NX-OS generates a default route only for routes that pass the route map. Use the **always** keyword to generate the default route regardless of whether the default route is in the route table.


Note

The **default-information originate** command ignores **match** statements in the optional route map.

This command requires the LAN Base Services license.

Examples This example shows how to configure the default route redistributed into the OSPF routing domain for the Enhanced Interior Gateway Protocol (EIGRP):

```
switch# configure terminal
switch(config)# router ospf 109
switch(config-router)# redistribute eigrp 108 route-map EigrpPolicy
switch(config-router)# default-information originate always
switch(config-router)#
```


Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	redistribute (OSPF)	Redistributes routes from one routing domain into OSPF.
	route-map	Defines a filter policy for routes.
	show ip ospf	Displays OSPF information.

default-information originate (RIP)

To generate a default route into the Routing Information Protocol (RIP), use the **default-information originate** command. To disable this feature, use the **no** form of this command.

default-information originate [**always**] [**route-map** *map-name*]

no default-information originate

Syntax Description	always	(Optional) Generates the default route if the route is not in the RIP routing information base.
	route-map <i>map-name</i>	(Optional) Generates the default route only if the route is permitted by the route map. The map name is any alphanumeric string up to 63 characters.

Command Default Disabled

Command Modes Router address-family configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to originate a default route (0.0.0.0/0) to all routes that pass the Condition route map:

```
switch# configure terminal
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# default-information originate route-map Condition
switch(config-router-af)#
```

Related Commands	Command	Description
	address-family	Enters address-family configuration mode.
	default-metric	Sets the metric for routes redistributed into RIP.
	redistribute	Redistributes routes from other routing protocols into RIP.
	show ip rip route	Displays the routes in RIP table.

default-metric (EIGRP)

To set metrics for an Enhanced Interior Gateway Routing Protocol (EIGRP), use the **default-metric** command. To remove the metric value and restore the default state, use the **no** form of this command.

default-metric *bandwidth delay reliability loading mtu*

no default-metric

Syntax Description	
<i>bandwidth</i>	Minimum bandwidth of the route in kilobits per second. The range is from 1 to 16777215. The default value is 100000.
<i>delay</i>	Route delay in tens of microseconds. The range is from 1 to 16777215. The default value is 100 (tens of microseconds).
<i>reliability</i>	Likelihood of successful packet transmission expressed as a number between 0 and 255. The value 255 means 100-percent reliability; 0 means no reliability. The default value is 255.
<i>loading</i>	Effective bandwidth of the route expressed as a number from 1 to 255 (255 is 100-percent loading). The default value is 1.
<i>mtu</i>	Minimum maximum transmission unit (MTU) size of the route in bytes. The range is from 128 to 4352.

Command Default	
	bandwidth: 100000 delay: 100 (tens of microseconds) reliability: 255 loading: 1

Command Modes	
	Address-family configuration mode Router configuration mode Router VRF configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	
	Use the default-metric command with the redistribute command to use the same metric value for all redistributed routes. A default metric helps to solve the problem of redistributing routes with incompatible metrics. Whenever external metrics do not convert to EIGRP metrics, you can use a default metric to provide a reasonable substitute to the external metric and enable the redistribution to proceed. This command requires the LAN Base Services license.

Examples	
	This example shows how to take redistributed Routing Information Protocol (RIP) metrics and translate them into EIGRP metrics with the following values: bandwidth = 1000, delay = 100, reliability = 250, loading = 100, and MTU = 1500.

■ default-metric (EIGRP)

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# redistribute rip 100 route-map FilterRIP
switch(config-router-af)# default-metric 1000 100 250 100 1500
switch(config-router-af)#
```

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	redistribute	Redistributes routes from one routing domain into another routing domain.
	show ip eigrp route-map statistics redistribute	Displays information about EIGRP route map statistics.

default-metric (OSPF)

To set default metric values for the Open Shortest Path First (OSPF) routing protocol, use the **default-metric** command. To return to the default state, use the **no** form of this command.

default-metric *metric-value*

no default-metric *metric-value*

Syntax Description	<i>metric-value</i>	Default metric value appropriate for the specified routing protocol. The range is from 1 to 1677214.
---------------------------	---------------------	--

Command Default	The metric for redistributed, connected, and static routes is set to 25.
------------------------	--

Command Modes	Router configuration mode
----------------------	---------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Use the default-metric command with the redistribute command to configure the same metric value for all redistributed routes except static and directly connected routes. A default metric helps to redistribute routes with incompatible metrics. Whenever external route metrics do not convert to an OSPF metric, use a default metric to enable the redistribution to proceed.
-------------------------	--

**Note**

The **default-metric** command does not apply to the redistribution of directly connected routes into OSPF. Use a route map to change the default metric for directly connected routes.

This command requires the LAN Base Services license.

Examples	This example shows how to configure OSPF to redistribute RIP and BGP and set the default metric to 10:
-----------------	--

```
switch# configure terminal
switch(config)# router ospf 201
switch(config-router)# default-metric 10
switch(config-router)# redistribute rip 109 route-map FilterRip
switch(config-router)# redistribute bgp 4 route-map FilterBgp
switch(config-router)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
redistribute (OSPF)	Redistributes routes from another routing domain into OSPF.
show ip ospf	Displays OSPF information.

default-metric (RIP)

To set default metric values for the Routing Information Protocol (RIP), use the **default-metric** command in router address-family configuration mode. To return to the default state, use the **no** form of this command.

default-metric *value*

no default-metric [*value*]

Syntax Description	<i>value</i>	Default metric value. The range is from 1 to 15.
---------------------------	--------------	--

Command Default	<i>value</i> : 1
------------------------	------------------

Command Modes	Router address-family configuration mode
----------------------	--

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	<p>Use the default-metric command with the redistribute command to use the same metric value for all redistributed routes. A default metric helps to solve the problem of redistributing routes with incompatible metrics. Whenever external metrics do not convert to RIP metrics, you can use a default metric to provide a reasonable substitute to the external metric and enable the redistribution to proceed.</p> <p>This command does not require a license.</p>
-------------------------	--

Examples	<p>This example shows how to advertise Open Shortest Path First (OSPF) routes using RIP and assign the OSPF-derived routes with a RIP metric of 10:</p>
-----------------	---

```
switch# configure terminal
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# default-metric 10
switch(config-router-af)# redistribute ospf 109 route-map FilterOSPF
switch(config-router-af)#
```

Related Commands	Command	Description
	address-family	Enters address-family configuration mode.
	copy running-config startup-config	Saves the configuration to the startup configuration file.
	default-information originate	Generates a default route for routes redistributed into RIP.

Command	Description
redistribute	Redistributes routes from one routing domain into another routing domain.
show ip rip route	Displays the routes in RIP table.

delay minimum

To delay the Hot Standby Router Protocol (HSRP) initialization after a reload or after an interface comes up, use the **delay minimum** command. To disable this function, use the **no** form of this command.

delay minimum [*min-delay*] **reload** [*reload-delay*]

no delay minimum [*min-delay*] **reload** [*reload-delay*]

Syntax Description	<i>min-delay</i>	Minimum time (in seconds) to delay HSRP group initialization after an interface comes up. This period applies to all subsequent interface events. The default is 0 seconds.
	reload <i>reload-delay</i>	Specifies the time period to delay HSRP group initialization after the router has reloaded. This period applies only to the first interface-up event after the router has reloaded. The default is 0 seconds.

Command Default The HSRP delay default is 0 seconds.

Command Modes Interface configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines The delayed HSRP initialization configuration allows the interface and router to stabilize after the interface comes up and helps to prevent HSRP state flapping.

This command does not require a license.

Examples This example shows how to configure a minimum delay of 3 seconds and a group initialization delay of 10 seconds:

```
switch# configure terminal
switch(config)# configure terminal
switch(config)# interface ethernet 1/5
switch(config-if)# no switchport
switch(config-if)# ip address 192.168.9.5 255.255.255.0
switch(config-if)# hsrp 1
switch(config-if)# delay minimum 3 reload 10
switch(config-if)# ip 192.168.0.100
switch(config-if)#
```

Related Commands	Command	Description
	feature hsrp	Enables the HSRP configuration.

delay

To delay a state change for object tracking, use the **delay** command. To disable this function, use the **no** form of this command.

```
delay {up up-time [down down-time] | down down-time [up up-time]}

no delay
```

Syntax Description	up up-time	Delays the object track state change for an up condition. The range is from 0 to 180 seconds.
	down down-time	Delays the object track state change for a down condition. The range is from 0 to 180 seconds.

Command Default	None
-----------------	------

Command Modes	Object track mode
---------------	-------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Use this command to delay when object tracking detects an up or down state change for a tracked object or track list. This delay helps to prevent state flapping. This command does not require a license.
------------------	---

Examples	This example shows how to configure the delay timer for a tracked object: switch# configure terminal switch(config)# configure terminal switch(config)# track 1 interface ethernet 1/2 line-protocol switch(config-track)# delay up 30 down 30 switch(config-track)#
----------	---

Related Commands	Command	Description
	track	Configures a tracked object or track list.

disable-peer-as-check

To configure eBGP learned routes to advertise between peers in the same AS, use the **disable-peer-as-check** command.

disable-peer-as-check



Note

You can configure the **disable-peer-as-check** command in the peer-template and it is inherited in neighbor configuration mode.

Syntax Description

This command has no arguments or keywords.

Command Modes

Neighbor configuration mode

Command History

Release	Modification
5.0(3)U5(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to :

```
switch# configure terminal
switch(config)# router bgp 66
switch(config-router)# neighbor 209.165.201.1 remote-as 64497
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# disable-peer-as-check
switch(config-router-neighbor-af)#
```

Related Commands

Command	Description
show running-config bgp	Displays BGP configuration.

distance (EIGRP)

To allow the use of two administrative distances—internal and external—for the Enhanced Interior Gateway Routing Protocol (EIGRP) that could provide a better route to a node, use the **distance** command. To return to the default setting, use the **no** form of this command.

distance *internal-distance external-distance*

no distance

Syntax Description

<i>internal-distance</i>	Administrative distance for EIGRP internal routes. Internal routes are routes that are learned from another entity within the same autonomous system (AS). The distance can be a value from 1 to 255. The default value is 90.
<i>external-distance</i>	Administrative distance for EIGRP external routes. External routes are routes for which the best path is learned from a source external to this autonomous system. The distance can be a value from 1 to 255. The default value is 170.

Command Default

internal-distance: 90
external-distance: 170

Command Modes

Address-family configuration mode
Router configuration mode
Router VRF configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

An administrative distance is a rating of the trustworthiness of a routing information source, such as an individual router or a group of routers. Numerically, an administrative distance is an integer from 0 to 255. In general, a higher value indicates a lower trust rating. An administrative distance of 255 means that the routing information source cannot be trusted and should be ignored.

Use the **distance** command if another protocol is known to provide a better route to a node than was actually learned through the external EIGRP or some internal routes should be preferred by EIGRP.

This command requires the LAN Base Services license.

Examples

This example shows how to set the administrative distance of all EIGRP 1 internal routes to 80 and all EIGRP external routes to 130:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# distance 80 130
```

```
switch(config-router)#
```

Related Commands

Command	Description
show ip eigrp	Displays EIGRP information.

distance (OSPF)

To define the Open Shortest Path First (OSPF) route administrative distance, use the **distance** command. To restore the default, use the **no** form of this command.

```
distance distance

no distance
```

Syntax Description	distance	Administrative distance for all routes local to this OSPF process. The range is from 1 to 255.
--------------------	----------	--

Command Default	110
-----------------	-----

Command Modes	Router configuration mode
---------------	---------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use this command to set a distance for an entire group of routes or when you configure multiple routing protocols and you want to choose one set of routes over the other.

This command requires the LAN Base Services license.

Examples

This example shows how to set the distance to 200, making the route less reliable:

```
switch# configure terminal
switch(config)# router ospf 1
switch(config-router)# distance 200
switch(config-router)#
```

Related Commands	Command	Description
	show ip ospf	Displays OSPF information.
	copy running-config startup-config	Saves this configuration change to the startup configuration file.

distance (RIP)

To define the administrative distance assigned to routes discovered by the Routing Information Protocol (RIP), use the **distance** command. To remove the distance and restore the system to its default condition, use the **no** form of this command.

distance *admin-distance*

no distance *admin-distance*

Syntax Description	<i>admin-distance</i>	Administrative distance to be assigned to RIP routes. The range is from 1 to 255.
---------------------------	-----------------------	---

Command Default	<i>admin-distance</i> : 120
------------------------	-----------------------------

Command Modes	Router address-family configuration mode
----------------------	--

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Use this command to change the preference of RIP routes over other protocol routes. Numerically, an administrative distance is an integer from 1 to 255. In general, a higher value indicates a lower trust rating. An administrative distance of 255 means that the routing information source cannot be trusted at all and should be ignored.
-------------------------	---

This command does not require a license.

Examples	This example shows how to set the administrative distance for RIP:
-----------------	--

```
switch# configure terminal
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# distance 85
switch(config-router-af)#
```

Related Commands	Command	Description
	address-family	Enters address-family configuration mode.
	redistribute	Redistributes routes from one routing domain into RIP.
	show ip rip	Displays a summary of RIP information for all RIP instances.

ebgp-multihop

To configure the exterior Border Gateway Protocol (eBGP) time-to-live (TTL) value to support eBGP multihop, use the **ebgp-multihop** command. To return to the default setting, use the **no** form of this command.

```
ebgp-multihop ttl-value
no ebgp-multihop ttl-value
```

Syntax Description	ttl-value	TTL value for eBGP multihop. The range is from 2 to 255. You must manually reset the BGP sessions after using this command.
--------------------	-----------	---

Command Default	None
-----------------	------

Command Modes	BGP neighbor configuration mode
---------------	---------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	In some situations, an eBGP peer is not directly connected to another eBGP peer and requires multiple hops to reach the remote eBGP peer. You can configure the eBGP TTL value for a neighbor session to allow these multihop sessions. This command requires the LAN Enterprise Services license.
------------------	---

Examples	This example shows how to configure the eBGP multihop value: switch# configure terminal switch(config)# router bgp 1.1 switch(config-router)# neighbor 192.0.2.1 remote-as 1.2 switch(config-route-neighbor)# ebgp-multihop 2 switch(config-route-neighbor)#
----------	---

Related Commands	Command	Description
	feature bgp	Enables the BGP feature.

eigrp log-neighbor-changes

To enable the logging of changes in Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor adjacencies, use the **eigrp log-neighbor-changes** command. To disable the logging of changes in EIGRP neighbor adjacencies, use the **no** form of this command.

eigrp log-neighbor-changes

no eigrp log-neighbor-changes

Syntax Description This command has no arguments or keywords.

Command Default Adjacency changes are logged.

Command Modes

- Address-family configuration mode
- Router configuration mode
- Router VRF configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Base Services license.

Examples This example shows how to enable logging of neighbor changes for EIGRP process 209:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# eigrp log-neighbor-changes
switch(config-router)#
```

Related Commands	Command	Description
	log-neighbor-changes	Enables logging of EIGRP neighbor changes.
	log-neighbor-warnings	Enables logging of EIGRP neighbor warnings.
	log-adjacency-changes	Enables logging of EIGRP adjacency state changes.

eigrp log-neighbor-warnings

To enable the logging of Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor warning messages and to configure the interval between repeated neighbor warning messages, use the **eigrp log-neighbor-warnings** command. To disable the logging of EIGRP neighbor warning messages, use the **no** form of this command.

eigrp log-neighbor-warnings [*seconds*]

no eigrp log-neighbor-warnings

Syntax Description	<i>seconds</i> (Optional) Time interval (in seconds) between repeated neighbor warning messages. The range of seconds is from 1 to 65535.
---------------------------	---

Command Default	Neighbor warning messages are logged.
------------------------	---------------------------------------

Command Modes	Address-family configuration mode Router configuration mode Router VRF configuration mode
----------------------	---

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Base Services license.
-------------------------	--

Examples	This example shows how to log neighbor warning messages for EIGRP process 209 and to repeat the warning messages in 5-minute (300 seconds) intervals:
-----------------	---

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# eigrp log-neighbor-warnings 30
switch(config-router)#
```

Related Commands	Command	Description
	log-neighbor-changes	Enables logging of EIGRP neighbor changes.
	log-neighbor-warnings	Enables logging of EIGRP neighbor warnings.
	log-adjacency-changes	Enables logging of EIGRP adjacency state changes.

eigrp router-id

To set the router ID used by the Enhanced Interior Gateway Routing Protocol (EIGRP) when communicating with its neighbors, use the **eigrp router-id** command. To remove the configured router ID, use the **no** form of this command.

eigrp router-id *ip-address*

no eigrp router-id *ip-address*

Syntax Description

<i>ip-address</i>	Router ID in dotted decimal notation.
-------------------	---------------------------------------

Command Default

EIGRP automatically selects an IP address to use as the router ID when an EIGRP process is started.

Command Modes

Address-family configuration mode
Router configuration mode
Router VRF configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

EIGRP automatically selects an IP address to use as the router ID when an EIGRP process is started. The highest local IP address is selected and loopback interfaces are preferred. The router ID is not changed unless the EIGRP process is removed with the **no router eigrp** command or if the router ID is manually configured with the **eigrp router-id** command.

The router ID is used to identify the originating router for external routes. If an external route is received with the local router ID, the route is discarded. The router ID can be configured with any IP address with two exceptions; 0.0.0.0 and 255.255.255.255 are not legal values and cannot be entered. You should configure a unique value for each router.

This command requires the LAN Base Services license.

Examples

This example shows how to configure 192.168.0.3 as a fixed router ID:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# eigrp router-id 192.168.0.3
switch(config-router)#
```

Related Commands

Command	Description
show ip eigrp	Displays a summary of the EIGRP processes.

eigrp stub

To configure a router as a stub using the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **eigrp stub** command. To disable the EIGRP stub routing feature, use the **no** form of this command.

eigrp stub [**direct** | **leak-map** *map-name*] **receive-only** | **redistributed**]

no eigrp stub [**direct** | **leak-map** *map-name*] **receive-only** | **redistributed**]]

Syntax Description

direct	(Optional) Advertises directly connected routes. This is enabled by default.
leak-map <i>map-name</i>	(Optional) Allows dynamic prefixes based on the leak map.
receive-only	(Optional) Sets the router as a receive-only neighbor.
redistributed	(Optional) Advertises redistributed routes from other protocols and autonomous systems.

Command Default

Disabled

Command Modes

Address-family configuration mode
Router configuration mode
Router VRF configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

The **receive-only** keyword restricts the router from sharing any of its routes with any other router in that EIGRP autonomous system, and the **receive-only** keyword does not permit any other option to be specified because it prevents any type of route from being sent.

The **redistributed** keyword permits the EIGRP Stub Routing feature to send other routing protocols and autonomous systems. Without the configuration of this option, EIGRP does not advertise redistributed routes.

If you use any of these four keywords (**direct**, **leak-map**, **receive-only**, **redistributed**) with the **eigrp stub** command, only the route types specified by the particular keyword are advertised.

This command requires the LAN Base Services license.

Examples

This example shows how to configure the router as a receive-only neighbor:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# eigrp stub receive-only
switch(config-router)#
```

Related Commands

Command	Description
show ip eigrp	Displays a summary of the EIGRP processes.

feature bfd

To enable Bidirectional Forwarding Detection (BFD), use the **feature bfd** command. To return to the default setting, use the **no** form of this command.

feature bfd

no feature bfd

Syntax Description This command has no arguments or keywords.

Command Default Disabled

Command Modes Global configuration mode

Command History	Release	Modification
	5.0(3)U2(2)	This command was introduced.

Usage Guidelines You must use the **feature bfd** command to enable the BFD functionality.



Note

The switch does not display any BFD commands until you enable the feature.



Note

Before you enable the BFD feature, we recommend that you disable the sending of Internet Control Message Protocol (ICMP) redirect messages by using the **no ip redirects** command.

This command does not require a license.

Examples This example shows how to enable BFD functionality on the switch:

```
switch# configure terminal
switch(config)# feature bfd
switch(config)#
```

Related Commands	Command	Description
	bfd	Enables BFD for the Border Gateway Protocol (BGP).
	ip redirects	Enables the sending of ICMP redirect messages if the Cisco NX-OS software is forced to resend a packet through the same interface on which it was received.
	show feature	Displays information about the features enabled on the switch.

feature bgp

To enable the Border Gateway Protocol (BGP), use the **feature bgp** command. To disable BGP, use the **no** form of this command.

feature bgp

no feature bgp

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	Disabled
------------------------	----------

Command Modes	Global configuration mode
----------------------	---------------------------

Command History	Release	Modified
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	<p>You must enable the BGP feature before you can configure BGP.</p> <p>This command requires the LAN Enterprise Services license.</p>
-------------------------	--

Examples	<p>This example shows how to enable a BGP configuration:</p>
-----------------	--

```
switch# configure terminal
switch(config)# feature bgp
switch(config)#
```

This example shows how to disable the BGP feature:

```
switch# configure terminal
switch(config)# no feature bgp
switch(config)#
```

Related Commands	Command	Description
	show bgp	Displays BGP configuration information.
	show feature	Displays the status of features on a switch.
	router bgp	Creates a BGP instance.

feature eigrp

To enable the Enhanced Interior Gateway Protocol (EIGRP), use the **feature eigrp** command. To disable EIGRP, use the **no** form of this command.

feature eigrp

no feature eigrp

Syntax Description This command has no arguments or keywords.

Command Default Disabled

Command Modes Global configuration mode

Command History	Release	Modified
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines You must enable the EIGRP feature before you can configure EIGRP.
This command requires the LAN Base Services license.

Examples This example shows how to enable the EIGRP feature:

```
switch# configure terminal
switch(config)# feature eigrp
switch(config)#
```

This example shows how to disable the EIGRP feature:

```
switch# configure terminal
switch(config)# no feature eigrp
switch(config)#
```

Related Commands	Command	Description
	show feature	Displays the features enabled on the switch.
	show ip eigrp	Displays EIGRP configuration information.
	router eigrp	Creates an EIGRP instance.

feature hsrp

To enter Hot Standby Router Protocol (HSRP) configuration mode and enable HSRP, use the **feature hsrp** command. To disable HSRP, use the **no** form of this command.

feature hsrp

no feature hsrp

Syntax Description	The command has no arguments or keywords.
---------------------------	---

Command Default	Disabled
------------------------	----------

Command Modes	Global configuration mode
----------------------	---------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	<p>You must enable the HSRP feature before you can configure HSRP.</p> <p>This command does not require a license.</p>
-------------------------	--

Examples	<p>This example shows how to enable HSRP on the switch:</p>
-----------------	---

```
switch# configure terminal
switch(config)# feature hsrp
switch(config)#
```

This example shows how to disable HSRP:

```
switch# configure terminal
switch(config)# no feature hsrp
switch(config)#
```

Related Commands	Command	Description
	hsrp group	Creates and activates an HSRP group.
	show feature	Displays the status of features on a switch.
	show hsrp	Displays HSRP information.

feature ospf

To enable the Open Shortest Path First Protocol (OSPF), use the **feature ospf** command. To disable OSPF, use the **no** form of this command.

feature ospf

no feature ospf

Syntax Description This command has no arguments or keywords.

Command Default Disabled

Command Modes Global configuration mode

Command History	Release	Modified
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines You must enable the OSPF feature before you can configure OSPF.
This command requires the LAN Base Services license.

Examples This example shows how to enable the OSPF feature:

```
switch# configure terminal
switch(config)# feature ospf
switch(config)#
```

This example shows how to disable the OSPF feature:

```
switch# configure terminal
switch(config)# no feature ospf
switch(config)#
```

Related Commands	Command	Description
	show feature	Displays the status of features on a switch.
	show ospf	Displays OSPF configuration information.
	router ospf	Creates an OSPF instance.

feature pbr

To enable the policy-based routing (PBR) feature, use the **feature pbr** command. To disable PBR, use the **no** form of this command.

feature pbr

no feature pbr

Syntax Description This command has no arguments or keywords.

Command Default Disabled

Command Modes Global configuration mode

Command History	Release	Modified
	6.0(2)U2(1)	This command was introduced.

Usage Guidelines You must enable the PBR feature before you can configure policy-based routing. This command requires the Enterprise Services license.

Examples This example shows how to enable the PBR feature:

```
switch# configure terminal
switch(config)# feature pbr
switch(config)#
```

This example shows how to disable the PBR feature:

```
switch# configure terminal
switch(config)# no feature pbr
switch(config)#
```

Related Commands	Command	Description
	show feature	Displays the status of features on a switch.
	ip policy route-map	Assigns a policy-based route map to an interface.
	show ip policy	Displays information about policy-based routing.
	route-map	Creates a route map.
	show route-map pbr-statistics	Displays statistics about policy-based route maps

feature rip

To enable the Routing Information Protocol (RIP), use the **feature rip** command. To disable RIP, use the **no** form of this command.

feature rip
no feature rip

Syntax Description This command has no arguments or keywords.

Command Default Disabled

Command Modes Global configuration mode

Command History	Release	Modified
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines You must enable the RIP feature before you can configure RIP.

This command does not require a license but if you want to enable Layer 3 interfaces, you must install the LAN Base Services license.

Examples This example shows how to enable the RIP feature:

```
switch# configure terminal
switch(config)# feature rip
switch(config)#
```

This example shows how to disable the RIP feature:

```
switch# configure terminal
switch(config)# no feature rip
switch(config)#
```

Related Commands	Command	Description
	show feature	Displays the status of features on a switch.
	show rip	Displays RIP configuration information.
	router rip	Creates a RIP instance.

feature vrrp

To enable the Virtual Router Redundancy Protocol (VRRP), use the **feature vrrp** command. To disable VRRP, use the **no** form of this command.

feature vrrp

no feature vrrp

Syntax Description This command has no arguments or keywords.

Command Default Disabled

Command Modes Global configuration mode

Command History	Release	Modified
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines You must enable the VRRP feature before you can configure VRRP.

This command does not require a license but if you want to enable Layer 3 interfaces, you must install the LAN Base Services license.

Examples This example shows how to enable the VRRP feature:

```
switch# configure terminal
switch(config)# feature vrrp
switch(config)#
```

This example shows how to disable the VRRP feature:

```
switch# configure terminal
switch(config)# no feature vrrp
switch(config)#
```

Related Commands	Command	Description
	clear vrrp	Clears all the software counters for the specified virtual router.
	show feature	Displays the status of features on a switch.
	show vrrp	Displays VRRP configuration information.
	vrrp	Configures a VRRP group on an interface.

flush-routes (EIGRP)

To flush all EIGRP routes in the unicast RIB when an EIGRP instance restarts, use the **flush-routes** command. To disable this feature, use the **no** form of this command.

flush-routes

no flush-routes

Syntax Description This command has no arguments or keywords.

Command Default Disabled

Command Modes Router configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Base Services license.

Examples This example shows how to flush routes when an EIGRP instance restarts:

```
switch# configure terminal
switch(config)# router eigrp Test1
switch(config-router)# flush-routes
switch(config-router)#
```

Related Commands	Command	Description
	show ip eigrp interfaces	Displays information about EIGRP interfaces.

flush-routes (OSPF)

To flush routes on a restart for the Open Shortest Path First (OSPF) protocol, use the **flush-routes** command. To disable this feature, use the **no** form of this command.

flush-routes

no flush-routes

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	Disabled
------------------------	----------

Command Modes	Router configuration mode
----------------------	---------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	<p>This command causes OSPF to unregister from the unicast RIB when OSPF shuts down. The unicast RIB removes all the routes associated with this OSPF instance. If you do not configure the flush-routes command, OSPF does not unregister and the OSPF routes will be stale. The OSPF routes are eventually removed from the unicast RIB after a timeout period.</p>
-------------------------	--

This command requires the LAN Base Services license.

Examples	This example shows how to flush routes for an OSPF restart:
-----------------	---

```
switch# configure terminal
switch(config)# router ospf 202
switch(config-router)# flush-routes
switch(config-router)#
```

Related Commands	Command	Description
	show ip ospf	Displays OSPF information.

hardware ecmp hash-offset

To configure a ECMP hash-offset, use the **hardware ecmp hash-offset** command. To restore the ECMP hash default, use the **no** form of this command.

hardware ecmp hash-offset *number*

no hardware ecmp hash-offset

Syntax Description	number The hash-offset value. The range is from 0 to15.
---------------------------	--

Command Default	Offset 0
------------------------	----------

Command Modes	Global configuration mode
----------------------	---------------------------

Command History	Release	Modification
	5.0(3)U5(1)	This command was introduced.

Usage Guidelines	To avoid ECMP polarization in a multi-tier ECMP session, you must configure hash offset values on each tier.
	You can use the ECMP hash-offset configured by using the hardware ecmp hash-offset command along with different universal IDs configured by using the ip load-sharing address command to produce various hash results in the load-sharing algorithm.
	This command does not require a license.

Examples	This example shows how to limit the maximum number of drop adjacencies that are installed in the FIB:
	<pre>switch# configure terminal switch(config)# hardware ecmp hash off-set 5 switch(config)#</pre>

Related Commands	Command	Description
	show routing hash	Displays information about the routing hash configuration.
	show running-config	Displays information about the running configuration.

hardware forwarding dynamic-allocation

To enable or disable dynamic TCAM block allocation in the Forwarding Information Base (FIB), use the **hardware forwarding dynamic-allocation** command.

hardware forwarding dynamic-allocation {enable | disable}

Syntax Description	enable	Enables dynamic TCAM allocation.
	disable	Disables dynamic TCAM allocation.

Command Default	Enabled
-----------------	---------

Command Modes	EXEC mode
---------------	-----------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	The disable keyword returns the TCAM to the default allocation if there are no routes in the reallocated blocks.
	This command does not require a license.

Examples	This example shows how to enable dynamic TCAM allocation:
	<pre>switch# configure terminal switch(config)# hardware forwarding dynamic-allocation enable switch(config)#</pre>

Related Commands	Command	Description
	show hardware forwarding dynamic-allocation	Displays information about dynamic TCAM allocation for each module.

hardware ip glean throttle

To enable Address Resolution Protocol (ARP) throttling, use the **hardware ip glean throttle** command. To return to the default setting, use the **no** form of this command.

hardware ip glean throttle

no hardware ip glean throttle

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	Disabled
------------------------	----------

Command Modes	Global configuration mode
----------------------	---------------------------

Command History	Release	Modification
	5.0(3)U2(1)	This command was introduced.

Usage Guidelines



Note

We recommend that you configure the IP glean throttle feature by using the **hardware ip glean throttle** command to filter the unnecessary glean packets that are sent to the supervisor for ARP resolution for the next hops that are not reachable or do not exist. IP glean throttling boosts software performance and helps to manage traffic more efficiently.

This command does not require a license.

Examples	This example shows how to enable ARP throttling:
-----------------	--

```
switch# configure terminal
switch(config)# hardware ip glean throttle
switch(config)#
```

Related Commands	Command	Description
	show running-config	Displays information about the running configuration.

hardware ip glean throttle maximum

To limit the maximum number of drop adjacencies that will be installed in the Forwarding Information Base (FIB), use the **hardware ip glean throttle maximum** command. To apply the default limits, use the **no** form of this command.

hardware ip glean throttle maximum *count*

no hardware ip glean throttle maximum

Syntax Description	<i>count</i> Maximum count. The range is from 0 to 16383.
---------------------------	---

Command Default	1000 entries
------------------------	--------------

Command Modes	Global configuration mode
----------------------	---------------------------

Command History	Release	Modification
	5.0(3)U2(1)	This command was introduced.

Usage Guidelines	Before you use this command, make sure that you enable the IP glean throttle feature by using the hardware ip glean throttle command.
	If the maximum number of entries are exceeded, the packets for which ARP is not resolved continue to be processed in the software instead of getting dropped in the hardware.
	This command does not require a license.

Examples	This example shows how to limit the maximum number of drop adjacencies that are installed in the FIB:
	switch# configure terminal
	switch(config)# hardware ip glean throttle maximum 16383
	switch(config)#

Related Commands	Command	Description
	hardware ip glean throttle	Enables the IP glean throttle feature.
	show running-config	Displays information about the running configuration.

hardware ip glean throttle syslog

To generate a syslog if the number of packets that get dropped for a specific flow exceeds the configured packet count, use the **hardware ip glean throttle syslog** command. To return to the default setting, use the **no** form of this command.

hardware ip glean throttle syslog *pkt-count*

no hardware ip glean throttle syslog

Syntax Description

<i>pkt-count</i>	Packet count. The range is from 0 to 65535.
------------------	---

Command Default

10000 packets

Command Modes

Global configuration mode

Command History

Release	Modification
5.0(3)U2(1)	This command was introduced.

Usage Guidelines

Before you use this command, make sure that you enable the IP glean throttle feature by using the **hardware ip glean throttle** command.

After the timeout period is exceeded, the drop adjacencies are removed from the FIB.



Note

The Adjmgr generates a syslog for the configured packet count that will not be accurate to the dropped glean packets that are forwarded to the FIB. The drop statistics collected from the FIB in the software (Adjmgr) occurs every 2 minutes. The Adjmgr generates a syslog only after it receives the statistics from the FIB every 2 minutes only for the adjacencies where the drop count exceeds the configured packet count.

This command does not require a license.

Examples

This example shows how to generate a syslog if the number of packets that get dropped for a specific flow exceed the configured packet count:

```
switch# configure terminal
switch(config)# hardware ip glean throttle syslog 1030
switch(config)#
```

Related Commands	Command	Description
	hardware ip glean throttle	Enables the IP glean throttle feature.
	show running-config	Displays information about the running configuration.

hardware ip glean throttle timeout

To configure a timeout for the installed drop adjacencies to remain in the Forwarding Information Base (FIB), use the **hardware ip glean throttle timeout** command. To return to the default setting, use the **no** form of this command.

hardware ip glean throttle timeout *timeout-in-sec*

no hardware ip glean throttle timeout

Syntax Description	<i>timeout -in-sec</i> Timeout value in seconds. The range is from 300 to 1800.							
Command Default	300 seconds							
Command Modes	Global configuration mode							
Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>5.0(3)U2(1)</td><td>This command was introduced.</td></tr></table>		Release	Modification	5.0(3)U2(1)	This command was introduced.		
Release	Modification							
5.0(3)U2(1)	This command was introduced.							
Usage Guidelines	<p>Before you use this command, make sure that you enable the IP glean throttle feature by using the hardware ip glean throttle command.</p> <p>The timeout value (seconds) must be in multiples of 30.</p> <p>After the timeout period is exceeded, the drop adjacencies are removed from the FIB.</p> <p>This command does not require a license.</p>							
Examples	<p>This example shows how to limit the maximum number of drop adjacencies that are installed in the FIB:</p> <pre>switch# configure terminal switch(config)# hardware ip glean throttle timeout 300 switch(config)#</pre>							
Related Commands	<table><tr><th>Command</th><th>Description</th></tr><tr><td>hardware ip glean throttle</td><td>Enables the IP glean throttle feature.</td></tr><tr><td>show running-config</td><td>Displays information about the running configuration.</td></tr></table>		Command	Description	hardware ip glean throttle	Enables the IP glean throttle feature.	show running-config	Displays information about the running configuration.
Command	Description							
hardware ip glean throttle	Enables the IP glean throttle feature.							
show running-config	Displays information about the running configuration.							

hardware profile ecmp auto-recovery threshold

To configure the threshold for ECMP recovery, use the **hardware profile ecmp auto-recovery threshold** command.

hardware profile ecmp auto-recovery threshold *percentage*

Syntax Description

ecmp auto-recovery threshold *percentage*

Threshold limit for ECMP recovery. It triggers ECMP recovery when the configured percentage of the ECMP table becomes free. The range is from 1 to 100.

The maximum ECMP table size is 64 for Cisco Nexus 3000 Series switches and 256 for Cisco Nexus 3100 Series switches. Hence, for instance, if the configured percentage value is 1%, ECMP recovery for Cisco Nexus 3000 Series switches begins when 1 entry is available, whereas for Cisco Nexus 3100 Series switches, ECMP recovery begins only when 2 entries are available.

Defaults

ECMP recovery is disabled by default.

Command Modes

Global configuration mode

Command History

Release

Modification

6.0(2)U3(1)

This command was introduced.

Examples

This example shows how to configure the threshold for ECMP recovery:

```
switch# configure terminal
switch(config)# hardware profile ecmp auto-recovery threshold 15
switch(config)# exit
switch# copy running-config startup-config
```

Related Commands

Command

Description

show running-config

Displays information about the running configuration.

hardware profile ucast6 lpm-65-to-127-max-limit

Command	Description
hardware profile multicast max-limit	Sets the maximum number of entries in the multicast routing table.
show hardware profile status	Displays information about the multicast and unicast routing table limits.
To reserve unicast IPv6 entries of mask length 65 to 127 for the LPM table, use the hardware profile ucast6 lpm-65-to-127-max-limit command.	

hardware profile ucast6 lpm-65-to-127-max-limit *max-limit*

Syntax Description	<p>lpm-65-to-127-max-limit <i>max-limit</i></p> <p>Maximum limit for the unicast IPv6 lpm-65-to-127 entries for Cisco Nexus 3100 Series switches. The range is from 0 to 4096.</p> <p>If Unicast Reverse Path Forwarding (UPRF) is enabled, only half of max-limit is configured for IPv6 lpm-65-to-127 routes. The other half of max-limit is used for UPRF.</p>
---------------------------	--

Defaults	256 entries. If UPRF is enabled, only 128 entries are reserved for IPv6 lpm-65-to-127 routes. If UPRF is disabled, then 256 entries are reserved for IPv6 lpm-65-to-127 routes.
-----------------	---

Command Modes	Global configuration mode
----------------------	---------------------------

Command History	Release	Modification
	6.0(2)U2(1)	This command was introduced.

Usage Guidelines	<p>Use the hardware profile ucast6 lpm-65-to-127-max-limit command to reserve LPM table entries for IPv6 routes of mask length 65 to 127. This is applicable only to Cisco Nexus 3100 Series switches.</p> <p>After running this command, run the copy running-config startup-config command and reload command for this configuration to become applicable.</p> <p>This example shows how to reserve the maximum number of unicast IPv6 entries in the LPM table:</p> <pre>switch# configure terminal switch(config)# hardware profile ucast6 lpm-65-to-127-max-limit 4096 Warning: Please copy running-config to startup-config and reload the switch to apply changes. switch(config)# exit switch# copy running-config startup-config switch# reload</pre>
-------------------------	---

Related Commands	Command	Description
	hardware profile multicast max-limit	Sets the maximum number of entries in the multicast routing table.
	show hardware profile status	Displays information about the multicast and unicast routing table limits.

hardware profile ucast6 max-limit

To set the maximum number of unicast IPv6 entry limit for the host table, use the **hardware profile ucast6 max-limit** command.

hardware profile ucast6 max-limit *max-limit*

Syntax Description	max-limit <i>max-limit</i> Maximum limit for the unicast IPv6 entries. The range is from 0 to 8000.
---------------------------	--

Defaults	4000
-----------------	------

Command Modes	Global configuration mode
----------------------	---------------------------

Command History	Release	Modification
	5.0(3)U3(1)	This command was introduced.

Usage Guidelines	Use the hardware profile ucast6 max-limit command to limit the maximum number of host entries in the host table.
	After setting the limit for multicast and IPv6 in the host table, the remaining number of entries are allocated for IPv4 host entries.



Note

A limit set by using the **hardware profile multicast max-limit** command overrides the limit set by using the **hardware profile ucast6 max-limit** command.

This example shows how to set the maximum number of unicast IPv6 entry limit in the host table:

```
switch# configure terminal
switch(config)# hardware profile ucast6 max-limit 2500
Warning!:: The host (v4 & v6) unicast route limits have been changed.
switch(config)#
```

Related Commands	Command	Description
	hardware profile multicast max-limit	Sets the maximum number of entries in the multicast routing table.
	show hardware profile status	Displays information about the multicast and unicast routing table limits.

hardware profile unicast enable-host-ecmp

To enable equal-cost multipathing (ECMP) support for IPv4 and IPv4 host routes, use the **hardware profile unicast enable-host-ecmp** command. To return to the default setting, use the **no** form of this command.

hardware profile unicast enable-host-ecmp [ipv4 | ipv6 | arp-nd | ipv4 arp | ipv6 nd]

no hardware profile unicast enable-host-ecmp [ipv4 | ipv6]

Syntax Description

ipv4	Specifies to enable ECMP for only the IPv4 host routes.
ipv6	Specifies to enable ECMP for only the IPv6 routes.
arp-nd	Specifies to retain ARP (IPv4) and ND (IPv6) routes in the host table.
ipv4 arp	Specifies to retain ARP routes in the host table.
ipv6 nd	Specifies to retain ND routes in the host table.

Command Default

Disabled

Command Modes

Global configuration mode

Command History

Release	Modification
5.0(3)U2(2)	This command was introduced.
5.0(3)U5(1d)	Added the ability to enable or disable ECMP separately for IPv4 host routes or IPv6 host routes.
6.0(2)U2(1)	Added the ability to retain ARP and ND entries in the host table.

Usage Guidelines

When you enable ECMP support, all unicast prefix and unicast host routes are programmed into the longest-prefix match algorithm (LPM) table. When you want to retain the ARP, ND, or both ARP and ND routes in the host table and store the rest of the routes in the LPM table, use the **arp**, **nd**, or **arp-nd** options.



Note

Before you use this command, we recommend that you disable URPF globally on the switch using the **system urpf disable** command and then save the configuration and reload the switch. Disabling URPF globally extends the LPM table size.

After running this command, run the **copy running-config startup-config** command and the **reload** command for this configuration to become applicable.

Examples

This example shows how to disable URPF and configure ECMP for host routes:

```
switch# configure terminal
```

```
switch(config)# system urpf disable
switch(config)# hardware profile unicast enable-host-ecmp
switch(config)# copy running-config startup-config
switch(config)# reload
```

This example shows how to disable URPF and configure ECMP for only IPv6 host routes:

```
switch# configure terminal
switch(config)# system urpf disable
switch(config)# hardware profile unicast enable-host-ecmp ipv6
switch(config)# copy running-config startup-config
switch(config)# reload
```

This example show how to disable ECMP for host routes:

```
switch# configure terminal
switch(config)# no hardware profile unicast enable-host-ecmp
switch(config)# copy running-config startup-config
switch(config)# reload
```

This example show how to disable ECMP for only IPv6 host routes:

```
switch# configure terminal
switch(config)# no hardware profile unicast enable-host-ecmp ipv6
switch(config)# copy running-config startup-config
switch(config)# reload
```

This example show how to retain ARP and ND routes in the host table:

```
switch# configure terminal
switch(config)# hardware profile unicast enable-host-ecmp arp-nd
switch(config)# copy running-config startup-config
switch(config)# reload
```

Command History

Command	Description
feature bgp	Enables the Border Gateway Protocol (BGP) on the switch.
show hardware profile status	Displays the entries of the unicast & multicast routing table in the hardware
show running-config	Displays the running system configuration.
system urpf disable	Disables URPF on the switch.

hardware profile unicast syslog-threshold

To configure the syslog threshold for the unicast route table so that a syslog message is generated when the table capacity reaches the specified percentage, use the **hardware profile unicast syslog-threshold** command. To reset the value to the default, use the **no** form of this command.

hardware profile unicast syslog-threshold *percentage*

no hardware profile unicast syslog-threshold

Syntax Description	<i>percentage</i> Percentage of table capacity. The range is from 1 to 100. The default value is 90 percent.
--------------------	--

Defaults	The unicast route table threshold is 90 percent.
----------	--

Command Modes	Global configuration mode
---------------	---------------------------

Command History	Release	Modification
	5.0(3)U3(2)	This command was introduced.

Usage Guidelines	This command does not require a license.
------------------	--

Examples	<p>This example shows how to set the syslog threshold to 20 percent for the unicast route table:</p> <pre>switch# configure terminal switch(config)# hardware profile unicast syslog-threshold 20 switch(config)#</pre>
----------	---

Related Commands	Command	Description
	copy running-config startup config	Copies the running configuration to the startup configuration file.
	show running-config	Displays the information for the running configuration.

hello-interval (OSPF virtual link)

To specify the interval between hello packets that Cisco NX-OS sends on an Open Shortest Path First (OSPF) virtual link, use the **hello-interval** command. To return to the default setting, use the **no** form of this command.

hello-interval *seconds*

no hello-interval

Syntax Description	<i>seconds</i>	Hello interval (in seconds). The value must be the same for all nodes on a specific virtual link. The range is from 1 to 65535.
--------------------	----------------	---

Command Default	10 seconds
-----------------	------------

Command Modes	Virtual link configuration mode
---------------	---------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	<p>A shorter hello interval detects topological changes faster but causes more routing traffic. The hello interval must be the same for all devices on a virtual link.</p> <p>This command requires the LAN Base Services license.</p>
------------------	--

Examples	<p>This example shows how to configure the hello interval to 15 seconds:</p> <pre>switch# configure terminal switch(config)# router ospf 202 switch(config-router)# ip ospf area 99 virtual-link 192.0.2.4 switch(config-router-vlink)# hello-interval 15 switch(config-router-vlink)#</pre>
----------	--

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	dead-interval (virtual link)	Sets the time period to declare a neighbor as down if the local device receives no hello packets.
	show ip ospf virtual-link	Displays OSPF virtual link information.

hsrp

To enter Hot Standby Router Protocol (HSRP) configuration mode and create an HSRP group, use the **hsrp** command. To disable HSRP, use the **no** form of this command.

hsrp *group-number* **ipv4**

no hsrp *group-number* **ipv4**

Syntax Description

<i>group-number</i>	Number of HSRP groups that can be configured on a Gigabit Ethernet port, including the main interfaces and subinterfaces. The range is from 1 to 255. The default value is 0.
ipv4	(Optional) Sets the HSRP group for IPv4.

Command Default

Disabled

Command Modes

Interface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

You must globally enable HSRP before you can configure any HSRP options or create an HSRP group. This command does not require a license.

Examples

This example shows how to create and activate an HSRP group:

```
switch# configure terminal
switch(config)# interface ethernet 0
switch(config-if)# no switchport
switch(config-if)# ip address 192.168.0.5 255.255.255.0
switch(config-if)# hsrp 1
switch(config-if-hsrp)#
```

Related Commands

Command	Description
feature hsrp	Enables the HSRP configuration.
show hsrp	Displays HSRP information.
ip address	Creates a virtual IP address for the HSRP group. The IP address must be in the same subnet as the interface IP address.

hsrp delay

To delay Hot Standby Router Protocol (HSRP) initialization after a reload or after an interface comes up, use the **hsrp delay** command. To disable this function, use the **no** form of this command.

hsrp delay {**minimum** *min-delay* | **reload** *reload-delay*}

no delay {**minimum** *min-delay* | **reload** *reload-delay*}

Syntax Description

minimum <i>min-delay</i>	Minimum time (in seconds) to delay HSRP group initialization after an interface comes up. This period applies to all subsequent interface events. The range is from 1 to 10,000. The default is 0 seconds.
reload <i>reload-delay</i>	Time period to delay HSRP group initialization after the router has reloaded. This period applies only to the first interface-up event after the router has reloaded. The range is from 1 to 10,000. The default is 0 seconds.

Command Default

The HSRP delay default is 0 seconds.

Command Modes

Interface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

The HSRP delayed initialization configuration allows the interface and router to stabilize after the interface comes up and helps prevent HSRP state flapping.

This command does not require a license.

Examples

This example shows how to configure a minimum delay of 3 seconds and a group initialization delay of 10 seconds:

```
switch# configure terminal
switch(config)# interface ethernet 1/5
switch(config-if)# no switchport
switch(config-if)# ip address 192.168.0.5 255.255.255.0
switch(config-if)# hsrp 1
switch(config-if)# hsrp delay minimum 3 reload 10
switch(config-if)#
```

Related Commands

Command	Description
feature hsrp	Enables the HSRP configuration.

Command	Description
hsrp	Creates HSRP groups.
show hsrp delay	Displays the HSRP delay information.

ip (HSRP)

To assign a virtual address to a Hot Standby Router Protocol (HSRP) group, use the **ip** command. To disable HSRP in the group, use the **no** form of this command.

ip [**autoconfig** | *ip-address* [**secondary**]]

no ip [**autoconfig** | *ip-address* [**secondary**]]

Syntax Description	autoconfig	(Optional) Generates a link-local address from the link-local prefix and a modified EUI-64 format Interface Identifier, where the EUI-64 Interface Identifier is created from the relevant HSRP virtual MAC address.
	<i>ip-address</i>	(Optional) Virtual IP address for the virtual router (HSRP group). The IP address must be in the same subnet as the interface IP address. You must configure the virtual IP address for at least one of the routers in the HSRP group. Other routers in the group will pick up this address. The IP address can be an IPv4 address.
	secondary	(Optional) Indicates that the IPv4 address is a secondary HSRP virtual address.

Command Default Disabled

Command Modes HSRP configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines If you configure a virtual IP address, that address is the designated virtual IP address for the entire HSRP group. For IPv4 groups, if you do not configure a virtual IP address, the gateway learns the virtual IP address from another gateway in the same HSRP group. To allow HSRP to elect an active virtual gateway (AVG), you must configure at least one gateway on the LAN with a virtual IP address.

Configuring the virtual IP address on the AVG always overrides a virtual IP address that is in use.

When you configure the **ip** command for an IPv4 HSRP group on an interface, the handling of proxy Address Resolution Protocol (ARP) requests changes (unless proxy ARP was disabled). Hosts send ARP requests to map an IP address to a MAC address. The HSRP gateway intercepts the ARP requests and replies to the ARP requests on behalf of the connected nodes. If a forwarder in the HSRP group is active, proxy ARP requests are answered using the MAC address of the first active forwarder in the group. If no forwarder is active, proxy ARP responses are suppressed.



Note

You must configure all HSRP options before you use the **ip** command to assign a virtual IP address and activate the HSRP group so that you can avoid authentication error messages and unexpected state changes that can occur in other routers when a group is enabled first and then there is a delay before the configuration is created. We recommend that you always specify an IP address.

This command does not require a license.

Examples

This example shows how to activate HSRP for group 10 on Ethernet interface 1/1. The virtual IP address used by the HSRP group is set to 192.0.2.10.

```
switch# configure terminal
switch(config)# interface ethernet 1/1
switch(config-if)# no switchport
switch(config-if)# ip address 192.0.2.32 255.255.255.0
switch(config-if)# hsrp 10
switch(config-hsrp)# ip 192.0.2.10
switch(config-hsrp)#
```

This example shows how to activate HSRP for group 10 on Ethernet interface 2/1. The virtual IP address used by the HSRP group will be learned from another gateway configured to be in the same HSRP group.

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# hsrp 10
switch(config-if-hsrp)#
```

This example shows how to activate HSRP for group 2 on Ethernet interface 1/1 and creates a secondary IP address on the interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/1
switch(config-if)# no switchport
switch(config-if)# ip address 20.20.20.1 255.255.255.0 secondary
switch(config-if)# ip address 10.10.10.1 255.255.255.0
switch(config-if)# hsrp 2
switch(config-if-hsrp)# ip 10.10.10.2
switch(config-if-hsrp)# ip 20.20.20.2 secondary
switch(config-if-hsrp)#
```

Related Commands

Command	Description
feature hsrp	Enables the HSRP configuration.
show hsrp	Displays HSRP information.

ip address

To set a primary or secondary IP address for an interface, use the **ip address** command. To remove an IP address or disable IP processing, use the **no** form of this command.

```
ip address ip-address mask [secondary]

no ip address ip-address mask [secondary]
```

Syntax Description

<i>ip-address</i>	IPv4 address in the format <i>A.B.C.D</i> or <i>A.B.C.D/length</i> .
<i>mask</i>	Mask for the associated IP subnet.
secondary	(Optional) Specifies that the configured address is a secondary IP address. If this keyword is omitted, the configured address is the primary IP address.

Command Default

No IP address is defined for the interface.

SupportedUserRoles

Interface configuration mode
Subinterface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines



Note

Before you use this command, make sure that you use the **no switchport** command on the interface to use the Layer 3 features.

An interface can have one primary IP address and one secondary IP address.

You can disable IP processing on a particular interface by removing its IP address with the **no ip address** command.

The optional **secondary** keyword allows you to specify a secondary IP address. Secondary addresses are treated like primary addresses, except the system never generates datagrams other than routing updates with secondary source addresses. IP broadcasts and Address Resolution Protocol (ARP) requests are handled, as are interface routes in the IP routing table.



Note

When you are routing using the Open Shortest Path First (OSPF) algorithm, ensure that the secondary address of an interface fall into the same OSPF area as the primary addresses. Make sure that the LAN Enterprise Services license is installed.

This command does not require a license but if you want to enable Layer 3 interfaces, you must install the LAN Base Services license.

Examples

This example shows how to configure the IP address 192.168.0.27 as the primary address and 192.168.0.5 as the secondary address for Ethernet interface 1/5:

```
switch# configure terminal
switch(config)# interface ethernet 1/5
switch(config-if)# no switchport
switch(config-if)# ip address 192.168.0.27 255.255.255.0
switch(config-if)# ip address 192.168.0.5 255.255.255.0 secondary
switch(config-if)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration change to the startup configuration file.
no switchport	Enables an interface for Layer 3 configuration.
show ip interface	Displays interfaces configured for IPv4.

ip arp

To configure a static Address Resolution Protocol (ARP) entry, use the **ip arp** command. To remove a static ARP entry, use the **no** form of this command.

ip arp *ip-address mac-address*

no ip arp *ip-address*

Syntax Description

<i>ip-address</i>	IPv4 address, in <i>A.B.C.D</i> format.
<i>mac-address</i>	MAC address in one of the following formats: <ul style="list-style-type: none">• E.E.E• EE-EE-EE-EE-EE-EE• EE:EE:EE:EE:EE:EE• EEEE.EEEE.EEEE

Command Default

None

Command Modes

Interface configuration mode
Subinterface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use this command on Layer 3 interfaces and Layer 3 subinterfaces.

This command does not require a license but if you want to enable Layer 3 interfaces, you must install the LAN Base Services license.

Examples

This example shows how to configure a static ARP entry on interface Ethernet 1/2:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip arp 192.0.2.1 0150.5a03.efab
switch(config-if)#
```

This example shows how to configure a static ARP entry on a subinterface:

```
switch# configure terminal
switch(config)# interface ethernet 1/5
switch(config-if)# no switchport
switch(config-if)# interface ethernet 1/1.1
switch(config-subif)# ip arp 192.0.2.1 0150.5a03.efab
switch(config-subif)#
```

Related Commands	Command	Description
	show ip arp	Displays ARP entries.

ip arp gratuitous

To enable gratuitous Address Resolution Protocol (ARP), use the **ip arp gratuitous** command. To disable gratuitous ARP, use the **no** form of this command.

ip arp gratuitous {request | update}

no ip arp gratuitous {request | update}

Syntax Description

request	Enables sending gratuitous ARP requests when a duplicate address is detected.
update	Enables ARP cache updates for gratuitous ARP.

Command Default

Enabled

Command Modes

Interface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command does not require a license but if you want to enable Layer 3 interfaces, you must install the LAN Base Services license.

Examples

This example shows how to disable gratuitous ARP request on interface Ethernet 2/1:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip arp gratuitous
switch(config-if)#
```

Related Commands

Command	Description
ip arp	Configures a static ARP entry.
show ip arp	Displays ARP configuration information.

ip arp syslog-threshold

To configure the syslog threshold for the IP Address Resolution Protocol (ARP) table so that a syslog message is generated when the table capacity reaches the specified percentage, use the **ip arp syslog-threshold** command. To reset the value to the default, use the **no** form of this command.

ip arp syslog-threshold *percentage*

no ip arp syslog-threshold

Syntax Description	<i>percentage</i>	Percentage of table capacity. The range is from 1 to 100. The default value is 90 percent.
---------------------------	-------------------	--

Defaults	The IP ARP table threshold is 90 percent.
-----------------	---

Command Modes	Global configuration mode
----------------------	---------------------------

Command History	Release	Modification
	5.0(3)U3(2)	This command was introduced.

Usage Guidelines	This command does not require a license.
-------------------------	--

Examples	This example shows how to set the syslog threshold to 20 percent for the IP ARP table:
-----------------	--

```
switch# configure terminal
switch(config)# ip arp syslog-threshold 20
switch(config)#
```

Related Commands	Command	Description
	copy running-config startup config	Copies the running configuration to the startup configuration file.
	show running-config	Displays the information for the running configuration.

ip arp timeout

To configure an Address Resolution Protocol (ARP) timeout, use the **ip arp timeout** command. To revert to the default value, use the **no** form of this command.

ip arp timeout *timeout-value*

no ip arp timeout

Syntax Description	<i>timeout-value</i>	Time (in seconds) that an entry remains in the ARP cache. Valid values are from 60 to 28800, and the default is 1500.
---------------------------	----------------------	---

Command Default	1500 seconds
------------------------	--------------

Command Modes	Global configuration mode
----------------------	---------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	If the Cisco Nexus 3000 switch is used as a Layer 2 or Layer 3 termination switch, Cisco recommends that you set the mac-address-aging-time to 1800 (higher than the default ARP aging time of 1500 seconds) on all VLANs. Cisco Nexus 3000 switch does not support per-VLAN cam aging timers.
-------------------------	---

Examples	This example shows how to configure the ARP timeout value to 120 seconds:
-----------------	---

```
switch# configure terminal
switch(config)# ip arp timeout 120
switch(config)#
```

This example shows how to revert to the default ARP timeout value of 1500 seconds:

```
switch# configure terminal
switch(config)# no ip arp timeout
switch(config)#
```

Related Commands	Command	Description
	show running-config arp all	Displays the ARP configuration, including the default configurations.

ip as-path access-list

To configure an access-list filter for Border Gateway Protocol (BGP) autonomous system (AS) numbers, use the **ip as-path access-list** command. To remove the filter, use the **no** form of this command.

ip as-path access-list *name* {**deny** | **permit**} *regex*

no ip as-path access-list *name* {**deny** | **permit**} *regex*

Syntax Description	<i>name</i>	AS path access list name. The name can be any alphanumeric string up to 63 characters.
	deny	Rejects packets with AS numbers that match the <i>regex</i> argument.
	permit	Allows packets with AS numbers that match the <i>regex</i> argument.
	<i>regex</i>	Regular expression to match BGP AS paths.

Command Default None

Command Modes Global configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines You can apply autonomous system path filters to both inbound and outbound BGP paths. Each filter is defined by the regular expression. If the regular expression matches the representation of the autonomous system path of the route as an ASCII string, then the permit or deny condition applies. The autonomous system path should not contain the local autonomous system number.

This command requires the LAN Enterprise Services license.

Examples This example shows how to configure an AS path filter for BGP to permit AS numbers 55:33 and 20:01 and apply it to a BGP peer for inbound filtering:

```
switch# configure terminal
switch(config)# ip as-path access-list filter1 permit 55:33,20:01
switch(config) router bgp 65536:20
switch(config-router)# neighbor 192.0.2.1/16 remote-as 65536:20
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# filter-list filter1 in
switch(config-router-neighbor-af)#
```

Related Commands

Command	Description
filter-list	Assigns an AS path filter to a BGP peer.
show ip as-path access-list	Displays information about IP AS path access lists.

ip authentication key-chain eigrp

To enable authentication for the Enhanced Interior Gateway Routing Protocol (EIGRP) packets and to specify the set of keys that can be used on an interface, use the **ip authentication key-chain eigrp** command. To prevent authentication, use the **no** form of this command.

ip authentication key-chain eigrp *instance-tag* *name-of-chain*

no ip authentication key-chain eigrp *instance-tag* *name-of-chain*

Syntax Description

<i>instance-tag</i>	Name of the EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
<i>name-of-chain</i>	Group of keys that are valid.

Command Default

No authentication is provided for EIGRP packets.

Command Modes

Interface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

You must set the authentication mode using the **ip authentication mode eigrp** command in interface configuration mode. You must separately configure a key chain using the **key-chain** command to complete the authentication configuration for an interface.

This command requires the LAN Base Services license.

Examples

This example shows how to configure the interface to accept and send any key that belongs to the key-chain trees:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip authentication key-chain eigrp 209 trees
switch(config-if)#
```

Related Commands

Command	Description
ip authentication mode eigrp	Sets the authentication mode for EIGRP on an interface.
key-chain	Creates a set of keys that can be used by an authentication method.
show ip eigrp interfaces	Displays information about EIGRP interfaces.

ip authentication mode eigrp

To specify the type of authentication used in the Enhanced Interior Gateway Routing Protocol (EIGRP) packets, use the **ip authentication mode eigrp** command. To remove authentication, use the **no** form of this command.

```
ip authentication mode eigrp instance-tag md5

no ip authentication mode eigrp instance-tag md5
```

Syntax Description	instance-tag	Name of the EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
	md5	Specifies Message Digest 5 (MD5) authentication.

Command Default	None
-----------------	------

Command Modes	Interface configuration mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Base Services license.
------------------	--

Examples	<p>This example shows how to configure the interface to use MD5 authentication:</p> <pre>switch# configure terminal switch(config)# router eigrp 209 switch(config-router)# interface ethernet 1/2 switch(config-if)# no switchport switch(config-if)# ip authentication mode eigrp 209 md5 switch(config-if)#</pre>
----------	--

Related Commands	Command	Description
	authentication mode (EIGRP)	Configures the authentication mode for EIGRP in a VRF.
	copy running-config startup-config	Copies the configuration changes to the startup configuration file.
	ip authentication key-chain eigrp	Enables authentication for EIGRP and specifies the set of keys that can be used on an interface.

Command	Description
key chain	Creates a set of keys that can be used by an authentication method.
show ip eigrp interfaces	Displays information about EIGRP interfaces.

ip bandwidth eigrp

To configure the bandwidth metric on an Enhanced Interior Gateway Routing Protocol (EIGRP) interface, use the **ip bandwidth eigrp** command. To restore the default, use the **no** form of this command.

ip bandwidth eigrp *instance-tag* *bandwidth*

no ip bandwidth eigrp

Syntax Description	<i>instance-tag</i>	Name of the EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
	<i>bandwidth</i>	Bandwidth value. The range is from 1 to 2,560,000,000 kilobits.

Command Default	None
-----------------	------

Command Modes	Interface configuration mode
---------------	------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Base Services license.
------------------	--

Examples	<p>This example shows how to configure EIGRP to use a bandwidth metric of 10000 in autonomous system 209:</p> <pre>switch# configure terminal switch(config)# router eigrp 209 switch(config-router)# interface ethernet 2/1 switch(config-if)# no switchport switch(config-if)# ip bandwidth eigrp 209 10000 switch(config-if)#</pre>
----------	--

Related Commands	Command	Description
	ip bandwidth-percent eigrp	Sets the percent of the interface bandwidth that EIGRP can use.
	show ip eigrp	Displays EIGRP information.

ip bandwidth-percent eigrp

To configure the percentage of bandwidth that may be used by the Enhanced Interior Gateway Routing Protocol (EIGRP) on an interface, use the **ip bandwidth-percent eigrp** command. To restore the default, use the **no** form of this command.

ip bandwidth-percent eigrp *instance-tag percent*

no ip bandwidth-percent eigrp

Syntax Description

<i>instance-tag</i>	Name of the EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
<i>percent</i>	Percentage of bandwidth that EIGRP may use.

Command Default

percent: 50

Command Modes

Interface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

EIGRP uses up to 50 percent of the bandwidth of a link, as defined by the **ip bandwidth** interface configuration command. Use the **ip bandwidth-percent** command to change this default percent.

This command requires the LAN Base Services license.

Examples

This example shows how to configure EIGRP to use up to 75 percent of an interface in autonomous system 209:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# ip bandwidth-percent eigrp 209 75
switch(config-if)#
```

Related Commands

Command	Description
ip bandwidth eigrp	Sets the EIGRP bandwidth value for an interface.
show ip eigrp	Displays EIGRP information.

ip community-list

To create a community list entry, use the **ip community-list** command. To remove the entry, use the **no** form of this command.

ip community-list standard *list-name* {deny | permit} {aa:nn | internet | no-advertise | no-export}

no ip community-list standard *list-name*

ip community-list expanded *list-name* {deny | permit} *regex*

no ip community-list expanded *list-name*

Syntax Description

standard <i>list-name</i>	Configures a named standard community list.
permit	Permits access for a matching condition.
deny	Denies access for a matching condition.
<i>aa:nn</i>	(Optional) Autonomous system number and network number entered in the 4-byte new community format. This value is configured with two 2-byte numbers separated by a colon. A number from 1 to 65535 can be entered each 2-byte number. A single community can be entered or multiple communities can be entered, each separated by a space. You can pick more than one of these optional community keywords.
internet	(Optional) Specifies the Internet community. Routes with this community are advertised to all peers (internal and external). You can pick more than one of these optional community keywords.
no-export	(Optional) Specifies the no-export community. Routes with this community are advertised to only peers in the same autonomous system or to only other subautonomous systems within a confederation. These routes are not advertised to external peers. You can pick more than one of these optional community keywords.
no-advertise	(Optional) Specifies the no-advertise community. Routes with this community are not advertised to any peer (internal or external). You can pick more than one of these optional community keywords.
expanded <i>list-name</i>	Configures a named expanded community list.
<i>regex</i>	Regular expression that is used to specify a pattern to match against an input string. Note Regular expressions can be used with expanded community lists only.

Command Default

Community exchange is not enabled by default.

Command Modes

Global configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

The **ip community-list** command is used to configure BGP community filtering. BGP community values are configured as a 4-byte number. The first two bytes represent the autonomous system number, and the last two bytes represent a user-defined network number. BGP community attribute exchange between BGP peers is enabled when the **send-community** command is configured for the specified neighbor. The BGP community attribute is defined in RFC 1997 and RFC 1998.

BGP community exchange is not enabled by default. Use the **send-community** command in BGP neighbor fix-family configuration mode to enable a BGP community attribute exchange between BGP peers.

The Internet community is applied to all routes or prefixes by default until any other community value is configured with this command or the **set community** command.

Once you configure a permit value to match a given set of communities, the community list defaults to an implicit deny for all other community values. Use the **internet** community to apply an implicit permit to the community list.

Standard Community Lists

Standard community lists are used to configure well-known communities and specific community numbers. You can pick more than one of the optional community keywords. A maximum of 16 communities can be configured in a standard community list. If you attempt to configure more than 16 communities, the communities that exceed the limit are not processed or saved to the running configuration file.

You can configure up to 32 communities.

Expanded Community Lists

Expanded community lists are used to filter communities using a regular expression. Regular expressions are used to configure patterns to match community attributes. The order for matching using the * or + character is the longest construct is first. Nested constructs are matched from the outside in. Concatenated constructs are matched beginning at the left side. If a regular expression can match two different parts of an input string, it matches the earliest part first.

Community List Processing

When multiple values are configured in the same community list statement, a logical AND condition is created. All community values must match to satisfy an AND condition. When multiple values are configured in separate community list statements, a logical OR condition is created. The first list that matches a condition is processed.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure a standard community list where the routes with this community are advertised to all peers (internal and external):

```
switch# configure terminal
switch(config)# ip community-list standard test1 permit internet
switch(config)#
```

This example shows how to configure a logical AND condition; all community values must match in order for the list to be processed:

```
switch# configure terminal
switch(config)# ip community-list standard test1 permit 65534:40 65412:60 no-export
switch(config)#
```

In the above example, a standard community list is configured that permits routes from the following:

- Network 40 in autonomous system 65534 and from network 60 in autonomous system 65412.
- Peers in the same autonomous system or from subautonomous system peers in the same confederation.

This example shows how to configure a standard community list that denies routes that carry communities from network 40 in autonomous system 65534 and from network 60 in autonomous system 65412. This example shows a logical AND condition; all community values must match in order for the list to be processed.

```
switch# configure terminal
switch(config)# ip community-list standard test2 deny 65534:40 65412:60
switch(config)#
```

This example shows how to configure a named standard community list that permits routes from network 20 in autonomous system 40000.

```
switch# configure terminal
switch(config)# ip community-list standard RED permit 40000:20
switch(config)#
```

This example shows how to configure an expanded community list that denies routes that carry communities from any private autonomous system:

```
switch# configure terminal
switch(config)# ip community-list expanded 500 deny
_64[6-9][0-9][0-9]_|_65[0-9][0-9][0-9]_
switch(config)#
```

This example shows how to configure a named expanded community list that denies routes from network 1 through 99 in autonomous system 50000:

```
switch# configure terminal
switch(config)# ip community-list list expanded BLUE deny 50000:[0-9][0-9]_
switch(config)#
```

Related Commands

Command	Description
feature bgp	Enables BGP.
match community	Matches an community in a route map.
send-community	Configures BGP to propagate community attributes to BGP peers.
set community	Sets a community in a route map.

ip delay eigrp

To configure the throughput delay for the Enhanced Interior Gateway Routing Protocol (EIGRP) on an interface, use the **ip delay eigrp** command. To restore the default, use the **no** form of this command.

ip delay eigrp *instance-tag* *seconds*

no ip delay eigrp *instance-tag*

Syntax Description	<i>instance-tag</i>	Name of the EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
	<i>seconds</i>	Throughput delay, in tens of microseconds. The range is from 1 to 16777215.
Command Default	100 (10-microsecond units)	
Command Modes	Interface configuration mode	
Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.
Usage Guidelines	<p>You configure the throughput delay on an interface in 10-microsecond units. For example, if you set the ip delay eigrp command to 100, the throughput delay is 1000 microseconds.</p> <p>This command requires the LAN Base Services license.</p>	
Examples	<p>This example shows how to set the delay to 400 microseconds for the interface:</p> <pre>switch# configure terminal switch(config)# router eigrp 1 switch(config-router)# interface ethernet 2/1 switch(config-if)# no switchport switch(config-if)# ip delay eigrp 1 40 switch(config-if)#</pre>	
Related Commands	Command	Description
	ip hello-interval eigrp	Configures the hello interval on an interface for the EIGRP routing process that is designated by an autonomous system number.
	show ip eigrp	Displays EIGRP information.

ip directed-broadcast

To enable the translation of a directed broadcast to physical broadcasts, use the **ip directed-broadcast** command. To disable this function, use the **no** form of this command.

ip directed-broadcast

no ip directed-broadcast

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled; all IP directed broadcasts are dropped.

Command Modes

Interface configuration mode
Subinterface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

An IP directed broadcast is an IP packet whose destination address is a valid broadcast address for some IP subnet but which originates from a node that is not itself part of that destination subnet.

A device that is not directly connected to its destination subnet forwards an IP directed broadcast in the same way it would forward unicast IP packets destined to a host on that subnet. When a directed broadcast packet reaches a device that is directly connected to its destination subnet, that packet is broadcast on the destination subnet. The destination address in the IP header of the packet is rewritten to the configured IP broadcast address for the subnet, and the packet is sent as a link-layer broadcast.

If directed broadcast is enabled for an interface, incoming IP packets whose addresses identify them as directed broadcasts intended for the subnet to which that interface is attached are broadcast on that subnet.

If the **no ip directed-broadcast** command has been configured for an interface, directed broadcasts destined for the subnet to which that interface is attached are dropped, rather than being broadcast.



Note

Because directed broadcasts, and particularly Internet Control Message Protocol (ICMP) directed broadcasts, have been abused by malicious persons, we recommend that you disable the **ip directed-broadcast** command on any interface where directed broadcasts are not needed. We also recommend that you use access lists to limit the number of broadcast packets.

This command requires the LAN Base Services license.

Examples

This example shows how to enable forwarding of IP directed broadcasts on Ethernet interface 2/1:

```
switch# configure terminal
```

```
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# ip directed-broadcast
switch(config-if)#
```

Related Commands

Command	Description
show ip interface	Displays IP information for an interface.

ip distribute-list eigrp

To configure a distribution list for the Enhanced Interior Gateway Routing Protocol (EIGRP) on an interface, use the **ip distribute-list eigrp** command. To restore the default, use the **no** form of this command.

ip distribute-list eigrp *instance-tag* {**prefix-list** *list-name* | **route-map** *map-name*} {**in** | **out**}

no ip distribute-list eigrp *instance-tag* {**prefix-list** *list-name* | **route-map** *map-name*} {**in** | **out**}

Syntax Description

<i>instance-tag</i>	Name of the EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
prefix-list <i>list-name</i>	Specifies the name of an IP prefix list to filter EIGRP routes.
route-map <i>map-name</i>	Specifies the name of a route map to filter EIGRP routes.
in	Applies the route policy to incoming routes.
out	Applies the route policy to outgoing routes.

Command Default

None

Command Modes

Interface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

You must configure the named route map or prefix list to complete this configuration.
This command requires the LAN Base Services license.

Examples

This example shows how to configure a route map for all EIGRP routes coming into the interface:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# ip distribute-list eigrp 209 route-map InputFilter in
switch(config-if)#
```

Related Commands

Command	Description
prefix-list	Configures a prefix list.
route-map	Configures a route map.
show ip eigrp	Displays EIGRP information.

ip eigrp shutdown

To shut down the Enhanced Interior Gateway Routing Protocol (EIGRP) on an interface, use the **ip eigrp shutdown** command. To restore the default, use the **no** form of this command.

ip eigrp *instance-tag* **shutdown**

no ip eigrp *instance-tag* **shutdown**

Syntax Description	<i>instance-tag</i>	Name of the EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
--------------------	---------------------	---

Command Default	None
-----------------	------

Command Modes	Interface configuration mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	When you shut down the interface for EIGRP and prevent EIGRP adjacency for the interface for maintenance purposes, the network address for the interface does not show up in the EIGRP topology table. Use the ip passive-interface eigrp command to prevent EIGRP adjacency but keep the network address in the topology table.
------------------	---

This command requires the LAN Base Services license.

Examples	This example shows how to disable EIGRP on an interface:
----------	--

```
switch# configure terminal
switch(config)# router eigrp 201
switch(config-router)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# ip eigrp 201 shutdown
switch(config-if)#
```

Related Commands	Command	Description
	ip passive-interface eigrp	Configures an instance of EIGRP.
	router eigrp	Configures an instance of EIGRP.

ip extcommunity-list

To create an extended community list entry, use the **ip extcommunity-list** command. To remove the entry, use the **no** form of this command.

ip extcommunity-list standard *list-name* [{deny | permit} 4byteas-generic {transitive | nontransitive} *aa4:nn*]

no ip extcommunity-list standard *list-name* [[deny | permit] 4byteas-generic {transitive | nontransitive} *aa4:nn*]

ip extcommunity-list expanded *list-name* {deny | permit} *regex*

no ip extcommunity-list expanded *list-name* [[deny | permit] *regex*]

Syntax Description	standard <i>list-name</i>	Configures a named standard extended community list.
	deny	Denies access for a matching condition.
	permit	Permits access for a matching condition.
	4byteas-generic	Specifies the generic specific extended community type.
	transitive	Configures BGP to propagate the extended community attributes to other autonomous systems.
	nontransitive	Configures BGP to propagate the extended community attributes to other autonomous systems.
	<i>aa4:nn</i>	(Optional) Autonomous system number and network number. This value is configured with a 4-byte AS number and a 2-byte network number separated by a colon. The 4-byte AS number range is from 1 to 4294967295 in plaintext notation, or from 1.0 to 56636.65535 in AS.dot notation. You can enter a single community or multiple communities, each separated by a space.
	expanded <i>list-name</i>	Configures a named expanded extended community list.
	<i>regex</i>	Regular expression that is used to specify a pattern to match against an input string. The regular expression must be in the format <i>aa:nn</i> and can be a maximum of 63 characters.
	Note	Regular expressions can be used with expanded extended community lists only.

Command Default Community exchange is not enabled by default.

Command Modes Global configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Extended community values are configured as a 6-byte number. The first four bytes represent the autonomous system number, and the last two bytes represent a user-defined network number. The BGP generic specific community attribute is defined in draft-ietf-idr-as4octet-extcomm-generic-subtype-00.txt.

BGP extended community exchange is not enabled by default. Use the **send-extcommunity** command in BGP neighbor fix-family configuration mode to enable extended community attribute exchange between BGP peers.

Once you configure a permit value to match a given set of extended communities, the extended community list defaults to an implicit deny for all other extended community values.

Standard Extended Community Lists

Use standard extended community lists to configure specific extended community numbers. You can configure a maximum of 16 extended communities in a standard extended community list.

Expanded Extended Community Lists

Use expanded extended community lists to filter communities using a regular expression. Use regular expressions to configure patterns to match community attributes. The order for matching using the * or + character is the longest construct is first. Nested constructs are matched from the outside in. Concatenated constructs are matched beginning at the left side. If a regular expression can match two different parts of an input string, it matches the earliest part first.

Community List Processing

When you configure multiple values in the same extended community list statement, a logical AND condition is created. All extended community values must match to satisfy the AND condition. When you configure multiple values in separate community list statements, a logical OR condition is created. The first list that matches a condition is processed.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure a standard generic specific extended community list that permits routes from network 40 in autonomous system 1.65534 and from network 60 in autonomous system 1.65412:

```
switch# configure terminal
switch(config)# ip extcommunity-list standard test1 permit generic transitive 1.65534:40
switch(config)#
```

All community values must match in order for the list to be processed.

This example shows how to configure an expanded extended community list that permits advertisements that contain a route target extended community attribute beginning with the pattern 100:.

```
switch# configure terminal
switch(config)# ip extcommunity-list expanded test2 permit 100:.*
switch(config)#
```

Related Commands

Command	Description
feature bgp	Enables BGP.
match extcommunity	Matches an extended community in a route map.

Command	Description
send-community	Configures BGP to propagate community attributes to BGP peers.
set extcommunity	Sets an extended community in a route map.

ip forward

To allow IPv4 traffic on an interface even when there is no IP address configuration on that interface, use the **ip forward** command. To disable this function, use the **no** form of this command.

ip forward

no ip forward

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	Disabled
------------------------	----------

Command Modes	Global configuration mode
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Command History	Release	Modification
	6.0(2)U4(1)	This command was introduced.

Usage Guidelines	<p>Beginning with Cisco NX-OS Release 6.0(2)U4(1), BGP supports RFC 5549, which allows an IPv4 prefix to be carried over an IPv6 next hop.</p> <p>This command requires the Enterprise Services license.</p>
-------------------------	--

Examples	<p>This example shows how allow IPv4 traffic on an interface:</p> <pre>switch(config)# interface ethernet 1/2 switch(config-if)# ipv6 address ABCF:1::3/64 switch(config-if)# ip forward switch(config-if)#</pre>
-----------------	--

ip hello-interval eigrp

To configure the Enhanced Interior Gateway Routing Protocol (EIGRP) hello interval for an interface, use the **ip hello-interval eigrp** command. To restore the default, use the **no** form of this command.

ip hello-interval eigrp *instance-tag seconds*

no ip hello-interval eigrp *instance-tag*

Syntax Description	<i>instance-tag</i>	Name of the EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
	<i>seconds</i>	Hello interval (in seconds). The range is from 1 to 65535.

Command Default 5 seconds

Command Modes Interface configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Base Services license.

Examples This example shows how to set the hello interval to 10 seconds for the interface:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# ip hello-interval eigrp 1 10
switch(config-if)#
```

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	show ip eigrp	Displays EIGRP information.

ip hold-time eigrp

To configure the hold time for an Enhanced Interior Gateway Routing Protocol (EIGRP) interface, use the **ip hold-time eigrp** command. To restore the default, use the **no** form of this command.

ip hold-time eigrp *instance-tag seconds*

no ip hold-time eigrp *instance-tag*

Syntax Description	<i>instance-tag</i>	Name of the EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
	<i>seconds</i>	Hold time (in seconds). The range is from 1 to 65535.

Command Default	15 seconds
-----------------	------------

Command Modes	Interface configuration mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

We recommend that you configure the hold time to be at least three times the hello interval. If a router does not receive a hello packet within the specified hold time, routes through this router are considered unavailable.

Increasing the hold time delays route convergence across the network.

This command requires the LAN Base Services license.

Examples

This example shows how to set the hold time to 40 seconds for the interface:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# ip hold-time eigrp 209 40
switch(config-if)#
```

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	ip hello-interval eigrp	Configures the hello interval on an interface for the EIGRP routing process designated by an autonomous system number.
	show ip eigrp	Displays EIGRP information.

ip load-sharing address

To configure the load-sharing algorithm used by the unicast Forwarding Information Base (FIB), use the **ip load-sharing address command**. To restore the default, use the **no** form of this command.

```
ip load-sharing address { destination port destination | source-destination [port
source-destination] } [universal-id seed]
```

```
no ip load-sharing address { destination port destination | source-destination [port
source-destination] } [universal-id seed]
```

Syntax Description

destination port destination	Sets the load-sharing algorithm based on the destination address and port.
source-destination	Sets the load-sharing algorithm based on the source and destination address.
port source-destination	(Optional) Sets the load-sharing algorithm based on the source and destination address and port address.
universal-id seed	(Optional) Sets the random seed for the load sharing hash algorithm. The range is from 1 to 4294967295.

Command Default

IP source-destination address and port source-destination address

Command Modes

Global configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

```
This example shows how to set the load-sharing algorithm to use the source and destination address:
switch# configure terminal
switch(config)# ip load-sharing address source-destination
switch(config)#
```

Related Commands

Command	Description
show ip load-sharing	Displays the load-sharing algorithm.
show routing hash	Displays the path the RIB and FIB select for a source/destination pair.

ip local-proxy-arp

To enable the local proxy Address Resolution Protocol (ARP) feature, use the **ip local-proxy-arp** command. To disable this feature, use the **no** form of this command.

ip local-proxy-arp

no ip local-proxy-arp

Syntax Description This command has no arguments or keywords.

Command Default Disabled

Command Modes Interface configuration mode
Subinterface configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines Before the local proxy ARP feature can be used, you must enable the IP proxy ARP feature by using the **ip proxy-arp** command. The IP proxy ARP feature is disabled by default.



Note

This command is not applicable to Layer 3 loopback interfaces.

This command requires the LAN Base Services license.

Examples This example shows how to enable the local proxy ARP:

```
switch# configure terminal
switch(config)# interface ethernet 1/5
switch(config-if)# no switchport
switch(config-if)# ip arp local-proxy-arp
switch(config-if)#
```

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration to the startup configuration file.
	ip proxy-arp	Enables proxy ARP on an interface.
	show ip arp	Displays ARP configuration information.

ip next-hop-self eigrp

To instruct the Enhanced Interior Gateway Routing Protocol (EIGRP) process to use the local IP address as the next-hop address when advertising these routes, use the **ip next-hop-self eigrp** command. To use the received next-hop value, use the **no** form of this command.

ip next-hop-self eigrp *instance-tag*

no ip next-hop-self eigrp *instance-tag*

Syntax Description

<i>instance-tag</i>	Name of the EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
---------------------	---

Command Default

EIGRP always sets the IP next-hop value to be itself.

Command Modes

Interface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

EIGRP, by default, sets the IP next-hop value to be itself for routes that it is advertising, even when advertising those routes on the same interface from which the router learned them. To change this default, you must use the **no ip next-hop-self eigrp** command to instruct EIGRP to use the received next-hop value when advertising these routes.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to change the default IP next-hop value and instruct EIGRP to use the received next-hop value:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# no ip next-hop-self eigrp 209
switch(config-if)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
show ip eigrp	Displays EIGRP information.

ip offset-list eigrp

To configure an offset list for the Enhanced Interior Gateway Routing Protocol (EIGRP) on an interface, use the **ip offset-list eigrp** command. To restore the default, use the **no** form of this command.

ip offset-list eigrp *instance-tag* {**prefix-list** *list-name* | **route-map** *map-name*} {**in** | **out**} *offset*

no ip offset-list eigrp *instance-tag* {**prefix-list** *list-name* | **route-map** *map-name*} {**in** | **out**} *offset*

Syntax Description	<i>instance-tag</i>	Name of the EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
	prefix-list <i>list-name</i>	Specifies the name of an IP prefix list to filter EIGRP routes.
	route-map <i>map-name</i>	Specifies the name of a route map to filter EIGRP routes.
	in	Applies the route policy to incoming routes.
	out	Applies the route policy to outgoing routes.
	<i>offset</i>	Value to add to the EIGRP metric. The range is from 0 to 2147483647.

Command Default	None
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Command Modes	Interface configuration mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	<p>Cisco NX-OS adds the configured offset value to any routes that match the configured prefix list or route map. You must configure the named route map or prefix list to complete this configuration.</p> <p>This command requires the LAN Base Services license.</p>
-------------------------	---

Examples	<p>This example shows how to configure an offset list filter to add 20 to the metric for EIGRP routes coming into the interface that match the route map OffsetFilter:</p> <pre>switch# configure terminal switch(config)# router eigrp 209 switch(config-router)# interface ethernet 2/1 switch(config-if)# no switchport switch(config-if)# ip offset-list eigrp 209 route-map OffsetFilter in 20 switch(config-if)#</pre>
-----------------	--

Related Commands

Command	Description
prefix-list	Configures a prefix list.
route-map	Configures a route map.
show ip eigrp	Displays EIGRP information.

ip ospf authentication

To specify the authentication type for an Open Shortest Path First (OSPF) interface, use the **ip ospf authentication** command. To remove the authentication type for an interface, use the **no** form of this command.

ip ospf authentication [**key-chain** *key-name* | **message-digest** | **null**]

no ip ospf authentication

Syntax Description	key-chain <i>key-name</i>	(Optional) Specifies a key chain to use for authentication. The <i>key-name</i> argument can be a maximum of 63 alphanumeric characters.
	message-digest	(Optional) Specifies that message-digest authentication is used.
	null	(Optional) Specifies that no authentication is used. Use this keyword to override any other authentication configured for an area.

Command Default No authentication

Command Modes Interface configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines If you use this command with no keywords, use the **ip ospf authentication-key** command to configure the password. If you use the **message-digest** keyword, use the **ip ospf message-digest-key** command to configure the message-digest key for the interface.

The authentication that you configure on an interface overrides the authentication that you configure for the area.

This command requires the LAN Base Services license.

Examples This example shows how to configure message-digest authentication:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# ip ospf authentication message-digest
switch(config-if)# ip ospf message-digest-key 33 md5 0 mypassword
switch(config-if)#
```

Related Commands	Command	Description
	area authentication	Enables authentication for an OSPF area.
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	ip ospf authentication-key	Assigns a password to be used by neighboring routers that are using the password authentication of OSPF.
	ip ospf message-digest-key	Configures the OSPF MD5 message-digest key.
	show ip ospf	Displays OSPF information.

ip ospf authentication-key

To assign a password for simple password authentication to be used by neighboring Open Shortest Path First (OSPF) routers, use the **ip ospf authentication-key** command. To remove a previously assigned OSPF password, use the **no** form of this command.

ip ospf authentication-key [**0** | **3** | **7**] *password*

no ip ospf authentication-key

Syntax Description	0	(Optional) Configures an unencrypted password.
	3	(Optional) Configures a 3DES encrypted password string.
	7	(Optional) Configures a Cisco type 7 encrypted password string.
	<i>password</i>	Any continuous string of characters that can be entered from the keyboard up to 8 bytes.

Command Default	Unencrypted password
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Command Modes	Interface configuration mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	The password created by this command is used as a key that is inserted directly into the OSPF header when Cisco NX-OS originates routing protocol packets. You can assign a separate password to each network on a per-interface basis. All neighboring routers on the same network must have the same password to be able to exchange OSPF information.
------------------	--

**Note**

Cisco NX-OS uses this key when you enable authentication for an interface with the **ip ospf authentication** interface configuration command or if you configure the area for authentication with the **area authentication** command in router configuration mode.

This command requires the LAN Base Services license.

Examples	This example shows how to configure an unencrypted authentication key with the string yourpass:
----------	---

```
switch# configure terminal
switch(config)# interface ethernet 1/5
switch(config-if)# no switchport
switch(config-if)# ip ospf authentication-key yourpass
switch(config-if)#
```

Related Commands	Command	Description
	area authentication	Specifies the authentication type for an OSPF area.
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	ip ospf authentication	Specifies the authentication type for an interface.
	show ip ospf interface	Displays OSPF information.

ip ospf cost

To specify the cost of sending a packet on an interface, use the **ip ospf cost** command. To reset the path cost to the default, use the **no** form of this command.

ip ospf cost *interface-cost*

no ip ospf cost *interface-cost*

Syntax Description	<i>interface-cost</i> Unsigned integer value expressed as the link-state metric. The range is from 1 to 65535.					
Command Default	Calculates the cost based on the reference bandwidth divided by the configured interface bandwidth. You can configure the reference bandwidth or it defaults to 40 Gb/s.					
Command Modes	Interface configuration mode					
Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr></table>		Release	Modification	5.0(3)U1(1)	This command was introduced.
Release	Modification					
5.0(3)U1(1)	This command was introduced.					
Usage Guidelines	<p>This command overrides any settings for the reference bandwidth that you set using the reference-bandwidth command in router configuration mode.</p> <p>If this command is not used, the link cost is calculated using the following formula:</p> <p>link cost = reference bandwidth / interface bandwidth</p> <p>This command requires the LAN Base Services license.</p>					
Examples	<p>This example shows how to configure the interface cost value to 65:</p> <pre>switch# configure terminal switch(config)# interface ethernet 1/2 switch(config-if)# no switchport switch(config-if)# ip ospf cost 65 switch(config-if)#</pre>					
Related Commands	<table><tr><th>Command</th><th>Description</th></tr><tr><td>reference-bandwidth</td><td>Specifies the reference bandwidth that OSPF uses to calculate the link cost.</td></tr></table>		Command	Description	reference-bandwidth	Specifies the reference bandwidth that OSPF uses to calculate the link cost.
Command	Description					
reference-bandwidth	Specifies the reference bandwidth that OSPF uses to calculate the link cost.					

ip ospf dead-interval

To set the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down, use the **ip ospf dead-interval** command. To restore the default, use the **no** form of this command.

ip ospf dead-interval *seconds*

no ip ospf dead-interval

Syntax Description	<i>seconds</i>	Interval (in seconds) during which the router must receive at least one hello packet from a neighbor or that neighbor adjacency is removed from the local router and does not participate in routing. The range is from 1 to 65535, and the default is 40. The value must be the same for all nodes on the network.
--------------------	----------------	---

Command Default	The default for <i>seconds</i> is four times the interval set by the ip ospf hello-interval command.	
-----------------	---	--

Command Modes	Interface configuration mode	
---------------	------------------------------	--

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	The dead interval value must be the same for all networking devices on a specific network.	
	Configure a shorter dead interval to detect down neighbors faster and improve convergence. Very short dead intervals could cause routing instability.	
	Use the show ip ospf interface command to verify the dead interval and hello interval.	
	This command requires the LAN Base Services license.	

Examples	This example shows how to set the OSPF dead interval to 20 seconds:	
	<pre>switch# configure terminal switch(config)# interface ethernet 1/2 switch(config-if)# no switchport switch(config-if)# ip ospf dead-interval 20 switch(config-if)#</pre>	

Related Commands	Command	Description
	ip ospf hello-interval	Specifies the interval between hello packets that OSPF sends on the interface.
	show ip ospf interface	Displays OSPF interface-related information.

ip ospf hello-interval

To specify the interval between hello packets that Open Shortest Path First (OSPF) sends on the interface, use the **ip ospf hello-interval** command. To return to the default, use the **no** form of this command.

ip ospf hello-interval *seconds*

no ip ospf hello-interval

Syntax Description	<i>seconds</i> Interval (in seconds). The value must be the same for all nodes on a specific network. The range is from 1 to 65535.									
Command Default	10 seconds									
Command Modes	Interface configuration mode									
Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr></table>		Release	Modification	5.0(3)U1(1)	This command was introduced.				
Release	Modification									
5.0(3)U1(1)	This command was introduced.									
Usage Guidelines	<p>Shorter hello intervals allow OSPF to detect topological changes faster. This value must be the same for all routers and access servers on a specific network.</p> <p>This command requires the LAN Base Services license.</p>									
Examples	<p>This example shows how to set the interval between hello packets to 15 seconds:</p> <pre>switch# configure terminal switch(config)# interface ethernet 1/2 switch(config-if)# no switchport switch(config-if)# ip ospf hello-interval 15 switch(config-if)#</pre>									
Related Commands	<table><tr><th>Command</th><th>Description</th></tr><tr><td>copy running-config startup-config</td><td>Saves the configuration changes to the startup configuration file.</td></tr><tr><td>ip ospf dead-interval</td><td>Sets the time period for which hello packets must not have been seen before neighbors declare the router as down.</td></tr><tr><td>show ip ospf</td><td>Displays OSPF information.</td></tr></table>		Command	Description	copy running-config startup-config	Saves the configuration changes to the startup configuration file.	ip ospf dead-interval	Sets the time period for which hello packets must not have been seen before neighbors declare the router as down.	show ip ospf	Displays OSPF information.
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ip ospf dead-interval	Sets the time period for which hello packets must not have been seen before neighbors declare the router as down.									
show ip ospf	Displays OSPF information.									

ip ospf message-digest-key

To enable Open Shortest Path First (OSPF) Message Digest 5 (MD5) authentication, use the **ip ospf message-digest-key** command. To remove an old MD5 key, use the **no** form of this command.

```
ip ospf message-digest-key key-id md5 [0 | 3 | 7] key

no ip ospf message-digest-key key-id
```

Syntax Description

key-id	Identifier in the range from 1 to 255.
md5	Specifies the Message Digest 5 (MD5) authentication.
0	(Optional) Specifies an unencrypted password to generate the md5 key.
3	(Optional) Specifies an encrypted 3DES password to generate the md5 key.
7	(Optional) Specifies a Cisco type 7 encrypted password to generate the md5 key.
key	Alphanumeric password of up to 16 bytes.

Command Default

Unencrypted

Command Modes

Interface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

All neighbor routers must have the same *key* value on the network.
This command requires the LAN Base Services license.

Examples

This example shows how to set key 19 with the password 8ry4222:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf message-digest-key 19 md5 8ry4222
switch(config-if)#
```

Related Commands	Command	Description
	area authentication	Enables authentication for an OSPF area.
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	ip ospf authentication	Specifies the authentication type for an interface.
	show ip ospf	Displays OSPF information.

ip ospf mtu-ignore

To disable Open Shortest Path First (OSPF) maximum transmission unit (MTU) mismatch detection on received Database Descriptor (DBD) packets, use the **ip ospf mtu-ignore** command. To return to the default, use the **no** form of this command.

ip ospf mtu-ignore
no ip ospf mtu-ignore

Syntax Description This command has no arguments or keywords.

Command Default OSPF MTU mismatch detection is enabled.

Command Modes Interface configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines By default, OSPF checks whether neighbors are using the same MTU on a common interface. If the receiving MTU is higher than the IP MTU configured on the incoming interface, OSPF does not establish adjacencies. Use the **ip ospf mtu-ignore** command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

This command requires the LAN Base Services license.

Examples This example shows how to disable MTU mismatch detection on received DBD packets:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf mtu-ignore
switch(config-if)#
```

Related Commands	Command	Description
	show ip ospf	Displays general information about OSPF routing instances.
	show ip ospf interface	Displays OSPF-related interface information.

ip ospf network

To configure the Open Shortest Path First (OSPF) network type to a type other than the default for an interface, use the **ip ospf network** command. To return to the default, use the **no** form of this command.

ip ospf network {broadcast | point-to-point}

no ip ospf network

Syntax Description	broadcast	Sets the network type as broadcast.
	point-to-point	Sets the network type as point-to-point.

Command Default	Depends on the network type.
-----------------	------------------------------

Command Modes	Interface configuration mode
---------------	------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	The network type influences the behavior of the OSPF interface. An OSPF network type is usually broadcast, which uses OSPF multicasting capabilities. Under this network type, a designated router and backup designated router are elected. For point-to-point networks, there are only two neighbors and multicast is not required. For routers on an interface to become neighbors, the network type for all should match.
------------------	---

This command overrides the **medium {broadcast | p2p}** command in interface configuration mode.

This command requires the LAN Base Services license.

Examples	This example shows how to set an OSPF network as a broadcast network:
----------	---

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip address 192.0.2.33 255.255.255.0
switch(config-if)# ip ospf network broadcast
switch(config-if)#
```

Related Commands	Command	Description
	show ip ospf	Displays general information about OSPF routing instances.
	show ip ospf interface	Displays OSPF-related interface information.

ip ospf passive-interface

To suppress Open Shortest Path First (OSPF) routing updates on an interface, use the **ip ospf passive-interface** command. To return to the default, use the **no** form of this command.

ip ospf passive-interface

no ip ospf passive-interface

Syntax Description This command has no arguments or keywords.

Command Default Disabled

Command Modes Interface configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines If an interface is configured as a passive interface, it does not participate in OSPF and does not establish adjacencies or send routing updates. However, the interface is announced as part of the routing network. This command requires the LAN Base Services license.

Examples This example shows how to set an interface as passive:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf passive-interface
switch(config-if)#
```

Related Commands	Command	Description
	show ip ospf	Displays general information about OSPF routing instances.
	show ip ospf interface	Displays OSPF-related interface information.

ip ospf priority

To set the router priority for an Open Shortest Path First (OSPF) interface, use the **ip ospf priority** command. To return to the default, use the **no** form of this command.

ip ospf priority *number-value*

no ip ospf priority *number-value*

Syntax Description	<i>number-value</i>	Number that specifies the priority of the router. The range is from 0 to 255.
---------------------------	---------------------	---

Command Default	Priority of 1
------------------------	---------------

Command Modes	Interface configuration mode
----------------------	------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Use this command to set the router priority, which determines the designated router for this network. When two routers are attached to a network, both attempt to become the designated router. The router with the higher router priority takes precedence. If there is a tie, the router with the higher router ID takes precedence. A router with a router priority set to zero cannot become the designated router or backup designated router.
-------------------------	---

Cisco NX-OS uses this priority value when you configure OSPF for broadcast networks using the **neighbor** command in router configuration mode.

This command requires the LAN Base Services license.

Examples	This example shows how to set the router priority value to 4:
-----------------	---

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf priority 4
switch(config-if)#
```

Related Commands	Command	Description
	ip ospf network	Configures the OSPF network type to a type other than the default for a given medium.

ip ospf retransmit-interval

To specify the time between Open Shortest Path First (OSPF) link-state advertisement (LSA) retransmissions for adjacencies that belongs to the interface, use the **ip ospf retransmit-interval** command. To return to the default, use the **no** form of this command.

ip ospf retransmit-interval *seconds*

no ip ospf retransmit-interval

Syntax Description

<i>seconds</i>	Time (in seconds) between retransmissions. The time must be greater than the expected round-trip delay between any two routers on the attached network. The range is from 1 to 65535 seconds. The default is 5 seconds.
----------------	---

Command Default

5 seconds

Command Modes

Interface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

When a router sends an LSA to its neighbor, it keeps the LSA until it receives an acknowledgment message from the neighbor. If the router receives no acknowledgment within the retransmit interval, the local router resends the LSA.

This command requires the LAN Base Services license.

Examples

This example shows how to set the retransmit interval value to 8 seconds:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf retransmit-interval 8
switch(config-if)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
ip ospf transmit-delay	Sets the estimated time to transmit an LSA to a neighbor.
show ip ospf	Displays OSPF information.

ip ospf shutdown

To shut down an Open Shortest Path First (OSPF) interface, use the **ip ospf shutdown** command. To return to the default, use the **no** form of this command.

ip ospf shutdown

no ip ospf shutdown

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	Interface configuration mode
----------------------	------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Base Services license.
-------------------------	--

Examples	This example shows how to shut down OSPF on an interface:
-----------------	---

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf shutdown
switch(config-if)#
```

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	show ip ospf	Displays OSPF information.

ip ospf transmit-delay

To set the estimated time required to send an Open Shortest Path First (OSPF) link-state update packet on the interface, use the **ip ospf transmit-delay** command. To return to the default, use the **no** form of this command.

ip ospf transmit-delay *seconds*

no ip ospf transmit-delay

Syntax Description	<i>seconds</i>	Time (in seconds) required to send a link-state update. The range is from 1 to 450 seconds, and the default is 1.
--------------------	----------------	---

Command Default	1 second
-----------------	----------

Command Modes	Interface configuration mode
---------------	------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	OSPF increments the LSA age time by the transmit delay amount before transmitting the LSA update. You should take into account the transmission and propagation delays for the interface when you set this value. This command requires the LAN Base Services license.
------------------	---

Examples	This example shows how to set the transmit delay value to 8 seconds:
----------	--

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf transmit-delay 8
switch(config-if)#
```

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	ip ospf retransmit-interval	Sets the estimated time between LSAs transmitted from this interface.
	show ip ospf	Displays OSPF information.

ip passive-interface eigrp

To suppress all routing updates on an Enhanced Interior Gateway Routing Protocol (EIGRP) interface, use the **ip passive-interface eigrp** command. To reenble the sending of routing updates, use the **no** form of this command.

ip passive-interface eigrp *instance-tag*

no ip passive-interface eigrp *instance-tag*

Syntax Description

<i>instance-tag</i>	Name of the EIGRP instance. The name can be any case-sensitive, alphanumeric string up to 20 characters.
---------------------	--

Command Default

Routing updates are sent on the interface.

Command Modes

Interface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

When you use this command to stop all routing updates on an interface and suppress the formation of EIGRP adjacencies, the network address for the interface remains in the EIGRP topology table.

This command requires the LAN Base Services license.

Examples

This example shows how to stop EIGRP routing updates on ethernet 2/1:

```
switch# configure terminal
switch(config)# router eigrp 201
switch(config-router)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# ip passive-interface eigrp 201
switch(config-if)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration in the startup configuration file.
no switchport	Configures an interface as a Layer 3 routed interface.
show ip eigrp interfaces	Displays information about EIGRP interfaces.

ip policy route-map

To identify a route map to use for policy routing on an interface, use the **ip policy route-map** command. To remove the route map, use the **no** form of this command.

```
ip policy route-map name
no ip policy route-map name
```

Syntax Description	name Name of the route map. The name can be any alphanumeric string up to 63 characters.	
Command Default	Enabled	
Command Modes	Interface configuration mode	
Command History	Release	Modification
	6.0(2)U2(1)	This command was introduced.

Usage Guidelines

Use the **ip policy route-map** command to identify a route map to use for policy routing. Use the **route-map** command to create the rout map. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which policy routing is allowed for the interface, based on the destination IP address of the packet. The **set** commands specify the set actions—the particular policy routing actions to perform if the criteria enforced by the **match** commands are met. The **no ip policy route-map** command deletes the pointer to the route map.

You can perform policy-based routing on any match criteria that can be defined in an expanded IP access list when using the **match ip address** command and referencing an expanded IP access list.

You must enable policy-based routing with the **feature pbr** command before you can use the **ip policy route-map** command.

This command requires the Enterprise Services license.

Examples

This example shows how to configure a policy-based route map to an interface:

```
switch# configure terminal
switch(config)# feature pbr
switch(config)# interface ethernet 1/2
switch(config-if)# ip policy route-map policymap
switch(config-if)#
```

Related Commands

Command	Description
feature pbr	Enables the policy-based routing feature.
route-map	Creates a route map.
show route-map pbr-statistics	Displays statistics about policy-based route maps.

ip port-unreachable

To enable the generation of Internet Control Message Protocol (ICMP) port unreachable messages, use the **ip port-unreachable** command. To disable this function, use the **no** form of this command.

```
ip port-unreachable
no ip port-unreachable
```

Syntax Description This command has no arguments or keywords.

Command Default Enabled

Command Modes Interface configuration mode
Subinterface configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to enable the generation of ICMP port unreachable messages, as appropriate, on an interface:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# ip port-unreachable
switch(config-if)#
```

Related Commands	Command	Description
	ip unreachable	Sends ICMP unreachable messages.

ip prefix-list

To create a prefix list to match IP packets or routes against, use the **ip prefix-list** command. To remove the prefix-list, use the **no** form of this command.

```
ip prefix-list name [seq number] {permit | deny} prefix [eq length | ge length] [le length] [mask mask]
```

```
no prefix-list name [seq number] {permit | deny} prefix [eq length | ge length] [le length] [mask mask]
```

Syntax Description	<i>name</i>	IP prefix list name. The name can be any alphanumeric string up to 63 characters.
	seq <i>number</i>	(Optional) Specifies the number to order entries in the prefix list. The range is from 1 to 4294967294.
	permit	Allows routes or IP packets that match the prefix list.
	deny	Rejects routes or IP packets that match the prefix list.
	<i>prefix</i>	IP prefix in A.B.C.D/length format.
	eq <i>length</i>	(Optional) Specifies the prefix length to match. The range is from 1 to 32.
	ge <i>length</i>	(Optional) Specifies the prefix length to match. The range is from 1 to 32.
	le <i>length</i>	(Optional) Specifies the prefix length to match. The range is from 1 to 32.
	mask <i>mask</i>	(Optional) Specifies the bits of a prefix address in a prefix list that are compared to the bits of the prefix address used in routing protocols during redistribution.

Command Default None

Command Modes Global configuration mode

Command History	Release	Modification
	6.0(2)U3(1)	The mask option was introduced.
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines You configure prefix lists with **permit** or **deny** keywords to either permit or deny the prefix based on the matching condition. A prefix list consists of an IP address and a bit mask. The bit mask is entered as a number from 1 to 32. An implicit deny is applied to traffic that does not match any prefix-list entry.

You can configure prefix lists to match an exact prefix length or a prefix range. Use the **ge** and **le** keywords to specify a range of the prefix lengths to match, which provides a more flexible configuration. If you do not configure a sequence number, Cisco NX-OS applies a default sequence number of 5 to the prefix list and subsequent prefix list entries are incremented by 5 (for example, 5, 10, 15, and so on). If you configure a sequence number for the first prefix list entry but not subsequent entries, then Cisco NX-OS increments the subsequent entries by 5 (for example, if the first configured sequence number is 3, then subsequent entries will be 8, 13, 18, and so on). You can suppress default sequence numbers by entering the **no** form of this command with the **seq** keyword.

Cisco NX-OS evaluates prefix lists that start with the lowest sequence number and continue down the list until a match is made. Once a match is made, the **permit** or **deny** statement is applied to that network and the rest of the list is not evaluated.

**Tip**

For the best performance of your network, you should configure the most frequently processed prefix list statements with the lowest sequence numbers. The **seq number** keyword and argument can be used for resequencing.

You can use a prefix list to match the IP address in a route-map, which in turn is used in routing protocols during redistribution. The IP address is matched against the prefix list where the bits corresponding to the mask bit 1 are the same as the subnet provided in the prefix list.

By carefully setting masks, you can select a single, or several IP addresses for permit or deny tests.

The prefix list mask allows noncontiguous bits in the mask. You can thus define a range of even or odd numbered IP addresses.

This command does not require a license.

Examples

This example shows how to configure a prefix list and apply it to a Border Gateway Protocol (BGP) peer:

```
switch# configure terminal
switch(config)# ip prefix-list allowprefix 10 permit 192.0.2.0 eq 24
switch(config)# ip prefix-list allowprefix 20 permit 209.165.201.0 eq 27
switch(config) router bgp 65536:20
switch(config-router)# neighbor 192.0.2.1/16 remote-as 65536:20
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# prefix-list allowprefix in
switch(config-router-neighbor-af)#
```

This example shows how to create an IPv4 prefix list with a match mask for odd IP addresses:

```
switch# configure terminal
switch(config)# ip prefix-list odd permit 0.0.0.1/32 mask 0.0.0.1
```

Related Commands

Command	Description
clear ip prefix-list	Clears counters for IP prefix lists.
prefix-list	Applies a prefix list to BGP peer.
show ip prefix-list	Displays information about IP prefix lists.

ip prefix-list description

To configure a description string for an IP prefix list, use the **ip prefix-list description** command. To revert to default, use the **no** form of this command.

ip prefix-list *name* **description** *string*

no ip prefix-list *name* **description**

Syntax Description	<i>name</i>	Name of the prefix list. The name can be any alphanumeric string up to 63 characters.
	<i>string</i>	Descriptive string for the prefix list. The string can be any alphanumeric string up to 90 characters.

Command Default	None
------------------------	------

Command Modes	Global configuration mode
----------------------	---------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command does not require a license.
-------------------------	--

Examples	This example shows how to configure a description for an IP prefix list:
	switch# configure terminal
	switch(config)# ip prefix-list test1 description "this is a test"
	switch(config)#

Related Commands	Command	Description
	show ip prefix-list	Displays information about IPv4 prefix lists.

ip proxy-arp

To enable proxy Address Resolution Protocol (ARP) on an interface, use the **ip proxy-arp** command. To disable proxy ARP on the interface, use the **no** form of this command.

ip proxy-arp

no ip proxy-arp

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Interface configuration mode
Subinterface configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to enable proxy ARP:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# ip proxy-arp
switch(config-if)#
```

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration to the startup configuration file.
	show ip arp	Displays ARP configuration information.

ip redirects

To send Internet Control Message Protocol (ICMP) redirect messages on interfaces, use the **ip redirects** command. To disable the sending of ICMP redirect messages, use the **no** form of this command.

ip redirects

no ip redirects

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	Interface configuration mode
----------------------	------------------------------

Command History	Release	Modification
	5.0(3)U2(2)	This command was introduced.

Usage Guidelines	This command requires the LAN Base Services license.
-------------------------	--

Examples	This example shows how to enable ICMP redirect messages on a Layer 3 interface:
-----------------	---

```
switch# configure terminal
switch(config)# interface ethernet 1/5
switch(config-if)# no switchport
switch(config-if)# no ip redirects
switch(config-if)#
```

This example shows how to disable ICMP redirect messages on a Layer 3 interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/5
switch(config-if)# no switchport
switch(config-if)# no ip redirects
switch(config-if)#
```

Related Commands	Command	Description
	feature bfd	Enables Bidirectional Forwarding Detection (BFD) on the switch.

ip rip authentication key-chain

To enable authentication for the Routing Information Protocol (RIP) Version 2 packets and to specify the set of keys that can be used on an interface, use the **ip rip authentication key-chain** command. To prevent authentication, use the **no** form of this command.

ip rip authentication key-chain *name-of-chain*

no ip rip authentication key-chain [*name-of-chain*]

Syntax Description

<i>name-of-chain</i>	Group of valid keys.
----------------------	----------------------

Command Default

No authentication is provided for RIP packets.

Command Modes

Interface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command does not require a license but if you want to enable Layer 3 interfaces, you must install the LAN Base Services license.

Examples

This example shows how to configure the interface to accept and send any key that belongs to the key-chain trees:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip rip authentication key-chain trees
switch(config-if)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration to the startup configuration file.
key-chain	Creates a set of keys that can be used by an authentication method.
show ip rip	Displays a summary of RIP information for all RIP instances.

ip rip authentication mode

To specify the type of authentication used in the Routing Information Protocol (RIP) Version 2 packets, use the **ip rip authentication mode** command. To restore clear text authentication, use the **no** form of this command.

ip rip authentication mode { text | md5 }

no ip rip authentication mode

Syntax Description

text	Specifies the clear text authentication.
md5	Specifies the message Digest 5 (MD5) authentication.

Command Default

Clear text authentication is provided for RIP packets if you configured a key chain.

Command Modes

Interface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command does not require a license but if you want to enable Layer 3 interfaces, you must install the LAN Base Services license.

Examples

This example shows how to configure the interface to use MD5 authentication:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip rip authentication mode md5
switch(config-if)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration to the startup configuration file.
ip rip authentication key-chain	Enables authentication for RIP Version 2 packets and specifies the set of keys that can be used on an interface.
key chain	Enables authentication for routing protocols.
show ip rip	Displays a summary of RIP information for all RIP instances.

ip rip metric-offset

To add an additional value to the incoming IP Routing Information Protocol (RIP) route metric for an interface, use the **ip rip metric-offset** command. To return the metric to its default value, use the **no** form of this command.

ip rip metric-offset *value*

no ip rip metric-offset

Syntax Description	<i>value</i>	Value to add to the incoming route metric for an interface. The range is from 1 to 15. The default is 1.
--------------------	--------------	--

Command Default	<i>value: 1</i>
-----------------	-----------------

Command Modes	Interface configuration mode
---------------	------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	<p>This command allows you to add a fixed offset to the route metric of all incoming routes on an interface. For example, if you set the metric-offset to 5 on an interface and the incoming route metric is 5, then Cisco NX-OS adds the route to the route table with a metric of 10.</p> <p>This command does not require a license but if you want to enable Layer 3 interfaces, you must install the LAN Base Services license.</p>
------------------	--

Examples	<p>This example shows how to configure a metric offset of 10 for all incoming RIP routes on Ethernet interface 2/1:</p> <pre>switch# configure terminal switch(config)# interface ethernet 2/1 switch(config-if)# no switchport switch(config-if)# ip rip metric-offset 10 switch(config-if)#</pre>
----------	---

Related Commands	Command	Description
	ip rip offset-list	Adds an offset value to incoming RIP route metrics.

ip rip offset-list

To add an offset to incoming and outgoing metrics to routes learned via Routing Information Protocol (RIP), use the **ip rip offset-list** command. To remove an offset list, use the **no** form of this command.

ip rip offset-list *value*

no ip rip offset-list

Syntax Description	<i>value</i>	Value to add to the incoming route metric for an interface. The range is from 1 to 15. The default is 1.
--------------------	--------------	--

Command Default	<i>value: 1</i>
-----------------	-----------------

Command Modes	Router address-family configuration mode
---------------	--

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command does not require a license but if you want to enable Layer 3 interfaces, you must install the LAN Base Services license.
------------------	---

Examples	This example shows how to configure an offset of 10 for all incoming RIP routes on Ethernet interface 2/1:
----------	--

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# ip rip offset-list 10
switch(config-if)#
```

Related Commands	Command	Description
	ip rip metric-offset	Adds an offset value to incoming RIP route metrics.

ip rip passive-interface

To suppress the sending of the Routing Information Protocol (RIP) updates on an interface, use the **ip rip passive-interface** command. To unsuppress updates, use the **no** form of this command.

ip rip passive-interface

no ip rip passive-interface

Syntax Description This command has no arguments or keywords.

Command Default RIP updates are sent on the interface.

Command Modes Interface configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

While RIP stops sending routing updates to the multicast (or broadcast) address on a passive interface, RIP continues to receive and process routing updates from its neighbors on that interface.

This command does not require a license but if you want to enable Layer 3 interfaces, you must install the LAN Base Services license.

Examples This example shows how to configure Ethernet 1/2 as a passive interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip rip passive-interface
switch(config-if)#
```

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration to the startup configuration file.
	show ip rip	Displays a summary of RIP information for all RIP instances.

ip rip poison-reverse

To enable poison-reverse processing of the Routing Information Protocol (RIP) router updates, use the **ip rip poison-reverse** command. To disable poison-reverse processing of RIP updates, use the **no** form of this command.

ip rip poison-reverse

no ip rip poison-reverse

Syntax Description

This command has no arguments or keywords.

Command Default

Split horizon is always enabled. Poison-reverse processing is disabled.

Command Modes

Interface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

By default, Cisco NX-OS does not advertise RIP routes out the interface over which they were learned (split horizon). If you configure both poison reverse and split horizon, then Cisco NX-OS advertises the learned routes as unreachable over the interface on which the route was learned.

This command does not require a license but if you want to enable Layer 3 interfaces, you must install the LAN Base Services license.

Examples

This example shows how to enable poison-reverse processing for an interface running RIP:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip rip poison-reverse
switch(config-if)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration to the startup configuration file.
show ip rip	Displays a summary of RIP information for all RIP instances.

ip rip route-filter

To filter the Routing Information Protocol (RIP) routes coming in or out of an interface, use the **ip rip route-filter** command. To remove filtering from an interface, use the **no** form of this command.

```
ip rip route-filter {prefix-list list-name | route-map map-name} {in | out}

no ip rip route-filter {prefix-list list-name | route-map map-name} {in | out}
```

Syntax Description

prefix-list <i>list-name</i>	Associates a prefix list to filter RIP packets.
route-map <i>map-name</i>	Associates a route map to set the redistribution policy for RIP.
in	Filters incoming routes.
out	Filters outgoing routes.

Command Default

Route filtering is disabled.

Command Modes

Interface configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command does not require a license but if you want to enable Layer 3 interfaces, you must install the LAN Base Services license.

Examples

This example shows how to use a route map to filter routes for a RIP interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip rip route-filter route-map InRipFilter in
switch(config-if)#
```

Related Commands

Command	Description
route-map	Creates a route map.
prefix-list	Creates a prefix list.

ip rip summary-address

To configure a summary aggregate address under an interface for the Routing Information Protocol (RIP), use the **ip rip summary-address** command. To disable summarization of the specified address or subnet, use the **no** form of this command.

ip rip summary-address *ip-prefix/mask*

no ip rip summary-address *ip-prefix/mask*

Syntax Description	<i>ip-prefix/length</i> IP prefix and prefix length to be summarized.						
Command Default	Disabled						
Command Modes	Interface configuration mode						
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr> </table>	Release	Modification	5.0(3)U1(1)	This command was introduced.		
Release	Modification						
5.0(3)U1(1)	This command was introduced.						
Usage Guidelines	This command requires the LAN Base Services license.						
Examples	<p>This example shows how to configure the summary address 192.0.2.0 that is advertised out Ethernet interface 1/2:</p> <pre>switch# configure terminal switch(config)# interface ethernet 1/2 switch(config-if)# no switchport switch(config-if)# ip rip summary-address 192.0.2.0/24 switch(config-if)#</pre>						
Related Commands	<table> <tr> <th>Command</th><th>Description</th></tr> <tr> <td>copy running-config startup-config</td><td>Saves the configuration to the startup configuration file.</td></tr> <tr> <td>show ip rip</td><td>Displays a summary of RIP information for all RIP instances.</td></tr> </table>	Command	Description	copy running-config startup-config	Saves the configuration to the startup configuration file.	show ip rip	Displays a summary of RIP information for all RIP instances.
Command	Description						
copy running-config startup-config	Saves the configuration to the startup configuration file.						
show ip rip	Displays a summary of RIP information for all RIP instances.						

ip route

To configure a static route, use the **ip route** command. To remove the static route, use the **no** form of this command.

```
ip route ip-prefix/mask {[interface] next-hop} [preference] [tag id] [track] [vrf]

no ip route ip-prefix/mask {[interface] next-hop} [preference] [tag id] [track] [vrf]
```

Syntax Description

<i>ip-prefix/length</i>	IP prefix and prefix length. The format is x.x.x.x/length. The length is 1 to 32.
<i>interface</i>	(Optional) Interface on which all packets are sent to reach this route. Use ? to display a list of supported interfaces.
<i>next-hop</i>	IP address of the next hop that can be used to reach that network. You can specify an IP address and an interface type and interface number. The format is x.x.x.x/length. The length is 1 to 32.
<i>preference</i>	(Optional) Route preference that is used as the administrative distance to this route. The range is from 1 to 255. The default is 1.
<i>tag id</i>	(Optional) Assigns a route tag that can be used to match against in a route map. The range is from 0 to 4294967295. The default is 0.
<i>track</i>	(Optional) Specifies the object to be tracked.
<i>vrf</i>	(Optional) The vrf for next-hop if different from the present vrf.

Command Default

None

Command Modes

Global configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Static routes have a default administrative distance of 1. If you want a dynamic routing protocol to take precedence over a static route, you must configure the static route preference argument to be greater than the administrative distance of the dynamic routing protocol. For example, routes derived with the Enhanced Interior Gateway Routing Protocol (EIGRP) have a default administrative distance of 100. To have a static route that would be overridden by an EIGRP dynamic route, you should specify an administrative distance greater than 100.

This command does not require a license.

Examples

This example shows how to create a static route for destinations with the IP address prefix 192.168.1.1/32, reachable through the next-hop address 10.0.0.2:

```
switch# configure terminal
switch(config)# ip route 192.168.1.1/32 10.0.0.2
```

```
switch(config)#
```

This example shows how to assign a tag to the previous example so that you can configure a route map that can match on this static route:

```
switch# configure terminal
switch(config)# ip route 192.168.1.1/32 10.0.0.2 tag 5
switch(config)#
```

This example shows how to choose a preference of 110. In this case, packets for prefix 10.0.0.0 are routed to a router at 192.168.0.4 if dynamic route information with an administrative distance less than 110 is not available.

```
switch# configure terminal
switch(config)# ip route 10.0.0.0/8 192.168.0.4 110
switch(config)#
```

Related Commands

Command	Description
match tag	Matches the tag value associated with a route.

ip router eigrp

To specify the Enhanced Interior Gateway Routing Protocol (EIGRP) instance for an interface, use the **ip router eigrp** command. To return to the default, use the **no** form of this command.

ip router eigrp *instance-tag*

no ip router eigrp *instance-tag*

Syntax Description	<i>instance-tag</i> Name of the EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.	
Command Default	None	
Command Modes	Interface configuration mode	
Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.
Usage Guidelines	<p>Before you use this command, make sure that you enable EIGRP on the switch.</p> <p>This command requires the LAN Base Services license.</p>	
Examples	<p>This example shows how to set the EIGRP instance for an interface:</p> <pre>switch# configure terminal switch(config)# interface ethernet 1/2 switch(config-if)# no switchport switch(config-if)# ip router eigrp Base switch(config-if)#</pre>	
Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes in the startup configuration file.
	feature eigrp	Enables EIGRP on the switch.
	show ip eigrp interfaces	Displays information about EIGRP interfaces.

ip router ospf area

To specify the Open Shortest Path First (OSPF) instance and area for an interface, use the **ip router ospf area** command. To return to the default, use the **no** form of this command.

ip router ospf *instance-tag* **area** *area-id* [**secondaries none**]

no ip router ospf *instance-tag* **area** *area-id* [**secondaries none**]

Syntax Description	<i>instance-tag</i>	Instance tag. The <i>instance-tag</i> can be an alphanumeric string of 20 characters.
	<i>area-id</i>	Identifier for the OSPF area where you want to enable authentication. The area ID can be either a positive integer value from 0 to 4294967295 or an IP address.
	secondaries none	(Optional) Excludes secondary IP addresses.

Command Default 10 seconds

Command Modes Interface configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Base Services license.

Examples This example shows how to configure an interface for OSPF:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip router ospf Base area 33
switch(config-if)#
```

Related Commands	Command	Description
	show ip ospf interface	Displays OSPF interface-related information.
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.

ip router ospf multi-area

To configure a multi-area adjacency on an Open Shortest Path First (OSPF) interface, use the **ip router ospf multi-area** command. To return to the default, use the **no** form of this command.

```
ip router ospf instance-tag multi-area area-id

no ip router ospf instance-tag multi-area area-id
```

Syntax Description	<i>instance-tag</i>	Instance tag. Specify as an case-sensitive alphanumeric string up to 20 characters.
	<i>area-id</i>	Identifier for the OSPF area where you want to add as another area to the primary interface. The area ID can be either a positive integer value from 0 to 4294967295 or an IP address.

Command Default	None
-----------------	------

Command Modes	Interface configuration mode
---------------	------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Before you use this command, make sure that you enable OSPF on the switch. This command requires the LAN Base Services license.
------------------	--

Examples	This example shows how to configure a multi-area adjacency: switch# configure terminal switch(config)# interface ethernet 1/2 switch(config-if)# no switchport switch(config-if)# ip router ospf Base area 33 switch(config-if)# ip router ospf Base multi-area 99 switch(config-if)#
----------	--

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	feature ospf	Enables OSP on the switch.
	show ip ospf interface	Displays OSPF interface-related information.

ip router rip

To specify the Routing Information Protocol (RIP) instance for an interface, use the **ip router rip** command. To return to the default, use the **no** form of this command.

ip router rip *instance-tag*

no ip router rip *instance-tag*

Syntax Description	<i>instance-tag</i>	Name of the RIP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
---------------------------	---------------------	---

Command Default	None
------------------------	------

Command Modes	Interface configuration mode
----------------------	------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Before you use this command, make sure that you enable RIP on the switch. This command requires the LAN Base Services license.
-------------------------	---

Examples	This example shows how to set the RIP instance for an interface: switch# configure terminal switch(config)# interface ethernet 1/2 switch(config-if)# no switchport switch(config-if)# ip router rip Enterprise switch(config-if)#
-----------------	---

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration to the startup configuration file.
	feature rip	Enables RIP on the switch.
	show ip rip	Displays a summary of RIP information for all RIP instances.

ip route static bfd

To enable Bidirectional Forwarding Detection (BFD) on a static route, use the **ip route static bfd** command. To return to the default setting, use the **no** form of this command.

```
ip route static bfd interface {nh-address | nh-prefix}

no ip route static bfd interface {nh-address | nh-prefix}
```

Syntax Description	interface	Interface that this static route resides on. Use the ? keyword to display the supported interfaces.
	nh-address	Next-hop address for this static route, in dotted decimal notation.
	nh-prefix	Next-hop prefix for this static route, in dotted decimal notation.

Defaults	None
----------	------

Command Modes	Interface configuration mode
---------------	------------------------------

Command History	Release	Modification
	5.0(3)U4(1)	This command was introduced.

Usage Guidelines	Use the ip route static bfd command to enable BFD on a static route. This command does not require a license.
------------------	---

Examples	This example shows how to enable BFD for a static route: switch# configure terminal switch(config)# interface ethernet 2/1 switch(config-if)# ip route static bfd ethernet 2/1 192.0.2.4
----------	--

Related Commands	Command	Description
	feature bfd	Enables the BFD feature.

ip source

To configure an interface IP address for Internet Control Message Protocol (ICMP) source IP field to route the ICMP error messages use the **ip source** command. To unprovision the IP address, use the **no** form of this command.

ip source { *ethernet slot/port* | *loopback number* | *port-channel number* } { *icmp-errors* }

no ip source { *ethernet slot/port* | *loopback number* | *port-channel number* } { *icmp-errors* }

Syntax Description

ethernet <i>slot/port</i>	Interface to handle ICMP error messages.
loopback <i>number</i>	All neighbors on a loopback interface.
port-channel <i>number</i>	All neighbors on a port-channel interface.
icmp-errors	Specifies the ICMP unreachable, TTL-exceeded, or param-prob messages that need to be routed.

Defaults

Enabled

Command Modes

Global configuration mode

Command History

Release	Modification
6.0(2)U2(1)	This command was introduced.

Examples

This example shows how to configure an ethernet interface to where the ICMP error messages are routed:

```
switch# configure terminal
switch(config)# interface ethernet 1/1 icmp-errors
switch(config-if)# exit
```

Related Commands

Command	Description
ip unreachable	Sends ICMP unreachable messages.
ip port-unreachable	Enables generation of ICMP port unreachable messages.

ip split-horizon eigrp

Command	Description
feature bfd	Enables the BFD feature.
To enable split horizon for an Enhanced Interior Gateway Routing Protocol (EIGRP) process, use the ip split-horizon eigrp command. To disable split horizon, use the no form of this command.	
ip split-horizon eigrp <i>instance-tag</i>	
no ip split-horizon eigrp <i>instance-tag</i>	

Syntax Description	<i>instance-tag</i>	Name of the EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
---------------------------	---------------------	---

Command Default	Enabled
------------------------	---------

Command Modes	Interface configuration mode
----------------------	------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Base Services license.
-------------------------	--

Examples	<p>This example shows how to disable split horizon an an Ethernet link:</p> <pre>switch# configure terminal switch(config)# router eigrp 209 switch(config-router)# interface ethernet 2/1 switch(config-if)# no switchport switch(config-if)# no ip split-horizon eigrp 209 switch(config-if)#</pre>
-----------------	---

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	show ip eigrp	Displays EIGRP information.

ip summary-address eigrp

To configure a summary aggregate address for the specified Enhanced Interior Gateway Routing Protocol (EIGRP) interface, use the **ip summary-address eigrp** command. To disable a configuration, use the **no** form of this command.

ip summary-address eigrp *instance-tag* { *ip-address/length* | *ip-address mask* } [*admin-distance* | **leak-map** *map-name*]

no ip summary-address eigrp *instance-tag* { *ip-address/length* | *ip-address mask* }

Syntax Description		
<i>instance-tag</i>		Name of the EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
<i>ip-address/length</i>		Summary IP prefix and prefix length to apply to an interface in four-part, dotted-decimal notation. For example, /8 indicates that the first eight bits in the IP prefix are network bits. If <i>length</i> is used, the slash is required.
<i>ip-address</i>		Summary IP address to apply to an interface in four-part, dotted-decimal notation.
<i>mask</i>		IP address mask.
<i>admin-distance</i>		(Optional) Administrative distance. The range is from 1 to 255.
leak-map <i>map-name</i>		(Optional) Specifies the leak map.

Command Default An administrative distance of 5 is applied to EIGRP summary routes. No summary addresses are predefined.

Command Modes Interface configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Base Services license.

Examples This example shows how to configure an administrative distance of 95 on an EIGRP interface for the 192.168.0.0/16 summary address:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# ip summary-address eigrp 209 192.168.0.0/16 95
switch(config-if)#
```

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	show ip eigrp interfaces	Displays EIGRP interface-related information.

ip tcp path-mtu-discovery

To enable path maximum transmission unit (MTU) discovery on an IPv4 interface, use the **ip tcp path-mtu discovery** command. To disable this feature, use the **no** form of this command.

ip ip tcp path-mtu discovery

no ip tcp path-mtu discovery

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	Disabled
------------------------	----------

Command Modes	Interface configuration mode
----------------------	------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Base Services license.
-------------------------	--

Examples	This example shows how to enable path MTU discovery for both IPv4:
-----------------	--

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# ip tcp path-mtu-discovery
switch(config-if)#
```

Related Commands	Command	Description
	show ip arp	Displays ARP configuration information.

ip unreachable

To enable the generation of Internet Control Message Protocol (ICMP) unreachable messages, use the **ip unreachable** command. To disable this function, use the **no** form of this command.

- ip unreachable**
- no ip unreachable**

Syntax Description This command has no arguments or keywords.

Command Default Enabled

Command Modes Interface configuration mode
Subinterface configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Base Services license.

Examples This example shows how to enable the generation of ICMP unreachable messages on an interface:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# ip unreachable
switch(config-if)#
```

Related Commands	Command	Description
	ip port-unreachable	Sends ICMP port unreachable messages.

ipv6 nd

To configure IPv6 neighbor discovery (ND), use the **ipv6 nd** command. To remove the IPv6 ND configuration, use the **no** form of this command.

```
ipv6 nd { hop-limit hop-limit | managed-config-flag | mtu | ns-interval ns-interval |
other-config-flag | prefix { A:B::C:D/LEN | default { 0-4294967295 | infinite { infinite
[no-autoconfig | no-onlink | off-link] } | no-advertise } } | ra-interval ra-interval | ra-lifetime
ra-lifetime | reachable-time reachable-time | redirects | retrans-timer retrans-timer |
suppress-ra [mtu] }
```

```
no ipv6 nd { hop-limit hop-limit | managed-config-flag | mtu mtu-size | ns-interval ns-interval |
other-config-flag | prefix { A:B::C:D/LEN | default { 0-4294967295 | infinite { infinite
[no-autoconfig | no-onlink | off-link] } | no-advertise } } | ra-interval ra-interval | ra-lifetime
ra-lifetime | reachable-time reachable-time | redirects | retrans-timer retrans-timer |
suppress-ra [mtu] }
```

Syntax Description

hop-limit	Specifies the hop limit in the IPv6 header.
hop-limit	Hop limit. The range is from 0 to 255.
managed-config-flag	Informs hosts to use stateful address autoconfiguration to obtain address information.
mtu	Specifies the MTU size.
mtu-size	MTU size. The range is from 1280 to 65535.
ns-interval	Specifies the retransmission interval between sending the neighbor-solicitation messages.
ns-interval	Interval in milliseconds. The range is from 1000 to 3600000.
other-config-flag	Informs hosts to use stateful autoconfiguration to obtain non-address related information.
prefix	Specifies the IPv6 prefix to advertise in the router-advertisement message.
A:B::C:D/LEN	Specifies the IPv6 address prefix.
default	Specifies the prefix default parameters.
0-4294967295	Valid value for the life time.
infinite	Specifies the indefinite lifetime.
no-autoconfig	(Optional) Specifies no to use the prefix for autoconfiguration.
no-onlink	(Optional) Specifies not use the prefix for the onlink determination.
off-link	Indicates the prefix is offlink.
no-advertise	Specifies not to advertise the prefix.
ra-interval	Specifies the interval between sending the router-advertisement message.
ra-interval	Router-advertisement message interval. The range is from 4 to 1800.
ra-lifetime	Specifies the router lifetime of a default router.
ra-lifetime	Router-advertisement message lifetime. The range is from 4 to 1800. The value for the default router cannot be 0.
reachable-time	Specifies the advertised time when a node considers a neighbor is up after receiving a reachability confirmation.
reachable-time	Reachable time. The range is from 0 to 3600000.

redirects	Enables sending ICMPv6 Redirect messages.
retrans-timer	Specifies the advertised time between NS messages.
retrans-timer	Time between messages. The range is from 0 to 4294967295.
suppress-ra	Disables sending router-advertisement messages.

Defaults

hop-limit-64
mtu-1500
ns-interval-1000
ra-interval-600
reachable-time-0
retrans-timer-0

Command Modes

Interface configuration mode

Command History

Release	Modification
5.0(3)U3(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure IPv6 neighbor discovery:

```
switch# configure terminal  
switch(config)# interface ethernet 1/5  
switch(config-if)# ipv6 nd  
switch(config-if)# ipv6 nd reachable time 30
```

This example shows how to remove IPv6 neighbor discovery:

```
switch(config-if)# no ipv6 nd reachable time 30  
switch(config-if)#
```

Related Commands

Command	Description
show ipv6 nd interface	Displays neighbor discovery interface information.

ipv6 route

To configure a static IPv6 route, use the **ipv6 route** command. To remove this static route, use the **no** form of this command.

```
ipv6 route ipv6-prefix/length { {next-hop-addr | next-hop-prefix} | interface | link-local-addr }
[preference] [tag tag-id]
```

```
no ipv6 route ipv6-prefix/length
```

Syntax Description

<i>ipv6-prefix/length</i>	IPv6 prefix and prefix length. The format is A:B::C:D/length. The length range is from 1 to 128.
<i>next-hop-addr</i>	Next-hop address. The format is A:B::C:D.
<i>next-hop-prefix</i>	Next-hop prefix and length. The format is A:B::C:D/length. The length range is from 1 to 128.
<i>interface</i>	Interface to reach this route. Use ? to display a list of supported interfaces.
<i>link-local-addr</i>	IPv6 link-local address. The format is A:B::C:D.
<i>preference</i>	(Optional) Sets the route preference, used as the administrative distance to this route. The range is from 1 to 255. The default is 1.
tag <i>id</i>	(Optional) Assigns a route tag that can be used to match against in a route map. The range is from 0 to 4294967295. The default is 0.

Defaults

Disabled

Command Modes

Global configuration mode

Command History

Release	Modification
6.0(2)U4(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to create an IPv6 static route:

```
switch# configure terminal
switch(config)# ipv6 route 2001:0DB8::/48 2b11::2f01:4c
```

Related Commands

Command	Description
ip route	Configures an IPv4 static route.

ipv6 route static bfd

To specify static route Bidirectional Forwarding Detection for IPv6 (BFDv6) neighbors, use the **ipv6 route static bfd** command in the global configuration mode. To remove a static route BFDv6 neighbor, use the **no** form of this command.

ipv6 route static bfd *interface-type slot/port* {*next-hop-addr* | *next-hop-prefix*}

no ipv6 route static bfd

Syntax Description	<i>interface-type</i>	Interface to reach this route. Use ? to display a list of supported interfaces.
	<i>next-hop-addr</i>	Next-hop address. The format is A:B::C:D.
	<i>next-hop-prefix</i>	Next-hop prefix and length. The format is A:B::C:D/length. The length range is from 1 to 128.

Defaults No static route BFDv6 neighbors are specified

Command Modes Global configuration mode

Command History	Release	Modification
	6.0(2)U4(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to create a static route BFD for an IPv6 neighbor:

```
switch# configure terminal
switch(config)# ipv6 route static bfd ethernet 1/3 2::2
```

Related Commands	Command	Description
	show ipv6 static	Displays the current contents of the IPv6 routing table.

log-adjacency-changes (EIGRP)

To enable the logging of changes in the Enhanced Interior Gateway Routing Protocol (EIGRP) adjacency state, use the **log-adjacency-changes** command. To disable the logging of changes in the EIGRP adjacency state, use the **no** form of this command.

log-adjacency-changes

no log-adjacency-changes

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	Adjacency changes are not logged.
------------------------	-----------------------------------

Command Modes	Address-family configuration mode Router configuration mode Router VRF configuration mode
----------------------	---

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	This example shows how to enable logging of adjacency state changes for EIGRP 1:
-----------------	--

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# address-family ipv4
switch(config-router-af)# log-adjacency-changes
switch(config-router-af)#
```

Related Commands	Command	Description
	ip eigrp log-neighbor-changes	Logs changes to neighbors for an interface.
	ip eigrp log-neighbor-warnings	Logs neighbor warnings for an interface.
	show ip eigrp interfaces	Displays information about EIGRP interfaces.

log-adjacency-changes (OSPF)

To configure the router to send a syslog message when the state of an Open Shortest Path First (OSPF) neighbor changes, use the **log-adjacency-changes** command. To turn off this function, use the **no** form of this command.

log adjacency changes [detail]

Syntax Description	detail (Optional) Provides all (DOWN, INIT, 2WAY, EXSTART, EXCHANGE, LOADING, FULL) adjacency state changes.	
Command Default	The router sends a system message when the state of an OSPF neighbor changes.	
Command Modes	Router configuration mode Router VRF configuration mode	
Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.
Usage Guidelines	<p>This command is on by default but only reports the up/down (full/down) events if you do not use the detail keyword.</p> <p>This command requires the LAN Enterprise Services license.</p>	
Examples	<p>This example shows how to configure the router to send a system message when an OSPF neighbor state changes:</p> <pre>switch# configure terminal switch(config)# router ospf 209 switch(config-router)# log-adjacency-changes detail switch(config-router)#</pre>	
Related Commands	Command	Description
	show ip ospf	Displays OSPF information.
	copy running-config startup-config	Saves this configuration change to the startup configuration file.

log-neighbor-warnings

To enable the logging of Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor warning messages, use the **log-neighbor-warnings** command. To disable the logging of EIGRP neighbor warning messages, use the **no** form of this command.

log-neighbor-warnings [*seconds*]

no log-neighbor-warnings [*seconds*]

Syntax Description	<i>seconds</i>	(Optional) Time interval (in seconds) between repeated neighbor warning messages. The range of seconds is from 1 to 65535.
---------------------------	----------------	--

Command Default	Neighbor warning messages are logged.
------------------------	---------------------------------------

Command Modes	Address-family configuration mode Router configuration mode Router VRF configuration mode
----------------------	---

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	This example shows how to log neighbor warning messages for EIGRP process 209 and to repeat the warning messages in 5-minute (300 seconds) intervals:
-----------------	---

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# log-neighbor-warnings 30
switch(config-router)#
```

Related Commands	Command	Description
	log-adjacency-changes	Enables logging of EIGRP adjacency state changes.
	show ip eigrp interfaces	Displays information about EIGRP interfaces.

low-memory exempt

To exempt a Border Gateway Protocol (BGP) neighbor from a low-memory shutdown, use the **low-memory exempt** command. To make a BGP neighbor eligible for a low-memory shutdown, use the **no** form of this command.

- low-memory exempt**
- no low-memory exempt**

Syntax Description This command has no arguments or keywords.

Command Default Some eBGP peers shut down for severe memory alerts.

Command Modes Neighbor configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Enterprise Services license.

Examples This example shows how to exempt a neighbor from low-memory shutdown:

```
switch# configure terminal
switch(config)# router bgp 1.0
switch(config-router)# neighbor 192.0.2.0/24 remote-as 1.5
switch(config-router-af)# low-memory exempt
switch(config-router-af)#
```

Related Commands	Command	Description
	feature bgp	Enables BGP.

mac-list

To filter based on a MAC address, use the **mac-list** command. To remove the MAC list entry, use the **no** form of this command.

mac-list *name* [*seq number*] {**permit** | **deny**} *mac-address* [*mac-mask*]

no mac-list *name* [*seq number*] {**permit** | **deny**} *mac-address* [*mac-mask*]

Syntax Description	<i>name</i>	MAC list name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
	<i>seq number</i>	(Optional) Creates an entry in the MAC list. The <i>seq</i> range is from 1 to 4294967294.
	permit	Allows the packet or route that matches a MAC address in the MAC list.
	deny	Blocks the packet or route that matches a MAC address in the MAC list.
	<i>mac-address</i>	MAC address to filter against.
	<i>mac-mask</i>	(Optional) Portion of the MAC address to match against, in MAC address format.

Command Default	No match values are defined.
-----------------	------------------------------

Command Modes	Global configuration mode
---------------	---------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	You can match against the MAC list in a route map. This command requires the LAN Enterprise Services license.
------------------	--

Examples	This example shows how to create the Red MAC list:
----------	--

```
switch# configure terminal
switch(config)# mac-list Red seq 1 permit 0022.5579.a4c1 ffff.ffff.0000
switch(config)#
```

Related Commands

Command	Description
match mac-list	Matches a MAC address in a MAC list.
show mac-list	Displays information about a MAC list.

match as-number

To match to a Border Gateway Protocol (BGP) autonomous system (AS) number, use the **match as-number** command. To remove an AS number list entry, use the **no** form of this command.

match as-number {*number* [,*number*...] | **as-path-access-list** *name* [...*name*]}

no match as-number {*number* [,*number*...] | **as-path-access-list** *name* [...*name*]}

Syntax Description	<i>number</i>	AS number. The range is from 1 to 65535.
	<i>...number</i>	(Optional) AS number. The range is from 1 to 65535.
	as-path-access-list <i>name</i>	Specifies an AS-path access list to match AS numbers against. The name can be any alphanumeric string up to 63 characters.
	<i>...name</i>	(Optional) AS-path access list. The name can be any alphanumeric string up to 63 characters.

Command Default	None
-----------------	------

Command Modes	Route-map configuration mode
---------------	------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use this command to provide a list of AS numbers or an AS-path access list using a regular expression. BGP uses this match criteria to determine the BGP peers that will be used to create a BGP session.

Use the route map to specify a range of AS numbers whose peers can establish a session with the local BGP through prefix peering. Cisco NX-OS ignores any other **match** commands if the **match as-number** command is present in the route map.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure a list of AS numbers:

```
switch# configure terminal
switch(config)# route-map IGP2BGP
switch(config-route-map)# match as-number 64496, 64498-64510
switch(config-route-map)#
```

■ match as-number

Related Commands

Command	Description
ip as-path access-list	Creates an AS-path list.
neighbor	Configures BGP peers.
route-map	Defines the conditions for redistributing routes from one routing protocol into another.

match as-path

To match a Border Gateway Protocol (BGP) autonomous system (AS) path access list, use the **match as-path** command. To remove a path list entry, use the **no** form of this command.

match as-path *name* [...*name*]

no match as-path *name* [...*name*]

Syntax Description	<i>name</i>	Autonomous system path access list. The name can be any alphanumeric string up to 63 characters.
	<i>...name</i>	(Optional) Autonomous system path access list. You can configure up to 32 access list names.

Command Default	No path lists are defined.
------------------------	----------------------------

Command Modes	Route-map configuration mode
----------------------	------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	The values set by the match as-path command overrides global values.
	A route map can have several parts. Any route that does not match at least one match clause relating to a route-map command is ignored; that is, the route is not advertised for outbound route maps and is not accepted for inbound route maps. If you want to modify some particular data, you must configure a second route-map section with an explicit match specified.
	This command requires the LAN Enterprise Services license.

Examples	This example sets the autonomous system path to match BGP autonomous system path access list 20:
	switch# configure terminal
	switch(config)# route-map IGP2BGP
	switch(config-route-map)# match as-path 20
	switch(config-route-map)#

Related Commands	Command	Description
	match community	Matches a BGP community.
	match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list.

Command	Description
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match route-type	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map	Defines the conditions for redistributing routes from one routing protocol into another.
set as-path	Modifies an autonomous system path for BGP routes.
set comm-list	Automatically computes the tag value in a route map configuration.
set community	Sets BGP community list (for deletion).
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric (BGP, OSPF, RIP)	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set origin (BGP)	Sets the BGP origin code.
set tag	Sets the value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

match community

To match a Border Gateway Protocol (BGP) community, use the **match community** command. To restore the system to its default condition where the software removes the BGP community list entry, use the **no** form of this command.

match community *name* [...*name*] [**exact-match**]

no match community *name* [...*name*] [**exact-match**]

Syntax Description

<i>name</i>	One or more community list names. The name can be any alphanumeric string up to 63 characters. You can configure a maximum of 32 community lists.
exact-match	(Optional) Indicates that an exact match is required. All of the communities and only those communities specified must be present.

Command Default

No community list is matched by the route map.

Command Modes

Route-map configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

A route map can have several parts. Any route that does not match at least one **match** command that is related to a **route-map** command is ignored; that is, the route is not advertised for outbound route maps and is not accepted for inbound route maps. If you want to modify some particular data, you must configure a second route-map section with an explicit match specified.

Matching that is based on the community list number is one of the types of **match** commands applicable to BGP.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to match two BGP communities:

```
switch# configure terminal
switch(config)# route-map test2
switch(config-route-map)# match community bgpLow bgpHigh
switch(config-route-map)#
```

This example shows that the routes that match community list 1 have the weight set to 200. Any route that has the standard community 109 only has the weight set to 200.

```
switch# configure terminal
switch(config)# ip community-list standard bgpLow permit 109
switch(config)# route-map set_weight
switch(config-route-map)# match community bgpLow exact-match
```

```
switch(config-route-map)# set weight 200
switch(config-route-map)#
```

This example shows the routes that match the community list 500. Any route that has expanded community 1 have the weight set to 150.

```
switch# configure terminal
switch(config)# ip community-list expanded 500 permit [0-9]*
switch(config)# route-map MAP_NAME permit 10
switch(config-route-map)# match community 500
switch(config-route-map)# set weight 150
switch(config-route-map)#
```

Related Commands

Command	Description
ip community-list	Creates a community list for BGP and controls access to it.
route-map	Defines the conditions for redistributing routes from one routing protocol into another.
set weight	Specifies the BGP weight for the routing table.

match extcommunity

To match a Border Gateway Protocol (BGP) extended community in a route map, use the **match extcommunity** command. To remove the match from the route map, use the **no** form of this command.

match extcommunity *name* [...*name*] [**exact-match**]

no match extcommunity *name* [...*name*] [**exact-match**]

Syntax Description]	<i>name</i>	One or more extended community list names. The name can be any alphanumeric string up to 63 characters. You can configure a maximum of 32 community lists.
	exact-match	(Optional) Indicates that an exact match is required. All of the communities and only those extended communities specified must be present.

Command Default	No community list is matched by the route map.
-----------------	--

Command Modes	Route-map configuration mode
---------------	------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

A route map can have several parts. Any route that does not match at least one **match** command in the route map is ignored; that is, the route is not advertised for outbound route maps and is not accepted for inbound route maps. If you want to modify some particular data, you must configure a second route-map section with an explicit match specified.

Matching that is based on the extended community list number is one of the types of **match** commands applicable to BGP.

This command requires the LAN Enterprise Services license.

Examples	This example shows how to match two BGP extended community lists:
----------	---

```
switch# configure terminal
switch(config)# route-map test2
switch(config-route-map)# match extcommunity bgpLocal bgpRemote
switch(config-route-map)#
```

This example shows that the routes that match the extended community list bgpLocal change from nontransitive to transitive:

```
switch# configure terminal
switch(config)# ip extcommunity-list standard bgpLocal permit generic nontransitive 1.9
switch(config)# route-map deletCommunity
switch(config-route-map)# match extcommunity bgpLocal exact-match
```

match extcommunity

```
switch(config-route-map)# set extcommunity generic transitive 1.9
switch(config-route-map)#
```

Related Commands	Command	Description
	ip extcommunity-list	Creates a community list for BGP and controls access to it.
	route-map	Defines the conditions for redistributing routes from one routing protocol into another.
	send-community	Configures BGP to propagate community attributes to BGP peers.
	set extcommunity	Sets an extended community in a route map.

match interface

To match an interface in a route map, use the **match interface** command. To remove the match, use the **no** form of this command.

```
match interface { {ethernet slot/port | loopback if_number | mgmt mgmt-id | port-channel
number } [, {ethernet slot/port | loopback if_number | mgmt mgmt-id | port-channel
number } ... ] }
```

```
no interface { {ethernet slot/port | loopback if_number | mgmt mgmt-id | port-channel number } [,
{ethernet slot/port | loopback if_number | mgmt mgmt-id | port-channel number } ... ] }
```

Syntax Description

ethernet <i>slot/port</i>	Specifies the Ethernet interface and the slot number and port number. The slot number is from 1 to 255, and the port number is from 1 to 128.
loopback <i>if_number</i>	Specifies the loopback interface. The loopback interface number is from 0 to 1023.
port-channel <i>number</i>	Specifies the EtherChannel interface and EtherChannel number. The range is from 1 to 4096.
mgmt <i>mgmt-id</i>	Specifies the management interface. The interface number is 0.

Command Default

None

Command Modes

Route-map configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Route next-hop addresses that are reached by one of the interfaces result in a match for the route map. A route map can have several parts. Any route that does not match at least one **match** clause that relates to a **route-map** command is ignored; that is, the route is not advertised for outbound route maps and is not accepted for inbound route maps. If you want to modify some particular data, you must configure a second route-map section with an explicit match specified.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure a list of interfaces:

```
switch# configure terminal
switch(config)# route-map test1
switch(config-route-map)# match interface ethernet 2/1, ethernet 4/3
switch(config-route-map)#
```

match interface

Related Commands

Command	Description
route-map	Defines the conditions for redistributing routes from one routing protocol into another.

match ip address

To distribute any routes that have a destination IP network number address that is permitted by a standard access list, an expanded access list, or a prefix list, use the **match ip address** command. To remove the **match ip address** entry, use the **no** form of this command.

```
match ip address {access-list-name [access-list-name...] | prefix-list prefix-list-name [prefix-list-name...]}
```

```
no match ip address {access-list-name [access-list-name...] | prefix-list prefix-list-name [prefix-list-name...]}
```

Syntax Description	<i>access-list-name...</i>	Name of a standard or expanded access list. It can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered, up to 32 access lists.
	prefix-list <i>prefix-list-name...</i>	Distributes routes based on a prefix list. The prefix list name can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered, up to 32 prefix lists.

Command Default	No prefix lists are specified.
------------------------	--------------------------------

Command Modes	Route-map configuration mode
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Command History	Release	Modification
	7.0(3)I2(1)	The match ip address prefix-list command displays the message “invalid command.”
	6.0(2)U2(1)	The access-list-name option was introduced.
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	The access-list-name argument is supported in route maps for Policy based-routing (PBR) only.
	An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the <i>prefix-list-name</i> argument.

Like matches in the same route map subblock are filtered with “or” semantics. If any one match clause is matched in the entire route map subblock, this match is treated as a successful match. Dissimilar match clauses are filtered with “and” semantics, so dissimilar matches are filtered logically. If the first set of conditions is not met, the second match clause is filtered. This process continues until a match occurs or there are no more match clauses.

Use route maps to redistribute routes or to subject packets to policy routing.

Redistribution

Use the **route-map** global configuration command and the **match** and **set** route-map configuration commands to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands

specify the match criteria—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must pass to cause the route to be redistributed according to the set actions given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

When you are passing routes through a route map, a route map can have several sections that contain specific **match** clauses. Any route that does not match at least one **match** clause that relates to a **route-map** command is ignored; that is, the route is not advertised for outbound route maps and is not accepted for inbound route maps. If you want to modify some particular data, you must configure a second route map section with an explicit match specified.

Policy Routing

Another purpose of route maps is to enable policy routing. The **match ip address** command allows you to policy route packets based on criteria that can be matched with an expanded access list; for example, a protocol, protocol service, and source or destination IP address. To define the conditions for policy routing packets, use the **ip policy route-map** interface configuration command, in addition to the **route-map** global configuration command, and the **match** and **set route-map** configuration commands. Each **route-map** command has a list of match and set commands associated with it. The match commands specify the *match criteria*—the conditions under which policy routing occurs. The **set** commands specify the *set actions*—the particular routing actions to perform if the criteria enforced by the **match** commands are met. You might want to policy route packets based on their source, for example, using an access list.

This command requires the LAN Base Services license..



Note Beginning in Release 7.0(3)I2(1), the **match ip address prefix-list** command displays the message “invalid command.”

Examples

This example shows how to match routes that have addresses specified by an access list test:

```
switch# configure terminal
switch(config)# interface ethernet 2/10
switch(config-if)# no switchport
switch(config-if)# exit
switch(config)# route-map chicago
switch(config-route-map)# match ip address test
switch(config-route-map)#
```

This example shows how to match routes that have addresses specified by an access list test:

```
switch# configure terminal
switch(config)# feature pbr
switch(config)# interface ethernet 2/10
switch(config-if)# ip policy route-map chicago
switch(config-if)# exit
switch(config)# route-map chicago
switch(config-route-map)# match ip address test
```


Related Commands	Command	Description
	match as-path	Matches a BGP autonomous system path access list.
	match community	Matches a BGP community.
	match interface	Distributes any routes that have their next hop out one of the interfaces specified.
	match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
	match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
	match metric	Redistributes routes with the metric specified.
	match route-type	Redistributes routes of the specified type.
	match tag	Redistributes routes in the routing table that match the specified tags.
	route-map	Defines the conditions for redistributing routes from one routing protocol into another.
	set as-path	Modifies an autonomous system path for BGP routes.
	set automatic-tag	Automatically computes the tag value.
	set community	Sets the BGP communities attribute.
	set level	Indicates where to import routes.
	set local-preference	Specifies a preference value for the autonomous system path.
	set metric (BGP, OSPF, RIP)	Sets the metric value for a routing protocol.
	set metric-type	Sets the metric type for the destination routing protocol.
	set next-hop	Specifies the address of the next hop.
	set tag	Sets a tag value of the destination routing protocol.
	set weight	Specifies the BGP weight for the routing table.

match ip multicast

To configure the IPv4 multicast features for the route-map matching, use the **match ip multicast** command. To remove the match, use the **no** form of this command.

```
match ip multicast {group address/length | source address/length | rp address/length [rp-type
asm]}
```

```
no match ip multicast
```

Syntax Description	<div><div>group address/length</div><div>Specifies the group address and the length of the network mask in bits in this format: <i>A.B.C.D/length</i>. The network number can be any valid IP address or prefix. The bit mask can be a number from 0 to 32.</div><div>You can configure group, source, and rp options.</div></div>
	<div><div>source address/length</div><div>Specifies the source address and the length of the network mask in bits in this format: <i>A.B.C.D/length</i>. The network number can be any valid IP address or prefix. The bit mask can be a number from 0 to 32.</div><div>You can configure group, source, and rp options.</div></div>
	<div><div>rp address/length</div><div>Specifies the IPv4 rendezvous prefix (RP) and the length of the IPv4 prefix mask in bits in this format: <i>A.B.C.D/length</i>. The network number can be any valid IPv4 address or prefix. The bit mask can be a number from 0 to 32.</div><div>You can configure group, source, and rp options.</div></div>
	<div><div>rp-type</div><div>(Optional) Specifies the multicast rendezvous point type.</div></div>
	<div><div>asm</div><div>(Optional) Specifies the any-source multicast (ASM) rendezvous point type.</div></div>

Command Default	None
-----------------	------

Command Modes	Route-map configuration mode
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Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr></table>	Release	Modification	5.0(3)U1(1)	This command was introduced.
Release	Modification				
5.0(3)U1(1)	This command was introduced.				

Usage Guidelines

The **match ip multicast** command is the only **match** command that is evaluated in the route map. You can specify the group prefix, group range, and source prefix to filter messages with the **match ip multicast** command.

Use the **route-map** command to enter route-map configuration mode. Once you enter the **route-map** command, the prompt changes to the following:

```
switch(config-route-map)#
```

Once you enter route-map configuration mode, you can enter the **match ip multicast** command.

You can configure both group and rp options.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to specify the group IPv4 prefix and the length of the IPv4 prefix for the neighbors to match:

```
switch# configure terminal
switch(config)# route-map blueberry
switch(config-route-map)# match ip multicast group 192.0.0.0/19
switch(config-route-map)#
```

This example shows how to specify both the group IPv4 prefix and the rendezvous point of the IPv4 prefix for the neighbors to match:

```
switch# configure terminal
switch(config)# route-map raspberry
switch(config-route-map)# match ip multicast group 192.0.0.0/19 rp 209.165.201.0/27
switch(config-route-map)#
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match interface	Distributes any routes that have their next hop out one of the interfaces specified.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric	Redistributes routes with the metric specified.
match route-type	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map	Defines the conditions for redistributing routes from one routing protocol into another.
set as-path	Modifies an autonomous system path for BGP routes.
set automatic-tag	Automatically computes the tag value.
set community	Sets the BGP communities attribute.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric (BGP, OSPF, RIP)	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

match ip next-hop prefix-list

To redistribute any IPv4 routes that have a next-hop router address passed by one of the access lists specified, use the **match ip next-hop prefix-list** command. To remove the next hop entry, use the **no** form of this command.

```
match ip next-hop prefix-list prefix-list-name [...prefix-list-name]

no match ip next-hop prefix-list prefix-list-name [...prefix-list-name]
```

Syntax Description	<div> <div>prefix-list-name</div> <div>Number or name of a prefix list. It can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered, up to 32 prefix lists.</div> </div>
--------------------	--

Command Default	Routes are distributed freely, without being required to match a next hop address.
-----------------	--

Command Modes	Route-map configuration mode
---------------	------------------------------

Command History	<div> <div>Release</div> <div>Modification</div> </div>
	<div> <div>5.0(3)U1(1)</div> <div>This command was introduced.</div> </div>

Usage Guidelines	<div>An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the <i>prefix-list-name</i> argument.</div>
------------------	--

Use the **route-map** global configuration command, and the **match** and **set** route-map configuration commands to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match** route-map configuration command has multiple formats. The **match** commands can be given in any order and all **match** commands must pass to cause the route to be redistributed according to the set actions given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

When you are passing routes through a route map, a route map can have several parts. Any route that does not match at least one **match** clause that relates to a **route-map** command is ignored; that is, the route is not advertised for outbound route maps and is not accepted for inbound route maps. If you want to modify some particular data, you must configure a second route map section with an explicit match specified.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to distributes routes that have a next-hop router address passed by the prefix list test:

```
switch# configure terminal
switch(config)# route-map blue
switch(config-route-map)# match ip next-hop prefix-list test
switch(config-route-map)#
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match route-type	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map	Defines the conditions for redistributing routes from one routing protocol into another.
set as-path	Modifies an autonomous system path for BGP routes.
set automatic-tag	Automatically computes the tag value.
set community	Sets the BGP communities attribute.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric (BGP, OSPF, RIP)	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

match ip route-source prefix-list

To redistribute IPv4 routes that have been advertised by routers and access servers at the address specified by the access lists, use the **match ip route-source prefix-list** command. To remove the route-source entry, use the **no** form of this command.

match ip route-source prefix-list *prefix-list-name* [...*prefix-list-name*]

no match ip route-source prefix-list *prefix-list-name* [...*prefix-list-name*]

Syntax Description	<i>prefix-list-name</i>	Number or name of a prefix list. It can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered, up to 32 prefix lists.
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Command Default	No filtering on route source.
-----------------	-------------------------------

Command Modes	Route-map configuration mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the <i>prefix-list-name</i> argument.
------------------	---

Use the **route-map** global configuration command, and the **match** and **set** route-map configuration commands to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must pass to cause the route to be redistributed according to the set actions given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

A route map can have several parts. Any route that does not match at least one **match** clause that relates to a **route-map** command is ignored; that is, the route is not advertised for outbound route maps and is not accepted for inbound route maps. If you want to modify only some data, you must configure second route map section with an explicit match specified.

There are situations in which the next hop and source router address of the route are not the same.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to distribute routes that have been advertised by routers and access servers at the addresses specified by access lists 5 and 80:

```
switch# configure terminal
switch(config)# route-map blue
switch(config-route-map)# match ip route-source prefix-list 5 80
switch(config-route-map)#
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match route-type	Redistributes routes of the specified type.
route-map	Defines the conditions for redistributing routes from one routing protocol into another.
set as-path	Modifies an autonomous system path for BGP routes.
set automatic-tag	Automatically computes the tag value.
set community	Sets the BGP communities attribute.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric (BGP, OSPF, RIP)	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

match metric

To redistribute routes in the routing table that match the routing metric value, use the **match metric** command. To remove the tag entry, use the **no** form of this command.

```
match metric metric-value [+ deviation-number] [...metric-value [+ deviation-number]]

no match metric metric-value [+ deviation-number] [...metric-value [+ deviation-number]]
```

Syntax Description

<i>metric-value</i>	Internal route metric. The range is from 0to 4,294,967,295.
+-	Specifies a standard deviation range of the metric. The router matches any metric that falls inclusively in that range. The maximum size is 2 characters.
<i>deviation-number</i>	(Optional) Standard deviation number that offsets the number configured for the <i>metric-value</i> argument. The range is from 0to 4,294,967,295. There is no default.

Command Default

No match values are defined.

Command Modes

Route-map configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

To redistribute routes with the specified metric, use the **match metric** command in route-map configuration mode. To remove the entry for the redistributed route from the routing table, use the **no** form of this command.

You can specify one or more metrics (or) range of metrics using the *deviation-number* argument. At least one of the specified metrics must match for the command to pass.

An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the arguments.

Use the **route-map** global configuration command, and the **match** and **set** route-map configuration commands to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match** route-map configuration command has multiple formats. The **match** commands can be given in any order and all **match** commands must pass to cause the route to be redistributed according to the set actions given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

A route map can have several parts. Any route that does not match at least one **match** clause that relates to a **route-map** command is ignored; that is, the route is not advertised for outbound route maps and is not accepted for inbound route maps. If you want to modify some particular data, you must configure second route map section with an explicit match specified.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to redistribute routes stored in the routing table with a metric of 5:

```
switch# configure terminal
switch(config)# route-map blueberry
switch(config-route-map)# match metric 5
switch(config-route-map)#
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric	Redistributes routes with the metric specified.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map	Defines the conditions for redistributing routes from one routing protocol into another.
set as-path	Modifies an autonomous system path for BGP routes.
set community	Sets the BGP communities attribute.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

match mac-list

To redistribute routes in the routing table that match a MAC address in the MAC list, use the **match mac-list** command. To remove the tag entry, use the **no** form of this command.

```
match mac-list listname

no match mac-list listname
```

Syntax Description	listname	MAC list name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
--------------------	----------	---

Command Default	No match values are defined.
-----------------	------------------------------

Command Modes	Route-map configuration mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **route-map** global configuration command, and the **match** and **set** route-map configuration commands to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match** route-map configuration command has multiple formats. The **match** commands can be given in any order and all **match** commands must pass to cause the route to be redistributed according to the set actions given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

A route map can have several parts. Any route that does not match at least one **match** clause that relates to a **route-map** command is ignored; that is, the route is not advertised for outbound route maps and is not accepted for inbound route maps. If you want to modify some particular data, you must configure a second route map section with an explicit match specified.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to redistribute routes stored in the routing table that match entries in the Red MAC list:

```
switch# configure terminal
switch(config)# route-map blueberry
switch(config-route-map)# match mac-list Red
switch(config-route-map)#
```

Related Commands	Command	Description
	match as-path	Matches a BGP autonomous system path access list.
	match community	Matches a BGP community.
	match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
	match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
	match metric	Redistributes routes with the metric specified.
	match tag	Redistributes routes in the routing table that match the specified tags.
	route-map	Defines the conditions for redistributing routes from one routing protocol into another.
	set as-path	Modifies an autonomous system path for BGP routes.
	set community	Sets the BGP communities attribute.
	set level	Indicates where to import routes.
	set local-preference	Specifies a preference value for the autonomous system path.
	set metric	Sets the metric value for a routing protocol.
	set metric-type	Sets the metric type for the destination routing protocol.
	set next-hop	Specifies the address of the next hop.
	set tag	Sets a tag value of the destination routing protocol.
	set weight	Specifies the BGP weight for the routing table.

match route-type

To redistribute routes of the specified type, use the **match route-type** command. To remove the route type entry, use the **no** form of this command.

match route-type { **external** | **internal** | **local** | **nssa-external** | **type-1** | **type-2** }

no match route-type { **external** | **internal** | **local** | **nssa-external** | **type-1** | **type-2** }

Syntax Description

external	Specifies the external route (Border Gateway Protocol [BGP], Enhanced Interior Gateway Routing Protocol [EIGRP], and Open Shortest Path First [OSPF] type 1/2). You can specify more than one keyword.
internal	Specifies the internal route (including the OSPF intra/inter area). You can specify more than one keyword.
local	Specifies the locally generated route. You can specify more than one keyword.
nssa-external	Specifies the nssa-external route (OSPF type 1/2). You can specify more than one keyword.
type-1	Specifies the OSPF external type 1 route. You can specify more than one keyword.
type-2	Specifies the OSPF external type 2 route. You can specify more than one keyword.

Command Default

Disabled

Command Modes

Route-map configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **route-map** global configuration command and the **match** and **set** route-map configuration commands to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match** route-map configuration command has multiple formats. The **match** commands can be given in any order and all **match** commands must pass to cause the route to be redistributed according to the set actions given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

A route map can have several parts. Any route that does not match at least one **match** clause that relates to a **route-map** command is ignored; that is, the route is not advertised for outbound route maps and is not accepted for inbound route maps. If you want to modify some particular data, you must configure a second route map section with an explicit match specified.

You can specify more than one keyword.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to redistribute internal routes:

```
switch# configure terminal
switch(config)# route-map blueberry
switch(config-route-map)# match route-type internal
switch(config-route-map)#
```

This example shows how to redistribute internal routes and type-1 OSPF routes:

```
switch# configure terminal
switch(config)# route-map blueberry
switch(config-route-map)# match route-type internal type-1
switch(config-route-map)#
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric	Redistributes routes with the metric specified.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map	Defines the conditions for redistributing routes from one routing protocol into another.
set as-path	Modifies an autonomous system path for BGP routes.
set community	Sets the BGP communities attribute.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

match tag

To redistribute routes in the routing table that match the specified tags, use the **match tag** command. To remove the tag entry, use the **no** form of this command.

match tag *tag-value* [...*tag-value*]

no match tag *tag-value* [...*tag-value*]

Syntax Description	<i>tag-value</i>	List of one or more route tag values. Each can be an integer from 0 to 4,294,967,295. You can configure up to 32 tags.
Command Default	No match tag values are defined.	
Command Modes	Route-map configuration mode	
Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the *tag-value* argument.

Use the **route-map** global configuration command and the **match** and **set** route-map configuration commands to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match** route-map configuration command has multiple formats. The **match** commands can be given in any order and all **match** commands must pass to cause the route to be redistributed according to the set actions given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

A route map can have several parts. Any route that does not match at least one **match** clause that relates to a **route-map** command is ignored; that is, the route is not advertised for outbound route maps and is not accepted for inbound route maps. If you want to modify some particular data, you must configure a second route map section with an explicit match specified.

This command requires the LAN Enterprise Services license.

Examples This example shows how to redistribute routes stored in the routing table with tag 5:

```
switch# configure terminal
switch(config)# route-map blueberry
```

```
switch(config-route-map)# match tag 5
switch(config-route-map)#
```

Related Commands	Command	Description
	match as-path	Matches a BGP autonomous system path access list.
	match community	Matches a BGP community.
	match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
	match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
	match metric	Redistributes routes with the metric specified.
	match tag	Redistributes routes in the routing table that match the specified tags.
	route-map	Defines the conditions for redistributing routes from one routing protocol into another.
	set as-path	Modifies an autonomous system path for BGP routes.
	set community	Sets the BGP communities attribute.
	set level	Indicates where to import routes.
	set local-preference	Specifies a preference value for the autonomous system path.
	set metric	Sets the metric value for a routing protocol.
	set metric-type	Sets the metric type for the destination routing protocol.
	set next-hop	Specifies the address of the next hop.
	set tag	Sets a tag value of the destination routing protocol.
	set weight	Specifies the BGP weight for the routing table.

match vlan

To filter routes with the specified VLAN, use the **match vlan** command. To remove the entry for the redistributed route from the routing table, use the **no** form of this command.

```
match vlan vlan-range

no match vlan vlan-range
```

Syntax Description	<i>vlan-range</i>	Range of VLAN that this command matches against. The range is from 1 to 4094.
--------------------	-------------------	---

Command Default	No match VLAN values are defined.
-----------------	-----------------------------------

Command Modes	Route-map configuration mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

To filter routes with the specified VLAN, use the **match vlan** command. You can specify one or more VLANs (or) range of VLANs. At least one of the specified VLANs must match for the command to pass. The command matches any VLAN that falls inclusive in the range.

Use the **route-map** global configuration command and the **match** and **set** route-map configuration commands to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match** route-map configuration command has multiple formats. The **match** commands can be given in any order and all **match** commands must pass to cause the route to be redistributed according to the set actions given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

A route map can have several parts. Any route that does not match at least one **match** clause that relates to a **route-map** command is ignored; that is, the route is not advertised for outbound route maps and is not accepted for inbound route maps. If you want to modify some particular data, you must configure a second route map section with an explicit match specified.

This command requires the LAN Enterprise Services license.

Examples	This example shows how to redistribute routes that match VLANs 5 to 10: switch# configure terminal
----------	--


```
switch(config)# route-map blueberry
switch(config-route-map)# match vlan 5-10
switch(config-route-map)#
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric	Redistributes routes with the metric specified.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map	Defines the conditions for redistributing routes from one routing protocol into another.
set as-path	Modifies an autonomous system path for BGP routes.
set community	Sets the BGP communities attribute.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

max-metric router-lsa (OSPF)

To configure the Open Shortest Path First (OSPF) protocol to advertise a maximum metric so that other routers do not prefer the router as an intermediate hop in their shortest path first (SPF) calculations, use the **max-metric router-lsa** command. To disable the advertisement of a maximum metric, use the **no** form of this command.

max-metric router-lsa [**on-startup** [*seconds* | **wait-for bgp tag**]]

no max-metric router-lsa [**on-startup** [*seconds* | **wait-for bgp tag**]]

Syntax Description	on-startup	(Optional) Configures the router to advertise a maximum metric at startup.
	<i>seconds</i>	(Optional) Maximum metric (in seconds) that is advertised for the specified time interval. The configurable range is from 5 to 86400 seconds. The default is 600 seconds.
	wait-for bgp tag	(Optional) Advertises a maximum metric until Border Gateway Protocol (BGP) routing tables have converged or the default timer has expired. The default timer is 600 seconds. The <i>tag</i> name can be a maximum of 20 characters.

Command Default	Originates router link-state advertisements (LSAs) with normal link metrics.
-----------------	--

Command Modes	Router configuration mode Router VRF configuration mode
---------------	--

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command allows Border Gateway Protocol (BGP) routing tables to converge without attracting transit traffic (if there are not alternate lower cost paths to the router). The router advertises accurate (normal) metrics after the configured or default timers expire or after BGP sends a notification that routing tables have converged.
------------------	--

**Note**

Directly connected links in a stub network are not affected by the configuration of a maximum or infinite metric because the cost of a stub link is always set to the output interface cost.

You can use the **max-metric router-lsa** command in the following situations:

- Reloading a router. After a router is reloaded, Interior Gateway Protocols (IGPs) converge very quickly, and other routers may try to forward traffic through the newly reloaded router. If the router is still building BGP routing tables, the packets that are destined for other networks that the router has not learned through BGP may be dropped.

- Introducing a router into a network without routing traffic through it. You might want to connect a router to an OSPF network but not want real traffic to flow through the router if there are better alternate paths. If no alternate paths exist, then this router would still accept transit traffic.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure a router that is running OSPF to advertise a maximum metric for 100 seconds:

```
switch# configure terminal
switch(config)# router ospf 100
switch(config-router)# max-metric router-lsa on-startup 100
switch(config-router)#
```

This example shows how to configure a router to advertise a maximum metric until BGP routing tables converge or until the default timer expires (600 seconds):

```
switch# configure terminal
switch(config)# router ospf 100
switch(config-router)# max-metric router-lsa on-startup wait-for bgp bgpTag
switch(config-router)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
show ip ospf	Displays OSPF information.

maxas-limit

To configure the external Border Gateway Protocol (eBGP) to discard routes that have a high number of autonomous system (AS) numbers in the AS-path attribute, use the **maxas-limit** command. To revert to the default, use the **no** form of this command.

maxas-limit [*number*]

no maxas-limit

Syntax Description	<i>number</i> (Optional) Maximum number of AS numbers allowed in the AS-path attribute. The range is from 1 to 2000.							
Command Default	No limit							
Command Modes	Router configuration mode VRF configuration mode							
Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr></table>		Release	Modification	5.0(3)U1(1)	This command was introduced.		
Release	Modification							
5.0(3)U1(1)	This command was introduced.							
Usage Guidelines	This command requires the LAN Enterprise Services license.							
Examples	<p>This example shows how to set the maximum number of AS numbers to 50:</p> <pre>switch# configure terminal switch(config)# router bgp 64496 switch(config-router)# maxas-limit 50 switch(config-router)#</pre>							
Related Commands	<table><tr><th>Command</th><th>Description</th></tr><tr><td>feature bgp</td><td>Enables the BGP feature.</td></tr><tr><td>router bgp</td><td>Creates a BGP instance.</td></tr></table>		Command	Description	feature bgp	Enables the BGP feature.	router bgp	Creates a BGP instance.
Command	Description							
feature bgp	Enables the BGP feature.							
router bgp	Creates a BGP instance.							

maximum-paths (BGP)

To control the maximum number of parallel routes that the Border Gateway Protocol (BGP) can support, use the **maximum-paths** command. To restore the default number of parallel routes, use the **no** form of this command.

maximum-paths [**ibgp**] *number-paths*

no maximum-paths [**ibgp**] *number-paths*

Syntax Description	ibgp	Configures the maximum interior BGP (iBGP) paths.
	<i>number-paths</i>	Maximum number of parallel routes that an IP routing protocol installs in a routing table. The range is from 1 to 32.

Command Default	1 <i>path</i>
------------------------	---------------

Command Modes	Router address family configuration mode
----------------------	--

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	This example shows how to allow a maximum of 16 paths to a destination for a BGP routing process:
	<pre>switch# configure terminal switch(config)# router bgp 64496 switch(config-router)# address-family ipv4 unicast switch(config-router-af)# maximum-paths 16 switch(config-router-af)#</pre>

Related Commands	Command	Description
	feature bgp	Enables the BGP feature on the router.
	router bgp	Enables BGP.

maximum-paths (EIGRP)

To control the maximum number of parallel routes that the Enhanced Interior Gateway Routing Protocol (EIGRP) can support, use the **maximum-paths** command. To remove the **maximum-paths** command from the configuration file and restore the default, use the **no** form of this command.

maximum-paths *maximum*

no maximum-paths

Syntax Description	<i>maximum</i>	Maximum number of parallel routes that EIGRP can install in a routing table. The range is from 1 to 32 routes.
--------------------	----------------	--

Command Default	8 <i>paths</i>
-----------------	----------------

Command Modes	Address-family configuration mode Router configuration mode Router VRF configuration mode
---------------	---

Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr></table>	Release	Modification	5.0(3)U1(1)	This command was introduced.
Release	Modification				
5.0(3)U1(1)	This command was introduced.				

Usage Guidelines	Multiple paths are installed for both internal and external routes that are learned in the same autonomous system and that have an equal cost (according to the EIGRP best path algorithm). This command requires the LAN Enterprise Services license.
------------------	---

Examples	This example shows how to allow a maximum of 10 paths to a destination: switch# configure terminal switch(config)# router eigrp 1 switch(config-router)# maximum-paths 10 switch(config-router)#
----------	---

Related Commands	<table><tr><th>Command</th><th>Description</th></tr><tr><td>copy running-config startup-config</td><td>Saves the configuration changes to the startup configuration file.</td></tr><tr><td>show ip eigrp</td><td>Displays EIGRP information.</td></tr></table>	Command	Description	copy running-config startup-config	Saves the configuration changes to the startup configuration file.	show ip eigrp	Displays EIGRP information.
Command	Description						
copy running-config startup-config	Saves the configuration changes to the startup configuration file.						
show ip eigrp	Displays EIGRP information.						

maximum-paths (RIP)

To configure the maximum number of equal cost parallel routes that the Routing Information Protocol (RIP) can install into the routing table, use the **maximum-paths** command. To remove the **maximum-paths** command and restore the system to its default condition, use the **no** form of this command.

maximum-paths *maximum*

no maximum-paths

Syntax Description	<i>maximum</i>	Maximum number of parallel routes that RIP can install in a routing table. The range is from 1 to 32.
---------------------------	----------------	---

Command Default	8 <i>paths</i>
------------------------	----------------

Command Modes	Router address-family configuration mode
----------------------	--

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command does not require a license.
-------------------------	--

Examples	This example shows how to allow a maximum of 16 equal cost paths to a destination:
-----------------	--

```
switch# configure terminal
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# maximum-paths 16
switch(config-router-af)#
```

Related Commands	Command	Description
	address-family	Enters address-family configuration mode.
	copy running-config startup-config	Saves the configuration to the startup configuration file.
	show ip rip	Displays a summary of RIP information for all RIP instances.

maximum-paths (OSPF)

To control the maximum number of parallel routes that Open Shortest Path First (OSPF) can support, use the **maximum-paths** command. To remove the **maximum-paths** command from the configuration file and restore the system to the default, use the **no** form of this command.

maximum-paths *maximum*

no maximum-paths

Syntax Description	<i>maximum</i>	Maximum number of parallel routes that OSPF can install in a routing table. The range is from 1 to 32 routes.
--------------------	----------------	---

Command Default	8 <i>paths</i>
-----------------	----------------

Command Modes	Router configuration mode Router VRF configuration mode
---------------	--

Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr></table>	Release	Modification	5.0(3)U1(1)	This command was introduced.
Release	Modification				
5.0(3)U1(1)	This command was introduced.				

Usage Guidelines	Multiple paths are installed for both internal and external routes that are learned in the same autonomous system and that have an equal cost (according to the OSPF shortest path first algorithm). This command requires the LAN Enterprise Services license.
------------------	--

Examples	This example shows how to allow a maximum of 10 paths to a destination: switch# configure terminal switch(config)# router ospf 1 switch(config-router)# maximum-paths 10 switch(config-router)#
----------	--

Related Commands	<table><tr><th>Command</th><th>Description</th></tr><tr><td>show ip ospf</td><td>Displays OSPF information.</td></tr><tr><td>copy running-config startup-config</td><td>Saves the configuration changes to the startup configuration file.</td></tr></table>	Command	Description	show ip ospf	Displays OSPF information.	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
Command	Description						
show ip ospf	Displays OSPF information.						
copy running-config startup-config	Saves the configuration changes to the startup configuration file.						

maximum-prefix (BGP)

To control how many prefixes can be received from a neighbor, use the **maximum-prefix** command. To disable this function, use the **no** form of this command.

maximum-prefix *maximum* [**threshold**] [**restart** *restart-interval*] [**warning-only**]

no maximum-prefix

Syntax Description	<i>maximum</i>	Maximum number of prefixes allowed from the specified neighbor. The number of prefixes that can be configured is limited only by the available system resources on a router. The range is from 1 to 300000.
	threshold	(Optional) Specifies the percentage of the maximum-prefix limit at which the router starts to generate a warning message. The range is from 1 to 100. The default is 75.
	restart <i>restart-interval</i>	(Optional) Specifies the time interval (in minutes) that a peering session is reestablished. The range is from 1 to 65535.
	warning-only	(Optional) Allows the router to generate a syslog message when the maximum-prefix limit is exceeded, instead of terminating the peering session.

Command Default	This command is disabled by default. Peering sessions are disabled when the maximum number of prefixes is exceeded. If you do not configure the restart interval, a disabled session stays down after the maximum-prefix limit is exceeded.
------------------------	---

Command Modes	Peer template configuration mode BGP router configuration mode BGP neighbor address-family configuration mode
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Command History	<table border="1"> <thead> <tr> <th>Release</th><th>Modification</th></tr> </thead> <tbody> <tr> <td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr> </tbody> </table>	Release	Modification	5.0(3)U1(1)	This command was introduced.
Release	Modification				
5.0(3)U1(1)	This command was introduced.				

Usage Guidelines	<p>The number of prefixes that can be configured is limited only by the available system resources on a router.</p> <p>The maximum-prefix command allows you to configure a maximum number of prefixes that a Border Gateway Protocol (BGP) routing process accepts from the specified peer. This feature provides a mechanism (in addition to distribute lists, filter lists, and route maps) to control prefixes received from a peer.</p> <p>When the number of received prefixes exceeds the maximum number configured, BGP disables the peering session (by default). If you configure the restart interval, BGP automatically reestablishes the peering session at the configured time interval. If you do not configure the restart interval and a peering</p>
-------------------------	--

session is terminated because the maximum prefix limit has been exceeded, the peering session is not reestablished until you enter the **clear ip bgp** command. If the **warning-only** keyword is configured, BGP sends only a log message and continues to peer with the sender.

There is no default limit on the number of prefixes that can be configured with this command. Limitations on the number of prefixes that can be configured are determined by the amount of available system resources.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to set the maximum prefixes that are accepted from the 192.168.1.1 neighbor to 1000:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# network 192.168.0.0
switch(config-router)# maximum-prefix 1000
switch(config-router)#
```

This example shows how to set the maximum number of prefixes that are accepted from the 192.168.2.2 neighbor to 5000. The router is also configured to display warning messages when 50 percent of the maximum-prefix limit (2500 prefixes) has been reached.

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# network 192.168.0.0
switch(config-router)# maximum-prefix 5000 50
switch(config-router)#
```

This example shows how to set the maximum number of prefixes that are accepted from the 192.168.3.3 neighbor to 2000. The router is also configured to reestablish a disabled peering session after 30 minutes.

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# network 192.168.0.0
switch(config-router)# maximum-prefix 2000 restart 30
switch(config-router)#
```

This example shows how to set the warning messages that are displayed when the maximum-prefix limit (500) for the 192.168.4.4 neighbor is exceeded:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# network 192.168.0.0
switch(config-router)# maximum-prefix 500 warning-only
switch(config-router)#
```

This example shows how to set the maximum number of prefixes that are accepted from the 192.168.1.3 neighbor to 1500.

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# neighbor 192.168.1.3 remote-as 64497
switch(config-router-neighbor)# address-family ipv4 multicast
switch(config-router-neighbor-af)# maximum-prefix 1500
switch(config-router-neighbor-af)#
```

Related Commands	Command	Description
	address-family (BGP neighbor)	Enters BGP neighbor address-family configuration mode.
	neighbor	Configures a BGP neighbor.
	network	Configures an IP prefix to advertise.
	show ip bgp	Displays BGP configuration information.

message-digest-key (OSPF virtual link)

To enable Open Shortest Path First (OSPF) Message Digest 5 (MD5) authentication on a virtual link, use the **message-digest-key** command. To remove an old MD5 key, use the **no** form of this command.

```
message-digest-key key-id md5 [0 | 3] key

no message-digest-key key-id
```

Syntax Description

key-id	Identifier in the range from 1 to 255.
md5	Specifies Message Digest 5 (MD5) authentication.
0	(Optional) Specifies to use an unencrypted password to generate the md5 key.
3	(Optional) Specifies to use an encrypted 3DES password to generate the md5 key.
key	Alphanumeric password of up to 16 bytes.

Command Default

Unencrypted

Command Modes

Virtual link configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

When you configure the MD5 digest authentication mode, make sure that both interfaces on the virtual link have the same *key* value.

This command requires the LAN Base Services license.

Examples

```
This example shows how to set key 19 with the password 8ry4222:

switch# configure terminal
switch(config-router)# area 22 virtual-link 192.0.2.2
switch(config-router-vlink)# message-digest-key 19 md5 8ry4222
switch(config-router-vlink)#
```

Related Commands

Command	Description
authentication (virtual-link)	Configures the authentication mode on a virtual link.

metric maximum-hops

To advertise that those Enhanced Interior Gateway Routing Protocol (EIGRP) routes with a higher hop count than you specified are unreachable, use the **metric maximum-hops** command. To reset the value to the default, use the **no** form of this command.

metric maximum-hops *hops-number*

no metric maximum-hops

Syntax Description

<i>hops-number</i>	Maximum hop count. The range is from 1 to 255 hops.
--------------------	---

Command Default

hops-number: 100

Command Modes

Address-family configuration mode
Router configuration mode
Router VRF configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use this command to provide a safety mechanism that causes EIGRP to advertise routes with a hop count greater than the value assigned to the *hops-number* argument as unreachable.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure a hop count to 200:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# metric maximum-hops 200
switch(config-router-af)#
```

Related Commands

Command	Description
metric weights	Tunes the EIGRP metric calculations.

metric weights

To tune the Enhanced Interior Gateway Routing Protocol (EIGRP) metric calculations, use the **metric weights** command. To reset the values to their defaults, use the **no** form of this command.

metric weights *tos k1 k2 k3 k4 k5*

no metric weights

Syntax Description	<i>tos</i>	Type of service (ToS). The range is from 0 to 8.
	<i>k1 k2 k3 k4 k5</i>	Constants that convert an EIGRP metric vector into a scalar quantity. The arguments are as follows: <ul style="list-style-type: none">• k1—The range is from 0 to 255. The default is 1.• k2—The range is from 0 to 255. The default is 0.• k3—The range is from 1 to 255. The default is 1.• k4—The range is from 0 to 255. The default is 0.• k5—The range is from 0 to 255. The default is 0.

Command Default	<i>tos</i> : 0
	<i>k1</i> : 1
	<i>k2</i> : 0
	<i>k3</i> : 1
	<i>k4</i> : 0
	<i>k5</i> : 0

Command Modes	Address-family configuration mode
	Router configuration mode
	Router VRF configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	<p>This example shows how to set the metric weights to change the default values:</p> <pre>switch# configure terminal switch(config)# router eigrp 1 switch(config-router) address-family ipv4 unicast switch(config-router-af)# metric weights 0 2 0 2 0 0</pre>
----------	---

```
switch(config-router-af)#
```

Related Commands

Command	Description
bandwidth	Sets the EIGRP bandwidth metric in interface configuration mode.
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
delay	Sets the EIGRP delay metric in interface configuration mode.
show ip eigrp	Displays EIGRP information.

neighbor

To configure a Border Gateway Protocol (BGP) neighbor (router or VRF) and enter the neighbor configuration mode, use the **neighbor** command. To remove an entry, use the **no** form of this command.

```
neighbor {ip-addr | ip-prefix/length} [remote-as {as-num[.as-num]}]

no neighbor {ip-addr | ip-prefix/length} [remote-as {as-num[.as-num]}]
```

Syntax Description

<i>ip-addr</i>	IP address of the neighbor in this format: A.B.C.D.
<i>ip-prefix/length</i>	IP prefix and the length of the IP prefix. The format is x.x.x.x/length. The <i>length</i> range is from 1 to 32.
remote-as	(Optional) Specifies the autonomous system (AS) number of the neighbor.
<i>as-num</i>	Number of an AS that identifies the router to other BGP routers and tags the routing information passed along. The range is from 1 to 65535.
<i>.as-num</i>	(Optional) Number of an AS that identifies the router to other BGP routers and tags the routing information passed along. The range is from 1 to 65535.

Command Default

None

Command Modes

Neighbor address-family configuration mode
Router bgp configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **neighbor** command to enter the BGP neighbor configuration mode. When you enter the **neighbor** command, the prompt changes to switch(config-router-neighbor)#.

From the BGP neighbor configuration mode, you can perform the following actions:

- **address-family**—Configure an address-family (router, neighbor, vrf). See the **address-family (BGP)** command for information.
- **description** *description*—Describes the neighbor. You can enter up to 80 characters including spaces.
- **disable-connected-check**—Disables the connection verification for the directly connected peer. Use the **disable-connected-check** command is to disable a check for an eBGP peer that is directly connected to the local router. BGP triggers a connection check automatically for all eBGP peers that are known to be single hop away, unless you disable this check with the **disable-connected-check**

command. BGP does not bring up sessions if the check fails. BGP considers an EBGp peer as a single hop away, if the eBGP peer does not have the **ebgp-multihop** command configured (that is, the time-to-live(TTL) value is one).

- **dont-capability-negotiate**—Turns off the negotiate capability with this neighbor.
- **dynamic-capability**—Enables the dynamic capability.
- **ebgp-multihop**—Accepts and attempts BGP connections to external peers that reside on networks that are not directly connected.



Note You should enter this command under the guidance of Cisco technical support staff only.

- **exit**—Exits from the current command mode.
- **inherit peer-session session-name**—Configures a peer to inherit the configuration from another peer-session template. To remove an inherit statement from a peer-session template, use the **no** form of this command.
- **no**—Negates a command or sets its defaults.
- **transport connection-mode passive**—Allows a passive connection setup only. To remove the restriction, use the no form of this command.
- **remove-private-as**—Removes the private AS number from the outbound updates.
- **shutdown**—Administratively shuts down this neighbor.
- **timers keepalive-time**—Configures keepalive and hold timers in seconds. The range is from 0 to 3600. The default is 60.
- **update-source {ethernet mod/port | loopback virtual-interface | port-channel number[.sub-interface]}**—Specifies the source of the BGP session and updates. The range for *virtual-interface* is from 0 to 1023. The range for *number* is from 0 to 4096. The range for *sub-interface* is from 1 to 4093.

The Cisco NX-OS software allows BGP sessions to use any operational interface for TCP connections, when you enter the **update-source** command in neighbor configuration mode. To restore the interface assignment to the closest interface, which is called the best local address, use the **no** form of this command.

You must use the **update-source** command to enable IPv6 link-local peering for internal or external BGP sessions.

This command requires the Enterprise Services license.

Examples

This example shows how to configure a single-hop eBGP peering session between two BGP peers that are reachable on the same network segment through a local loopback interfaces on each router:

BGP Peer 1

```
switch# configure terminal
switch(config)# interface loopback 1
switch(config-if)# ip address 10.0.0.100 255.255.255
switch(config-if)# exit
switch(config)# router bgp 64497
switch(config-router)# neighbor 192.168.0.200 remote-as 64496
switch(config-router-neighbor)# update-source loopback 2
switch(config-router-neighbor)# disable-connected-check
switch(config-router-neighbor)#
```

BGP Peer 2

```
switch# configure terminal
switch(config)# interface loopback 2
switch(config-if)# ip address 192.168.0.200 255.255.255
switch(config-if)# exit
switch(config)# router bgp 64496
switch(config-router)# neighbor 10.0.0.100 remote-as 64497
switch(config-router-neighbor)# update-source loopback 1
switch(config-router-neighbor)# disable-connected-check
switch(config-router-neighbor)#
```

This example shows how to source BGP TCP connections for the specified neighbor with the IP address of the loopback interface rather than the best local address:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# neighbor 192.168.0.0 remote-as 64496
switch(config-router-neighbor)# update-source Loopback0
switch(config-router-neighbor)#
```

Related Commands

Command	Description
feature bgp	Enables BGP on the router.
route-map	Creates a route map.

neighbor-down

To configure accelerated hardware updates for IPv4 or IPv6 adjacencies of a Border Gateway Protocol (BGP) neighbor when a BGP session goes down, use the **neighbor-down** command. To remove this configuration, use the **no** form of this command.

neighbor-down fib-accelerate

no neighbor-down fib-accelerate

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes Router bgp configuration mode

Command History	Release	Modification
	6.0(2)U4(1)	This command was introduced.

Usage Guidelines This command applies to the accelerated handling of the following BGP path failure events:

- BFD failure detections for BGP neighbors
- Administrative shutdown of BGP neighbors (using the **shutdown** command)

Examples This example shows how to configure accelerated hardware updates for IPv4 or IPv6 adjacencies of a Border Gateway Protocol (BGP) neighbor when a BGP session goes down:

```
switch# configure terminal
switch(config)# router bgp 64497
switch(config-router)# neighbor-down fib-accelerate
switch(config-router)#
```

Related Commands	Command	Description
	feature bgp	Enables BGP on the router.
	router bgp	Configures a BGP process.

network

To configure an IP prefix to advertise, use the **network** command. To remove the IP prefix to advertise, use the **no** form of this command.

network *ip-addr* | *ip-prefix/length* **mask** *mask-num* [**route-map** *name*]

no network *ip-addr* | *ip-prefix/length* **mask** *mask-num* [**route-map** *name*]

Syntax Description	<i>ip-addr</i>	IP network address to advertise; use the following format: A.B.C.D.
	<i>ip-prefix/length</i>	IP prefix and the length of the IP prefix. Use the following format: A.B.C.D/length.
	mask <i>mask-num</i>	Configures the mask of the IP prefix to advertise in dotted 4-octet format.
	route-map <i>name</i>	(Optional) Specifies the name of the route map to modify attributes.

Command Default	None
-----------------	------

Command Modes	Neighbor address-family configuration mode Router bgp configuration mode
---------------	---

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	The IP prefix to advertise is considered as a best path and advertisement to peers only if a route of equal or more specificity is present in the routing table. This command requires the LAN Enterprise Services license.
------------------	--

Examples	This example shows how to configure an IP prefix to advertise: switch# configure terminal switch(config)# router bgp 64496 switch(config-router)# address-family ipv4 unicast switch(config-router-af)# network 2.2.2.2 mask 3.3.3.3 route-map test switch(config-router-af)#
----------	--

Related Commands	Command	Description
	address-family (BGP router)	Enters the address family mode and configures submode commands for the Border Gateway Protocol (BGP).

nexthop route-map

To specify that Border Gateway Protocol (BGP) routes are resolved using only the next hops that have routes that match specific characteristics, use the **nexthop route-map** command. To remove the route map, use the **no** form of this command.

nexthop route-map *name*

no nexthop route-map *name*

Syntax Description

<i>name</i>	Route map name. The name can be any alphanumeric string up to 63 characters.
-------------	--

Command Default

None

Command Modes

Address-family configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

BGP next-hop filtering allows you to specify that when a next-hop address is checked with the Routing Information Base (RIB), the underlying route for that next-hop address is passed through the route map. If the route map rejects the route, the next-hop address is treated as unreachable.

BGP marks all next hops that are rejected by the route policy as invalid and does not calculate the best path for the routes that use the invalid next-hop address.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure a route map to filter the next-hop address:

```
switch# configure terminal
switch(config)# route-map CHECK-BGP25 deny 10
switch(config-route-map)# match ip address prefix-list FILTER25
switch(config-route-map)# match source-protocol ospf-o1
switch(config-route-map)# exit
switch(config)# ip prefix-list FILTER25 seq 5 permit 0.0.0.0/0 le 25
switch(config)# router bgp 1.0
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# nexthop route-map CHECK-BGP25
switch(config-router-af)#
```

Related Commands

Command	Description
feature bgp	Enables BGP.
nexthop trigger-delay	Configures the delay timers for BGP next-hop address tracking.
route-map	Defines the conditions for redistributing routes from one routing protocol into another.
show routing memory estimate	Displays an estimate of routing memory requirements.

next-hop-self

To set the IP address of the router as the next hop address, use the **next-hop-self** command. To revert to the default configuration, use the **no** form of this command.

next-hop-self

no next-hop-self

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	BGP neighbor address-family configuration mode
----------------------	--

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires a LAN Enterprise Services license.
-------------------------	--

Examples	This example shows how to configure the IP address of a router as the next-hop address:
-----------------	---

```
switch# configure terminal
switch(config)# router bgp 102
switch(config-router)# neighbor 192.168.1.3 remote-as 64497
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# next-hop-self
switch(config-router-neighbor-af)#
```

Related Commands	Command	Description
	feature bgp	Enables BGP.
	address-family (BGP neighbor)	Enters the BGP neighbor address-family configuration mode.
	show ip bgp	Displays BGP configuration information.

nexthop trigger-delay

To specify a Border Gateway Protocol (BGP) delay for triggering next-hop calculations, use the **nexthop trigger-delay** command. To set the trigger delay to the default value, use the **no** form of this command.

nexthop trigger-delay { **critical** *delay* | **non-critical** *delay* }

no nexthop trigger-delay { **critical** *delay* | **non-critical** *delay* }

Syntax Description

critical <i>delay</i>	Specifies the critical next-hop trigger delay, in milliseconds. The range is from 0 to 4294967295. The default is 3000.
non-critical <i>delay</i>	Specifies the noncritical next-hop trigger delay, in milliseconds. The range is from 0 to 4294967295. The default is 10000.

Command Default

Critical delay: 3000 milliseconds.
Noncritical delay: 10000 milliseconds.

Command Modes

Address-family configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

The **non-critical** *delay* value must always be set to a value that is at least equal or greater to the **critical** *delay* value.

The delay should be slightly higher than the time it takes for the Interior Gateway Protocol (IGP) to settle into a steady state after some event (IGP convergence time).

This command requires a LAN Enterprise Services license.

Examples

This example shows how to modify the next-hop address tracking delay:

```
switch# configure terminal
switch(config)# router bgp 1.0
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# nexthop trigger-delay critical 5000 non-critical 20000
switch(config-router-af)#
```

Related Commands

Command	Description
feature bgp	Enables BGP.
nexthop route-map	Configures a route map for BGP next-hop address tracking.

no switchport

To configure the interface as a Layer 3 Ethernet interface, use the **no switchport** command.

no switchport

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	Interface configuration mode
----------------------	------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	<p>You can configure any Ethernet port as a routed interface. When you configure an interface as a Layer 3 interface, any configuration specific to Layer 2 on this interface is deleted.</p> <p>If you want to configure a Layer 3 interface for Layer 2, enter the switchport command. Then, if you change a Layer 2 interface to a routed interface, enter the no switchport command.</p> <p>This command requires the LAN Base Services license.</p>
-------------------------	--

Examples	<p>This example shows how to enable an interface as a Layer 3 routed interface:</p>
-----------------	---

```
switch# configure terminal
switch(config)# interface ethernet 1/5
switch(config-if)# no switchport
switch(config-if)#
```

This example shows how to configure a Layer 3 interface as a Layer 2 interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/5
switch(config-if)# switchport
switch(config-if)#
```

Related Commands	Command	Description
	copy running-config startup-config	Saves the running configuration to the startup configuration file.
	ip address	Sets a primary or secondary IP address for an interface.
	show interfaces	Displays interface information.

object

To specify an object for a tracked list, use the **object** command. To remove the object from the tracked list, use the **no** form of this command.

```
object object-number [not] [weight weight-number]

no object object-number
```

Syntax Description

<i>object-number</i>	Tracked object number. The range is from 1 to 500.
not	(Optional) Negates the state of an object. Note You cannot use the not keyword in a weight or percentage threshold list. You can use this keyword only in a Boolean list.
weight <i>weight-number</i>	(Optional) Specifies a threshold weight for each object.

Command Default

None

Command Modes

Tracking configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

You can configure an object track list that contains multiple tracked objects. A tracked list contains one or more objects.

The Boolean expression enables two types of calculation by using either “and” or “or” operators.

You can also configure an object track list that contains a percentage threshold. The percentage of up objects must exceed the configured track list up percent threshold before the track list is in an up state. For example, if the tracked list has three objects, and you configure an up threshold of 60 percent, two of the objects must be in the up state (66 percent of all objects) for the track list to be in the up state.

You can also configure an object track list that contains a weight threshold. A tracked list contains one or more objects. The combined weight of up objects must exceed the configured track list up weight threshold before the track list is in an up state. For example, if the tracked list has three objects with the default weight of 10 each, and you configure an up threshold of 15, two of the objects must be in the up state (combined weight of 20) for the track list to be in the up state.

This command does not require a license.

Examples

This example shows how to configure a track list with an up weight threshold of 30 and a down threshold of 10:

```
switch# configure terminal
```

```
switch(config)# track 1 list threshold weight
switch(config-track)# threshold weight up 30 down 10
switch(config-track)# object 10 weight 15
switch(config-track)# object 20 weight 15
switch(config-track)# object 30
switch(config-track)#
```

Related Commands

Command	Description
track list	Configures a track list for object tracking.

password (BGP)

To configure the Border Gateway Protocol (BGP) to use MD5 authentication, use the **password** command. To disable this function, use the **no** form of this command.

password [*auth-key string* | *string*]

no password [*auth-key string* | *string*]

Syntax Description	<div><div><i>auth-key</i></div><div>(Optional) MD5 authentication key. You can enter an unencrypted (cleartext) key, or one of these values followed by a space and the MD5 authentication key:<ul style="list-style-type: none">0—Specifies an unencrypted (cleartext) key3—Specifies a 3-DES encrypted key7—Specifies a Cisco Type 7 encrypted keyThe key can be from 1 to 16 characters.</div></div> <div><div><i>string</i></div><div>Neighbor password.</div></div>				
Command Default	None				
Command Modes	BGP neighbor configuration mode				
Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr></table>	Release	Modification	5.0(3)U1(1)	This command was introduced.
Release	Modification				
5.0(3)U1(1)	This command was introduced.				
Usage Guidelines	This command requires the LAN Enterprise Services license.				
Examples	This example shows how to enable an unencrypted key for a BGP neighbor:				

Related Commands

Command	Description
<code>show ip bgp</code>	Displays information about BGP routes.

platform ip verify

To configure IP packet verification, use the **platform ip verify** command. To return to the default setting, use the **no** form of this command.

platform ip verify {checksum | fragment | tcp tiny-frag | version}

no platform ip verify {checksum | fragment}

Syntax Description	checksum	Drops IPv4 packets if the checksum is invalid.
	fragment	Drops IPv4 packets if the packet fragment has a nonzero offset and the Don't Fragment (DF) bit is active.
	tcp tiny-frag	Drops IPv4 packets if the IP fragment offset is 1 or if the IP fragment offset is 0 and the IP payload length is less than 16.
	version	Drops IPv4 packets if the EtherType is not set to 4 (IPv4).

Command Default All address tests are enabled.

Command Modes Global configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines Use this command to configure packet verification tests on IPv4 packets based on checksum or fragments.

This command does not require a license.

Examples This example shows how to drop fragmented IPv4 packets:

```
switch# configure terminal
switch(config)# platform ip verify fragment
switch(config)#
```

Related Commands	Command	Description
	platform ip verify address	Configures IPv4 packet verification checks based on addresses.
	platform ip verify length	Configures IPv4 packet verification checks based on length.
	show hardware forwarding ip verify	Displays information about IP packet verification checks.

platform ip verify address

To perform packet verification on IP addresses, use the **platform ip verify address** command. To return to the default setting, use the **no** form of this command.

platform ip verify address { **destination zero** | **identical** | **reserved** | **source** { **broadcast** | **multicast** } }

no platform ip verify address { **destination zero** | **identical** | **reserved** | **source** { **broadcast** | **multicast** } }

Syntax Description	
destination zero	Drops IP packets if the destination IPv4 address is 0.0.0.0.
identical	Drops IP packets if the source IPv4 address is identical to the destination IPv4 address.
reserved	Drops IP packets if the IPv4 address is in the 127.x.x.x range.
source	Drops IP packets based on the IP source address.
broadcast	Drops IP packets if the IP source address is 255.255.255.255.
multicast	Drops IP packets if the IPv4 source address is in the 224.x.x.x range.

Command Default All address tests are enabled.

Command Modes Global configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to drop broadcast IPv4 packets:

```
switch# configure terminal
switch(config)# platform ip verify address source broadcast
switch(config)#
```

Related Commands	Command	Description
	platform ip verify	Configures IPv4 packet verification checks based on checksum or fragments.

Command	Description
platform ip verify length	Configures IPv4 packet verification checks based on length.
show hardware forwarding ip verify	Displays information about IP packet verification checks.

platform ip verify length

To configure IPv4 packet verification based on packet length, use the **platform ip verify length** command. To return to the default setting, use the **no** form of this command.

platform ip verify length {consistent | maximum {max-frag | max-tcp | udp} | minimum}

no platform ip verify length {consistent | maximum {max-frag | max-tcp | udp} | minimum}

Syntax Description		
consistent		Drops IPv4 packets where the Ethernet frame size is greater than or equal to the IP packet length plus the Ethernet header.
maximum		Specifies maximum IP packets.
max-frag		Specifies the IP packets if the maximum fragment offset is greater than 65536.
max-tcp		Specifies the IP packets if the TCP length is greater than the IP payload length.
udp		Specifies the IP packets if the IP payload length is less than the UDP packet length.
minimum		Specifies the IP packets if the Ethernet frame length is less than the IP packet length plus four octets (the CRC length).

Command Default All address tests are enabled.

Command Modes Global configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to drop minimum-length IPv4 packets:

```
switch# configure terminal
switch(config)# platform ip verify length minimum
switch(config)#
```

Related Commands	Command	Description
	platform ip verify	Configures IPv4 packet verification checks based on checksum or fragments.

Command	Description
platform ip verify address	Configures IPv4 packet verification checks based on addresses.
show hardware forwarding ip verify	Displays information about IP packet verification checks.

policy statistics enable (OSPF)

To enable Open Shortest Path First (OSPF) policy statistics, use the **policy statistics enable** command. To disable policy statistics, use the **no** form of this command.

policy statistics enable

no policy statistics enable

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	Policy statistics are disabled.
------------------------	---------------------------------

Command Modes	Router configuration mode
----------------------	---------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	This example shows how to enable policy statistics gathering on OSPF 2:
-----------------	---

```
switch# configure terminal
switch(config)# ospf 2
switch(config-router)# policy statistics enable
switch(config-router)#
```

Related Commands	Command	Description
	show ip ospf policy statistics	Shows policy statistics.

preempt (HSRP)

To configure a preemption delay, use the **preempt** command. To disable this feature, use the **no** form of this command.

preempt [**delay** { **minimum** *min-delay* | **reload** *rel-delay* | **sync** *sync-delay* }]

no preempt [**delay** { **minimum** *min-delay* | **reload** *rel-delay* | **sync** *sync-delay* }]

Syntax Description	delay minimum <i>min-delay</i>	(Optional) Specifies the minimum number of seconds that preemption is delayed to allow routing tables to be updated before a router becomes active. The default value is 0.
	reload <i>rel-delay</i>	(Optional) Specifies the time delay after the router has reloaded. This period applies only to the first interface-up event after the router has reloaded. The default value is 0.
	sync <i>sync-delay</i>	(Optional) Specifies the maximum number of seconds to allow IP redundancy clients to prevent preemption. When this period expires, preemption occurs regardless of the state of the IP redundancy clients. The default value is 0.

Command Default The default delay time for all options is 0 seconds.

Command Modes Interface configuration or HSRP template mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines Specifying a minimum delay allows routing tables to be updated before a router becomes active. When a router first comes up, it does not have a complete routing table. A high-priority router will only delay preemption if it first receives a hello packet from a low-priority active router. If the high-priority router does not receive a hello packet from the low-priority active router when it is starting up, it assumes there is no active router for the group and becomes active as soon as possible.

This command requires the LAN Base Services license.

Examples This example shows how to configure a delay when a router becomes active when its priority is 110:

```
switch# configure terminal
switch(config)# interface ethernet 0/1
switch(config-if)# no switchport
switch(config-if)# ip address 10.0.0.1 255.255.255.0
switch(config-if)# hsrp 4
switch(config-if-hsrp)# priority 110
switch(config-if-hsrp)# preempt
switch(config-if-hsrp)# authentication text sanjose
```

```
switch(config-if-hsrp)# ip 10.0.0.3
switch(config-if-hsrp)# end
switch(config-if-hsrp)#
```

Related Commands

Command	Description
feature hsrp	Enables the HSRP configuration.
show hsrp	Displays HSRP information.

preempt (VRRP)

To enable a high-priority backup virtual router to preempt the low-priority master virtual router, use the **preempt** command. To disable a high-priority backup virtual router from preempting the low-priority master virtual router, use the **no** form of this command.

preempt
no preempt

Syntax Description This command has no arguments or keywords.

Command Default Enabled

Command Modes VRRP configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

VRRP enables you to preempt a virtual router backup that has taken over for a failing virtual router master with a high-priority virtual router backup that has become available.

By default, a preemptive scheme is enabled. A backup high-priority virtual router that becomes available takes over for the backup virtual router that was elected to become the virtual router master. If you disable preemption, the backup virtual router that is elected to become the virtual router master remains the master until the original virtual router master recovers and becomes the master again.


Note

This preemption does not apply to the primary IP address.

If the virtual IP address is also the IP address for the interface, then preemption is applied.

This command requires the LAN Base Services license.

Examples

This example shows how to enable the backup high-priority virtual router to preempt the low-priority master virtual router:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# vrrp 250
switch(config-if-vrrp)# preempt
switch(config-if-vrrp)#
```

Related Commands

Command	Description
clear vrrp	Clears all the software counters for the specified virtual router.
show vrrp	Displays VRRP configuration information.
vrrp	Configures a VRRP group.

priority (HSRP)

To set the priority level within a Hot Standby Router Protocol (HSRP) group, use the **priority** command. To remove the priority level, use the **no** form of this command.

```
priority level [forwarding-threshold lower lower-value upper upper-value]

no priority level [forwarding-threshold lower lower-value upper upper-value]
```

Syntax Description

<i>level</i>	Interface priority for a virtual router. The range of values is from 0 to 255. If this router is the owner of the IP addresses, then the value is automatically set to 255. The default is 100.
forwarding-threshold	(Optional) Sets the threshold for the virtual router.
lower <i>lower-value</i>	(Optional) Sets the low threshold value. The range is from 0 to 255. The default is 1.
upper <i>upper-value</i>	(Optional) Sets the upper threshold value. The range is from 0 to 255. The default is 255.

Command Default

level: 100
lower-value: 1
upper-value: 255

Command Modes

HSRP configuration or HSRP template mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

HSRP compares the priorities of all virtual routers in the HSRP group and selects the router with the numerically highest priority. If two virtual routers have equal priority, HSRP selects the router with the highest IP address.

This command requires the LAN Base Services license.

Examples

This example shows how to configure a virtual router with a priority of 254:

```
switch# configure terminal
switch(config)# interface ethernet 0/1
switch(config-if)# no switchport
switch(config-if)# ip address 10.0.0.1 255.255.255.0
switch(config-if)# hsrp 3
switch(config-if-hsrp)# priority 254
switch(config-if-hsrp)#
```


Related Commands

Command	Description
feature hsrp	Enables the HSRP configuration.
show hsrp	Displays HSRP information.

priority (VRRP)

To set the priority for the Virtual Router Redundancy Protocol (VRRP), use the **priority** command. To revert to the default value, use the **no** form of this command.

priority *level* [**forwarding-threshold** **lower** *lower-value* **upper** *upper-value*]

no priority *level* [**forwarding-threshold** **lower** *lower-value* **upper** *upper-value*]

Syntax Description	<i>level</i>	Interface priority for a virtual router. The range of values is from 1 to 254. If this router is the owner of the IP addresses, then the value is automatically set to 254. The default is 100.
	forwarding-threshold	(Optional) Sets the threshold used by a virtual router.
	lower <i>lower-value</i>	(Optional) Sets the low threshold value. The range is from 1 to 254. The default is 1.
	upper <i>upper-value</i>	(Optional) Sets the upper threshold value. The range is from 1 to 254. The default is 254.

Command Default	The default value is 100. For switches whose interface IP address is the same as the primary virtual IP address, the default value is 254.
------------------------	--

Command Modes	VRRP configuration mode
----------------------	-------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	The priority determines whether or not a VRRP router functions as a virtual router backup, the order of ascendancy for the VRRP router to become a virtual router master if the virtual router master fails, the role that each VRRP router plays, and what happens if the virtual router master fails.
	If a VRRP router owns the IP address of the virtual router and the IP address of the physical interface, then this router functions as a virtual router master.
	By default, a preemptive scheme is enabled. A backup high-priority virtual router that becomes available takes over for the backup virtual router that was elected to become the virtual router master. If you disable preemption, then the backup virtual router that is elected to become the virtual router master remains the master until the original virtual router master recovers and becomes the master again.
	This command requires the LAN Base Services license.

Examples	This example shows how to specify the priority for a virtual router:
-----------------	--

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
```

```
switch(config-if)# vrrp 250
switch(config-if-vrrp)# priority 2
switch(config-if-vrrp)#
```

Related Commands

Command	Description
feature vrrp	Enables VRRP.
preempt	Enables preemption on the virtual router.
show vrrp	Displays VRRP configuration information.
shutdown (VRRP)	Disables the VRRP configuration.
vrrp	Configures a VRRP group.

protocol shutdown (OSPF)

To shut down an Open Shortest Path First (OSPF) instance without removing the configuration, use the **protocol shutdown** command. To disable this function, use the **no** form of this command.

protocol shutdown

no protocol shutdown

Syntax Description	This command has no arguments or keywords.	
Command Default	The OSPF instance is enabled by default when configured.	
Command Modes	Router configuration mode Router VRF configuration mode	
Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.
Usage Guidelines	This command requires the LAN Enterprise Services license.	
Examples	This example shows how to disable OSPF 209: switch# configure terminal switch(config) router ospf 209 switch(config-router)# protocol shutdown switch(config-router)#	
Related Commands	Command	Description
	show running-config ospf	Displays the running configuration for OSPF version 2.

reconnect-interval (BGP)

To configure an interval after which a Border Gateway Protocol (BGP) connection can reconnect, use the **reconnect-interval** command. To remove the **reconnect-interval** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

reconnect-interval *interval*

no reconnect-interval *interval*

Syntax Description	<i>interval</i>	Specifies the interval after which a dropped BGP connection can automatically reconnect. The <i>interval</i> range is from 1 second to 60 seconds. The default value of the interval is 30 seconds.
---------------------------	-----------------	--

Command Default	30 seconds
------------------------	------------

Command Modes	Router configuration mode
----------------------	---------------------------

Command History	Release	Modification
	6.0(2)U4(1)	This command was introduced.

Examples This example shows how to configure a reconnect interval for a BGP connection:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router) reconnect-interval 20
switch(config-router)# copy running-config startup-config
switch(config-router)#
```

Related Commands	Command	Description
	feature bgp	Enables BGP on the router.

redistribute (BGP)

To inject routes from one routing domain into the Border Gateway Protocol (BGP), use the **redistribute** command. To remove the **redistribute** command from the configuration file and restore the system to its default condition in which the software does not redistribute routes, use the **no** form of this command.

```
redistribute { direct | eigrp instance-tag | ospf instance-tag | rip instance-tag | static } [route-map map-name]

no redistribute { direct | eigrp instance-tag | ospf instance-tag | rip instance-tag | static }
[route-map map-name]
```

Syntax Description

direct	Distributes routes that are directly connected on an interface.
eigrp <i>instance-tag</i>	Specifies the name of an EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
ospf <i>instance-tag</i>	Distributes routes from the OSPF protocol. This protocol is supported in the IPv4 address family. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
rip <i>instance-tag</i>	Distributes routes from the RIP protocol. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
static	Redistributes IP static routes.
route-map <i>map-name</i>	(Optional) Specifies the identifier of a configured route map. Use a route map to filter which routes are redistributed into EIGRP.

Command Default

Disabled

Command Modes

Address family configuration mode
Router configuration mode
Router VRF configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

You should always use a route map to filter these routes to ensure that BGP redistributes only the routes that you intend to redistribute.

You must configure a default metric to redistribute routes from another protocol into BGP. You can configure the default metric with the **default-metric** command or with the route map configured with the **redistribute** command.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to redistribute BGP routes into an EIGRP autonomous system:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router) address-family ipv4 unicast
switch(config-router-af)# redistribute eigrp 100
switch(config-router-af)#
```

Related Commands

Command	Description
default-metric (BGP)	Sets the default metrics for routes redistributed into BGP.

redistribute (EIGRP)

To inject routes from one routing domain into the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **redistribute** command. To remove the **redistribute** command from the configuration file and restore the system to its default condition in which the software does not redistribute routes, use the **no** form of this command.

```

redistribute {bgp as-number | direct | eigrp id | ospf instance-tag | rip instance-tag | static}
[route-map map-name]

no redistribute {bgp as-number | direct | eigrp as-number | ospf instance-tag | rip instance-tag |
static}

```

Syntax Description

bgp <i>as-number</i>	Distributes routes from Border Gateway Protocol (BGP). The <i>as-number</i> is a 2-byte or 4-byte autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535.
direct	Distributes routes that are directly connected on an interface.
eigrp <i>id</i>	Specifies the name of an EIGRP instance. The <i>id</i> can be any case-sensitive, alphanumeric string up to 20 characters.
ospf <i>instance-tag</i>	Distributes routes from the OSPF protocol. This protocol is supported in the IPv4 address family. The <i>instance-tag</i> can be a maximum of 20 alphanumeric characters.
rip <i>instance-tag</i>	Distributes routes from the RIP protocol. The <i>instance-tag</i> can be a maximum of 20 alphanumeric characters.
static	Redistributes IP static routes.
route-map <i>map-name</i>	(Optional) Specifies the identifier of a configured route map. Use a route map to filter which routes are redistributed into EIGRP.

Command Default

Disabled

Command Modes

Address family configuration mode
Router configuration mode
Router VRF configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

You should always use a route map to filter these routes to ensure that EIGRP redistributes only the routes that you intend to redistribute.

You must configure a default metric to redistribute routes from another protocol into EIGRP. You can configure the default metric with the **default-metric** command or with the route map configured with the **redistribute** command.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to redistribute BGP routes into an EIGRP autonomous system:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router) address-family ipv4 unicast
switch(config-router-af)# redistribute bgp 64496
switch(config-router-af)
```

Related Commands

Command	Description
default-metric (EIGRP)	Sets the default metrics for routes redistributed into EIGRP.
show ip eigrp	Displays EIGRP information.

redistribute (OSPF)

To inject routes from one routing domain into Open Shortest Path First (OSPF), use the **redistribute** command. To remove the **redistribute** command from the configuration file and restore the system to its default condition in which the software does not redistribute routes, use the **no** form of this command.

redistribute { **bgp** *as-number* | **direct** | **eigrp** *id* | **ospf** *instance-tag* | **rip** *instance-tag* | **static** }
[**route-map** *map-name*]

no redistribute { **bgp** *as-number* | **direct** | **eigrp** *id* | **ospf** *instance-tag* | **rip** *instance-tag* | **static** }

Syntax Description

bgp <i>as-number</i>	(Optional) Distributes routes from Border Gateway Protocol (BGP). The <i>as-number</i> is a 2-byte or 4-byte autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1 to 4294967295.
direct	Distributes routes that are directly connected on an interface.
eigrp <i>id</i>	Distributes routes from EIGRP. The <i>id</i> argument can be any case-sensitive, alphanumeric string.
ospf <i>instance-tag</i>	Distributes routes from the OSPF protocol. This protocol is supported in the IPv4 address family. The <i>instance-tag</i> argument can be any case-sensitive, alphanumeric string of up to 20 characters.
rip <i>instance-tag</i>	Distributes routes from the RIP protocol. The <i>instance-tag</i> can be a maximum of 20 alphanumeric characters.
static	Redistributes IP static routes, including the default static route.
route-map <i>map-name</i>	(Optional) Specifies the identifier of a configured route map. Use a route map to filter which routes are redistributed into EIGRP. The <i>map-name</i> argument can be a maximum of 63 alphanumeric characters.

Command Default

Route redistribution is disabled.

Command Modes

Router configuration mode
Router VRF configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

You should always use a route map to filter these routes to ensure that OSPF redistributes only the routes that you intend.

You must configure a default metric to redistribute routes from another protocol into OSPF. You can configure the default metric with the **default-metric** command or with the route map configured with the **redistribute** command.

**Note**

If you redistribute static routes, Cisco NX-OS also redistributes the default static route.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to redistribute BGP routes into an OSPF autonomous system:

```
switch# configure terminal
switch(config)# router ospf 209
switch(config-router)# redistribute bgp 64496
switch(config-router)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
default-metric (OSPF)	Sets the default metrics for routes redistributed into OSPF.
show ip ospf	Displays OSPF information.

redistribute (RIP)

To redistribute routes from another routing domain into the Routing Information Protocol (RIP), use the **redistribute** command. To restore the system to its default condition in which the software does not redistribute routes, use the **no** form of this command.

```
redistribute {bgp id | direct | eigrp id | ospf id | static} route-map map-name
```

Syntax Description	bgp	Redistributes routes from the Border Gateway Protocol (BGP).
	direct	Redistributes routes from directly connected routes only.
	eigrp	Redistributes routes from the Enhanced Interior Gateway Routing Protocol (EIGRP).
	ospf	Redistributes routes from the Open Shortest Path First (OSPF) protocol.
	static	Redistributes routes from IP static routes.
	<i>id</i>	For the bgp keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the eigrp keyword, an EIGRP instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the ospf keyword, an OSPF instance name from which routes are to be redistributed. The value takes the form of a string. A decimal number can be entered, but it is stored internally as a string.
	route-map <i>map-name</i>	Associates a route map to set the redistribution policy for RIP.

Command Default	Route redistribution is disabled.
-----------------	-----------------------------------

Command Modes	Router address-family configuration mode
---------------	--

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	<p>Cisco NX-OS filters redistributed routing information using a route map. You can configure the route map to set the RIP metric used for redistributed routes. If you do not set the RIP metric with a route map, Cisco NX-OS determines the metric based on the redistributed protocol or by the default-metric command. If Cisco NX-OS cannot determine a valid metric, then it does not redistribute the routes.</p> <p>This command does not require a license.</p>
------------------	--

Examples	<p>This example shows how to redistribute BGP routes into a RIP process:</p> <pre>switch# configure terminal</pre>
----------	--

```
switch(config)# router rip Enterprise  
switch(config-router)# address-family ipv4 unicast  
switch(config-router-af)# redistribute bgp 64496  
switch(config-router-af)#
```

Related Commands

Command	Description
address-family	Enters address-family configuration mode.
default-information originate	Generates a default route for routes redistributed into RIP.
default-metric	Sets default metric values for routes redistributed from other protocols into RIP.
show ip rip	Displays a summary of RIP information for all RIP instances.

redistribute maximum-prefix (EIGRP)

To limit the number of routes redistributed into Enhanced Interior Gateway Routing Protocol (EIGRP), use the **redistribute maximum-prefix** command. To return to the default setting, use the **no** form of this command.

```
redistribute maximum-prefix max [threshold] [warning-only | withdraw [num-retries timeout]]

no redistribute maximum-prefix max [threshold] [warning-only | withdraw [num-retries
                                timeout]]
```

Syntax Description	<i>max</i>	Maximum number of prefixes that EIGRP will distribute. The range is from 0 to 65536.
	<i>threshold</i>	(Optional) Percentage of maximum prefixes that triggers a warning message. The range is from 1 to 100. The default is 75 percent.
	warning-only	(Optional) Logs a warning message when the maximum number of prefixes is exceeded.
	withdraw	(Optional) Withdraws all redistributed routes.
	<i>num-retries</i>	(Optional) Number of times EIGRP tries to retrieve the redistributed routes. The range is from 1 to 12. The default is 1.
	<i>timeout</i>	(Optional) Time between retry attempts. The range is from 60 to 600 seconds. The default is 300.

Command Default No limit

Command Modes Router configuration mode
VRF configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines Use the **clear ip eigrp redistribute** command if all routes are withdrawn.
This command requires the LAN Enterprise Services license.

Examples This example shows how to limit the number of redistributed routes into EIGRP:

```
switch# configure terminal
switch(config)# router eigrp 201
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# redistribute bgp route-map FilterExternalBGP
switch(config-router-af)# redistribute maximum-prefix 1000 75
switch(config-router-af)#
```

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	feature eigrp	Enables the EIGRP feature.
	redistribute (EIGRP)	Configures route redistribution for EIGRP.
	show running-config eigrp	Displays the EIGRP running configuration.

redistribute maximum-prefix (OSPF)

To limit the number of routes redistributed into Open Shortest Path First (OSPF), use the **redistribute maximum-prefix** command. To return to the default setting, use the **no** form of this command.

```
redistribute maximum-prefix max [threshold] [warning-only | withdraw [num-retries timeout]]

no redistribute maximum-prefix max [threshold] [warning-only | withdraw [num-retries
                                timeout]]
```

Syntax Description	<i>max</i>	Maximum number of prefixes that OSPF will distribute. The range is from 0 to 65535.
	<i>threshold</i>	(Optional) Percentage of maximum prefixes that triggers a warning message. The range is from 1 to 100. The default is 75 percent.
	warning-only	(Optional) Logs a warning message when the maximum number of prefixes is exceeded.
	withdraw	(Optional) Withdraws all redistributed routes.
	<i>num-retries</i>	(Optional) Number of times OSPF tries to retrieve the redistributed routes. The range is from 1 to 12. The default is 1.
	<i>timeout</i>	(Optional) Time between retry attempts. The range is from 60 to 600 seconds. The default is 300.

Command Default	No limit
-----------------	----------

Command Modes	Router configuration mode VRF configuration mode
---------------	---

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Use the clear ip ospf redistribute command if all routes are withdrawn. This command requires the LAN Enterprise Services license.
------------------	--

Examples	<p>This example shows how to limit the number of redistributed routes into OSPF:</p> <pre>switch# configure terminal switch(config)# router ospf 201 switch(config-router)# redistribute bgp route-map FilterExternalBGP switch(config-router)# redistribute maximum-prefix 1000 75 switch(config-router)#</pre>
----------	--

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	show ip ospf	Displays OSPF information.
	show running-config ospf	Displays the OSPF running configuration.

remote-as

To specify the autonomous system (AS) number for a neighbor, use the **remote-as** command. To remove an AS number, use the **no** form of this command.

remote-as *number*

no remote-as *number*

Syntax Description	<i>number</i>	AS number. The format is x for a two-byte value or x.x for a four-byte value. The range is from 1 to 65535.

Command Default	None
-----------------	------

Command Modes	Neighbor configuration mode
---------------	-----------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	This example shows how to configure the neighbor AS number:
----------	---

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# neighbor 10.0.0.100
switch(config-router-neighbor)# remote-as 64497
switch(config-router-neighbor)#
```

Related Commands	Command	Description
	feature bgp	Enables BGP on the router.
	neighbor	Configures BGP peers.

remove-private-as

To remove the private autonomous system (AS) from the autonomous system path (a list of autonomous systems that a route passes through to reach a BGP peer) in External Border Gateway Protocol (eBGP) outbound routing updates, use the **remove-private-as** command in the BGP neighbor configuration mode. To disable this function, use the **no** form of this command.

remove-private-as [**all** | **replace-as**]

no remove-private-as [**all** | **replace-as**]

Syntax Description	all	(Optional) Removes all private AS numbers from the AS-path in outgoing updates even if the AS-path contains both public and private ASNs.
	replace-as	(Optional) Replaces all private AS numbers from the AS-path with the local AS number in outgoing updates.

Command Default	No private AS numbers are removed from the AS-path.
-----------------	---

Command Modes	Neighbor configuration mode
---------------	-----------------------------

Command History	Release	Modification
	6.0(2)U2(1)	This command was introduced.

- | | |
|------------------|--|
| Usage Guidelines | <ul style="list-style-type: none">• This command is available for external BGP (eBGP) neighbors only.• The remove-private-as all command removes private AS numbers from the AS path even if the path contains both public and private ASNs.• If the local ASN of the device is a private ASN, you cannot use the remove-private-as configuration command for any other neighbor on the same device. As a workaround, you can use the local-as command on each neighbor with a public local ASN.• If the real ASN of the device is a private ASN and remove-private-as all command is configured for a neighbor with a public local-as number, use local-as number [no-prepend [replace-as]] command to ensure that the real private ASN is not appended to the AS-path.• If the real ASN of the device is a public ASN and remove-private-as all command is configured for a neighbor, you cannot configure a private local-as number for the same neighbor. As a workaround, you must remove the existing configuration to proceed further.• The remove-private-as command removes private AS numbers even if the AS path contains only private AS numbers. There is no likelihood of a 0-length AS path because this command can be applied to eBGP peers only, in which case the AS number of the local device is appended to the AS path.• The remove-private-as command removes private AS numbers even if the private ASNs appear before the Confederation segments in the AS path. |
|------------------|--|

- Upon removing private AS numbers from the AS path, the path length of prefixes being sent out will decrease. Because the AS path length is a key element of BGP best path selection, it might be necessary to retain the path length. The **replace-as** keyword ensures that the path length is retained by replacing all removed AS numbers with the local router’s AS number.

Examples

This example shows how to remove the private autonomous system (AS) from the autonomous system path:

```
switch# configure terminal
switch(config)# router bgp 100
switch(config-router)# neighbor 10.0.0.100 remote-as 100
switch(config-router-neighbor)# remove-private-as
switch(config-router-neighbor)#
```

Use the **show ip bgp neighbors** command to display the information about removed private ASNs.

Related Commands

Command	Description
show ip bgp neighbors	Displays BGP peer information.
local-as <i>number</i>	Configures eBGP to prepend the local AS <i>number</i> to the AS_PATH attribute.
[no-prepend	The AS <i>number</i> can be a 16-bit integer or a 32-bit integer in the form of a
[replace-as [dual-as]]]	higher 16-bit decimal number and a lower 16-bit decimal number in xx.xx format.

restart bgp

To restart a Border Gateway Protocol (BGP) autonomous system and remove all associated neighbors, use the **restart bgp** command.

restart bgp *as-num* [*.as-num*]

Syntax Description	<i>as-num</i>	Number of an autonomous system that identifies the router to other BGP routers and tags the routing information passed along; valid values are from 1 to 65535.
	<i>.as-num</i>	(Optional) Number of an autonomous system that identifies the router to other BGP routers and tags the routing information passed along; valid values are from 0 to 65535.

Command Default	None
-----------------	------

Command Modes	EXEC mode
---------------	-----------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	This example shows how to restart the BGP autonomous system: switch# restart bgp 64496 switch#
----------	---

Related Commands	Command	Description
	router bgp	Configures a BGP process.

restart eigrp

To restart an Enhanced Interior Gateway Routing Protocol (EIGRP) instance and remove all associated neighbors, use the **restart eigrp** command.

restart eigrp *instance-tag*

Syntax Description	<i>instance-tag</i>	Name for an EIGRP routing instance. The name can be a maximum of 20 alphanumeric characters.
--------------------	---------------------	--

Command Default	None
-----------------	------

Command Modes	Global configuration mode
---------------	---------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	<p>This example shows how to restart the OSPFv2 instance and remove all neighbors:</p> <pre>switch# configure terminal switch(config)# restart eigrp Test1 switch(config)#</pre>
----------	--

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration in the startup configuration file.
	show ip eigrp interfaces	Displays information about EIGRP interfaces.

restart ospf

To restart an Open Shortest Path First version 2 (OSPFv2) instance and remove all associated neighbors, use the **restart ospf** command.

restart ospf *instance-tag*

Syntax Description	<i>instance-tag</i>	Internally used identification parameter for an OSPF routing instance. It is locally assigned and can be any word or positive integer. The <i>instance-tag</i> argument can be a maximum of 20 alphanumeric characters.
---------------------------	---------------------	---

Command Default	None
------------------------	------

Command Modes	Global configuration mode
----------------------	---------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	This example shows how to restart the OSPFv2 instance and remove all neighbors:
-----------------	---

```
switch# configure terminal
switch(config)# restart ospf 12
switch(config)#
```

Related Commands	Command	Description
	show ip ospf	Displays OSPF information.

restart rip

To restart a Routing Information Protocol (RIP) instance and remove all associated neighbors, use the **restart rip** command.

restart rip *instance-tag*

Syntax Description	<i>instance-tag</i>	Name for an RIP routing instance. The name can be a maximum of 20 alphanumeric characters.
--------------------	---------------------	--

Command Default	None
-----------------	------

Command Modes	Global configuration mode
---------------	---------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command does not require a license.
------------------	--

Examples This example shows how to restart the RIP instance and remove all neighbors:

```
switch# configure terminal
switch(config)# restart rip Enterprise
switch(config)#
```

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration in the startup configuration file.
	show ip eigrp interfaces	Displays information about EIGRP interfaces.

retransmit-interval (OSPF virtual link)

To specify the time between link-state advertisement (LSA) retransmissions for adjacencies that belong to the virtual link, use the **retransmit-interval** command. To return to the default, use the **no** form of this command.

retransmit-interval *seconds*

retransmit-interval

Syntax Description	<i>seconds</i>	Time (in seconds) between retransmissions. The time must be greater than the expected round-trip delay between any two routers on the attached network. The range is from 1 to 65535 seconds. The default is 5 seconds.
---------------------------	----------------	---

Command Default	5 seconds
------------------------	-----------

Command Modes	Virtual link configuration mode
----------------------	---------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Use this command to set the LSA retransmission time. If a router receives no acknowledgment that an LSA was received, the router resends the LSA at the retransmission interval.
	You should set this value larger for virtual links.
	This command requires the LAN Enterprise Services license.

Examples	This example shows how to set the retransmit interval value to 8 seconds:
-----------------	---

```
switch# configure terminal
switch(config)# router ospf 109
switch(config-router)# area 33 virtual-link 192.0.2.2
switch(config-router-vrf)# retransmit-interval 8
switch(config-router-vrf)#
```

Related Commands	Command	Description
	area virtual-link	Creates a virtual link in an OSPF area.

rfc1583compatibility

To configure RFC 1583 compatibility as the method used to calculate summary route costs, use the **rfc1583compatibility** command. To disable RFC 1583 compatibility, use the **no** form of this command.

```
rfc1583compatibility

no rfc1583compatibility
```

Syntax Description This command has no arguments or keywords.

Command Default RFC 1583 compatibility is disabled.

Command Modes Router configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

To minimize the chance of routing loops, all Open Shortest Path First (OSPF) routers in an OSPF routing domain should have RFC compatibility set identically.

Because of the introduction of RFC 2328, OSPF Version 2, the method used to calculate summary route costs has changed. Use the **no rfc1583compatibility** command to enable the calculation method used per RFC 2328.

This command requires the LAN Enterprise Services license.

Examples

This example specifies that the router process is compatible with RFC 1583:

```
switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# router ospf 2
switch(config-router)# rfc1583compatibility
switch(config-router)#
```

route delete dampen interval

To delay route creation from the hardware, use the **route delete dampen interval** command. To remove this delay, use the **no** form of this command.

route delete dampen interval *seconds*

no route delete dampen interval *seconds*

Syntax Description

<i>seconds</i>	Number of seconds after which route deletion is done from the hardware. Range: 1 second to 30 seconds. The default value is 0 seconds
----------------	---

Command Default

The default value of the interval is 0 seconds.

Command Modes

Global configuration mode

Command History

Release	Modification
6.0(2)U4(1)	This command was introduced.

Usage Guidelines

You must use this command when the route gets completely deleted, and not when a subset of next-hops is being removed from the route, or when backup paths exist for the route.

Examples

This example shows how to delay route deletion from hardware:

```
switch# configure terminal
switch(config)# route delete dampen interval 20
switch(config)#
```

route-map

To create a route map, enter the route-map configuration mode, or define the conditions for redistributing routes from one routing protocol into another, use the **route-map** command. To delete an entry, use the **no** form of this command.

```
route-map map-tag [deny | permit] [sequence-number]

no route-map map-tag [permit | deny] [sequence-number]
```

Syntax Description

<i>map-tag</i>	Route map name.
deny	(Optional) Specifies that the route or packet is not distributed if the match criteria are met for the route map.
permit	(Optional) Specifies that the route or packet is distributed if the match criteria for this route are met.
<i>sequence-number</i>	(Optional) Number that indicates the position a new route map has in the list of route maps already configured with the same name. The no form of this command deletes the position of the route map. Range: 0 to 65535.

Command Default

The **permit** keyword is the default.

Command Modes

Global configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

If you make changes to a route map that is used by a client, you must exit the route-map configuration submode before the changes take effect in the client. The route-map changes are not propagated to its clients until you exit from the route-map configuration submode or 60 seconds expire since entering the submode.

Use route maps to redistribute routes.

Redistribution

The **redistribute** router configuration command uses the *map-tag* name to reference the route map. Multiple route maps may share the same map tag name.

Use the **route-map** global configuration command and the **match** and **set** route-map configuration commands to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must pass to cause the route to be redistributed according to the set actions given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

Use route maps when you want detailed control over how routes are redistributed between routing processes. The destination routing protocol is the one you specify with the **router** global configuration command. The source routing protocol is the one you specify with the **redistribute** router configuration command. See the “Examples” section for an illustration of how route maps are configured.

When you are passing routes through a route map, a route map can have several parts. Any route that does not match at least one **match** clause that relates to a **route-map** command is ignored; that is, the route is not advertised for outbound route maps and is not accepted for inbound route maps. If you want to modify some particular data, you must configure a second route map section with an explicit match specified.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to redistribute Routing Information Protocol (RIP) routes with a hop count equal to 1 into Open Shortest Path First (OSPF). These routes are redistributed into OSPF as external link-state advertisements (LSAs) with a metric type of Type 1, and a tag equal to 1.

```
switch# configure terminal
switch(config)# router ospf 109
switch(config-route-map)# redistribute rip route-map rip-to-ospf
switch(config-route-map)# route-map rip-to-ospf permit
switch(config-route-map)# set metric 5
switch(config-route-map)# set metric-type type1
switch(config-route-map)# set tag 1
switch(config-route-map)#
```

This example shows how to set the autonomous system path to match BGP autonomous system path access list 20:

```
switch# configure terminal
switch(config)# route-map IGP2BGP
switch(config-route-map)# match as-path 20
switch(config-route-map)#
```

This example shows how to configure that the routes matching community list 1 have the weight set to 100. Any route that has community 109 has the weight set to 100.

```
switch# configure terminal
switch(config)# ip community-list 1 permit 109
switch(config)# route-map set_weight
switch(config-route-map)# match community 1
switch(config-route-map)# set weight 100
switch(config-route-map)#
```

This example shows how to configure that the routes matching community list 1 have the weight set to 200. Any route that has community 109 alone has the weight set to 200.

```
switch# configure terminal
switch(config)# ip community-list 1 permit 109
switch(config)# route-map set_weight
switch(config-route-map)# match community 1 exact
switch(config-route-map)# set weight 200
switch(config-route-map)#
```

This example shows how to configure that the routes match community list LIST_NAME have the weight set to 100. Any route that has community 101 alone has the weight set to 100.

```
switch# configure terminal
switch(config)# ip community-list 1 permit 101
switch(config)# route-map set_weight
switch(config-route-map)# match community LIST_NAME
switch(config-route-map)# set weight 100
switch(config-route-map)#
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric	Redistributes routes with the metric specified.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another.
set as-path	Modifies an autonomous system path for BGP routes.
set community	Sets the BGP communities attribute.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

route-reflector-client (BGP)

To configure the router as a BGP route reflector and configure the specified neighbor as its client, use the **route-reflector-client** command. To indicate that the neighbor is not a client, use the **no** form of this command.

route-reflector-client

no route-reflector-client

Syntax Description

This command has no arguments or keywords.

Command Default

There is no route reflector in the autonomous system.

Command Modes

BGP Neighbor address-family configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

All the neighbors configured with this command will be members of the client group and the remaining BGP peers will be members of the nonclient group for the local route reflector.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure the local router as a route reflector to the neighbor at 192.168.0.1:

```
switch# configure terminal
switch(config)# router bgp 102
switch(config-router)# neighbor 192.168.0.1 remote-as 201
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# route-reflector-client
switch(config-router-neighbor-af)#
```

Related Commands

Command	Description
address-family (BGP)	Enters the router in address family configuration mode for configuring BGP routing sessions.
neighbor	Configures a BGP neighbor.
show ip bgp	Displays entries in the BGP routing table.

router bgp

To assign an autonomous system (AS) number to a router and enter the router BGP configuration mode, use the **router bgp** command. To remove an AS number assignment, use the **no** form of this command.

```
router bgp as-num[.as-num]

no router bgp as-num[.as-num]
```

Syntax Description

<i>as-num</i>	Number of an autonomous system that identifies the router to other BGP routers and tags the routing information passed along; valid values are from 1 to 65535.
<i>.as-num</i>	(Optional) Number of an autonomous system that identifies the router to other BGP routers and tags the routing information passed along; valid values are from 0 to 65535.

Command Default

No BGP routing process is enabled by default.

Command Modes

Address-family configuration mode
Neighbor address-family configuration mode
Router BGP configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

The *as-num* is the number for the local BGP speaker and allows you to create a unique identifier for the BGP process on the router.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure a BGP process for autonomous system 120:

```
switch# configure terminal
switch(config)# router bgp 120
switch(config-router)#
```

This example shows how to log neighbor changes for BGP in router configuration mode:

```
switch# configure terminal
switch(config)# bgp router 40000
switch(config-router)# log-neighbor-changes
switch(config-router)#
```

This example shows how to disable the BGP fast external fallover feature. If the link through which this session is carried flaps, the connection is not reset.

```
switch# configure terminal
```



```
switch(config)# bgp router 64496  
switch(config-router)# no fast-external-fallover  
switch(config-router)#
```

This example shows how all incoming updates from eBGP peers are examined to ensure that the first autonomous system number in the AS_PATH is the local AS number of the transmitting peer. The updates from the 10.100.0.1 peer are discarded if the first AS number is not 65001.

```
switch# configure terminal  
switch(config)# router bgp 64496  
switch(config-router)# bgp enforce-first-as  
switch(config-router)# address-family ipv4  
switch(config-router-af)# neighbor 10.100.0.1 remote-as 64496  
switch(config-router-af)#
```

Related Commands

Command	Description
show bgp	Displays BGP routes.
show running-config	Displays the running system configuration information.

router eigrp

To configure a routing process and enter router configuration mode for Enhanced Interior Gateway Routing Protocol (EIGRP), use the **router eigrp** command. To turn off the EIGRP routing process, use the **no** form of this command.

router eigrp *instance-tag*

no router eigrp *instance-tag*

Syntax Description

<i>instance-tag</i>	Name of an EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
---------------------	--

Command Default

None

Command Modes

Global configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure a routing process for EIGRP:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)#
```

Related Commands

Command	Description
default-information	Controls the distribution of a default route.
default-metric	Configures the default metric for routes redistributed into EIGRP.
distance	Configures the administrative distance.
maximum-paths	Configures the maximum number of equal-cost paths.
redistribute	Configures route redistribution for EIGRP.
router-id	Configures the router ID.
timers	Configures the EIGRP timers.

router ospf

To configure an Open Shortest Path First (OSPF) routing instance, use the **router ospf** command. To terminate an OSPF routing process, use the **no** form of this command.

router ospf *instance-tag*

no router ospf *instance-tag*

Syntax Description

<i>instance-tag</i>	Internally used identification parameter for an OSPF routing instance. It is locally assigned and can be any word or positive integer. The <i>instance-tag</i> argument can be a maximum of 20 alphanumeric characters.
---------------------	---

Command Default

No OSPF routing instance is defined.

Command Modes

Global configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure a basic OSPF instance:

```
switch# configure terminal
switch(config)# router ospf 12
switch(config-router)#
```

This example shows how to delete an OSPF instance:

```
switch# configure terminal
switch(config)# no router ospf 12
switch(config)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
show ip ospf	Displays OSPF information.

router rip

To configure the Routing Information Protocol (RIP) routing process, use the **router rip** command. To turn off the RIP routing process, use the **no** form of this command.

```
router rip instance-tag

no router rip
```

Syntax Description	instance-tag	Name for this RIP instance.
--------------------	--------------	-----------------------------

Command Default	No RIP routing process is defined.
-----------------	------------------------------------

Command Modes	Global configuration mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples

This example shows how to begin the RIP routing process:

switch# **configure terminal**
switch(config)# **router rip Enterprise**
switch(config-router)#

Related Commands	Command	Description
	ip router rip	Specifies a RIP instance for an interface.

router-id (EIGRP)

To configure a router ID for an Enhanced Interior Gateway Routing Protocol (EIGRP) process, use the **router-id** command. To cause the software to use the default method of determining the router ID, use the **no** form of this command.

router-id *router-id*

no router-id

Syntax Description

<i>router-id</i>	Unique 32-bit router ID value specified in four-part, dotted-decimal notation.
------------------	--

Command Default

If this command is not configured, EIGRP chooses an IPv4 address as the router ID from one of its interfaces.

Command Modes

Address family configuration mode
Router configuration mode
Router VRF configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Configuring a router ID ensures that EIGRP can function regardless of the interface address configuration.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to assign the IP address of 192.0.2.1 to the EIGRP process 1:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# address-family ipv4
switch(config-router-af)# router-id 192.0.2.1
switch(config-router-af)#
```

Related Commands

Command	Description
show running-config	Displays the running system configuration information.

router-id (OSPF)

To use a fixed router ID for an Open Shortest Path First (OSPF) instance, use the **router-id** command. To revert to the previous OSPF router ID behavior, use the **no** form of this command.

```
router-id ip-address
no router-id ip-address
```

Syntax Description	ip-address	Router ID in IP address format.
--------------------	------------	---------------------------------

Command Default	If this command is not configured, OSPF chooses an IPv4 address as the router ID from one of its interfaces.	
-----------------	--	--

Command Modes	Router configuration mode	
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Configuring a router ID ensures that EIGRP can function regardless of the interface address configuration.
	If this command is used on an OSPF instance that has neighbors, OSPF uses the new router ID at the next reload or at a restart of OSPF.
	This command requires the LAN Enterprise Services license.

Examples	This example shows how to configure the router ID:
	switch# configure terminal
	switch(config)# router ospf 12
	switch(config-router)# router-id 192.0.2.1
	switch(config-router)#

Related Commands	Command	Description
	router ospf	Configures the OSPF routing process.

routing-context vrf

To set the virtual routing and forwarding (VRF) scope for all EXEC commands, use the **routing-context vrf** command. To return to the default setting, use the **no** form of this command.

routing-context vrf *vrf-name*

no routing-context vrf *vrf-name*

Syntax Description	<i>vrf-name</i> Name of the VRF instance. The name can be any case-sensitive, alphanumeric string up to 32 characters. The VRF name can be one of the following: <ul style="list-style-type: none">• default—Specifies the default VRF.• management—Specifies the management VRF.				
Command Default	default VRF				
Command Modes	EXEC mode				
Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr></table>	Release	Modification	5.0(3)U1(1)	This command was introduced.
Release	Modification				
5.0(3)U1(1)	This command was introduced.				
Usage Guidelines	<p>This feature automatically restricts the scope of the output of EXEC commands to the configured VRF. You can override this scope by using the VRF keywords available for some EXEC commands.</p> <p>This command does not require a license.</p>				
Examples	<p>This example shows how to limit EXEC commands to the management VRF:</p> <pre>switch# routing-context vrf management switch%management#</pre>				
Related Commands	<table><tr><th>Command</th><th>Description</th></tr><tr><td>show routing-context</td><td>Displays the current routing context.</td></tr></table>	Command	Description	show routing-context	Displays the current routing context.
Command	Description				
show routing-context	Displays the current routing context.				

send-community

To send the Border Gateway Protocol (BGP) community attribute to a peer, use the **send-community** command. To revert to the defaults, use the **no** form of this command.

```
send-community [extended]

no send-community [extended]
```

Syntax Description	extended (Optional) Specifies the BGP extended community.
--------------------	--

Command Default	No community attributes are sent to the peer.
-----------------	---

Command Modes	BGP neighbor address-family configuration mode
---------------	--

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Before you use this command, you must configure BGP communities using the set community command.
	This command requires the LAN Enterprise Services license.

Examples	This example shows how to configure the router to send the community attribute to the neighbor 192.168.1.3:
	<pre>switch# configure terminal switch(config)# router bgp 102 switch(config-router)# neighbor 192.168.1.3 remote-as 64497 switch(config-router-neighbor)# address-family ipv4 multicast switch(config-router-neighbor-af)# send-community switch(config-router-neighbor-af)#</pre>

Related Commands	Command	Description
	set community	Defines the BGP community attributes.
	show ip bgp	Displays the BGP configuration information.

set as-path

To modify an autonomous system path (as-path) for BGP routes, use the **set as-path** command. To not modify the autonomous system (AS) path, use the **no** form of this command.

```
set as-path { tag | { prepend as-num[...as-num] | last-as num } }
```

```
no as-path { tag | { prepend as-num[...as-num] | last-as num } }
```

Syntax Description	tag	Converts the tag of a route into an autonomous system path. Applies only when redistributing routes into Border Gateway Protocol (BGP).
	prepend <i>as-num</i>	Appends the specified AS number to the autonomous system path of the route that is matched by the route map. Applies to both inbound and outbound BGP route maps. Range: 1 to 65535. You can configure more than one AS number.
	last-as <i>num</i>	Prepends the last AS numbers to the as-path. Range: 1 to 10.

Command Default	Autonomous system path is not modified.
------------------------	---

Command Modes	Route-map configuration mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Once you enter route-map configuration mode, you can enter the **set** command.

The only global BGP metric available to influence the best path selection is the autonomous system path length. By varying the length of the autonomous system path, a BGP speaker can influence the best-path selection by a peer further away.

By allowing you to convert the tag into an autonomous system path, the **set as-path tag** variation of this command modifies the autonomous system length. The **set as-path prepend** variation allows you to prepend an arbitrary autonomous system path string to BGP routes. Usually, the local autonomous system number is prepended multiple times, increasing the autonomous system path length.

This command requires the LAN Enterprise Services license.

Examples	This example shows how to convert the tag of a redistributed route into an autonomous system path:
-----------------	--

```
switch# configure terminal
switch(config)# route-map test1
switch(config-route-map)# set as-path tag
switch(config-route-map)#
```

This example shows how to prepend 100 to all the routes advertised to 10.108.1.1:

```

switch# configure terminal
switch(config)# route-map test1
switch(config-route-map)# match as-path 1
switch(config-route-map)# set as-path prepend 100
switch(config)# router bgp 64496
switch(config-router)# neighbor 10.108.1.1 remote-as 64497
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# route-map set-as-path test1 out
switch(config-router-neighbor-af)#

```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric	Redistributes routes with the metric specified.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another.
set as-path	Modifies an autonomous system path for BGP routes.
set community	Sets the BGP communities attribute.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

set comm-list delete

To remove communities from the community attribute of an inbound or outbound update, use the **set comm-list delete** command. To remove a previous **set comm-list delete** command, use the **no** form of this command.

set comm-list *community-list-name* **delete**

no set comm-list

Syntax Description

<i>community-list-name</i>	Standard or expanded community list name. The name is any alphanumeric string up to 63 characters.
----------------------------	--

Command Default

No communities are removed.

Command Modes

Route-map configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This **set** command removes communities from the community attribute of an inbound or outbound update using a route map to filter and determine the communities to be deleted. Depending upon whether the route map is applied to the inbound or outbound update for a neighbor, each community that passes the route map **permit** clause and matches the given community list is removed from the community attribute being received from or sent to the Border Gateway Protocol (BGP) neighbor.

Each entry of a standard community list should list only one community when used with the **set comm-list delete** command. For example, in order to be able to delete communities 10:10 and 10:20, you must use the following format to create the entries:

```
switch(config)# ip community-list 500 permit 10:10
switch(config)# ip community-list 500 permit 10:20
```

The following format for a community list entry, while acceptable otherwise, does not work with the **set comm-list delete** command:

```
switch(config)# ip community-list 500 permit 10:10 10:20
```

When both the **set community** *community-number* and **set comm-list delete** commands are configured in the same sequence of a route map attribute, the deletion operation (**set comm-list delete**) is performed before the set operation (**set community** *community-number*).

This command requires the LAN Enterprise Services license.

Examples

This example shows how to remove communities from the community attribute of an inbound or outbound update:

```

switch# configure terminal
switch(config)# route-map test1
switch(config-route-map)# match as-path 1
switch(config-route-map)# set comm-list list1 delete
switch(config-route-map)#

```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric	Redistributes routes with the metric specified.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another.
set as-path	Modifies an autonomous system path for BGP routes.
set community	Sets the BGP communities attribute.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

set community

To set the Border Gateway Protocol (BGP) communities attribute, use the **set community** command. To delete the entry, use the **no** form of this command.

set community { **none** | { *aa:nn* [...*aa:nn*] | **additive** | **no-advertise** | **no-export** } }

no set community { **none** | { *aa:nn* | **additive** | **no-advertise** | **no-export** } }

Syntax Description	
none	(Optional) Specifies the no community attribute. You cannot configure any other keyword if you configure the none keyword.
<i>aa:nn</i>	(Optional) Autonomous system (AS) number and network number entered in the 4-byte new community format. This value is configured with two 2-byte numbers separated by a colon. A number from 1 to 65535 can be entered as each 2-byte number. A single community can be entered or multiple communities can be entered, each separated by a space. You can configure one or more AS numbers. You can configure one or more keywords.
additive	(Optional) Adds to existing community. You can configure one or more keywords.
no-advertise	(Optional) Specifies the no-advertise community (well-known community). Routes with this community are not advertised to any peer (internal or external). You can configure one or more keywords.
no-export	(Optional) Specifies the no-export community (well-known community). Routes with this community are advertised to only peers in the same autonomous system or to only other subautonomous systems within a confederation. These routes are not advertised to external peers. You can configure one or more keywords.

Command Default No BGP communities attributes exist.

Command Modes Route-map configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines You must have a match clause (even if it points to a “permit everything” list) if you want to set tags.

Use the **route-map** global configuration command and the **match** and **set** route map configuration commands to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **set** route map configuration commands specify the redistribution set actions to be performed when all of the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure the routes that pass the autonomous system path access list 1 to have the community set to 109:02 and 33:40. Routes that pass the autonomous system path access list 2 have the community set to no-export (these routes are not advertised to any external BGP [eBGP] peers).

```
switch# configure terminal
switch(config)# route-map test1 10 permit
switch(config-route-map)# match as-path 1
switch(config-route-map)# set community 109:02 33:40
switch(config-route-map)# exit
switch(config)# route-map test1 20 permit
switch(config-route-map)# match as-path 2
switch(config-route-map)# set community no-export
switch(config-route-map)#
```

Related Commands

Command	Description
ip community-list	Creates a community list for BGP and control access to it.
match community	Matches a BGP community.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another.
set comm-list delete	Removes communities from the community attribute of an inbound or outbound update.
show ip bgp community	Displays routes that belong to specified BGP communities.

set dampening

To set the Border Gateway Protocol (BGP) route dampening factors, use the **set dampening** command. To disable this function, use the **no** form of this command.

set dampening *half-life reuse suppress max-suppress-time*

no set dampening

Syntax Description		
<i>half-life</i>		Time (in minutes) after which a penalty is decreased. Once the route has been assigned a penalty, the penalty is decreased by half after the half life period (which is 15 minutes by default). The process of reducing the penalty occurs every 5 seconds. The range is from 1 to 45, and the default is 15.
<i>reuse</i>		Route that is unsuppressed if the penalty for a flapping route decreases enough to fall below this value. The process of unsuppressing routes occurs at 10-second increments. Range: 1 to 20000. Default: 750.
<i>suppress</i>		Route that is suppressed when its penalty exceeds this limit. The range is from 1 to 20000, and the default is 2000.
<i>max-suppress-time</i>		Maximum time (in minutes) that a route can be suppressed. The range is from 1 to 255, and the default is four times the <i>half-life</i> value. If the default <i>half-life</i> value is used, the maximum suppress time defaults to 60 minutes.

Command Default	Disabled
-----------------	----------

Command Modes	Route-map configuration mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **route-map** global configuration command and the **match** and **set** route-map configuration commands to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

When a BGP peer is reset, the route is withdrawn and the flap statistics cleared. In this instance, the withdrawal does not incur a penalty even though route flap dampening is enabled.

This command requires the LAN Enterprise Services license.

Examples

This example sets the half life to 30 minutes, the reuse value to 1500, the suppress value to 10000, and the maximum suppress time to 120 minutes:

```
switch# configure terminal
switch(config)# route-map test1 10 permit
switch(config-route-map)# set dampening 30 1500 10000 120
switch(config-route-map)#
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric	Redistributes routes with the metric specified.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another.
set as-path	Modifies an autonomous system path for BGP routes.
set community	Sets the BGP communities attribute.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

set extcommunity

To set the Border Gateway Protocol (BGP) extended communities attribute, use the **set extcommunity** command. To delete the entry, use the **no** form of this command.

```
set extcommunity { none | { generic { transitive | nontransitive } aa4:nn [...aa4:nn] } | additive }
no set extcommunity { none | { generic { transitive | nontransitive } aa4:nn [...aa4:nn] } | additive }
```

Syntax Description	
none	(Optional) Specifies the no community attribute.
generic	Specifies the generic specific extended community type.
transitive	Configures BGP to propagate the extended community attributes to other autonomous systems.
nontransitive	Configures BGP to propagate the extended community attributes to other autonomous systems.
<i>aa4:nn</i>	(Optional) Autonomous system number and network number. This value is configured with a 4-byte AS number and a 2-byte network number separated by a colon. The 4-byte AS number range is from 1 to 4294967295 in plaintext notation, or from 1.0 to 56636.65535 in AS.dot notation. You can enter a single community or multiple communities, each separated by a space.
additive	(Optional) Adds to existing community.

Command Default No BGP communities attributes exist.

Command Modes Route-map configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines You must have a match clause in a route map (even if it points to a “permit everything” list) if you want to use **set** commands.

The **set** commands specify the set actions to be performed when all of the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

This command requires the LAN Enterprise Services license.

Examples This example shows how to configure a route map that sets the extended community to 1.5:

```
switch# configure terminal
switch(config)# route-map test1 10 permit
switch(config-route-map)# match as-path 1
switch(config-route-map)# set extcommunity generic transitive 1.5
```

```
switch(config-route-map) # exit
switch(config-route-map) #
```

Related Commands	Command	Description
	ip extcommunity-list	Creates a community list for BGP and controls access to it.
	route-map	Defines the conditions for redistributing routes from one routing protocol into another.
	send-community	Configures BGP to propagate community attributes to BGP peers.
	match extcommunity	Matches an extended community in a route map.
	ip extcommunity-list	Creates a community list for BGP and controls access to it.

set extcomm-list delete

To remove extended communities from the extended community attribute of an inbound or outbound Border Gateway Protocol (BGP) update, use the **set extcomm-list delete** command. To remove a previous **set extcomm-list delete** command, use the **no** form of this command.

set extcomm-list *community-list-name* **delete**

no set extcomm-list

Syntax Description

<i>community-list-name</i>	Standard or expanded extended community list name. The name is any alphanumeric string up to 63 characters.
----------------------------	---

Command Default

No communities are removed.

Command Modes

Route-map configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

You must have a match clause in a route map (even if it points to a “permit everything” list) if you want to use **set** commands.

The **set** commands specify the set actions to be performed when all of the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

When you configure both the **set extcommunity** *community-number* and **set ext comm-list delete** commands in the same sequence of a route map attribute, the deletion operation (**set extcomm-list delete**) is performed before the set operation (**set extcommunity** *community-number*).

This command requires the LAN Enterprise Services license.

Examples

This example shows how to remove extended communities from the extended community attribute of an inbound or outbound update:

```
switch# configure terminal
switch(config)# route-map test1
switch(config-route-map)# match as-path 1
switch(config-route-map)# set extcomm-list list1 delete
switch(config-route-map)#
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match extcommunity	Matches a BGP extended community.
set extcommunity	Sets the BGP extended communities attribute.

set forwarding-address

To set the Open Shortest Path First (OSPF) forwarding address for redistributed type-5 Link State Advertisements (LSAs), use the **set forwarding-address** command. To remove the address, use the **no** form of this command.

set forwarding-address

no forwarding-address

Syntax Description This command has no arguments or keywords.

Command Default No forwarding address is set as a default.

Command Modes Route-map configuration mode

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command is used by the OSPF to set the forwarding address for the redistributed type-5 LSAs. The value of the forwarding address specified by the autonomous system boundary router (ASBR) can be either 0.0.0.0 or nonzero. The 0.0.0.0 address indicates that the originating router (the ASBR) is the next hop.

If the ASBR redistributes routes and OSPF is not enabled on the next hop interface for those routes, the forwarding address is set to 0.0.0.0 .

All of the following conditions must be met to set the forwarding address field to a nonzero address:

- OSPF is enabled on the ASBR's next hop interface.
- ASBR's next hop interface is non-passive under OSPF.
- ASBR's next hop interface is not point-to-point.
- ASBR's next hop interface is not point-to-multipoint.

For all other conditions, set the forwarding address to 0.0.0.0.

This command requires the LAN Enterprise Services license.

Examples This example shows how to set the forwarding address:

```
switch# configure terminal
switch(config)# route-map test1 10 permit
switch(config-route-map)# set forwarding-address
switch(config-route-map)#
```

Related Commands	Command	Description
	match as-path	Matches a BGP autonomous system path access list.
	match community	Matches a BGP community.
	match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
	match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
	match metric	Redistributes routes with the metric specified.
	match tag	Redistributes routes in the routing table that match the specified tags.
	route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another.
	set as-path	Modifies an autonomous system path for BGP routes.
	set community	Sets the BGP communities attribute.
	set level	Indicates where to import routes.
	set local-preference	Specifies a preference value for the autonomous system path.
	set metric	Sets the metric value for a routing protocol.
	set metric-type	Sets the metric type for the destination routing protocol.
	set next-hop	Specifies the address of the next hop.
	set tag	Sets a tag value of the destination routing protocol.
	set weight	Specifies the BGP weight for the routing table.

set ip next-hop peer-address

To use a route-map to set the next-hop as peer-address and apply on the outbound Border Gateway Protocol (BGP) advertisements, use the **set ip next-hop peer-address** command. To remove the next-hop configuration, use the **no** form of this command.

set ip next-hop peer-address

no set ip next-hop peer-address

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Defaults	None
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Command Modes	Router map configuration mode
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Command History	Release	Modification
	5.0(3)U3(1)	This command was introduced.

Usage Guidelines	When you use the set ip next-hop peer-address command, the next-hop will change for route reflector clients to the self IP address.
-------------------------	--

This command does not require a license.

Examples	This example shows how to configure a route-map to set the next-hop as peer-address and apply on outbound BGP advertisements:
-----------------	---

```
switch# configure terminal
switch(config)# router bgp 65536
switch(config-router)# neighbor 192.0.2.10 remote-as 65536
switch(config-router-neighbor)# address-family ipv6 unicast
switch(config-router-neighbor)# route-reflector-client
switch(config-route-map)# route-map rml
switch(config-route-map)# set ip next-hop peer-address
switch(config-route-map)#
```

This example shows how to remove the route-map configurations for next hop:

```
switch(config-route-map)# set ip next-hop peer-address
switch(config-route-map)#
```

Related Commands	Command	Description
	route-map	Creates a route map and enters the route-map configuration mode.

set ip next-hop unchanged

To enable an external BGP (eBGP) peer that is configured as multihop to propagate the next hop unchanged, use the `set ip next-hop-unchanged` command in route-map configuration mode.

set ip next-hop unchanged

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Router map configuration mode

Command History	Release	Modification
	6.0(2)U2(1)	This command was introduced.

Usage Guidelines

By default, for eBGP, the next hop to reach a connected network is the IP address of the neighbor that sent the update. Therefore, as an update goes from device to device, the next hop typically changes to be the address of the neighbor that sent the update (the device’s own address).

However, there might be a scenario where you want the next hop to remain unchanged. The **set ip next-hop-unchanged** command is used to propagate the next hop unchanged for multihop eBGP peering sessions.

Examples This example shows how to configure a route map to set the next hop ip address unchanged:

```
switch# configure terminal
switch(config)# route-map route
switch(config-route-map)# set ip next-hop unchanged
switch(config-route-map)# exit
```

Related Commands	Command	Description
	route-map	Creates a route map and enters the route-map configuration mode.

set level

To indicate where to import routes, use the **set level** command. To delete an entry, use the **no** form of this command.

```
set level {level-1 | level-2 | level-1-2}
```

```
no set level {level-1 | level-2 | level-1-2}
```

Syntax Description

level-1	Imports routes into a Level 1 area.
level-2	Imports routes into a Level 2 subdomain.
level-1-2	Imports routes into Level 1 and Level 2.

Command Default

This command is disabled by default.

Command Modes

Route-map configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **route-map** global configuration command and the **match** and **set** route-map configuration commands to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **set** route-map configuration commands specify the redistribution set actions to be performed when all the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to import the routes into the Level 1 area:

```
switch# configure terminal
switch(config)# route-map testcase
switch(config-route-map)# set level level-1
switch(config-route-map)
```

Related Commands

Command	Description
neighbor next-hop-self	Disables next hop processing of BGP updates on the router.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol to another.

set local-preference

To specify a preference value for the autonomous system path, use the **set local-preference** command. To delete an entry, use the **no** form of this command.

set local-preference *number-value*

no set local-preference *number-value*

Syntax Description	<i>number-value</i>	Preference value. The range is from 0 to 4294967295. The default is 100.
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Command Default	Preference value of 100 by default.
-----------------	-------------------------------------

Command Modes	Route-map configuration mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	<p>The preference is sent only to all routers in the local autonomous system.</p> <p>You must have a match clause (even if it points to a “permit everything” list) if you want to set tags.</p> <p>Use the route-map global configuration command and the match and set route-map configuration commands to define the conditions for redistributing routes from one routing protocol into another. Each route-map command has a list of match and set commands associated with it. The match commands specify the match criteria—the conditions under which redistribution is allowed for the current route-map command. The set commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the match commands are met. The no route-map command deletes the route map.</p> <p>The set route-map configuration commands specify the redistribution set actions to be performed when all the match criteria of a route map are met. When all match criteria are met, all set actions are performed.</p> <p>You can change the default preference value with the bgp default local-preference command.</p> <p>This command requires the LAN Enterprise Services license.</p>
------------------	--

Examples	<p>This example shows how to set the local preference to 100 for all routes that are included in access list 1:</p> <pre>switch# configure terminal switch(config)# route-map map-preference switch(config-route-map)# match as-path 1 switch(config-route-map)# set local-preference 100 switch(config-route-map)#</pre>
----------	---

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match interface (IP)	Distributes routes that have their next hop out one of the interfaces specified.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric (IP)	Redistributes routes with the metric specified.
match route-type (IP)	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another.
set automatic-tag	Automatically computes the tag value.
set community	Sets the BGP communities attribute.
set level (IP)	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric (BGP, OSPF, RIP)	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set origin (BGP)	Sets the BGP origin code.
set tag (IP)	Sets the value of the destination routing protocol.

set metric

To set the metric value for a routing protocol, use the **set metric** command. To return to the default metric value, use the **no** form of this command.

set metric [**+** | **-**] *bandwidth-metric*

set metric *bandwidth-metric* [*delay-metric* *reliability-metric* *load-metric* *mtu*]

no set metric

Syntax Description	
+	(Optional) Adds to the existing delay metric value.
-	(Optional) Subtracts from the existing delay metric value.
<i>bandwidth-metric</i>	Interior Gateway Routing Protocol (IGRP) bandwidth metric, in Kb/s. The range is from 0 to 4294967295.
<i>delay-metric</i>	(Optional) Interior Gateway Routing Protocol (IGRP) delay metric, in 10 microsecond units. The range is from 1 to 4294967295.
<i>reliability-metric</i>	(Optional) IGRP reliability metric. The range is from 0 to 255.
<i>load-metric</i>	(Optional) IGRP load metric. The range is from 1 to 255.
<i>mtu</i>	(Optional) IGRP maximum transmission unit (MTU) of the path. The range is from 1 to 4294967295.

Command Default None

Command Modes Route-map configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines



Note

We recommend that you consult your Cisco technical support representative before changing the default value.

When you configure the *reliability-metric* and the *load-metric* arguments, 255 means 100 percent reliability.

Use the **+** or **-** keywords to modify the existing delay metric value. You can modify only the delay metric with these keywords.

Use the **route-map** global configuration command and the **match** and **set** route-map configuration command to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current

route-map command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **set** route-map configuration commands specify the redistribution set actions to be performed when all the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to set the bandwidth metric value for the routing protocol to 100:

```
switch# configure terminal
switch(config)# route-map set-metric
switch(config-route-map)# set metric 100
switch(config-route-map)#
```

This example shows how to increase the bandwidth metric value for the routing protocol by 100:

```
switch# configure terminal
switch(config)# route-map set-metric
switch(config-route-map)# set metric +100
switch(config-route-map)#
```

Related Commands

Command	Description
route-map	Defines the conditions for redistributing routes from one routing protocol into another.

set metric-type

To set the metric type for the destination routing protocol, use the **set metric-type** command. To return to the default, use the **no** form of this command.

```
set metric-type {internal | type-1 | type-2}
```

```
no set metric-type {internal | type-1 | type-2}
```

Syntax Description	internal	Specifies the Interior Gateway Protocol (IGP) metric as the multi-exit discriminator (MED) for BGP.
	type-1	Specifies the Open Shortest Path First (OSPF) external Type 1 metric.
	type-2	Specifies the OSPF external Type 2 metric.

Command Default	This command is disabled by default.
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Command Modes	Route-map configuration mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **route-map** global configuration command with **match** and **set** route-map configuration commands to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **set** route-map configuration commands specify the redistribution set actions to be performed when all the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

**Note**

This command is not supported for redistributing routes into Border Gateway Protocol (BGP).

This command requires the LAN Enterprise Services license.

Examples	This example shows how to set the metric type of the destination protocol to OSPF external Type 1:
----------	--

```
switch# configure terminal
switch(config)# route-map map-type
switch(config-route-map)# set metric-type type-1
switch(config-route-map)#
```

Related Commands	Command	Description
	match as-path	Matches a BGP autonomous system path access list.
	match community	Matches a BGP community.
	match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
	match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
	match metric	Redistributes routes with the metric specified.
	match route-type	Redistributes routes of the specified type.
	match tag	Redistributes routes in the routing table that match the specified tags.
	route-map	Defines the conditions for redistributing routes from one routing protocol into another.
	set as-path	Sets a BGP autonomous system path access list.
	set community	Sets the BGP communities attribute.
	set level	Indicates where to import routes.
	set local-preference	Specifies a preference value for the autonomous system path.
	set metric	Sets the metric value for a routing protocol.
	set metric-type	Sets the metric type for the destination routing protocol.
	set origin	Sets the BGP origin code.
	set tag	Sets the value of the destination routing protocol.

set origin

To set the Border Gateway Protocol (BGP) origin code, use the **set origin** command. To delete the entry, use the **no** form of this command.

```
set origin {egp as-num [:as-num] | igp | incomplete}
```

```
no set origin
```

Syntax Description

egp <i>as-num</i>	Specifies the autonomous system (AS) number for a remote exterior gateway protocol (EGP) system. You can specify the AS number as a 2-byte integer or a 4-byte integer in aa:nn format. The range is from 1 to 65535.
igp	Specifies a local interior gateway protocol (IGP) system.
incomplete	Specifies an unknown heritage.

Command Default

Default origin, based on route in main IP routing table.

Command Modes

Route-map configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

You must have a match clause (even if it points to a “permit everything” list) if you want to set tags.

Use the **route-map** global configuration command, and the **match** and **set** route-map configuration commands, to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **set route-map** configuration commands specify the redistribution set actions to be performed when all of the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to set the origin of routes that pass the route map to IGP:

```
switch# configure terminal
switch(config)# route-map set_origin
switch(config-route-map)# match as-path 10
switch(config-route-map)# set origin igp
switch(config-route-map)#
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric	Redistributes routes with the metric specified.
match route-type	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map	Defines the conditions for redistributing routes from one routing protocol into another.
set as-path	Sets a BGP autonomous system path access list.
set community	Sets the BGP communities attribute.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set origin	Sets the BGP origin code.
set tag	Sets the value of the destination routing protocol.

set path-selection all advertise

Use the **set path-selection all advertise** command in route-map configuration mode to advertise all BGP paths as additional paths to peers if the receive capability is enabled. To reset to the default, use the **no** form of this command.

set path-selection all advertise

no set path-selection all advertise

Syntax Description This command has no arguments or keywords.

Command Default Only the best-path is advertised to the peer.

Command Modes Route-map configuration (config-route-map)

Command History	Release	Modification
	6.0(2)U1(1)	This command was introduced.

Usage Guidelines Use the **set path-selection all advertise** command to advertise all BGP paths as additional paths to peers if the receive capability is enabled with the **capability additional-paths receive** command.

This command selects all BGP paths with a unique next hop as candidates to advertise to BGP peers; paths with a duplicate next hop are not considered.

Examples The following example shows how to set the advertising of additional paths in a route map:

```
switch# configure terminal
switch (config)# router bgp 65000
switch (config-router)# route-map add_path4 permit 10
switch (config-router)# set path-selection all advertise
```

Related Commands	Command	Description
	additional-paths receive	Enables BGP additional paths for a prefix to be received from a capable peer.
	additional-paths receive	Enables BGP additional paths for a prefix to be received from a capable peer.
	additional-paths selection	Configures additional paths selection capability for a prefix.
	capability additional-paths receive	Configures the capability of receiving additional paths from a peer.

set tag

To set a tag value of the destination routing protocol, use the **set tag** command. To delete the entry, use the **no** form of this command.

```
set tag tag-value

no set tag tag-value
```

Syntax Description	tag-value	Name for the tag. The value is an integer from 0 to 4294967295.
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Command Default	If not specified, the default action is to <i>forward</i> the tag in the source routing protocol onto the new destination protocol.	
-----------------	---	--

Command Modes	Route-map configuration mode	
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **route-map** global configuration command and the **match** and **set** route-map configuration commands to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **set** route-map configuration commands specify the redistribution set actions to be performed when all the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to set the tag value of the destination routing protocol to 5:

```
switch# configure terminal
switch(config)# route-map test
switch(config-route-map)# set tag 5
switch(config-route-map)#
```

Related Commands	Command	Description
	match as-path	Matches a BGP autonomous system path access list.
	match community	Matches a BGP community.
	match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list.
	match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
	match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
	match metric	Redistributes routes with the metric specified.
	match route-type	Redistributes routes of the specified type.
	match tag	Redistributes routes in the routing table that match the specified tags.
	route-map	Defines the conditions for redistributing routes from one routing protocol into another.
	set as-path	Sets a BGP autonomous system path access list.
	set community	Sets the BGP communities attribute.
	set level	Indicates where to import routes.
	set local-preference	Specifies a preference value for the autonomous system path.
	set metric	Sets the metric value for a routing protocol.
	set metric-type	Sets the metric type for the destination routing protocol.
	set origin	Sets the BGP origin code.
	set tag	Sets the value of the destination routing protocol.

set weight

To specify the Border Gateway Protocol (BGP) weight for the routing table, use the **set weight** command. To delete an entry, use the **no** form of this command.

set weight *number*

no set weight [*number*]

Syntax Description	<i>number</i>	Weight value. The range is from 0 to 65535.
---------------------------	---------------	---

Command Default	The weight is not changed by the specified route map.
------------------------	---

Command Modes	Route-map configuration mode
----------------------	------------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	<p>The implemented weight is based on the first matched autonomous system path. Weights indicated when an autonomous system path is matched override the weights assigned by global neighbor commands.</p> <p>This command requires the LAN Enterprise Services license.</p>
-------------------------	---

Examples	<p>This example shows how to set the BGP weight for the routes that match the autonomous system path access list to 200:</p>
-----------------	--

```
switch# configure terminal
switch(config)# route-map set-weight
switch(config-route-map)# match as-path 10
switch(config-route-map)# set weight 200
switch(config-route-map)#
```

Related Commands	Command	Description
	match as-path	Matches a BGP autonomous system path access list.
	match community	Matches a BGP community.
	match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list.
	match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
	match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.

Command	Description
match metric	Redistributes routes with the metric specified.
match route-type	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map	Defines the conditions for redistributing routes from one routing protocol into another.
set as-path	Sets a BGP autonomous system path access list.
set community	Sets the BGP communities attribute.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set origin	Sets the BGP origin code.
set tag	Sets the value of the destination routing protocol.

shutdown (BGP)

To shut down an instance of the Border Gateway Protocol (BGP) without removing the configuration, use the **shutdown** command. To disable this function, use the **no** form of this command.

shutdown

no shutdown

Syntax Description This command has no arguments or keywords.

Command Default Enabled

Command Modes Router configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Enterprise Services license.

Examples This example shows how to disable BGP 64496:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# shutdown
switch(config-router)#
```

Related Commands	Command	Description
	show bgp sessions	Displays BGP sessions.
	show running-config bgp	Displays the running configuration for the BGP.

shutdown (EIGRP)

To shut down an instance of Enhanced Interior Gateway Routing Protocol (EIGRP) without removing the configuration, use the **shutdown** command. To disable this function, use the **no** form of this command.

shutdown

no shutdown

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	Enabled
------------------------	---------

Command Modes	Address family configuration mode Router configuration mode Router VRF configuration mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	<p>This example shows how to disable eigrp 209:</p> <pre>switch# configure terminal switch(config)# router eigrp 209 switch(config-router)# shutdown switch(config-router)#</pre>
-----------------	--

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration in the startup configuration file.
	show ip eigrp interfaces	Displays information about EIGRP interfaces.

shutdown (OSPF)

To stop an Open Shortest Path First (OSPF) instance without removing the configuration, use the **shutdown** command. To start a stopped OSPF instance, use the **no** form of this command.

shutdown

no shutdown

Syntax Description This command has no arguments or keywords.

Command Default No process is stopped.

Command Modes Router configuration mode
VRF configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines The **shutdown** command is displayed in the running configuration file when enabled.
This command requires the LAN Enterprise Services license.

Examples This example shows how to stop an active OSPF instance:

```
switch# configure terminal
switch(config)# router ospf firstcompany
switch(config-router)# shutdown
switch(config-router)#
```

Related Commands	Command	Description
	feature ospf	Enables OSPF on the router.
	router ospf	Configures an OSPF instance.

shutdown (VRRP)

To disable a Virtual Router Redundancy Protocol (VRRP) configuration, use the **shutdown** command. To enable a VRRP configuration, use the **no** form of this command.

shutdown

no shutdown

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	Disabled
------------------------	----------

Command Modes	VRRP configuration mode
----------------------	-------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Shut down the virtual router before configuring the virtual router parameters; you can only configure the virtual router after it is in the administrative shut down state. Enter the no shutdown command to update the virtual router state after completing configuration.
-------------------------	---

This command requires the LAN Base Services license.

Examples	This example shows how to shut down a VRRP group:
-----------------	---

```
switch# configure terminal
switch(config)# interface ethernet 1/5
switch(config-if)# no switchport
switch(config-if)# vrrp 45
switch(config-if-vrrp)# shutdown
switch(config-if-vrrp)# address 6.6.6.45
switch(config-if-vrrp)# no shutdown
switch(config-if-vrrp)#
```

Related Commands	Command	Description
	feature vrrp	Enables VRRP.
	show vrrp	Displays VRRP configuration information.
	clear vrrp	Clears all the software counters for the specified virtual router.

soft-reconfiguration inbound(BGP)

To configure the switch software to start storing Border Gateway Protocol (BGP) peer updates, use the **soft-reconfiguration inbound always** command. To not store received updates, use the **no** form of this command.

soft-reconfiguration inbound [always]

no soft-reconfiguration inbound [always]

Syntax Description	always	Always perform a soft inbound clear using stored updates even if the neighbor supports the route refresh capability.
--------------------	---------------	--

Command Default	Disabled
-----------------	----------

Command Modes	Neighbor address-family configuration mode
---------------	--

Command History	Release	Modification
	6.0(2)U4(1)	The always command option was introduced.
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Entering this command starts the storage of updates, which is required to do inbound soft reconfiguration. To use soft reconfiguration, or soft reset, without preconfiguration, both BGP peers must support the soft route refresh capability. This command requires the LAN Enterprise Services license.
------------------	--

Examples	This example shows how to configure the soft reconfiguration on the neighbor at 192.168.0.1: switch# configure terminal switch(config)# router bgp 102 switch(config-router)# neighbor 192.168.0.1 remote-as 201 switch(config-router-neighbor)# address-family ipv4 unicast switch(config-router-neighbor-af)# soft-reconfiguration inbound always switch(config-router-neighbor-af)#
----------	---

Related Commands	Command	Description
	address-family (BGP)	Enters the router in address family configuration mode for configuring BGP routing sessions.

Command	Description
neighbor	Configures a BGP neighbor.
show ip bgp neighbors	Displays BGP peer information.

stub

To configure a router as a stub using the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **stub** command. To disable the EIGRP stub routing feature, use the **no** form of this command.

```
stub [direct | leak-map map-name | receive-only | redistributed]

no stub [direct | leak-map map-name | receive-only | redistributed]
```

Syntax Description

direct	(Optional) Advertises directly connected routes. This is enabled by default.
leak-map <i>map-name</i>	(Optional) Allows dynamic prefixes based on the leak map.
receive-only	(Optional) Sets the router as a receive-only neighbor.
redistributed	(Optional) Advertises redistributed routes from other protocols and autonomous systems.

Command Default

Disabled

Command Modes

Address-family configuration mode
Router configuration mode
Router VRF configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

The **receive-only** keyword restricts the router from sharing any of its routes with any other router in that EIGRP autonomous system, and the **receive-only** keyword does not permit any other option to be specified because it prevents any type of route from being sent.

The **redistributed** keyword permits EIGRP stub routing to send other routing protocols and autonomous systems. Without the configuration of this option, EIGRP does not advertise redistributed routes.

If you use any of these four keywords (**direct**, **leak-map**, **receive-only**, **redistributed**) with the **stub** command, only the route types specified by the particular keyword(s) are advertised.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure the router as a receive-only neighbor:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# stub receive-only
switch(config-router)#
```

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	show ip eigrp	Displays EIGRP information.
	show ip eigrp neighbors	Displays EIGRP neighbor information.

summary-address (OSPF)

To create aggregate addresses for the Open Shortest Path First (OSPF) protocol, use the **summary-address** command. To return to the default, use the **no** form of this command.

```
summary-address ip-prefix/length [not-advertise] [tag tag]

no summary-address ip-prefix/length [not-advertise] [tag tag]
```

Syntax Description

<i>ip-prefix/length</i>	IP prefix designated for a range of addresses, including the prefix length. Specify <i>ip-prefix</i> as an IP address. Specify <i>length</i> as a number from 1 to 31.
not-advertise	(Optional) Suppresses routes that match the specified prefix/length pair.
tag tag	(Optional) Specifies the tag value that can be used as a match value for controlling redistribution using route maps. The range is from 1 to 65535.

Command Default

None

Command Modes

Router configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

The metric used to advertise the summary is the smallest metric of all the more specific routes.

Use this command to help reduce the size of the routing table and allow an OSPF Autonomous System Boundary Router (ASBR) to advertise one external route as an aggregate for all redistributed routes that are covered by the address.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure the summary address 192.0.0.0 to include address 192.0.1.0, 192.0.2.0, 192.0.3.0, and so on. Only the address 192.0.0.0 is advertised in an external link-state advertisement.

```
switch# configure terminal
switch(config)# router ospf 201
switch(config-router)# summary-address 192.0.0.0/16
switch(config-router)#
```


Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	redistribute (OSPF)	Redistributes external routing protocol routes into OSPF.
	show ip ospf summary-address	Displays OSPF summary-address redistribution information.

suppress-fib-pending

To advertise newly-learned Border Gateway Protocol (BGP) routes only after these routes are confirmed by the Forwarding Information Base (FIB) and programmed in the hardware, use the **suppress-fib-pending** command. To remove the restriction, use the **no** form of this command.

- suppress-fib-pending**
- no suppress-fib-pending**

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes Router configuration mode

Command History	Release	Modification
	6.0(2)U4(1)	This command was introduced.

Usage Guidelines After the routes are programmed in the hardware, subsequent changes to these routes do not require this hardware-programming check.



Note When you enable fib-suppression on the switch and route programming fails in the hardware, BGP advertises routes that are not programmed locally in the hardware.

Examples This example shows how to suppress newly-learned BGP routes from being advertised to downstream BGP neighbors until the routes have been programmed in the hardware:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# suppress-fib-pending
switch(config-router)#
```

Related Commands	Command	Description
	router-bgp	Creates a BGP instance.

suppress-inactive

To advertise the active routes to a Border Gateway Protocol (BGP) peer only, use the **suppress-inactive** command. To remove the restriction, use the **no** form of this command. To return to the default setting, use the **default** form of this command.

suppress-inactive

no default suppress-inactive

Syntax Description

This command has no arguments or keywords.

Command Default

BGP advertises routes to a peer as soon as they are installed in the local routing table, even if the routes are not the active routes in the table.

Command Modes

Neighbor address-family configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command requires the LAN Enterprise Services license.

Examples

This example shows how to create a summary address. The path advertised for this route is an autonomous system set consisting of all elements contained in all paths that are being summarized.

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# neighbor 192.0.2.1/8 remote-as 64497
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor af)# suppress-inactive
switch(config-router-neighbor af)#
```

Related Commands

Command	Description
route-map	Creates a route map.

system urpf disable

To disable Unicast Reverse Path Forwarding (URPF) on the switch, use the **system urpf disable** command. To enable URPF, use the **no** form of this command.

```
system urpf disable
no system urpf disable
```

Syntax Description This command has no arguments or keywords.

Command Default Enabled

Command Modes Global configuration mode
Interface configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines The URPF feature verifies if the source IP address is reachable in order to prevent malformed or forged source IP addresses from entering a network. When a packet is received, this feature determines if its source IP address can be reached via the same (or any other) real interface. When enabled on an interface, any packets that have source addresses that are not found in the routing table are dropped.

This command does not require a license.

Examples This example shows how to disable URPF on the switch:

```
switch# configure terminal
switch(config)# system urpf disable
Warning: URPF successfully disabled
Warning: Please copy running-config to startup-config and reload the switch to a
pply changes
switch(config)#
```

Related Commands	Command	Description
	copy running-config startup-config	Copies the running configuration to the startup configuration file.
	ip verify unicast source reachable-via	Configures URPF on an interface.
	show running-config ip	Displays the IP configuration in the running configuration.

template (BGP)

To create a peer template and enter a peer template configuration mode, use the **template** command. To remove a peer template, use the **no** form of this command.

template { *peer name* | *peer-policy name* | *peer-session name* }

no template { *peer name* | *peer-policy name* | *peer-session name* }

Syntax Description

<i>peer name</i>	Specifies the name of the neighbor template.
<i>peer-policy name</i>	Specifies the name of the peer-policy template.
<i>peer-session name</i>	Specifies the name of the peer-session template.

Command Default

This command has no default settings.

Command Modes

Neighbor address-family configuration mode
Router bgp configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command allows you to enable a set of predefined attributes that a neighbor inherits.



Note

A Border Gateway Protocol (BGP) neighbor cannot be configured to work with both peer groups and peer templates. A BGP neighbor can be configured to belong to a peer group or to inherit policies from peer templates only.

Peer templates support only general policy commands. BGP policy configuration commands that are configured only for specific address families or NLRI configuration modes are configured with peer templates.

General session commands can be configured once in a peer-session template and then applied to many neighbors through the direct application of a peer-session template or through indirect inheritance from a peer-session template. The configuration of peer-session templates simplify the configuration of general session commands that are commonly applied to all neighbors within an autonomous system.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to create a peer-session template named CORE1. This example inherits the configuration of the peer-session template named INTERNAL-BGP.

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# template peer-session CORE1
```

```
switch(config-router-stmp)#
```

This example shows how to create and configure a peer-policy template named CUSTOMER-A:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# template peer-policy CUSTOMER-A
switch(config-router-ptmp)# exit
switch(config-router)# route-map SET-COMMUNITY in
switch(config-router)# filter-list 20 in
switch(config-router)# inherit peer-policy PRIMARY-IN 20
switch(config-router)# inherit peer-policy GLOBAL 10
switch(config-router)# exit-peer-policy
switch(config-router)#
```

This example shows that the maximum prefixes that are accepted from the 192.168.1.1 neighbor is set to 1000:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router) network 192.168.0.0
switch(config-router)# maximum-prefix 1000
switch(config-router)#
```

This example shows that the maximum number of prefixes that are accepted from the 192.168.2.2 neighbor is set to 5000. The router is also configured to display warning messages when 50 percent of the maximum-prefix limit (2500 prefixes) has been reached.

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router) network 192.168.0.0
switch(config-router)# maximum-prefix 5000 50
switch(config-router)#
```

This example shows that the maximum number of prefixes that are accepted from the 192.168.3.3 neighbor is set to 2000. The router is also configured to reestablish a disabled peering session after 30 minutes.

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router) network 192.168.0.0
switch(config-router)# neighbor 192.168.3.3 maximum-prefix 2000 restart 30
switch(config-router)#
```

This example shows that the warning messages are displayed when the maximum-prefix limit (500) for the 192.168.4.4 neighbor is exceeded:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# network 192.168.0.0
switch(config-router)# maximum-prefix 500 warning-only
switch(config-router)#
```

This example forces all updates destined for 10.108.1.1 to advertise this router as the next hop:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# next-hop-self
switch(config-router)#
```

This example shows that the router belongs to autonomous system 109 and is configured to send the communities attribute to its neighbor at IP address 182.168.0.23:

```
switch# configure terminal
```

```
switch(config)# router bgp 64496
switch(config-router)# send-community
switch(config-router)#
```

This example shows that the router belongs to autonomous system 109 and is configured to send the communities attribute to its neighbor at IP address 182.167.0.23:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# address-family ipv4 multicast
switch(config-router-af)# send-community
switch(config-router)#
```

This example enables inbound soft reconfiguration for the neighbor 192.168.0.1. All the updates received from this neighbor are stored unmodified, regardless of the inbound policy. When inbound soft reconfiguration is done later, the stored information is used to generate a new set of inbound updates.

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# soft-reconfiguration inbound
switch(config-router)#
```

Related Commands

Command	Description
address-family	Enters the address family mode for the Border Gateway Protocol (BGP).
password (BGP)	Configures a MD5 password for two BGP peers.
router bgp	Enters the assign an autonomous system (AS) number to a router and enters the router BGP configuration mode

test forwarding distribution perf

To test the forwarding distribution performance of the Forwarding Information Base (FIB), use the **test forwarding distribution perf** command.

test forwarding distribution perf

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to test the forwarding distribution performance:

```
switch# test forwarding distribution perf
```

```
switch#
```

Related Commands	Command	Description
	show forwarding distribution	Displays information about the FIB.

test forwarding inconsistency

To trigger the Layer 3 inconsistency checker for the Forwarding Information Base (FIB), use the **test forwarding inconsistency** command.

test forwarding inconsistency [**ipv4** | **ipv6**] [**unicast**] [**vrf** *vrf-name*] [**module** { *slot* | **all** }] [**stop**]

Syntax Description	ipv4	(Optional) Specifies the inconsistency check for IPv4 routes.
	ipv6	(Optional) Specifies the inconsistency check for IPv6 routes.
	unicast	(Optional) Specifies the inconsistency check for unicast routes.
	module	(Optional) Specifies the inconsistency check for one or more modules.
	<i>slot</i>	Module number. The range depends on the platform.
	all	(Optional) Specifies the inconsistency check for all modules.
	stop	(Optional) Stops the inconsistency check.
	vrf <i>vrf-name</i>	(Optional) Specifies the virtual routing and forwarding (VRF) context name. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default *None*

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to trigger the Layer 3 inconsistency checker for all modules:

```
switch# test forwarding inconsistency module all
```

This example shows how to stop the Layer 3 inconsistency checker for all modules:

```
switch# test forwarding inconsistency module all stop
```

Related Commands	Command	Description
	clear forwarding inconsistency	Clears the FIB inconsistencies.
	show forwarding inconsistency	Displays information about the FIB inconsistencies.

threshold percentage

To set a threshold percentage for a tracked object in a list of objects, use the **threshold percentage** command. To disable the threshold percentage, use the **no** form of this command.

```
threshold percentage {up number [down number] | down number [up number]}

no threshold percentage
```

Syntax Description

up	Specifies the up threshold.
down	(Optional) Specifies the down threshold.
number	Threshold value. The range is from 0 to 100.

Command Default

None

Command Modes

Tracking configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

When you configure a tracked list using the **track object-number list** command, there are two keywords available: **boolean** and **threshold**. If you specify the **threshold** keyword, you can specify either the **percentage** or **weight** keywords. If you specify the **percentage** keyword, the **weight** keyword is unavailable. If you specify the **weight** keyword, the **percentage** keyword is unavailable.

You should configure the up percentage first. The valid range is from 1 to 100. The down percentage depends on what you have configured for up. For example, if you configure 50 percent for up, you see a range from 0 to 49 percent for down.

This command does not require a license.

Examples

This example shows how to configure the tracked list 11 to measure the threshold using an up percentage of 50 and a down percentage of 32:

```
switch# configure terminal
switch(config)# track 11 list threshold percentage
switch(config-track)# object 1
switch(config-track)# object 2
switch(config-track)# threshold percentage up 50 down 32
switch(config-track)#
```

Related Commands

Command	Description
threshold weight	Sets a threshold weight for a tracked object in a list of objects.
track list	Specifies a list of objects to be tracked and the thresholds to be used for comparison.

threshold weight

To set a threshold weight for a tracked object in a list of objects, use the **threshold weight** command. To disable the threshold weight, use the **no** form of this command.

```
threshold weight {up number [down number] | down number [up number]}

no threshold weight
```

Syntax Description

up	Specifies the up threshold.
down	(Optional) Specifies the down threshold.
number	Threshold value. The range is from 1 to 255.

Command Default

None

Command Modes

Tracking configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

When you configure a tracked list using the **track object-number list** command, there are two keywords available: **boolean** and **threshold**. If you specify the **threshold** keyword, you can specify either the **percentage** or **weight** keywords. If you specify the **percentage** keyword, the **weight** keyword is unavailable. If you specify the **weight** keyword, the **percentage** keyword is unavailable.

You should configure the up weight first. The valid range is from 1 to 255. The available down weight depends on what you have configured for the up weight. For example, if you configure 25 for up, you will see a range from 0 to 24 for down.

This command does not require a license.

Examples

This example shows how to configure the tracked list 12 to measure a threshold using a specified weight:

```
switch# configure terminal
switch(config)# track 11 list threshold weight
switch(config-track)# object 1
switch(config-track)# object 2
switch(config-track)# threshold weight up 35 down 22
switch(config-track)#
```

Related Commands

Command	Description
threshold percentage	Sets a threshold percentage for a tracked object in a list of objects.
track list	Specifies a list of objects to be tracked and the thresholds to be used for comparison.

timers active-time

To adjust the Enhanced Interior Gateway Routing Protocol (EIGRP) time limit for the active state, use the **timers active-time** command. To disable this function, use the **no** form of the command.

timers active-time [*time-limit* | **disabled**]

no timers active-time

Syntax Description	<i>time-limit</i>	(Optional) Active time limit (in minutes). The range is from 1 to 65535 minutes. The default value is 3.
	disabled	(Optional) Disables the timers and permits the routing wait time to remain active indefinitely.

Command Default	Disabled
-----------------	----------

Command Modes	Address family configuration mode Router configuration mode Router VRF configuration mode
---------------	---

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Use this command to control the time that the router waits (after a query is sent) before declaring the route to be in the stuck in active (SIA) state. This command requires the LAN Enterprise Services license.
------------------	---

Examples	This example shows how to configure an indefinite routing wait time on the specified EIGRP route: switch# configure terminal switch(config)# router eigrp 1 switch(config-router) address-family ipv4 unicast switch(config-router-af)# timers active-time disabled switch(config-router-af)#
----------	--

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	show ip eigrp	Displays EIGRP information.

timers basic

To adjust the Routing Information Protocol (RIP) network timers, use the **timers basic** command. To restore the default timers, use the **no** form of this command.

timers basic *update invalid holddown flush*

no timers basic

Syntax Description		
<i>update</i>		Rate (in seconds) at which updates are sent. The range is from 5 to 4,294,967,295. The default is 30 seconds.
<i>invalid</i>		Interval of time (in seconds) after which a route is declared invalid; it should be at least three times the value of the <i>update</i> argument. A route becomes invalid when no updates refresh the route. The route then enters into a <i>holddown</i> state where it is marked as inaccessible and advertised as unreachable. However, the route is still used to forward packets. The range is from 1 to 4,294,967,295. The default is 180 seconds.
<i>holddown</i>		Interval (in seconds) during which routing information regarding better paths is suppressed; it should be at least three times the value of the <i>update</i> argument. A route enters into a <i>holddown</i> state when an update packet is received that indicates that the route is unreachable. The route is marked as inaccessible and advertised as unreachable. However, the route is still used to forward packets. When <i>holddown</i> expires, routes advertised by other sources are accepted and the route is no longer inaccessible. The range is from 0 to 4,294,967,295. The default is 180 seconds.
<i>flush</i>		Amount of time (in seconds) that must pass before the route is removed from the routing table; the interval specified should be greater than the sum of the <i>invalid</i> argument plus the <i>holddown</i> argument. If it is less than this sum, the proper <i>holddown</i> interval cannot elapse, which results in a new route being accepted before the <i>holddown</i> interval expires. The range is from 1 to 4,294,967,295. The default is 240 seconds.

Command Default	
<i>update</i> : 30 seconds	
<i>invalid</i> : 180 seconds	
<i>holddown</i> : 180 seconds	
<i>flush</i> : 240 seconds	

Command Modes	
	Router address-family configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	
	You can modify the basic timing parameters for RIP. These timers must be the same for all routers and servers in the network.

**Note**

You can view the current and default timer values by using the **show ip protocols** command.

This command does not require a license.

Examples

This example shows how to set updates to broadcast every 5 seconds. If Cisco NX-OS does not hear from a router in 15 seconds (the invalid time), it declares the route as unusable. Cisco NX-OS suppresses further information for an additional 15 seconds (the holddown time). At the end of the suppression period, Cisco NX-OS flushes the route from the routing table.

```
switch# configure terminal
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# timers basic 5 15 15 30
switch(config-router-af)#
```

Related Commands

Command	Description
address-family	Enters address-family configuration mode.
copy running-config startup-config	Saves the configuration to the startup configuration file.
show ip rip	Displays a summary of RIP information for all RIP instances.

timers lsa-arrival (OSPF)

To set the minimum interval in which the software accepts the same link-state advertisement (LSA) from Open Shortest Path First (OSPF) neighbors, use the **timers lsa-arrival** command. To return to the default, use the **no** form of this command.

timers lsa-arrival *milliseconds*

no timers lsa-arrival

Syntax Description	<i>milliseconds</i>	Minimum delay (in milliseconds) that must pass between acceptance of the same LSA arriving from neighbors. The range is from 10 to 600,000 milliseconds. The default is 1000 milliseconds.
---------------------------	---------------------	--

Command Default	1000 milliseconds
------------------------	-------------------

Command Modes	Router configuration mode VRF configuration mode
----------------------	---

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Use this command to configure the minimum interval for accepting the same LSA. The same LSA is an LSA instance that contains the same LSA ID number, LSA type, and advertising router ID. If an instance of the same LSA arrives sooner than the interval that is set, the software drops the LSA.
-------------------------	--

We recommend that you keep the *milliseconds* value of the **timers lsa-arrival** command less than or equal to the neighbors' *hold-interval* value of the **timers throttle lsa** command.

This command requires the LAN Enterprise Services license.

Examples	This example shows how to set the minimum interval for accepting the same LSA at 2000 milliseconds:
-----------------	---

```
switch# configure terminal
switch(config)# router ospf 1
switch(config-router)# timers lsa-arrival 2000
switch(config-router)#
```

Related Commands	Command	Description
	show ip ospf	Displays OSPF information.
	timers throttle lsa	Sets rate-limiting values for LSAs being generated.

timers lsa-group-pacing (OSPF)

To change the interval at which Open Shortest Path First (OSPF) link-state advertisements (LSAs) are collected into a group and refreshed, checksummed, or aged, use the **timers lsa-group-pacing** command. To return to the default, use the **no** form of this command.

timers lsa-group-pacing *seconds*

no timers lsa-group-pacing

Syntax Description	<i>seconds</i>	Time (in seconds) in the interval in which LSAs are grouped and refreshed, checksummed, or aged. The range is from 1 to 1800 seconds. The default value is 240 seconds.
--------------------	----------------	---

Command Default	The default interval for this command is 240 seconds. OSPF LSA group pacing is enabled by default.	
-----------------	--	--

Command Modes	Router configuration mode VRF configuration mode	
---------------	---	--

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	<p>Use this command to control the rate at which LSA updates occur and reduce the high CPU or buffer utilization that can occur when an area is flooded with a very large number of LSAs. The default settings for OSPF packet pacing timers are suitable for the majority of OSPF deployments. Do not change the packet pacing timers unless you have tried all other options to meet OSPF packet flooding requirements. You should try summarization, stub area usage, queue tuning, and buffer tuning before changing the default flooding timers. There are no guidelines for changing timer values; each OSPF deployment is unique and should be considered on a case-by-case basis.</p> <p>Cisco NX-OS groups the periodic refresh of LSAs to improve the LSA packing density for the refreshes in large topologies. The group timer controls the interval used for group refreshment of LSAs; however, this timer does not change the frequency that individual LSAs are refreshed (the default refresh rate is every 30 minutes).</p> <p>The duration of the LSA group pacing is inversely proportional to the number of LSAs that the router is handling. For example, if you have about 10,000 LSAs, you should decrease the pacing interval. If you have a very small database (40 to 100 LSAs), you should increase the pacing interval to 10 to 20 minutes.</p> <p>This command requires the LAN Enterprise Services license.</p>	
------------------	--	--

Examples	<p>This example shows how to configure OSPF group packet-pacing updates between LSA groups to occur in 60-second intervals for OSPF routing process 1:</p> <pre>switch# configure terminal switch(config)# router ospf 1</pre>	
----------	--	--

```
switch(config-router)# timers lsa-group-pacing 60  
switch(config-router)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
show ip ospf	Displays general information about OSPF routing processes.

timers nsf converge

To adjust the time limit for nonstop forwarding (NSF) convergence for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **timers nsf converge** command. To disable this function, use the **no** form of the command.

timers nsf converge *seconds*

no timers nsf converge

Syntax Description	<i>seconds</i>	Time limit for convergence after an NSF switchover (in seconds). The range is from 60 to 180 seconds. The default value is 120.
--------------------	----------------	---

Command Default	120 seconds
-----------------	-------------

Command Modes	Address family configuration mode Router configuration mode Router VRF configuration mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	This example shows how to configure the NSF convergence time for EIGRP: switch# configure terminal switch(config)# router eigrp 1 switch(config-router) address-family ipv4 unicast switch(config-router-af) # timers nsf converge 100 switch(config-router-af) #
----------	--

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	show ip eigrp	Displays EIGRP information.

timers nsf route-hold

To set the timer that determines how long an NSF-aware Enhanced Interior Gateway Routing Protocol (EIGRP) router holds routes for an inactive peer, use the **timers nsf route-hold** command. To return the route hold timer to the default value, use the **no** form of this command.

timers nsf route-hold *seconds*

no timers nsf route-hold

Syntax Description	<i>seconds</i>	Time, in seconds, that EIGRP holds routes for an inactive peer. The range is from 20 to 300 seconds. The default is 240.
---------------------------	----------------	--

Command Default	EIGRP NSF awareness is enabled. <i>seconds: 240</i>
------------------------	--

Command Modes	Address family configuration mode Router configuration mode Router VRF configuration mode
----------------------	---

Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr></table>	Release	Modification	5.0(3)U1(1)	This command was introduced.
Release	Modification				
5.0(3)U1(1)	This command was introduced.				

Usage Guidelines	<p>Use this command to set the maximum period of time that the NSF-aware router holds known routes for an NSF-capable neighbor during a switchover operation or a well-known failure condition. The route hold timer is configurable so that you can tune network performance and avoid undesired effects, such as “black holing” routes (advertising invalid 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.</p> <p>This command requires the LAN Enterprise Services license.</p>
-------------------------	---

Examples	<p>This example shows how to set the route hold timer value for an NSF-aware router to 2 minutes (120 seconds):</p> <pre>switch# configure terminal switch(config)# router eigrp 1 switch(config-router) address-family ipv4 unicast switch(config-router-af)# timers nsf route-hold 120 switch(config-router-af)#</pre>
-----------------	--

Related Commands

Command	Description
<code>copy running-config startup-config</code>	Saves the configuration changes to the startup configuration file.
<code>show ip eigrp</code>	Displays EIGRP information.

timers nsf signal

To set the time limit to signal a nonstop forwarding (NSF) restart for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **timers nsf signal** command. To return the route hold timer to the default, use the **no** form of this command.

timers nsf signal *seconds*

no timers nsf signal

Syntax Description	<i>seconds</i>	Time, in seconds, that EIGRP waits for a peer to signal an NSF restart. The range is from 10 to 360 seconds.
---------------------------	----------------	--

Command Default	EIGRP NSF awareness is enabled
------------------------	--------------------------------

Command Modes	Address family configuration mode Router configuration mode Router VRF configuration mode
----------------------	---

Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr></table>	Release	Modification	5.0(3)U1(1)	This command was introduced.
Release	Modification				
5.0(3)U1(1)	This command was introduced.				

Usage Guidelines	Use this command to set the maximum period of time that the NSF-aware router waits for an NSF-capable neighbor to signal a restart. This command requires the LAN Enterprise Services license.
-------------------------	---

Examples	This example shows how to set the signal timer value for an NSF-aware router to the maximum (30 seconds):
-----------------	---

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# timers nsf signal 30
switch(config-router-af)#
```

Related Commands	<table><tr><th>Command</th><th>Description</th></tr><tr><td>copy running-config startup-config</td><td>Saves the configuration changes to the startup configuration file.</td></tr><tr><td>show ip eigrp</td><td>Displays EIGRP information.</td></tr></table>	Command	Description	copy running-config startup-config	Saves the configuration changes to the startup configuration file.	show ip eigrp	Displays EIGRP information.
Command	Description						
copy running-config startup-config	Saves the configuration changes to the startup configuration file.						
show ip eigrp	Displays EIGRP information.						

timers prefix-peer-timeout

To configure the Border Gateway Protocol (BGP) prefix peering timeout value, use the **timers prefix-peer-timeout** command. To remove the timeout value, use the **no** form of this command.

timers prefix-peer-timeout *interval*

no timers prefix-peer-timeout

Syntax Description	<i>interval</i>	Timeout value for prefix peering. The range is from 0 to 1200 seconds. The default value is 30.
---------------------------	-----------------	---

Command Default	Timeout value is 30.
------------------------	----------------------

Command Modes	Router configuration mode Neighbor configuration
----------------------	---

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	BGP supports the prefix peering timeout for both IPv4 and IPv6, which means that you do not have to add each neighbor to the configuration.
	When you are defining a prefix peering, you must specify the remote AS number with the prefix. BGP accepts any peer that connects from that prefix and autonomous system if the prefix peering does not exceed the configured maximum peers allowed.
	When a BGP peer that is part of a prefix peering disconnects, Cisco NX-OS holds its peer structures for a defined prefix peer timeout value. An established peer can reset and reconnect without danger of being blocked because other peers have consumed all slots for that prefix peering.
	This command requires a Enterprise Services license.

Examples	This example shows how to specify the timeout interval as 100 seconds:
-----------------	--

```
switch# configure terminal
switch(config)# router bgp 65536
switch(config-router)# timers prefix-peer-timeout 100
switch(config-router)#
```

Related Commands	Command	Description
	address family (BGP)	Enters the address family configuration mode for BGP.
	timers	Configures the BGP prefix peering timeout interval value.
	prefix-peer-wait	

timers prefix-peer-wait

To configure the Border Gateway Protocol (BGP) prefix peering wait timer, use the **timers prefix-peer-wait** command. To remove the timer value, use the **no** form of this command.

timers prefix-peer-wait *interval*

no timers prefix-peer-wait

Syntax Description	<i>interval</i>	Prefix peer wait timer (seconds).
		The range is from 0 to 1200. The default value is 90.

Command Default	The prefix peer wait timer interval is 90 seconds.
-----------------	--

Command Modes	Router configuration mode Neighbor configuration
---------------	---

Command History	Release	Modification
	6.0(2)U4(1)	This command was introduced.

Usage Guidelines	You can use the timers prefix-peer-wait command to disable the peer prefix wait time so that there is no delay before BGP prefixes are inserted into the routing information base (RIB). This command is supported on a per-VRF basis or on the default VRF.
------------------	---

This timer is only applicable for BGP dynamic neighbors. It is only set when BGP is restarted or is coming up for the first time for the dynamic BGP neighbors.

This prefix-peer wait timer expires:

1. When at least one prefix-peer instance comes up.
2. When the prefix-peer convergence or the bestpath timer expires (this situation is applicable when the prefix-peer wait timer is greater than the best path timer).
3. None of the BGP prefix-peer instances comes up within this time.

Use the **show bgp convergence private** command to display details of the prefix peer wait timer.

This command requires a Enterprise Services license.

Examples	This example shows how to specify the timeout interval as 30 seconds:
----------	---

```
switch# configure terminal
switch(config)# router bgp 65536
switch(config-router)# timers prefix-peer-wait 30
switch(config-router)#
```

Related Commands

Command	Description
address family (BGP)	Enters the address family configuration mode for BGP.
timers	Configures the BGP prefix peering timeout value.
prefix-peer-timeout	

timers throttle lsa (OSPF)

To set rate-limiting values for Open Shortest Path First (OSPF) link-state advertisement (LSA) generation, use the **timers throttle lsa** command. To return to the default values, use the **no** form of this command.

timers throttle lsa *start-time hold-interval max-time*

no timers throttle lsa

Syntax Description	<i>start-time</i>	Start time (in milliseconds) that is used to calculate the subsequent rate limiting times for LSA generation. The range is from 0 to 5000 milliseconds. The default value is 0 milliseconds.
	<i>hold-interval</i>	Incremental time (in milliseconds) that is used to calculate the subsequent rate limiting times for LSA generation. The range is from 50 to 30,000 milliseconds. The default value is 5000 milliseconds.
	<i>max-time</i>	Maximum time (in milliseconds) that is used to calculate the subsequent rate limiting times for LSA generation. The range is from 50 to 30,000 milliseconds. The default value is 5000 milliseconds.

Command Default	<i>start-time</i> : 0 milliseconds <i>hold-interval</i> : 5000 milliseconds <i>max-time</i> : 5000 milliseconds
-----------------	---

Command Modes	Router configuration mode VRF configuration mode
---------------	---

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	This example shows how to customize OSPF LSA throttling:
----------	--

```
switch# configure terminal
switch(config)# router ospf 1
switch(config-router)# timers throttle lsa 50 5000 6000
switch(config-router)#
```

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	show ip ospf	Displays information about OSPF routing processes.
	timers lsa arrival	Sets the minimum interval at which the software accepts the same LSA from OSPF neighbors.

timers throttle spf (OSPF)

To set the shortest-path first (SPF) best-path schedule initial delay time and the minimum hold between SPF best-path calculation for Open Shortest Path First (OSPF), use the **timers throttle spf** command. To turn off SPF throttling, use the **no** form of this command.

timers throttle spf *spf-start spf-hold spf-max-wait*

no timers throttle spf *spf-start spf-hold spf-max-wait*

Syntax Description

<i>spf-start</i>	Initial SPF schedule delay in milliseconds. The range is from 1 to 600,000 milliseconds.
<i>spf-hold</i>	Minimum hold time between two consecutive SPF calculations. The range is from 1 to 600,000 milliseconds.
<i>spf-max-wait</i>	Maximum wait time between two consecutive SPF calculations. The range is from 1 to 600,000 milliseconds.

Command Default

SPF throttling is not set.

Command Modes

Router configuration mode
VRF configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

The first wait interval between SPF calculations is the amount of time in milliseconds specified by the *spf-start* argument. Each consecutive wait interval is two times the current hold level in milliseconds until the wait time reaches the maximum time in milliseconds as specified by the *spf-maximum* argument. Subsequent wait times remain at the maximum until the values are reset or an LSA is received between SPF calculations.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to configure a router configured with the start, hold, and maximum interval values for the **timers throttle spf** command set at 5, 1,000, and 90,000 milliseconds:

```
switch# configure terminal
switch(config)# router ospf 1
switch(config-router)# timers throttle spf 5 1000 90000
switch(config-router)#
```

Related Commands	Command	Description
	copy running-config startup-config	Saves the configuration changes to the startup configuration file.
	show ip ospf	Displays information about OSPF routing processes.
	timers lsa arrival	Sets the minimum interval at which the software accepts the same LSA from OSPF neighbors.
	timers throttle lsa	Sets the rate limit for generating LSAs.

track (VRRP)

To modify the priority for a virtual router based on a tracked object, use the **track** command. To disable priority tracking for a virtual router, use the **no** form of this command.

track *object-number* [**decrement** *value*]

no track *object-number* [**decrement** *value*]

Syntax Description	<i>object-number</i>	Number for a configured tracked object. The range is from 1 to 500.
	decrement <i>value</i>	(Optional) Decrements the VRRP priority if the tracked object is down. The range is from 1 to 254.

Command Default	None
------------------------	------

Command Modes	VRRP configuration mode
----------------------	-------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	When the tracked object is down, the priority reverts to the priority value for the virtual router. When the tracked object is up, the priority of the virtual router is restored to the original value.
	This command requires the LAN Base Services license.

Examples	This example shows how to enable object tracking for a virtual router:
-----------------	--

```
switch# configure terminal
switch(config)# track 33 ip route 192.0.2.0/24 reachability
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# vrrp 250
switch(config-if-vrrp)# track 33 priority 2
switch(config-if-vrrp)#
```

Related Commands	Command	Description
	feature vrrp	Enables VRRP.
	show vrrp	Displays VRRP configuration information.
	track interface (VRRP)	Tracks the state of an interface and modifies the VRRP priority if that interface state goes down.
	vrrp	Configures a VRRP group.

track interface

To configure object tracking on an interface, use the **track interface** command. To remove the object tracking for this interface, use the **no** form of this command.

track *object-id* **interface** { **ethernet** *slot/port* | **loopback** *if_number* | **port-channel** *number* } { **ip routing** | **line-protocol** }

no track *object-id* [**force**]

Syntax Description

<i>object-id</i>	Tracking ID. The range can be from 1 to 500.
ethernet <i>slot/port</i>	Specifies the Ethernet interface and the slot number and port number. The slot number is from 1 to 255, and the port number is from 1 to 128.
loopback <i>if_number</i>	Specifies the loopback interface. The loopback interface number is from 0 to 1023.
port-channel <i>number</i>	Specifies the EtherChannel interface and EtherChannel number. The range is from 1 to 4096.
ip routing	Tracks the IP routing state of the interface.
line-protocol	Tracks the line protocol state of the interface.
force	(Optional) Completely removes the object tracking instance.

Command Default

None

Command Modes

Global configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use this command to track the line protocol status or IPv4 routing state of an interface. This command enters the object tracking command mode. Use the **vrf member** command in object tracking configuration mode to track objects in a nondefault VRF.

This command does not require a license.

Examples

This example shows how to track the IP routing state on interface Ethernet 1/2:

```
switch# configure terminal
switch(config)# track 1 interface ethernet 1/2 ip routing
switch(config-track)#
```


Related Commands

Command	Description
show track	Displays information about object tracking.
track ip route reachability	Tracks the state of an IPv4 route reachability.
vrf member	Tracks an object in a nondefault VRF.

track interface (VRRP)

To track the priority for a virtual router based on an interface, use the **track interface** command. To disable priority tracking for a virtual router, use the **no** form of this command.

```
track interface {ethernet slot/port | port-channel number[.sub_if_number]} priority value

no track interface {ethernet slot/port | port-channel number[.sub_if_number]} priority value
```

Syntax Description

ethernet slot/port	Specifies the virtual router interface for which to track the priority. The slot number is from 1 to 255, and the port number is from 1 to 128.
port-channel number	Specifies the port-channel group for which to track priority. The range is from 1 to 4096.
sub_if-number	(Optional) Subinterface number. The range is from 1 to 4093.
priority value	Specifies the interface priority for a virtual router. The range of values is from 1 to 254. If this router is the owner of the IP addresses, the value is automatically set to 254.

Command Default

Disabled

Command Modes

VRRP configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use this command to change the priority of the virtual router based on the state of another interface in the switch. When the tracked interface is down, the priority reverts to the priority value for the virtual router. When the tracked interface is up, the priority of the virtual router is restored to the interface state tracking value.


Note

Interface state tracking will not be operational unless you enable preemption on the interface.

This command requires the LAN Base Services license.

Examples

This example shows how to enable interface state tracking for a virtual router:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# vrrp 250
switch(config-if-vrrp)# track interface ethernet 2/2 priority 2
switch(config-if-vrrp)#
```

Related Commands	Command	Description
	feature vrrp	Enables VRRP.
	show vrrp	Displays VRRP configuration information.
	track (VRRP)	Tracks an object to modify the VRRP priority.
	vrrp	Configures a VRRP group.

track ip route

To configure object tracking on an IP route, use the **track ip route** command. To remove the object tracking for this route, use the **no** form of this command.

track *object-id* **ip route** *ip-prefix/length* **reachability**

no track *object-id* [**force**]

Syntax Description	<i>object-id</i>	Tracking ID. The range can be from 1 to 500.
	<i>ip-prefix/length</i>	Prefix of route to track. The IP prefix is in dotted decimal format (X.X.X.X). The length can be from 1 to 32.
	reachability	Tracks the reachability state of an IP route.
	force	(Optional) Completely removes the object tracking instance.

Command Default None

Command Modes Global configuration mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **vrf member** command in object tracking configuration mode to track objects in a nondefault VRF.

This command does not require a license.

Examples This example shows how to track an IP route:

```
switch# configure terminal
switch(config)# track 1 ip route 10.10.10.0/8 reachability
switch(config-track)#
```

Related Commands	Command	Description
	show track	Displays information about object tracking.
	track interface	Tracks an interface.
	vrf member	Tracks an object in a nondefault VRF.

track list

To configure object tracking on an object list, use the **track list** command. To remove the object tracking for this object list, use the **no** form of this command.

track *object-id* **list** **boolean** {**and** | **or**}

track *object-id* **list** **threshold** {**percentage** | **weight**}

no track *object-id* [**force**]

Syntax Description

<i>object-id</i>	Tracking ID. The range can be from 1 to 500.
boolean	Combines the tracked object states as a boolean combination.
and	Combines the tracked object states as a boolean AND.
or	Combines the tracked object states as a boolean OR.
threshold	Combines the tracked object states as a percent or weight combination.
percentage	Combines the tracked object states as a percent of the total number of tracked objects in the list.
weight	Combines the tracked object states as a combination of their configured weights.
force	(Optional) Completely removes the object tracking instance.

Command Default

None

Command Modes

Global configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **track list** command to create a list of objects to combine into one tracked state. Use the **boolean and** keywords to combine the tracked objects as an AND function (that is, all objects must be up for the track list to be up). Use the **boolean or** keywords to combine the tracked objects as an OR (that is if any object is up, the tracked state is up).

The track list command enters the track command mode.

This command does not require a license.

Examples

This example shows how to create a track list of two objects and AND their state:

```
switch# configure terminal
switch(config)# track 1 boolean and
switch(config-track)# object 33
switch(config-track)# object 30
```

```
switch(config-track)#
```

This example shows how to configure a track list with an up threshold of 70 percent and a down threshold of 30 percent:

```
switch# configure terminal
switch(config)# track 1 list threshold percentage
switch(config-track)# threshold percentage up 70 down 30
switch(config-track)# object 10
switch(config-track)# object 20
switch(config-track)# object 30
switch(config-track)#
```

This example shows how to configure a track list with an up weight threshold of 30 and a down threshold of 10:

```
switch# configure terminal
switch(config)# track 1 list threshold weight
switch(config-track)# threshold weight up 30 down 10
switch(config-track)# object 10 weight 15
switch(config-track)# object 20 weight 15
switch(config-track)# object 30
switch(config-track)#
```

In this example, the track list is up if object 10 and object 20 are up, and the track list goes to the down state if all three objects are down.

Related Commands

Command	Description
show track	Displays information about object tracking.
track ip route	Tracks an interface.

transmit-delay (OSPF virtual link)

To set the estimated time required to end a link-state update packet on the interface, use the **transmit-delay** command. To return to the default, use the **no** form of this command.

transmit-delay *seconds*

no transmit-delay

Syntax Description	<i>seconds</i> Time (in seconds) required to send a link-state update. The range is from 1 to 65535 seconds. The default is 1 second.							
Command Default	1 second							
Command Modes	Virtual interface configuration mode							
Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr></table>		Release	Modification	5.0(3)U1(1)	This command was introduced.		
Release	Modification							
5.0(3)U1(1)	This command was introduced.							
Usage Guidelines	This command requires the LAN Enterprise Services license.							
Examples	This example sets the retransmit delay value to 3 seconds: switch# configure terminal switch(config)# router ospf 201 switch(config-router)# area 22 virtual-link 192.0.2.1 switch(config-router-vlink)# transmit-delay 3 switch(config-router-vlink)#							
Related Commands	<table><tr><th>Command</th><th>Description</th></tr><tr><td>show ip ospf traffic</td><td>Displays OSPF traffic statistics.</td></tr><tr><td>show ip ospf virtual-links</td><td>Displays parameters and the current state of OSPF virtual links.</td></tr></table>		Command	Description	show ip ospf traffic	Displays OSPF traffic statistics.	show ip ospf virtual-links	Displays parameters and the current state of OSPF virtual links.
Command	Description							
show ip ospf traffic	Displays OSPF traffic statistics.							
show ip ospf virtual-links	Displays parameters and the current state of OSPF virtual links.							

vrf context (Layer 2)

To create a virtual routing and forwarding (VRF) instance and enter VRF configuration mode, use the **vrf context** command. To remove a VRF entry, use the **no** form of this command.

vrf context {*name* | **management**}

no vrf context {*name* | **management**}

Syntax Description	<i>name</i>	Name of the VRF. The name can be a maximum of 32 alphanumeric characters and is case sensitive.
	management	Specifies the management VRF.

Command Default	None
-----------------	------

Command Modes	Global configuration mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	When you enter the VRF configuration mode, the following commands are available:
	<ul style="list-style-type: none">• exit—Exits from the current command mode.• ip—Enables configuration of IP features. <p>Additional commands available in IP configuration mode:</p> <ul style="list-style-type: none">– domain-list—Adds additional domain names.– domain-lookup—Enables or disables DNS lookup.– domain-name—Specifies the default domain name.– host—Adds an entry to the IP hostname table.– name-server—Specifies the IP address of a DNS name server.– route—Adds route information by specifying IP addresses of the next hop servers. <ul style="list-style-type: none">• no—Negates a command or set its defaults.• shutdown—Shuts down the current VRF context.

This command does not require a license.

Examples	This example shows how to enter VRF context mode:
----------	---

```
switch# configure terminal
switch(config)# vrf context management
switch(config-vrf)#
```


Related Commands

Command	Description
show vrf	Displays VRF information.

vrf

To create a virtual routing and forwarding (VRF) instance or enter the VRF configuration mode and configure submode commands, use the **vrf** command. To remove a VRF instance or disable the VRF configuration mode, use the **no** form of this command.

```
vrf {name | management}

no vrf {name | management}
```

Syntax Description

<i>name</i>	Name of the VRF. The <i>name</i> can be any case-sensitive, alphanumeric string up to 32 characters.
management	Specifies the management VRF.

Command Default

None

Command Modes

Address-family configuration mode
Router configuration mode
VRF configuration mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

The VRF does not become active until you create an identically named VRF in global configuration mode.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to enter VRF configuration mode in a BGP environment:

```
switch# configure terminal
switch(config)# router bgp 100
switch(config-router)# vrf management
switch(config-router-vrf)#
```

This example shows how to enter VRF configuration mode in an OSPF environment:

```
switch# configure terminal
switch(config)# vrf context RemoteOfficeVRF
switch(config-vrf)# router ospf 201
switch(config-router)# vrf RemoteOfficeVRF
switch(config-router-vrf)#
```

Related Commands

Command	Description
vrf context	Creates a VRF.

vrf context (Layer 3)

To create a virtual routing and forwarding instance (VRF) and enter VRF configuration mode, use the **vrf context** command. To remove a VRF entry, use the **no** form of this command.

vrf context {*name* | **management**}

no vrf context {*name* | **management**}

Syntax Description	<i>name</i>	Name of the VRF. The <i>name</i> can be any case-sensitive, alphanumeric string up to 32 characters.
	management	Specifies the management VRF.
Command Default	None	
Command Modes	Global configuration mode	
Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.
Usage Guidelines	This command does not require a license.	
Examples	This example shows how to create a VRF context: switch# configure terminal switch(config)# vrf context RemoteOfficeVRF switch(config-vrf)#	
Related Commands	Command	Description
	vrf	Creates or configures a VRF instance.

vrf member

To add an interface to a virtual routing and forwarding (VRF) instance or to configure object tracking on a VRF instance, use the **vrf member** command. To remove the object tracking for this route, use the **no** form of this command.

vrf member *vrf-name*

no vrf member *vrf-name*

Syntax Description	<i>vrf-name</i>	VRF name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
---------------------------	-----------------	--

Command Default	None
------------------------	------

Command Modes	Interface configuration mode Object tracking configuration mode
----------------------	--

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Base Services license.
-------------------------	--

Examples	This example shows how to track an IP route in VRF Red:
-----------------	---

```
switch# configure terminal
switch(config)# track 1 ip route 10.10.10.0/8 reachability
switch(config-track)# vrf member Red
switch(config-track)#
```

This example shows how to add the Ethernet interface 1/5 to VRF RemoteOfficeVRF:

```
switch# configure terminal
switch(config)# interface ethernet 1/5
switch(config-if)# no switchport
switch(config-if)# vrf member RemoteOfficeVRF
switch(config-if)#
```

Related Commands	Command	Description
	show ip eigrp	Displays Enhanced Interior Gateway Routing Protocol (EIGRP) information.
	show ip ospf interface	Displays Open Shortest Path First (OSPF) interface-related information.

Command	Description
show ip rip	Displays a summary of RIP information for all RIP instances.
show track	Displays information about object tracking.
track ip route	Tracks an interface.

vrrp

To create a Virtual Router Redundancy Protocol (VRRP) group on a particular Ethernet interface and assign a number to the VRRP group and enter VRRP configuration mode, use the **vrrp** command. To remove a VRRP group, use the **no** form of this command.

vrrp *number*

no vrrp *number*

Syntax Description

<i>number</i>	VRRP group number, which you can configure for a Gigabit Ethernet port, including the main interfaces and subinterfaces. The range is from 1 to 255.
---------------	--

Command Default

None

Command Modes

Interface configuration mode

Command History

Release	Modified
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

You can configure VRRP only if its state is disabled. Make sure that you configure at least one IP address before you attempt to enable a virtual router.

This command requires the LAN Base Services license.

Examples

This example shows how to create a VRRP group:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# vrrp 7
switch(config-if-vrrp)#
```

This example shows how to create a VRRP group and configure an IPv4 address for the group:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# vrrp 7
switch(config-if-vrrp)# address 10.0.0.10
switch(config-if-vrrp)# no shutdown
switch(config-if-vrrp)#
```

Related Commands

Command	Description
clear vrrp	Clears all the software counters for the specified virtual router.
feature vrrp	Enables VRRP.
address (VRRP)	Adds a primary or secondary IP address to a virtual router.
show vrrp	Displays VRRP configuration information.



Unicast Routing Show Commands

This chapter describes the Cisco NX-OS unicast routing **show** commands available on Cisco Nexus 3000 Series switches.

show bfd neighbors

To display information about Bidirectional Forwarding Detection (BFD) neighbors, use the **show bfd neighbors** command.

```
show bfd [ipv4 | ipv6] neighbors [application name | {dest-ip | src-ip} ipaddr interface {ethernet
slot/port | loopback loopbk_intf | port-channel channel_num}] [vrf vrf-name] [details]
```

Syntax Description		
ipv4		Displays BFD information for neighbors with IPv4 addresses.
ipv6		Displays BFD information for neighbors with IPv6 addresses.
application <i>name</i>		(Optional) Displays BFD information for the named protocol that BFD is enabled on.
dest-ip <i>ipaddr</i>		(Optional) Displays BFD information for the destination IP address. The IP address is in dotted decimal notation for IPv4.
src-ip <i>ipaddr</i>		(Optional) Displays BFD information for the source IP address. The IP address is in dotted decimal notation for IPv4.
interface		(Optional) Displays BFD information for the interface.
ethernet <i>slot/port</i>		Specifies an IEEE 802.3z Ethernet interface. The slot number is form 1 to 255 and the port number is from 1 to 128.
loopback <i>loopbk_intf</i>		Specifies the loopback interface. The interface number is from 0 to 1023.
port-channel <i>channel_num</i>		Specifes an EtherChaneel interface. The interface number is from 1 to 4096.
vrf <i>vrf-name</i>		(Optional) Displays BFD information for the virtual routing and forwarding (VRF) instance.
details		(Optional) Displays detailed BFD information.

Command Default	None
------------------------	------

Command Modes	EXEC mode
----------------------	-----------

Command History	Release	Modification
	6.0(2)U4(1)	The ipv4 and ipv6 command options were introduced.
	5.0(3)U2(2)	This command was introduced.

Usage Guidelines

Use this command to display information about BFD sessions. Use bgp as the application name if you use the **applications** keyword.

This command does not require a license.

Examples	This example shows how to display the BFD neighbors:
-----------------	--

```
switch# show bfd neighbors
```

```
OurAddr    NeighAddr  LD/RD                RH/RS    Holdown(mult)    State    Int
192.0.1.2  192.0.1.1  1124073474/1107296257 Up        582(3)           Up        Po10
switch#
```

This example shows how to display the detailed BFD information:

```
switch# show bfd neighbors application bfd_app details
```

```
OurAddr NeighAddr LD/RD                RH/RS    Holdown(mult)    State    Int
1.1.1.2 1.1.1.1 1090519041/1107296257 Up        137(3)           Up        Eth4/37
```

```
Session state is Up and not using echo function
Local Diag: 0, Demand mode: 0, Poll bit: 0
MinTxInt: 50000 us, MinRxInt: 50000 us, Multiplier: 3
Received MinRxInt: 50000 us, Received Multiplier: 3
Holdown (hits): 150 ms (2), Hello (hits): 50 ms (1232223)
Rx Count: 1267540, Rx Interval (ms) min/max/avg: 0/1789/44 last: 12 ms ago
Tx Count: 1232223, Tx Interval (ms) min/max/avg: 41/41/41 last: 13 ms ago
Registered protocols:  bgp
Uptime:  0day 15hour 5minute 8second 430ms
Last packet: Version: 1          - Diagnostic: 0
                  State bit: Up    - Demand bit: 0
                  Poll bit: 0      - Final bit: 0
                  Multiplier: 3    - Length: 24
                  My Discr.: 1107296257 - Your Discr.: 1090519041
                  Min tx interval: 50000 - Min rx interval: 50000
                  Min Echo interval: 0
```

```
switch#
```

Table 1 describes the significant fields shown in the display.

Table 1 *show bfd neighbors Field Descriptions*

Table	Description
OurAddr	IP address of the interface for which the show bfd neighbors command was entered.
NeighAddr	IPv4 address of the BFD adjacency or neighbor.
LD/RD	Local discriminator and remote discriminator being used for the session.
RH	Remote Heard—Indicates that the remote BFD neighbor has been heard.
Holdown(mult)	Detect timer multiplier that is used for this session.
State	State of the interface—Up or Down.
Int	Interface type and slot/port.
Session state is UP and not using echo function	BFD is up and not running in echo mode.
RX Count	Number of BFD control packets that have been received from the BFD neighbor.
TX Count	Number of BFD control packets that have been sent by the BFD neighbor.
TX Interval	Interval, in milliseconds, between sent BFD packets.
Registered protocols	Routing protocols that have been registered with BFD.
Last packet: Version:	BFD version detected and run between the BFD neighbors.

Table 1 *show bfd neighbors Field Descriptions (continued)*

Table	Description
Diagnostic	<p>Diagnostic code specifying the local system's reason for the last transition of the session from Up to some other state.</p> <p>State values are as follows:</p> <ul style="list-style-type: none"> • 0—No Diagnostic • 1—Control Detection Time Expired • 2—Echo Function Failed • 3—Neighbor Signaled Session Down • 4—Forwarding Plane Reset • 5—Path Down • 6—Concentrated Path Down • 7—Administratively Down
Demand bit	Demand Mode bit. If set, the transmitting system wants to operate in demand mode. BFD has two modes—asynchronous and demand. The Cisco implementation of BFD supports only asynchronous mode.
Poll bit	Poll bit. If the Poll bit is set, the transmitting system is requesting verification of connectivity or of a parameter change.
Final bit	Final bit. If the Final bit is set, the transmitting system is responding to a received BFD control packet that had a Poll (P) bit set.
Multiplier	<p>Detect time multiplier. The negotiated transmit interval, multiplied by the detect time multiplier, determines the detection time for the transmitting system in BFD asynchronous mode.</p> <p>The detect time multiplier for BFD: (transmit interval) * (detect multiplier) = detect timer. If a BFD control packet is not received from the remote system within the detect-timer interval, a failure has occurred.</p>
Length	Length of the BFD control packet, in bytes.
My Discr.	My Discriminator. Unique, nonzero discriminator value generated by the transmitting system used to demultiplex multiple BFD sessions between the same pair of systems.
Your Discr.	Your Discriminator. The discriminator received from the corresponding remote system. This field reflects the received value of My Discriminator, or is zero if that value is unknown.
Min tx interval	Minimum transmission interval, in microseconds, that the local system wants to use when sending BFD control packets.
Min rx interval	Minimum receipt interval, in microseconds, between received BFD control packets that the system can support.
Min Echo interval	Minimum interval, in microseconds, between received BFD control packets that the system can support. If the value is zero, the transmitting system does not support the receipt of BFD echo packets.

Related Commands

Command	Description
bfd echo	Enables BFD echo mode.
feature bfd	Enables BFD on the switch.

show bgp

To display Border Gateway Protocol (BGP) routes, use the **show bgp** command.

show bgp { **all** | **ipv4** { **unicast** | **multicast** } [*addr* | *prefix* [**longer-prefixes**]] [**vrf** *vrf-name* | **all**] }

Syntax Description

all	Displays BGP information for all address families.
ipv4	Displays BGP information for the IPv4 address family.
unicast	Displays BGP information for the unicast address family.
multicast	Displays BGP information for the multicast address family.
<i>addr</i>	(Optional) Network from the selected address family. The format is A.B.C.D for IPv4.
<i>prefix</i>	(Optional) Prefix from the selected address family. The format is A.B.C.D/length for IPv4.
longer-prefixes	(Optional) Displays the prefix and any more specific routes.
vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
all	(Optional) Specifies all VRF.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **show bgp** command to display information about BGP.
This command requires the LAN Enterprise Services license.

Examples

This example shows how to display an entry in the BGP table:

```
switch# show bgp ipv4 multicast
```

Related Commands

Command	Description
clear bgp	Clears entries in the BGP table.

show bgp community

To display Border Gateway Protocol (BGP) routes that match a community, use the **show bgp community** command.

```
show bgp {{ ip | ipv4 } { unicast | multicast } } community [as-number] no-advertise] [no-export]
[no-export-subconfed] [exact-match]] [vrf vrf-name]
```

Syntax Description		
ip		Displays BGP information for the IPv4 address family.
ipv4		Displays BGP information for the IPv4 address family.
unicast		Displays BGP information for the unicast address family.
multicast		Displays BGP information for the multicast address family.
<i>as-number</i>		(Optional) AS number. The AS number can be a 16-bit integer or a 32-bit integer in the form of <higher 16-bit decimal number>.<lower 16-bit decimal number>.
no-advertise		(Optional) Displays the no-advertise community.
no-export		(Optional) Displays the no-export community.
no-export-subconfed		(Optional) Displays the no-export-subconfed community.
exact-match		(Optional) Displays an exact match of the community.
vrf <i>vrf-name</i>		(Optional) Specifies the virtual routing and forwarding (VRF) instance. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	This example shows how to display the routes that match a community:
-----------------	--

```
switch# show bgp ip multicast community no-advertise
```

Related Commands	Command	Description
	ip community-list	Creates a community list.

show bgp community-list

To display Border Gateway Protocol (BGP) routes that match a community list, use the **show bgp community-list** command.

```
show bgp { {ip | ipv4} {unicast | multicast} } community-list commlist-name [exact-match] [vrf vrf-name]
```

Syntax Description		
ip		Displays BGP information for the IPv4 address family.
ipv4		Displays BGP information for the IPv4 address family.
unicast		Displays BGP information for the unicast address family.
multicast		Displays BGP information for the multicast address family.
<i>commlist-name</i>		Name of a community-list. The commlist-name can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match		(Optional) Displays an exact match of the communities.
vrf <i>vrf-name</i>		(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	<p>This example shows how to display the routes that match a community list:</p> <pre>switch(config)# show bgp ip unicast community-list test1</pre>
-----------------	--

Related Commands	Command	Description
	ip community-list	Creates a community list.

show bgp extcommunity

To display Border Gateway Protocol (BGP) routes that match an extended community, use the **show bgp extcommunity** command.

```
show bgp {{ip | ipv4} {unicast | multicast}} extcommunity 4byteas-generic {non-transitive |
transitive} [as4-number] [exact-match] [vrf vrf-name]
```

Syntax Description		
ip		Displays BGP information for the IPv4 address family.
ipv4		Displays BGP information for the IPv4 address family.
unicast		Displays BGP information for the unicast address family.
multicast		Displays BGP information for the multicast address family.
4byteas-generic		Displays the routes that match the generic specific extended communities.
non-transitive		Displays the routes that match the nontransitive extended communities.
transitive		Displays the routes that match the transitive extended communities.
<i>as4-number</i>		AS number. The <i>as4-number</i> is a 32-bit integer in the form of a plaintext integer or <higher 16-bit decimal number>.<lower 16-bit decimal number> .
exact-match		(Optional) Displays an exact match of the extended community.
vrf vrf-name		(Optional) Specifies the virtual routing and forwarding (VRF) context name. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	<p>This example shows how to display the routes that match an extended community:</p> <pre>switch# show bgp ip unicast extcommunity 4byteas-generic transitive 1.3:30</pre>
-----------------	---

Related Commands	Command	Description
	ip extcommunity-list	Creates an extended community list.

show bgp extcommunity-list

To display Border Gateway Protocol (BGP) routes that match an extended community list, use the **show bgp extcommunity-list** command.

```
show bgp { {ip | ipv4} {unicast | multicast} } extcommunity-list commlist-name [exact-match]
[vrf vrf-name]
```

Syntax Description		
ip		Displays BGP information for the IPv4 address family.
ipv4		Displays BGP information for the IPv4 address family.
unicast		Displays BGP information for the unicast address family.
multicast		Displays BGP information for the multicast address family.
<i>commlist-name</i>		Name of an extended community-list. The <i>commlist-name</i> can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match		(Optional) Displays an exact match of the extended communities.
vrf vrf-name		(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	<p>This example shows how to display the routes that match a community list:</p> <pre>switch# show bgp ipv4 unicast extcommunity-list test1</pre>
-----------------	---

Related Commands	Command	Description
	ip extcommunity-list	Creates an extended community list.

show bgp neighbors

To display Border Gateway Protocol (BGP) neighbors, use the **show bgp neighbors** command.

```
show bgp {ip | ipv4} {unicast | multicast} neighbors [addr [advertised-routes | flap-statistics |
paths | received-routes | routes [advertised | dampened | received]]] [vrf {all | vrf-name}]
```

Syntax Description		
ip		Displays the IPv4 neighbor information.
ipv4		Displays the IPv4 neighbor information.
unicast		Displays the unicast neighbor information.
multicast		Displays the multicast neighbor information.
<i>addr</i>		(Optional) IPv4 address. The format is x.x.x.x
advertised-routes		(Optional) Displays all the routes advertised to this neighbor.
flap-statistics		(Optional) Displays flap statistics for the routes received from this neighbor.
paths		(Optional) Displays AS paths learned from this neighbor.
received-routes		(Optional) Displays all the routes received from this neighbor.
routes		(Optional) Displays the routes received or advertised to or from this neighbor.
advertised		(Optional) Displays all the routes advertised for this neighbor.
dampened		(Optional) Displays all dampened routes received from this neighbor.
received		(Optional) Displays all the routes received from this neighbor.
vrf <i>vrf-name</i>		(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
all		Specifies all VRF instances.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	This example shows how to display the BGP neighbors:
-----------------	--

```
switch(config)# show bgp ipv4 unicast neighbors
BGP neighbor is 192.168.0.201, remote AS 201, ibgp link, Peer index 1
Description: Peer Router B
BGP version 4, remote router ID 0.0.0.0
```

show bgp neighbors

```
BGP state = Idle, down for 00:02:07, retry in 00:01:17
Last read never, hold time = 180, keepalive interval is 60 seconds
Last written never, keepalive timer not running
Received 0 messages, 0 notifications, 0 bytes in queue
Sent 0 messages, 0 notifications, 0 bytes in queue
Connections established 0, dropped 0
Connection attempts 4
Last reset by us never, due to No error
Last reset by peer never, due to No error

Message statistics:
                        Sent                Rcvd
<--Output truncated-->
switch#
```

Related Commands

Command	Description
show ip bgp neighbors	Displays the IPv4 BGP information.

show bgp sessions

To display Border Gateway Protocol (BGP) sessions, use the **show bgp sessions** command.

show bgp sessions [**vrf** *vrf-name*]

Syntax Description	vrf <i>vrf-name</i> (Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
--------------------	---

Command Default	None
-----------------	------

Command Modes	Any command mode
---------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	This example shows how to display the BGP sessions:
	<pre>switch# show bgp sessions Total peers 1, established peers 0 ASN 201 VRF default, local ASN 201 peers 1, established peers 0, local router-id 192.168.0.14 State: I-Idle, A-Active, O-Open, E-Established, C-Closing, S-Shutdown Neighbor ASN Flaps LastUpDn LastRead LastWrit St Port(L/R) Notif(S/R) 192.168.0.201 201 0 00:07:25 never never I 0/0 0/0 switch#</pre>

Related Commands	Command	Description
	clear bgp	Clears BGP sessions.

show bgp statistics

To display Border Gateway Protocol (BGP) traffic statistics, use the **show bgp statistics** command.

show bgp statistics

Syntax Description This command has no argument or keywords.

Command Default None

Command Modes EXEC mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Enterprise Services license.

Examples This example shows how to display the BGP traffic statistics:

```
switch# show bgp statistics
```

```
Neighbor aggregated statistics (sent/received)
```

Msgs	Bytes	Opens	Updates
0/0	0/0	0/0	0/0
Keepalives	Notifications	Route-refresh	Capabilities
0/0	0/0	0/0	0/0

```

BGP I/O Information
Active Open attempts      : 9
Passive Open attempts     : 0
BGP I/O Open loops       : 1144
BGP I/O Open calls        : 0
BGP I/O Open rcv calls    : 0
BGP I/O Send calls        : 0
BGP I/O Recv calls        : 0
BGP I/O Write calls       : 0
BGP I/O Write loops       : 1
BGP I/O Write loop yields : 0
BGP I/O Read calls        : 0
BGP I/O Read loops       : 1144
<--Output truncated-->
switch#
```

Related Commands

Command	Description
clear bgp	Clears BGP sessions.

show forwarding

To display forwarding information, use the **show forwarding** command.

show forwarding [**ipv4** | **ipv6**] {**adjacency** | **ecmp** [**partial**] | **interfaces** | **multicast** | **route** [**partial**] | **security** | **table** *id* | **trace** [**clear**] | **unicast** | **vlan** | **vrf** *vrf-name* | **vxlan**}

Syntax Description	
ipv4	(Optional) Displays the IPv4 forwarding information.
ipv6	(Optional) Displays the IPv6 forwarding information.
adjacency	Displays the adjacency information.
ecmp	Displays information about ECMPs.
ecmp partial	(Optional) Displays partially installed ECMPs.
interfaces	Displays the forwarding information for interfaces on a module.
multicast	Displays multicast IPv4 information.
route	Displays the route information from the IP routing table.
route partial	Displays routes with partial ECMPs.
security	Displays IP security information.
table <i>id</i>	Displays the forwarding information for a route table. The <i>id</i> range is from 0 to 2147483647.
trace	Displays the forwarding trace buffer on a module.
clear	(Optional) Clears the forwarding trace buffer on a module.
unicast	Displays unicast forwarding information.
vlan	Displays VLAN forwarding information.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
vxlan	Displays VXLAN forwarding information.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	6.0(2)U3(1)	The partial and vxlan options were added.
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines Use the **show forwarding** command on the supervisor to view forwarding information on a module. Optionally, you can use the **attach module** command to attach to a module and use the **show forwarding** command on the module.

This command does not require a license.

Examples

This example shows how to display the forwarding information:

```
switch# show forwarding route
```

```
IPv4 routes for table default/base
```

```
-----+-----+-----  
Prefix      | Next-hop      | Interface  
-----+-----+-----  
0.0.0.0/32   | Drop          | Null0  
255.255.255.255/32 | Receive      | sup-eth1  
switch#
```

Related Commands

Command	Description
show ip fib	Displays information about the FIB.

show forwarding distribution

To display forwarding distribution information, use the **show forwarding distribution** command.

show forwarding distribution [**clients** | **fib-state**]

Syntax Description	clients	(Optional) Displays the forwarding distribution information for unicast clients.
	fib-state	(Optional) Displays the forwarding distribution state for unicast Forwarding Information Base (FIB).

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples This example shows how to display the forwarding information for unicast clients:

```
switch# show forwarding distribution clients

id  pid    shmem-start  shmem-end  shmem-name
--  -
1   4359    0x52330130   0x52380000  u6rib-ufdm
2   4360    0x59900130   0x59b00000  urib-ufdm
switch#
```

Related Commands	Command	Description
	show ip fib distribution	Displays distribution information about the FIB.

show forwarding inconsistency

To display the results of the forwarding inconsistency checker, use the **show forwarding inconsistency** command.

show forwarding [ipv4] [ipv6] inconsistency [module slot | vrf vrf-name]

Syntax Description	module slot	(Optional) Displays inconsistency information for the module. The slot range depends on the hardware platform.
	vrf vrf-name	(Optional) Displays inconsistency information for the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	6.0(2)U2(1)	This command was modified.
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Use the show forwarding inconsistency command to display the results of the test forwarding inconsistency command.
	This command does not require a license.

Examples	This example shows how to display the forwarding inconsistency information for module 2:
	switch# show forwarding ipv6 inconsistency module 2

Related Commands	Command	Description
	clear forwarding inconsistency	Clears the forwarding inconsistency checker.
	test forwarding inconsistency	Triggers the forwarding inconsistency checker.

show hsrp

To display Hot Standby Router Protocol (HSRP) information for each HSRP group, use the **show hsrp** command.

show hsrp [**interface** {**ethernet** *slot/port* | **port-channel** *number* | **vlan** *vlan-id*}] [**group** *group-number*] [**active** | **init** | **listen** | **standby**] [**all**] [**brief**] [**detail**] [**ipv4**]

Syntax Description	
interface	(Optional) Specifies the interface for which to display HSRP information.
ethernet <i>slot/port</i>	Specifies the Ethernet interface and the slot number and port number. The slot number is from 1 to 255, and the port number is from 1 to 128.
port-channel <i>number</i>	Specifies the EtherChannel interface and EtherChannel number. The range is from 1 to 4096.
vlan <i>vlan-id</i>	Specifies the VLAN interface. The range is from 1 to 4094.
group <i>group-number</i>	(Optional) Specifies the HSRP group number of the interface to display information about. The range is from 0 to 4095.
active	(Optional) Displays HSRP groups that are in an active state.
init	(Optional) Displays HSRP groups that are in an initialization state.
listen	(Optional) Displays HSRP groups that are in an listen state.
standby	(Optional) Displays HSRP groups that are in an standby state.
all	(Optional) Displays all HSRP groups.
brief	(Optional) Summarizes each virtual gateway or virtual forwarder with a single line of output.
detail	(Optional) Displays detailed information about HSRP groups.
ipv4	(Optional) Displays HSRP IPv4 groups.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines Use the **show hsrp** command to display information about HSRP groups. The **brief** keyword displays a single line of information about each virtual gateway or virtual forwarder.

If you have not configured authentication, the **show hsrp** command will display the following string:

```
Authentication text "cisco"
```

This is the default behavior of HSRP as defined in RFC 2281:

If no authentication data is configured, the RECOMMENDED default value is 0x63 0x69 0x73 0x63 0x6F 0x00 0x00 0x00.

This command does not require a license but if you want to enable Layer 3 interfaces, you must install the LAN Base Services license.

Examples

This example shows how to display the default information about HSRP:

```
switch# show hsrp
```

This example shows how to display a brief summary of HSRP information:

```
switch# show hsrp brief
```

Related Commands

Command	Description
feature hsrp	Enables the HSRP feature.

show hsrp delay

To display the Hot Standby Router Protocol (HSRP) group delay information, use the **show hsrp delay** command.

show hsrp delay [*interface type number*] [*group group-number*] [*all*] [*brief*]

Syntax Description

interface <i>type number</i>	(Optional) Specifies the interface type and number for which to display HSRP information.
group <i>group-number</i>	(Optional) Specifies the HSRP group number of the interface to display information about. The range is from 0 to 4095.
all	(Optional) Specifies all HSRP information.
brief	(Optional) Specifies brief HSRP information.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command does not require a license but if you want to enable Layer 3 interfaces, you must install the LAN Base Services license.

Examples

This example shows how to display HSRP delay information:

```
switch# show hsrp delay
```

Related Commands

Command	Description
delay minimum	Configures the delay information for HSRP groups.
feature hsrp	Enables the HSRP feature.
hsrp delay	Configures the delay information for HSRP groups.

show hsrp summary

To display Hot Standby Router Protocol (HSRP) summary information for each HSRP group, use the **show hsrp summary** command.

show hsrp summary

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command does not require a license but if you want to enable Layer 3 interfaces, you must install the LAN Base Services license.
-------------------------	---

Examples	This example shows how to display a summary of HSRP information:
-----------------	--

```
switch# show hsrp summary
```

Related Commands	Command	Description
	feature hsrp	Enables the HSRP feature.
	hsrp	Configures HSRP groups.

show interface vlan counter

To display the counters for an interface VLAN, use the **show interface vlan counter** command.

show interface vlan counter {detailed [all [snmp]] | snmp}

Syntax Description	detailed	(Optional) Displays only non-zero counters.
	all	(Optional) Displays all information that is available.
	snmp	(Optional) Displays Simple Network Protocol (SNMP) MIB values.

Defaults	None
-----------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U3(1)	This command was introduced.

Usage Guidelines	This command does not require a license.
-------------------------	--

Examples This example shows how to display the counters for an interface VLAN:

```
switch# show interface vlan 1 counters detailed all snmp
  0.                total_bytes_in = 43946
  1.                total_pkts_in  = 317
  2.                total_bytes_out = 50676
  3.                total_pkts_out = 618
switch#
```

Related Commands	Command	Description
	show vlan id counters	Displays the counters for an interface.

show ip adjacency

To display adjacency information, use the **show ip adjacency** command.

show ip adjacency [*ip-addr* | *interface*] [**detail**] [**non-best**] [**statistics**] [**summary**] [**vrf** {*vrf-name* | **all** | **default** | **management**}]

Syntax Description

<i>ip-addr</i>	(Optional) IPv4 or IPv6 source address. The format for IPv4 is x.x.x.x. The format for IPv6 is A:B::C:D.
<i>interface</i>	(Optional) Interface. Use ? to determine the supported interface types.
detail	(Optional) Displays detailed adjacency information.
non-best	(Optional) Displays both the best and nonbest adjacency information.
statistics	(Optional) Displays adjacency statistics.
summary	(Optional) Displays a summary of the adjacency information.
vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
all	(Optional) Displays adjacency statistics for all VRF entries.
default	(Optional) Displays adjacency statistics for the default VRF.
management	(Optional) Displays adjacency statistics for the management VRF.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

The counter values in the output of **show ip adjacency {statistics | detail}** command are cleared after a supervisor module switchover.

This command does not require a license.

Examples

This example shows how to display a summary of the adjacency information:

```
switch# show ip adjacency summary
```

Related Commands

Command	Description
show forwarding adjacency	Displays forwarding adjacency information.

show ip adjacency summary

To display the IP adjacency summary, use the **show ip adjacency summary** command.

show ip adjacency summary

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	EXEC mode
----------------------	-----------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command does not require a license.
-------------------------	--

Examples	This example shows how to display the IP adjacency summary:
-----------------	---

```
switch# show ip adjacency summary
```

Related Commands	Command	Description
	ip arp timeout	Configures ARP.

show ip arp

To display the Address Resolution Protocol (ARP) information, use the **show ip arp** command.

```
show ip arp [ip-addr | { ethernet slot/port | loopback if_number | mgmt mif_number | port-channel
number }] [client] [static] [statistics] [vrf vrf-name]
```

Syntax Description		
<i>ip-addr</i>	(Optional) IPv4 or IPv6 source address. The format for IPv4 is x.x.x.x. The format for IPv6 is A:B::C:D.	
ethernet <i>slot/port</i>	(Optional) Specifies the Ethernet interface. The slot number is from 1 to 255, and the port number is from 1 to 128.	
loopback <i>if_number</i>	(Optional) Specifies the loopback interface. The loopback interface number is from 0 to 1023.	
mgmt <i>mif_number</i>	(Optional) Specifies the management interface. The management interface number is from 0 to 1023.	
port-channel <i>number</i>	(Optional) Specifies the EtherChannel interface and EtherChannel number. The range is from 1 to 4096.	
client	(Optional) Displays the ARP client table.	
static	(Optional) Displays static ARP entries.	
statistics	(Optional) Displays ARP statistics.	
vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.	

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples	This example shows how to display the ARP information:
-----------------	--

```
switch# show ip arp
```

Related Commands	Command	Description
	ip arp	Configures a static ARP entry.

show ip arp summary

To display ARP adjacency summary, use the **show ip arp summary** command.

show ip arp summary

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	Global configuration mode
----------------------	---------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples	<p>This example shows how to display ARP adjacency summary:</p> <pre>switch# show ip arp summary</pre>
-----------------	--

Related Commands	Command	Description
	ip arp timeout	Configures ARP.

show ip bgp

To display entries in the Border Gateway Protocol (BGP) table, use the **show ip bgp** command.

```
show ip bgp [ip-addr | ip-prefix [longer-prefixes]] [received-paths] [regex expression]
[route-map map-name] [summary] [vrf vrf-name]
```

Syntax Description	<i>ip-addr</i>	(Optional) Network from the BGP route table. The format is x.x.x.x. or A:B::C:D.
	<i>ip-prefix</i>	(Optional) Prefix from the BGP route table. The format is x.x.x.x/length.
	longer-prefixes	(Optional) Displays the prefix and any more specific routes.
	received-paths	(Optional) Displays paths stored for soft reconfiguration.
	regex <i>expression</i>	(Optional) Displays information that matches the regular expression.
	route-map <i>map-name</i>	(Optional) Displays routes that match the route map. The map name can be any case-sensitive, alphanumeric string up to 63 characters.
	summary	(Optional) Displays the summary of the routes.
	vrf <i>vrf-name</i>	(Optional) Specifies the virtual routing and forwarding (VRF) instance. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default None

Command Modes Any command mode


Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Enterprise Services license.

Examples This example shows how to display the BGP route table:

```
switch# show ip bgp
BGP routing table information for VRF default, address family IPv4 Unicast
BGP table version is 3, local router ID is 192.168.0.14
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath

      Network          Next Hop           Metric      LocPrf      Weight Path
    1192.0.0.0/2       0.0.0.0              100         32768 i
switch#
```

 show ip bgp**Related Commands**

Command	Description
clear ip bgp	Clears entries in the BGP route table.

show ip bgp all

To display the Border Gateway Protocol (BGP) entries for all address families, use the **show ip bgp all** command.

```
show ip bgp all [ip-addr | ip-prefix [longer-prefixes]] [filter-list list-name] [community-list
commlist-name [exact-match]] [flap-statistics] [nexthop-database] [received-paths]
[regex expression][route-map map-name] [summary] [vrf {vrf-name | all}]
```

```
show ip bgp all community [community-number] [{internet | no-advertise | no-export |
no-export-subconfed} | exact-match] [vrf {vrf-name | all}]
```

```
show ip bgp all extcommunity 4byteas-generic {non-transitive | transitive} [as4-number]
[exact-match] [vrf {vrf-name | all}]
```

```
show ip bgp all dampening {dampened-paths [regex expression] | flap-statistics |
history-paths [regex expression] | parameters} [vrf {vrf-name | all}]
```

```
show ip bgp all neighbors [ip-addr [advertised-routes | flap-statistics | paths | received-routes |
routes [advertised | dampened | received]]] [vrf {vrf-name | all}]
```

Syntax Description

<i>ip-addr</i>	(Optional) Network from the BGP route table. The format is x.x.x.x.
<i>ip-prefix</i>	(Optional) Prefix from the BGP route table. The format is x.x.x.x/length.
longer-prefixes	(Optional) Displays the prefix and any more specific routes.
filter-list	(Optional) Displays BGP routes that match a filter list.
<i>list-name</i>	Name of a filter list. The name can be any case-sensitive, alphanumeric string up to 63 characters.
community-list <i>commlist-name</i>	(Optional) Displays routes matching the community-list. The <i>commlist-name</i> can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the communities.
flap-statistics	Displays flap statistics for routes.
nexthop-database	(Optional) Displays the BGP next-hop database.
received-paths	(Optional) Displays paths stored for soft reconfiguration.
regex <i>expression</i>	(Optional) Displays information that matches the regular expression.
route-map <i>map-name</i>	(Optional) Displays routes that match the route map. The map name can be any case-sensitive, alphanumeric string up to 63 characters.
summary	(Optional) Displays the summary of the routes.
community	Displays BGP routes that match a community list.
<i>community-number</i>	(Optional) Community number. Valid value is a community number in the range from 1 to 4294967200, or AA:NN (autonomous system-community number/2-byte number).
no-export	(Optional) Displays routes with this community that are advertised to only peers in the same autonomous system or to only other subautonomous systems within a confederation.
no-advertise	(Optional) Displays routes that are not advertise to any peer (internal or external).

■ show ip bgp all

no-export-subconfed	(Optional) Displays routes that are part of the well-known community no-export-subconfed.
internet	(Optional) Displays routes that are part of the well-known community internet community.
extcommunity	Displays routes that match an extended community.
4byteas-generic	(Optional) Displays the routes that match the generic specific extended communities.
non-transitive	(Optional) Displays the routes that match the non-transitive extended communities.
transitive	(Optional) Displays the routes that match the transitive extended communities.
<i>as4-number</i>	(Optional) AS number. The <i>as4-number</i> is a 32-bit integer in the form of a plaintext integer or <higher 16-bit decimal number>.<lower 16-bit decimal number> .
exact-match	(Optional) Displays an exact match of the extended community.
dampening	Displays all dampening information.
dampened-paths	(Optional) Displays all dampened paths.
regex <i>expression</i>	(Optional) Display information that matches the regular expression.
history-paths	(Optional) Displays all history paths.
parameters	(Optional) Displays all dampening parameters.
neighbors	Displays all BGP neighbors.
advertised-routes	(Optional) Displays all the routes advertised to this neighbor.
flap-statistics	(Optional) Displays flap statistics for the routes received from this neighbor.
paths	(Optional) Displays AS paths learned from this neighbor.
received-routes	(Optional) Displays all the routes received from this neighbor.
routes	(Optional) Displays the routes received or advertised to or from this neighbor.
advertised	(Optional) Displays all the routes advertised for this neighbor.
dampened	(Optional) Displays all dampened routes received from this neighbor.
received	(Optional) Displays all the routes received from this neighbor.
vrf <i>vrf-name</i>	(Optional) Specifies the virtual routing and forwarding (VRF) instance. The name can be any case-sensitive, alphanumeric string up to 32 characters.
all	(Optional) Specifies the VFR reserved all name.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display the BGP entries for all address families:

```
switch# show ip bgp all
BGP routing table information for VRF default, address family IPv4 Unicast
BGP table version is 3, local router ID is 192.168.0.14
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath
```

Network	Next Hop	Metric	LocPrf	Weight	Path
1192.0.0.0/2	0.0.0.0		100	32768	i

```
BGP routing table information for VRF default, address family IPv4 Multicast
switch#
```

This example shows how to display a summary of the state of the BGP route table:

```
switch# show ip bgp all summary
BGP summary information for VRF default, address family IPv4 Unicast
BGP router identifier 192.168.0.14, local AS number 201
BGP table version is 3, IPv4 Unicast config peers 1, capable peers 0
1 network entries and 1 paths using 104 bytes of memory
BGP attribute entries [1/124], BGP AS path entries [0/0]
BGP community entries [0/0], BGP clusterlist entries [0/0]

Neighbor      V    AS MsgRcvd MsgSent  TblVer  InQ  OutQ  Up/Down  State/PfxRcd
192.168.0.201  4    201      0       0        0    0    0 00:59:21 Idle
switch#
```

Related Commands

Command	Description
clear ip bgp	Clears entries in the BGP route table.

show ip bgp community

To display Border Gateway Protocol (BGP) routes that match a community list, use the **show ip bgp community** command.

```
show ip bgp community {community-number} [{internet | no-advertise | no-export |
no-export-subconfed}] [vrf {vrf-name | all}]
```

Syntax Description

<i>community-number</i>	Community number. Valid value is a community number in the range from 1 to 4294967200, or AA:NN (autonomous system-community number/2-byte number).
internet	Displays routes that are part of the well-known community internet community.
no-advertise	Displays routes that are not advertise to any peer (internal or external).
no-export	Displays routes with this community that are advertised to only peers in the same autonomous system or to only other subautonomous systems within a confederation.
no-export-subconfed	Displays routes that are part of the well-known community no-export-subconfed.
vrf <i>vrf-name</i>	(Optional) Specifies the virtual routing and forwarding (VRF) instance. The name can be any case-sensitive, alphanumeric string up to 32 characters.
all	(Optional) Specifies the reserved all VRF.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display the routes that are part of the 201 BGP community:

```
switch# show ip bgp community 201
```

This example shows how to display the routes that are part of the no-advertise BGP community and all VRF:

```
switch# show ip bgp community no-advertise
```

Related Commands	Command	Description
	set community	Sets the attributes for BGP communities.
	show ip bgp community-list	Displays BGP routes that are permitted by the BGP community list.
	show ip bgp community exact-match	Displays the routes that have exactly the same specified BGP communities.

show ip bgp community exact-match

To display routes that matches a specific Border Gateway Protocol (BGP) community, use the **show ip bgp community exact-match** command.

show ip bgp community *community-number* **exact-match** [**vrf** {*vrf-name* | **all**}]

Syntax Description

<i>community-number</i>	Community number. Valid value is a community number in the range from 1 to 4294967200, or AA:NN (autonomous system-community number/2-byte number).
vrf <i>vrf-name</i>	(Optional) Specifies the virtual routing and forwarding (VRF) instance. The name can be any case-sensitive, alphanumeric string up to 32 characters.
all	(Optional) Specifies all VRF instances.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display the routes that have exactly the same specified BGP communities:

```
switch# show ip bgp community 201 exact-match
```

Related Commands

Command	Description
set community	Sets the attributes for BGP communities.
show ip bgp community	Displays the BGP routes that match a community list.
show ip bgp community-list	Displays BGP routes that are permitted by the BGP community list.

show ip bgp community-list

To display Border Gateway Protocol (BGP) routes that are permitted by the BGP community list, use the **show ip bgp community-list** command.

```
show ip bgp [[ipv4 | ipv6]{unicast | multicast} | all] community-list commlist-name
[exact-match]}
[vrf vrf-name]
```

Syntax Description	
ipv4	(Optional) Displays BGP information for the IPv4 address family.
ipv6	(Optional) Displays BGP information for the IPv6 address family.
unicast	Displays BGP information for the unicast address family.
multicast	Displays BGP information for the multicast address family.
all	Displays BGP information for all address families.
<i>commlist-name</i>	Community list name that can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the communities.
vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	<p>This example shows how to display routes that match a community list:</p> <pre>switch(config)# show ip bgp community-list test1</pre>
-----------------	--

Related Commands	Command	Description
	ip community-list	Creates a community list.

show ip bgp dampening

To display Border Gateway Protocol (BGP) dampening information, use the **show ip bgp dampening** command.

```
show ip bgp [[ipv4 | ipv6] {unicast | multicast} | all] dampening {dampened-paths [regex  
expression] | flap-statistics | history-paths [regex expression] | parameters} [vrf vrf-name]
```

Syntax Description	
ipv4	(Optional) Displays BGP information for the IPv4 address family.
ipv6	(Optional) Displays BGP information for the IPv6 address family.
unicast	Displays BGP information for the unicast address family.
multicast	Displays BGP information for the multicast address family.
all	Displays BGP information for all address families.
dampened-paths	Displays all dampened paths.
regex <i>expression</i>	(Optional) Displays information that matches the regular expression.
flap-statistics	Displays flap statistics for routes.
history-paths	Displays all history paths.
parameters	Displays all dampening parameters.
vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	<p>This example shows how to display the dampening information:</p> <pre>switch(config)# show ip bgp dampening dampened-paths</pre>
-----------------	--

Related Commands	
-------------------------	--

Command	Description
clear ip bgp dampening	Clears BGP route flap dampening information.
dampening (BGP)	Configures the route flap dampening.

show ip bgp extcommunity

To display Border Gateway Protocol (BGP) routes that match an extended community, use the **show ip bgp extcommunity** command.

```
show ip bgp extcommunity generic {non-transitive | transitive} [as4-number] [exact-match]
[vrf vrf-name]
```

Syntax Description	generic	Displays the routes that match the generic specific extended communities.
	non-transitive	Displays the routes that match the non-transitive extended communities.
	transitive	Displays the routes that match the transitive extended communities.
	<i>as4-number</i>	(Optional) AS number. The <i>as4-number</i> is a 32-bit integer in the form of a plaintext integer or <higher 16-bit decimal number>.<lower 16-bit decimal number> .
	exact-match	(Optional) Displays an exact match of the extended community.
	vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default	None
-----------------	------

Command Modes	Any command mode
---------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	<p>This example shows how to display routes that match an extended community:</p> <pre>switch(config)# show ip bgp extcommunity generic transitive 1.3:30</pre>
----------	---

Related Commands	Command	Description
	ip extcommunity-list	Creates an extended community list.

show ip bgp extcommunity-list

To display Border Gateway Protocol (BGP) routes that match an extended community list, use the **show ip bgp extcommunity-list** command.

show ip bgp extcommunity-list *commlist-name* [**exact-match**] [**vrf** *vrf-name*]

Syntax Description

<i>commlist-name</i>	Name of an extended community-list. The <i>commlist-name</i> can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the extended communities.
vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display routes that match a community list:

```
switch(config)# show ip bgp extcommunity-list test1
```

Related Commands

Command	Description
ip extcommunity-list	Creates an extended community list.

show ip bgp filter-list

To display Border Gateway Protocol (BGP) routes that match a filter list, use the **show ip bgp filter-list** command.

show ip bgp filter-list *list-name* [**exact-match**] [**vrf** *vrf-name*]

Syntax Description	<i>list-name</i>	Name of a filter list. The name can be any case-sensitive, alphanumeric string up to 63 characters.
	exact-match	(Optional) Displays an exact match of the filter.
	vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Enterprise Services license.

Examples This example shows how to display routes that match a filter list:

```
switch(config)# show ip bgp filter-list test1
```

Related Commands	Command	Description
	filter-list (BGP)	Configures a BGP filter.

show ip bgp flap-statistics

To display Border Gateway Protocol (BGP) flap statistics, use the **show ip bgp flap-statistics** command.

show ip bgp flap-statistics [*vrf vrf-name*]

Syntax Description	vrf <i>vrf-name</i> (Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.	
Command Default	None	
Command Modes	Any command mode	
Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.
Usage Guidelines	This command requires the LAN Enterprise Services license.	
Examples	This example shows how to display the flap statistics: <pre>switch(config)# show ip bgp flap-statistics</pre>	
Related Commands	Command	Description
	clear bgp flap-statistics	Clears BGP route flap statistics.

show ip bgp neighbors

To display Border Gateway Protocol (BGP) neighbors, use the **show ip bgp neighbors** command.

show ip bgp neighbors [*addr* [**advertised-routes** | **flap-statistics** | **paths** | **received-routes** | **routes** [**advertised** | **dampened** | **received**]]] [**vrf** {**all** | *vrf-name*}]

Syntax Description

<i>addr</i>	IPv4 or IPv6 address. The format for IPv4 is x.x.x.x and the format for IPv6 is A:B::C:D.
advertised-routes	(Optional) Displays all the routes advertised to this neighbor.
flap-statistics	(Optional) Displays flap statistics for the routes received from this neighbor.
paths	(Optional) Displays AS paths learned from this neighbor.
received-routes	(Optional) Displays all the routes received from this neighbor.
routes	(Optional) Displays the routes received or advertised to or from this neighbor.
advertised	(Optional) Displays all the routes advertised for this neighbor.
dampened	(Optional) Displays all dampened routes received from this neighbor.
received	(Optional) Displays all the routes received from this neighbor.
vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
all	(Optional) Specifies all VRF instances.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display the BGP neighbors:

```
switch(config)# show ip bgp neighbors
```

Related Commands

Command	Description
neighbor	Configures BGP neighbors.

show ip bgp nexthop

To display Border Gateway Protocol (BGP) next-hop information, use the **show ip bgp nexthop** command.

show ip bgp nexthop *addr* [**vrf** *vrf-name*]

Syntax Description	<i>addr</i>	IPv4 address. The format is x.x.x.x
	vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	This example shows how to display the BGP next-hop information:
	<code>switch(config)# show ip bgp nexthop 192.0.2.1</code>

Related Commands	Command	Description
	show ip bgp neighbors	Displays BGP neighbor information.

show ip bgp nexthop-database

To display Border Gateway Protocol (BGP) next-hop database, use the **show ip bgp nexthop-database** command.

show ip bgp nexthop-database [*vrf vrf-name*]

Syntax Description

vrf vrf-name	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
---------------------	--

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display the BGP next-hop database:

```
switch(config)# show ip bgp nexthop-database

Next Hop table for VRF default, address family IPv4 Unicast:

Nexthop: 0.0.0.0, Refcount: 1, IGP cost: 0
IGP Route type: 0, IGP preference: 0
Nexthop is not-attached local unreachable
Nexthop last resolved: never, using 0.0.0.0/0
Metric next advertise: Never
RNH epoch: 0

Nexthop: 192.0.0.0, Refcount: 0, IGP cost: -1
IGP Route type: 0, IGP preference: 0
Nexthop is not-attached not-local unreachable
Nexthop last resolved: never, using 0.0.0.0/0
Metric next advertise: Never
RNH epoch: 0
switch(config)#
```

Related Commands

Command	Description
show ip bgp neighbors	Displays BGP neighbor information.

show ip bgp paths

To display all the Border Gateway Protocol (BGP) paths in the database, use the **show ip bgp paths** command.

show ip bgp paths

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	Any command mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
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Examples	This example shows how to display the BGP paths in the database:
-----------------	--

```
switch(config)# show ip bgp paths
Address      Hash Refcount      Metric Path
0x5a7f46bc 2001          1          0 i
switch(config)#
```

Related Commands	Command	Description
	maximum-paths	Controls the maximum number of parallel routes that the Border Gateway Protocol (BGP) can support.
	show ip bgp	Displays the BGP table information.
	show ip bgp neighbors	Displays BGP neighbor information.

show ip bgp peer-policy

To display Border Gateway Protocol (BGP) peer policy template information, use the **show ip bgp peer-policy** command.

show ip bgp peer-policy *name*

Syntax Description	<i>name</i> Name of a BGP template. The name can be any case-sensitive, alphanumeric string up to 80 characters.							
Command Default	None							
Command Modes	Any command mode							
Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr></table>		Release	Modification	5.0(3)U1(1)	This command was introduced.		
Release	Modification							
5.0(3)U1(1)	This command was introduced.							
Usage Guidelines	This command requires the LAN Enterprise Services license.							
Examples	This example shows how to display the BGP peer policy: <pre>switch(config)# show ip bgp peer-policy test1</pre>							
Related Commands	<table><tr><th>Command</th><th>Description</th></tr><tr><td>inherit peer-policy</td><td>Inherits a peer policy template for a neighbor.</td></tr><tr><td>template peer-policy</td><td>Configures a peer policy template.</td></tr></table>		Command	Description	inherit peer-policy	Inherits a peer policy template for a neighbor.	template peer-policy	Configures a peer policy template.
Command	Description							
inherit peer-policy	Inherits a peer policy template for a neighbor.							
template peer-policy	Configures a peer policy template.							

show ip bgp peer-session

To display Border Gateway Protocol (BGP) peer session template information, use the **show ip bgp peer-session** command.

show ip bgp peer-session *name*

Syntax Description	<i>name</i>	Name of a BGP template. The name can be any case-sensitive, alphanumeric string up to 80 characters.
--------------------	-------------	--

Command Default	None
-----------------	------

Command Modes	Any command mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
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Examples	This example shows how to display the BGP peer session: <pre>switch(config)# show ip bgp peer-session test1</pre>
----------	--

Related Commands	Command	Description
	inherit peer-session	Inherits a peer session template for a neighbor.
	template peer-session	Configures a peer session template.

show ip bgp peer-template

To display Border Gateway Protocol (BGP) peer template information, use the **show ip bgp peer-template** command.

show ip bgp peer-template *name*

Syntax Description	<i>name</i> Name of a BGP template. The name can be any case-sensitive, alphanumeric string up to 80 characters.	
Command Default	None	
Command Modes	Any command mode	
Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.
Usage Guidelines	This command requires the LAN Enterprise Services license.	
Examples	This example shows how to display the BGP peer template: <pre>switch(config)# show ip bgp peer-template peer1</pre>	
Related Commands	Command	Description
	inherit peer-template	Inherits a peer template for a neighbor.
	template peer	Configures a peer template.

show ip bgp prefix-list

To display Border Gateway Protocol (BGP) routes that match a prefix list, use the **show ip bgp prefix-list** command.

show ip bgp prefix-list *list-name* [**exact-match**] [**vrf** *vrf-name*]

Syntax Description	<i>list-name</i>	Name of a prefix list. The commlist-name can be any case-sensitive, alphanumeric string up to 63 characters.
	exact-match	(Optional) Displays an exact match of the filter.
	vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	<p>This example shows how to display routes that match a prefix list:</p> <pre>switch(config)# show ip bgp prefix-list test1</pre>
-----------------	--

Related Commands	Command	Description
	maximum-prefix	Controls the number of prefixes that can be received from a BGP neighbor.

show ip bgp received-paths

To display the routes received from a Border Gateway Protocol (BGP) peer, use the **show ip bgp received-paths** command.

show ip bgp received-paths [**vrf** {*vrf-name* | **all**}]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
all	(Optional) Specifies all VRF instances.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display the received routes from a BGP peer:

```
switch(config)# show ip bgp received-paths
```

Related Commands

Command	Description
show ip bgp neighbors	Displays BGP neighbor information.

show ip bgp route-map

To display the Border Gateway Protocol (BGP) route maps from the BGP table, use the **show ip bgp route-map** command.

show ip bgp route-map *route-map-name* [**vrf** {*vrf-name* | **all**}]

Syntax Description	<i>route-map-name</i>	Route map name.
	vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
	all	(Optional) Specifies all VRF instances.

Command Default	None
-----------------	------

Command Modes	Any command mode
---------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	This example shows how to display the BGP route maps from the BGP table:
----------	--

```
switch(config)# show ip bgp route-map
```

Related Commands	Command	Description
	route-map	Creates route maps.
	clear ip bgp	Clear BGP routes from the BGP table.

show ip bgp summary

To display the status of all Border Gateway Protocol (BGP) connections, use the **show ip bgp summary** command.

show ip bgp summary [**vrf** {*vrf-name* | **all**}]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
all	(Optional) Specifies all VRF instances.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display the status of BGP connections:

```
switch(config)# show ip bgp summary
```

Related Commands

Command	Description
maximum-prefix	Controls the number of prefixes that can be received from a BGP neighbor.
router bgp	Assigns an autonomous system (AS) number to a router.

show ip client

To display information about the internal IP clients, use the **show ip client** command.

show ip client [*name*]

Syntax Description	<i>name</i> (Optional) Name of the client.	
Command Default	None	
Command Modes	Any command mode	
Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.
Examples	This example shows how to display the IP client information for the Address Resolution Protocol (ARP): switch(config)# show ip client arp	
Related Commands	Command	Description
	show ip process	Displays information about the IP process.

show ip community-list

To display community lists for the Border Gateway Protocol (BGP), use the **show ip community-list** command.

show ip community-list [*name*]

Syntax Description	<i>name</i> (Optional) Name of the community list. The name can be any case-sensitive, alphanumeric string up to 63 characters.	
Command Default	None	
Command Modes	Any command mode	
Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.
Examples	<p>This example shows how to display the community lists:</p> <pre>switch(config)# show ip community-list</pre>	
Related Commands	Command	Description
	ip community-list	Configures a BGP community list.

show ip eigrp

To display a summary of the Enhanced Interior Gateway Routing Protocol (EIGRP) processes, use the **show ip eigrp** command.

show ip eigrp [*instance-tag*]

Syntax Description	<i>instance-tag</i> (Optional) Name of the EIGRP instance. The <i>instance-tag</i> can be any case-sensitive, alphanumeric string up to 20 characters.
--------------------	--

Command Default	None
-----------------	------

Command Modes	Any command mode
---------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	This example shows how to display all the EIGRP instances: switch# show ip eigrp
----------	--

Related Commands	Command	Description
	show running-config eigrp	Displays EIGRP running configuration information.
	router eigrp	Configures an EIGRP instance.

show ip eigrp accounting

To display prefix accounting information for the Enhanced Interior Gateway Routing Protocol (EIGRP) processes, use the **show ip eigrp accounting** command.

show ip eigrp [*instance-tag*] **accounting** [**vrf** {*vrf-name* | **all** | **default** | **management**}]

Syntax Description

<i>instance-tag</i>	(Optional) Name of the EIGRP instance. This option is available when a virtual routing and forwarding (VRF) instance is not specified. The instance tag can be any case-sensitive, alphanumeric string up to 20 characters.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters.
all	(Optional) Specifies all VRF instances.
default	(Optional) Specifies the default VRF.
management	(Optional) Specifies the management VRF.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display the EIGRP accounting information:

```
switch# show ip eigrp accounting
```

Related Commands

Command	Description
show running-config eigrp	Displays EIGRP running configuration information.
router eigrp	Configures an EIGRP instance.

show ip eigrp interfaces

To display information about interfaces configured for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **show ip eigrp interfaces** command.

```
show ip eigrp [instance-tag] interfaces [{ethernet slot/port | loopback if_number | port-channel
number | vlan vlan-id}] [brief] [vrf {vrf-name | all | default | management}]
```

Syntax Description

<i>instance-tag</i>	EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 20 characters.
ethernet <i>slot/port</i>	Specifies the Ethernet interface and the slot number and port number. The slot number is from 1 to 255, and the port number is from 1 to 128.
loopback <i>if_number</i>	Specifies the loopback interface. The loopback interface number is from 0 to 1023.
port-channel <i>number</i>	Specifies the EtherChannel interface and EtherChannel number. The range is from 1 to 4096.
vlan <i>vlan-id</i>	Specifies the VLAN interface. The range is from 1 to 4094.
brief	(Optional) Displays a brief summary of EIGRP interface information.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters.
all	(Optional) Specifies all VRF instances.
default	(Optional) Specifies the default VRF.
management	(Optional) Specifies the management VRF.

Command Default

This command shows all interfaces for the default VRF if no VRF or no interface is specified.

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **show ip eigrp interfaces** command to determine on which interfaces EIGRP is active and learn information about EIGRP related to those interfaces.

If you specify an interface, only that interface is displayed. Otherwise, all interfaces on which EIGRP is running are displayed.

If you specify an autonomous system, only the routing process for the specified autonomous system is displayed. Otherwise, all EIGRP processes are displayed.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display information about EIGRP interfaces:

```
switch# show ip eigrp interfaces brief
```

This example shows how to display information about a particular EIGRP interface:

```
switch# show ip eigrp interfaces ethernet 2/5
```

Related Commands

Command	Description
show ip eigrp neighbors	Displays the neighbors discovered by EIGRP.
show running-config eigrp	Displays EIGRP running configuration information.

show ip eigrp neighbors

To display information about neighbors discovered by the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **show ip eigrp neighbors** command.

show ip eigrp [*instance-tag*] **neighbors** [**detail**] [{**ethernet** *slot/port* | **loopback** *if_number* | **port-channel** *number* | **vlan** *vlan-id*}] [[**vrf** {*vrf-name* | **all** | **default** | **management**}]]

Syntax Description	<i>instance-tag</i>	(Optional) Name of the EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 20 characters.
	detail	(Optional) Displays detailed EIGRP neighbor information.
	ethernet <i>slot/port</i>	(Optional) Specifies the Ethernet interface and the slot number and port number. The slot number is from 1 to 255, and the port number is from 1 to 128.
	loopback <i>if_number</i>	(Optional) Specifies the loopback interface. The loopback interface number is from 0 to 1023.
	port-channel <i>number</i>	(Optional) Specifies the EtherChannel interface and EtherChannel number. The range is from 1 to 4096.
	vlan <i>vlan-id</i>	(Optional) Specifies the VLAN interface. The range is from 1 to 4094.
	vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters.
	all	(Optional) Specifies all VRF instances.
	default	(Optional) Specifies the default VRF.
	management	(Optional) Specifies the management VRF.

Command Default This command displays all neighbors for the default VRF on all interfaces if no VRF or interface is specified.

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines Use the **show ip eigrp neighbors** command to determine when neighbors become active and inactive. This command is also useful for debugging certain types of transport problems.

This command requires the LAN Enterprise Services license.

Examples This example shows how to display information about EIGRP neighbors:

```
switch# show ip eigrp neighbors
```

show ip eigrp neighbors

This example shows how to display detailed information about EIGRP neighbors:

```
switch# show ip eigrp neighbors detail
```

Related Commands

Command	Description
clear ip eigrp neighbors	Clears neighbors for EIGRP.
show running-config eigrp	Displays EIGRP running configuration information.

show ip eigrp route

To display the Enhanced Interior Gateway Routing Protocol (EIGRP) routes, use the **show ip eigrp route** command in any mode.

show ip eigrp [*instance-tag*] **route** [*ip-prefix/length*] [**active**] [**all-links**] [**detail-links**] [**pending**] [**summary**] [**zero-successors**] [**vrf** {*vrf-name* | **all** | **default** | **management**}]

Syntax Description	
<i>instance-tag</i>	(Optional) Name of the EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 20 characters.
<i>ip-prefix/length</i>	(Optional) IP address in four-part, dotted-decimal notation with a network mask indicated as a slash (/) and number. For example, /8 indicates that the first 8 bits of the mask are 1s, and the corresponding bits of the address are the network address.
active	(Optional) Displays only active entries in the EIGRP topology table.
all-links	(Optional) Displays all entries in the EIGRP topology table.
detail-links	(Optional) Displays detailed information for all entries in the EIGRP topology table.
pending	(Optional) Displays all entries in the EIGRP topology table that are waiting for an update from a neighbor or are waiting to reply to a neighbor.
summary	(Optional) Displays a summary of the EIGRP topology table.
zero-successors	(Optional) Displays available routes in the EIGRP topology table.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters.
all	(Optional) Specifies all VRF instances.
default	(Optional) Specifies the default VRF.
management	(Optional) Specifies the management VRF.

Command Default None


Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines This command requires the LAN Enterprise Services license.

Examples This example shows how to display the EIGRP routes:

```
switch# show ip eigrp route
```

 `show ip eigrp route`

Related Commands	Command	Description
	<code>clear ip eigrp route-map statistics</code>	Clears route-map statistics for EIGRP.
	<code>show ip eigrp traffic</code>	Displays EIGRP traffic statistics.
	<code>show running-config eigrp</code>	Displays EIGRP running configuration information.

show ip eigrp route-map statistics

To display the route redistribution statistics for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **show ip eigrp route-map statistics** command in any mode.

```
show ip eigrp [instance-tag] route-map statistics redistribute {bgp id | direct | eigrp id | ospf id | rip id | static} [vrf {vrf-name | all | default | management}]
```

Syntax Description	
<i>instance-tag</i>	(Optional) Name of the EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 20 characters.
redistribute	Displays the statistics of redistributed routes.
bgp	Displays policy statistics for the Border Gateway Protocol (BGP).
direct	Displays policy statistics for directly connected routes only.
eigrp	Displays policy statistics for EIGRP.
ospf	Displays policy statistics for the Open Shortest Path First (OSPF) protocol.
rip	Displays policy statistics for the Routing Information Protocol (RIP).
static	Displays policy statistics for IP static routes.
<i>id</i>	<p>For the bgp keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535.</p> <p>For the eigrp keyword, an EIGRP instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.</p> <p>For the ospf keyword, an OSPF instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.</p>
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters.
all	(Optional) Specifies all VRF instances.
default	(Optional) Specifies the default VRF.
management	(Optional) Specifies the management VRF.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display route-map statistics for EIGRP:

```
switch# show ip eigrp route-map statistics redistribute direct
```

Related Commands

Command	Description
clear ip eigrp route-map statistics	Clears route-map statistics for EIGRP.
show ip eigrp traffic	Displays EIGRP traffic statistics.
show running-config eigrp	Displays EIGRP running configuration information.

show ip eigrp topology

To display the Enhanced Interior Gateway Routing Protocol (EIGRP) topology table, use the **show ip eigrp topology** command.

show ip eigrp [*instance-tag*] **topology** [*ip-address/length*] [**active** | **all-links** | **detail-links** | **pending** | **summary** | **zero-successors**] [**vrf** {*vrf-name* | **all** | **default** | **management**}]

Syntax Description	
<i>instance-tag</i>	(Optional) Name of the EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 20 characters.
<i>ip-address/length</i>	(Optional) IPv4 or IPv6 address in four-part, dotted-decimal notation with a network mask indicated as a slash (/) and number. For example, /8 indicates that the first 8 bits of the mask are 1s, and the corresponding bits of the address are the network address.
active	(Optional) Displays only active entries in the EIGRP topology table.
all-links	(Optional) Displays all entries in the EIGRP topology table.
detail-links	(Optional) Displays detailed information for all entries in the EIGRP topology table.
pending	(Optional) Displays all entries in the EIGRP topology table that are waiting for an update from a neighbor or are waiting to reply to a neighbor.
summary	(Optional) Displays a summary of the EIGRP topology table.
zero-successors	(Optional) Displays available routes in the EIGRP topology table.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters.
all	(Optional) Specifies all VRF instances.
default	(Optional) Specifies the default VRF.
management	(Optional) Specifies the management VRF.

Command Default This command displays information for the default VRF if no VRF is specified.

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines Use the **show ip eigrp topology** command to determine Diffusing Update Algorithm (DUAL) states and to debug possible DUAL problems.

When you use the **show ip eigrp topology** command without any keywords or arguments, Cisco NX-OS displays only routes that are feasible successors.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display the EIGRP topology table. The EIGRP metrics for specified internal routes and external routes are displayed.

```
switch# show ip eigrp topology 192.0.2.0/24
```

This example show how to display all the entries in the EIGRP topology table:

```
switch(config)# show ip eigrp topology all-links
```

This example shows how to display the detailed information for all entries in the EIGRP topology table:

```
switch(config)# show ip eigrp topology detail-links
```

This example shows how to display a summary of the topology table:

```
switch(config)# show ip eigrp topology summary
```

This example shows how to display the active entries in the topology table:

```
switch(config-if)# show ip eigrp topology active
```

This example shows how to display zero-successors in the topology table:

```
switch(config-router)# show ip eigrp topology zero-successors
```

This example shows how to display pending entries:

```
switch(config)# show ip eigrp topology pending
```

Related Commands

Command	Description
show running-config eigrp	Displays EIGRP running configuration information.

show ip eigrp traffic

To display the number of Enhanced Interior Gateway Routing Protocol (EIGRP) packets sent and received, use the **show ip eigrp traffic** command.

show ip eigrp [*instance-tag*] **traffic** [**vrf** {*vrf-name* | **all** | **default** | **management**}]

Syntax Description

<i>instance-tag</i>	(Optional) Name of the EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 20 characters.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters.
all	(Optional) Specifies all VRF instances.
default	(Optional) Specifies the default VRF.
management	(Optional) Specifies the management VRF.

Command Default

This command displays information for the default VRF if no VRF is specified.

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **show ip eigrp traffic** command to find the number of packets sent and received by this EIGRP instance.

In addition, this command is useful in determining whether packets from one node are not reaching the neighboring node due to connectivity or configuration problems.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display the EIGRP traffic statistics:

```
switch# show ip eigrp traffic
```

Related Commands

Command	Description
show running-config eigrp	Displays EIGRP running configuration information.

show ip fib

To display forwarding information, use the **show ip fib** command.

show ip fib { **adjacency** | **interfaces** | **route** } **module** *slot*

Syntax Description	adjacency	Displays the adjacency information.
	interfaces	Displays the forwarding information for interfaces on a module.
	route	Displays the forwarding information for routes on a module.
	module <i>slot</i>	Displays information for the module. The slot range depends on the hardware platform.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Use the show ip fib command on the supervisor to view forwarding information on a module. Optionally, you can use the attach module command to attach to a module and use the show ip fib command on the module.
-------------------------	---

This command does not require a license.

Examples	This example shows how to display the forwarding information for module 1:
-----------------	--

```
switch# show ip fib route module 1
```

Related Commands	Command	Description
	show forwarding	Displays information about the FIB.

show ip fib distribution

To display forwarding distribution information, use the **show ip fib distribution** command.

show ip fib distribution [**clients** | **state**]

Syntax Description	clients	(Optional) Displays the forwarding distribution information for unicast clients.
	state	(Optional) Displays the forwarding distribution state for unicast FIB.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples	This example shows how to display the forwarding information for unicast clients:
	switch# show ip fib distribution clients

Related Commands	Command	Description
	show forwarding distribution	Displays distribution information about the FIB.

show ip interface

To display IP information for an interface, use the **show ip interface** command.

show ip interface [*type number*] [**brief**] [**vrf** *vrf-name*]

Syntax Description	<i>type</i>	(Optional) Interface type. Use ? to see the options.
	<i>number</i>	(Optional) Interface number. Use ? to see the range.
	brief	(Optional) Displays a summary of IP information.
	vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples This example shows how to display the IP information for Ethernet 1/5:

```
switch# show ip interface ethernet 1/5
```

Related Commands	Command	Description
	ip address	Assigns a primary IP address for a network interface.

show ip load-sharing

To display IP load sharing information, use the **show ip load-sharing** command.

show ip load-sharing

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples	<p>This example shows how to display the IP load sharing information:</p> <pre>switch# show ip load-sharing</pre>
-----------------	---

Related Commands	Command	Description
	show ip load-sharing	Displays IP load sharing.

show ip ospf

To display general information about Open Shortest Path First (OSPF) routing instances, use the **show ip ospf** command.

show ip ospf [*instance-tag*] [**vrf** *vrf-name*]

Syntax Description

<i>instance-tag</i>	(Optional) Name of the OSPF instance. Use this tag to display OSPF information about a specific OSPF instance. The <i>instance-tag</i> argument can be any alphanumeric string of 20 characters.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf** command to display information about one or more OSPF instances. This command requires the LAN Enterprise Services license.

Examples

This example shows how to display information all about OSPF instances:

```
switch# show ip ospf
```

This example shows how to display information about one specific OSPF instance:

```
switch# show ip ospf 201
```

Related Commands

Command	Description
show running-config ospf	Displays the OSPF running configuration.

show ip ospf border-routers

To display the Open Shortest Path First (OSPF) routing table entries to an Area Border Router (ABR) and Autonomous System Boundary Router (ASBR), use the **show ip ospf border-routers** command.

show ip ospf [*instance-tag*] **border-routers** [**vrf** *vrf-name*]

Syntax Description	<i>instance-tag</i>	(Optional) Name of the OSPF instance. Use this tag to display OSPF information about a specific OSPF instance. The <i>instance-tag</i> argument can be a maximum of 20 alphanumeric characters.
	vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
Command Default	None	
Command Modes	Any command mode	
Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.
Usage Guidelines	Use the show ip ospf border-routers command to display information on ABRs. and ASBRs. This command requires the LAN Enterprise Services license.	
Examples	This example shows how to display information about border routers: switch# show ip ospf border-routers	
Related Commands	Command	Description
	show running-config ospf	Displays the OSPF running configuration.

show ip ospf database

To display the Open Shortest Path First (OSPF) database for a specific router, use the **show ip ospf database** command.

```
show ip ospf [instance-tag] database [area-id] [link-state-id] [adv-router ip-address |
self-originated] [detail] [vrf vrf-name]

show ip ospf [instance-tag] database asbr-summary [area-id] [link-state-id] [adv-router
ip-address | self-originated] [detail] [vrf vrf-name]

show ip ospf [instance-tag] database database-summary [vrf vrf-name]

show ip ospf [instance-tag] database external [ext_tag value] [link-state-id] [adv-router
ip-address | self-originated] [detail] [vrf vrf-name]

show ip ospf [instance-tag] database network [area-id] [link-state-id] [adv-router ip-address |
self-originated] [detail] [vrf vrf-name]

show ip ospf [instance-tag] database nssa-external [area-id] [link-state-id] [adv-router
ip-address | self-originated] [detail] [vrf vrf-name]

show ip ospf [instance-tag] database opaque-area [area-id] [link-state-id] [adv-router ip-address
| self-originated] [detail] [vrf vrf-name]

show ip ospf [instance-tag] database opaque-as [link-state-id] [adv-router ip-address |
self-originated] [detail] [vrf vrf-name]

show ip ospf [instance-tag] database opaque-link [area-id] [link-state-id] [adv-router ip-address
| self-originated] [detail] [vrf vrf-name]

show ip ospf [instance-tag] database router [area-id] [link-state-id] [adv-router ip-address |
self-originated] [detail] [vrf vrf-name]

show ip ospf [instance-tag] database summary [area-id] [link-state-id] [adv-router ip-address |
self-originated] [detail] [vrf vrf-name]
```

Syntax Description

<i>instance-tag</i>	(Optional) Name of the OSPF instance. The name can be a maximum of 20 alphanumeric characters.
<i>area-id</i>	(Optional) Area number used to define the particular area. Specify as either an IP address or a number from 0 to 4294967295.
<i>link-state-id</i>	(Optional) Portion of the Internet environment that is being described by the advertisement. The value entered depends on the advertisement's link-state type. Specify in the form of an IP address.
adv-router <i>ip-address</i>	(Optional) Displays all the link-state advertisements (LSAs) of the specified router.
self-originate	(Optional) Displays self-originated LSAs (from the local router).
asbr-summary	(Optional) Displays information about the autonomous system boundary router summary LSAs.
database-summary	(Optional) Displays each type of LSA for each area in the database, and the total number of LSAs.

external	(Optional) Displays information about the external LSAs.
ext_tag <i>value</i>	(Optional) Displays information based on an external tag. The range is from 1 to 4294967295.
network	(Optional) Displays information about the network LSAs.
nssa-external	(Optional) Displays information about the not-so-stubby area (NSSA) external LSAs.
opaque-area	(Optional) Displays information about the opaque area LSAs.
opaque-as	(Optional) Displays information about the opaque AS LSAs.
opaque-link	(Optional) Displays information about the opaque link-local LSAs.
router	(Optional) Displays information about the router LSAs.
summary	(Optional) Displays information about the summary LSAs.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines Use the **ip ospf database** command to display information about different OSPF LSAs. When the link state advertisement is describing a network, the *link-state-id* argument can take one of two forms:

- The network’s IP address (such as Type 3 summary link advertisements and autonomous system external link advertisements).
- A derived address obtained from the link state ID. (Note that masking a network links advertisement’s link state ID with the network’s subnet mask yields the network’s IP address.)
- When the link state advertisement is describing a router, the link state ID is always the described router’s OSPF router ID.
- When an autonomous system external advertisement (LS Type = 5) is describing a default route, its link state ID is set to Default Destination (0.0.0.0).

This command requires the LAN Enterprise Services license.

Examples This example shows how to display the OSPF database:

```
switch# show ip ospf database
```

This example shows how to display a summary of autonomous system border routers:

show ip ospf database

```
switch# show ip ospf database asbr-summary
```

This example shows how to display information about external links:

```
switch# show ip ospf database external
```

This example shows how to display a summary of the OSPF database:

```
switch# show ip ospf database database-summary
```

Related Commands

Command	Description
show running-config ospf	Displays the OSPF running configuration.

show ip ospf interface

To display Open Shortest Path First (OSPF)-related interface information, use the **show ip ospf interface** command.

```
show ip ospf interface [instance-tag] [{ethernet slot/port | loopback if_number | port-channel
number}] [brief] [vrf vrf-name]
```

Syntax Description	<i>instance-tag</i>	(Optional) Name of the OSPF instance. The name can be a maximum of 20 alphanumeric characters.
	ethernet <i>slot/port</i>	(Optional) Specifies the Ethernet interface. The slot number is from 1 to 255, and the port number is from 1 to 128.
	loopback <i>if_number</i>	(Optional) Specifies the loopback interface. The loopback interface number is from 0 to 1023.
	port-channel <i>number</i>	(Optional) Specifies the EtherChannel interface and EtherChannel number. The range is from 1 to 4096.
	brief	(Optional) Displays brief overview information for OSPF interfaces, states, addresses, masks, and areas on the router.
	vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf interface** command to display the OSPF status for the interface. This command requires the LAN Enterprise Services license.

Examples

This example shows how to display OSPF information for Ethernet interface 1/5:


```
switch# show ip ospf interface ethernet 1/5
```

This example shows how to display OSPF information for all VRFs:

```
switch# show ip ospf interface vrf all
```

This example shows how to display OSPF information in a brief format:

```
switch# show ip ospf interface brief
```

 `show ip ospf interface`

Related Commands	Command	Description
	<code>show running-config ospf</code>	Displays the OSPF running configuration.

show ip ospf lsa-content-changed-list

To display a list of all link-state advertisements (LSAs) with changed content, use the **show ip ospf lsa-content-changed-list** command.

```
show ip ospf lsa-content-changed-list neighbor-id {ethernet slot/port | loopback if_number |  
port-channel number}
```

Syntax Description	<i>neighbor-id</i>	Router ID for the neighbor in the format <i>A.B.C.D</i> or <i>A:B::C:D</i> .
	ethernet <i>slot/port</i>	Specifies the Ethernet interface and the slot number and port number. The slot number is from 1 to 255, and the port number is from 1 to 128.
	loopback <i>if_number</i>	Specifies the loopback interface. The loopback interface number is from 0 to 1023.
	port-channel <i>number</i>	Specifies the EtherChannel interface and EtherChannel number. The range is from 1 to 4096.

Command Default	None
-----------------	------

Command Modes	Any command mode
---------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	<p>This example shows how to display a list of LSAs that changed for Ethernet 2/1:</p> <pre>switch# show ip ospf lsa-content-changed-list 192.0.2.2 ethernet 2/1</pre>
----------	--

Related Commands	Command	Description
	show running-config ospf	Displays the OSPF running configuration.

show ip ospf neighbors

To display Open Shortest Path First (OSPF)-neighbor information on a per-interface basis, use the **show ip ospf neighbors** command.

```
show ip ospf [instance-tag] neighbors [{ethernet slot/port | loopback if_number | port-channel
number}] [neighbor-id] [detail] [summary] [vrf {vrf-name | all | default | management}]
```

Syntax Description	
<i>instance-tag</i>	(Optional) Name of the OSPF instance. Specify as an alphanumeric string of 20 characters.
ethernet <i>slot/port</i>	(Optional) Specifies the Ethernet interface and the slot number and port number. The slot number is from 1 to 255, and the port number is from 1 to 128.
loopback <i>if_number</i>	(Optional) Specifies the loopback interface. The loopback interface number is from 0 to 1023.
port-channel <i>number</i>	(Optional) Specifies the EtherChannel interface and EtherChannel number. The range is from 1 to 4096.
<i>neighbor-id</i>	(Optional) Router ID of the neighbor. Specify as an IP address.
detail	(Optional) Displays all neighbors given in detail (lists all neighbors).
summary	(Optional) Displays a summary of the neighbors.
vrf	(Optional) Specifies a virtual routing and forwarding (VRF) instance.
<i>vrf-name</i>	VRF name. The name can be a maximum of 32 alphanumeric characters and is case sensitive.
all	Specifies all VRF entries.
default	Specifies the default VRF.
management	Specifies the management VRF.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf neighbors** command to display information about all or some of the neighbors for this OSPF instance.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display the summary information about the neighbor that matches the neighbor ID:

```
switch# show ip ospf neighbors 10.199.199.137
```

This example shows how to display the neighbors that match the neighbor ID on an interface:

```
switch# show ip ospf neighbors ethernet 2/1 10.199.199.137
```

This example shows how to display detailed information about OSPF neighbors:

```
switch# show ip ospf neighbors detail
```

Related Commands

Command	Description
show running-config ospf	Displays the OSPF running configuration.

show ip ospf policy statistics area

To display Open Shortest Path First (OSPF) policy statistics for an area, use the **show ip ospf policy statistics area** command.

show ip ospf [*instance-tag*] **policy statistics area** *area-id* **filter-list** {**in** | **out**} [**vrf** *vrf-name*]

Syntax Description	<i>instance-tag</i>	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
	area <i>area-id</i>	Specifies the area number used to define the particular area. The area ID can be an IP address or a number from 0 to 4294967295.
	filter-list	Filters prefixes between OSPF areas.
	in	Displays policy statistics for incoming routes.
	out	Displays policy statistics for outgoing routes.
	vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default”, “management”, and “all” are reserved VRF names.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf policy statistics area** command to display information about the filter lists applied to an area.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display policy statistics for OSPF:

```
switch# show ip ospf policy statistics area 201 filter-list in
```

Related Commands	Command	Description
	area filter-list (OSPF)	Filters incoming or outgoing Network Summary (type 3) link-state advertisements (LSAs) on an Area Border Router (ABR).

Command	Description
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
show running-config ospf	Displays the OSPF running configuration.

show ip ospf policy statistics redistribute

To display Open Shortest Path First (OSPF) policy statistics, use the **show ip ospf policy statistics redistribute** command.

```
show ip ospf [instance-tag] policy statistics redistribute {bgp id | direct | eigrp id | ospf id | rip
id | static} [vrf vrf-name]
```

Syntax	Description
<i>instance-tag</i>	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
bgp	Displays policy statistics for the Border Gateway Protocol (BGP).
direct	Displays policy statistics for directly connected routes only.
eigrp	Displays policy statistics for the Enhanced Interior Gateway Routing Protocol (EIGRP).
ospf	Displays policy statistics for OSPF.
rip	Displays policy statistics for the Routing Information Protocol (RIP).
static	Displays policy statistics for IP static routes.
<i>id</i>	For the bgp keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. For the eigrp keyword, an autonomous system number. The range is from 1 to 65535. For the ospf and rip keywords, an instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default”, “management”, and “all” are reserved VRF names.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf policy statistics redistribute** command to display redistribution statistics. This command requires the LAN Enterprise Services license.

Examples

This example shows how to display policy statistics for redistributed routes:

```
switch# show ip ospf policy statistics redistribute
```

Related Commands

Command	Description
show running-config ospf	Displays the OSPF running configuration.

show ip ospf request-list

To display a list of all link-state advertisements (LSAs) requested by a router, use the **show ip ospf request-list** command.

```
show ip ospf request-list neighbor-id { ethernet slot/port | loopback if_number | port-channel
number }
```

Syntax Description

<i>neighbor-id</i>	Router ID of the neighbor. Specify as an IP address.
ethernet <i>slot/port</i>	(Optional) Specifies the Ethernet interface and the slot number and port number. The slot number is from 1 to 255, and the port number is from 1 to 128.
loopback <i>if_number</i>	(Optional) Specifies the loopback interface. The loopback interface number is from 0 to 1023.
port-channel <i>number</i>	(Optional) Specifies the EtherChannel interface and EtherChannel number. The range is from 1 to 4096.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf request-list** command to troubleshoot Open Shortest Path First (OSPF) routing operations.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display a list of all LSAs requested by a router:

```
switch# show ip ospf request-list 40.40.40 ethernet 2/1
```

Related Commands

Command	Description
show running-config ospf	Displays the OSPF running configuration.

show ip ospf retransmission-list

To display a list of all link-state advertisements (LSAs) waiting to be resent to neighbors, use the **show ip ospf retransmission-list** command.

```
show ip ospf retransmission-list neighbor-id { ethernet slot/port | loopback if_number |  
                                port-channel number }
```

Syntax Description	<i>neighbor-id</i>	Router ID of the neighbor. Specify as an IP address.
	ethernet <i>slot/port</i>	(Optional) Specifies the Ethernet interface and the slot number and port number. The slot number is from 1 to 255, and the port number is from 1 to 128.
	loopback <i>if_number</i>	(Optional) Specifies the loopback interface. The loopback interface number is from 0 to 1023.
	port-channel <i>number</i>	(Optional) Specifies the EtherChannel interface and EtherChannel number. The range is from 1 to 4096.

Command Default	None
-----------------	------

Command Modes	Any command mode
---------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	Use the show ip ospf retransmission-list command to troubleshoot Open Shortest Path First (OSPF) routing operations.
	This command requires the LAN Enterprise Services license.

Examples	This example shows how to display all LSAs waiting to be resent to neighbors:
	switch# show ip ospf retransmission-list 192.0.2.11 ethernet 2/1

Related Commands	Command	Description
	show running-config ospf	Displays the OSPF running configuration.

show ip ospf route

To display the Open Shortest Path First (OSPF) topology table, use the **show ip ospf route** command.

show ip ospf [*instance-tag*] **route** [*prefix/length* | **summary**] [**vrf** *vrf-name*]

Syntax Description	<i>instance-tag</i>	(Optional) Name of the OSPF instance. Specify as an alphanumeric string of 20 characters.
	<i>prefix/length</i>	(Optional) IP prefix, which limits output to a specific route. Indicate the length as a slash (/) and number from 1 to 31. For example, /8 indicates that the first eight bits in the IP prefix are network bits.
	summary	(Optional) Displays a summary of all routes.
	vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default”, “management”, and “all” are reserved VRF names.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines Use the **show ospf routes** command to display the OSPF private routing table (which contains only routes that are calculated by OSPF). If something is wrong with a route in the routing information base (RIB), then you should check the OSPF copy of the route to determine if it matches the RIB contents. If it does not match, a synchronization problem exists between OSPF and the RIB.

This command requires the LAN Enterprise Services license.

Examples This example shows how to display OSPF routes:

```
switch# show ip ospf route
```

Related Commands	Command	Description
	show running-config ospf	Displays the OSPF running configuration.

show ip ospf statistics

To display Open Shortest Path First (OSPF) shortest path first (SPF) calculation statistics, use the **show ip ospf statistics** command.

show ip ospf [*instance-tag*] **statistics** [**vrf** *vrf-name*]

Syntax Description	<i>instance-tag</i>	(Optional) Name of the OSPF instance. Specify as an alphanumeric string up to 20 characters.
	vrf <i>vrf-name</i>	(Optional) Name of the VRF. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default”, “management”, and “all” are reserved VRF names.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	<p>Use the show ip ospf statistics command to display information about link-state advertisements (LSAs). This information can be useful for both OSPF network maintenance and troubleshooting. For example, we recommend that you use the show ip ospf statistics command as the first troubleshooting step for LSA flapping.</p> <p>This command requires the LAN Enterprise Services license.</p>
-------------------------	--

Examples	<p>This example shows how to display information about the SPF calculations:</p> <pre>switch# show ip ospf statistics</pre>
-----------------	---

Related Commands	Command	Description
	show running-config ospf	Displays the OSPF running configuration.

show ip ospf summary-address

To display a list of all summary address redistribution information configured in an Open Shortest Path First (OSPF) instance, use the **show ip ospf summary-address** command.

show ip ospf [*instance-tag*] **summary-address** [**vrf** *vrf-name*]

Syntax Description

<i>instance-tag</i>	(Optional) Name of the OSPF instance. The name can be a maximum of 20 alphanumeric characters.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default”, “management”, and “all” are reserved VRF names.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display information about summary addresses:

```
switch# show ip ospf summary-address
```

Related Commands

Command	Description
show running-config ospf	Displays the OSPF running configuration.

show ip ospf traffic

To display Open Shortest Path First (OSPF) traffic statistics, use the **show ip ospf traffic** command.

```
show ip ospf [instance-tag] traffic [ethernet slot/port | loopback if_number | port-channel
number] [vrf vrf-name]
```

Syntax Description	
<i>instance-tag</i>	(Optional) Name of the OSPF instance. The name can be a maximum of 20 alphanumeric characters.
ethernet <i>slot/port</i>	(Optional) Specifies the Ethernet interface and the slot number and port number. The slot number is from 1 to 255, and the port number is from 1 to 128.
loopback <i>if_number</i>	(Optional) Specifies the loopback interface. The loopback interface number is from 0 to 1023.
port-channel <i>number</i>	(Optional) Specifies the EtherChannel interface and EtherChannel number. The range is from 1 to 4096.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default”, “management”, and “all” are reserved VRF names.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf traffic** command to display traffic statistics for one or more OSPF instances. This command requires the LAN Enterprise Services license.

Examples

This example shows how to display OSPF traffic statistics for interface 1/5:

```
switch# show ip ospf traffic ethernet 1/5
```

Related Commands	Command	Description
	clear ip ospf traffic	Clears OSPF traffic statistics.
	show running-config ospf	Displays the OSPF running configuration information.

show ip ospf virtual-links

To display parameters and the current state of Open Shortest Path First (OSPF) virtual links, use the **show ip ospf virtual-links** command.

show ip ospf [*instance-tag*] **virtual-links** [**brief**] [**vrf** *vrf-name*]

Syntax Description

<i>instance-tag</i>	(Optional) Instance tag. The name can be a maximum of 20 alphanumeric characters.
brief	(Optional) Displays a summary of the configured virtual links.
vrf <i>vrf-name</i>	(Optional) Name of the OSPF VRF. The <i>vrf-name</i> argument can be specified as an arbitrary string of 32 alphanumeric characters. The strings “default”, “management”, and “all” are reserved <i>vrf-names</i> .

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf virtual-links** command to display information about configured virtual links. This command requires the LAN Enterprise Services license.

Examples

This example shows how to display information about virtual links:

```
switch# show ip ospf virtual-links
```

This example shows how to display information about virtual links in brief format:

```
switch# show ip ospf virtual-links brief
```

Related Commands

Command	Description
show running-config ospf	Displays the OSPF running configuration.

show ip prefix-list

To display prefix lists for the Border Gateway Protocol (BGP), use the **show ip prefix-list** command.

show ip prefix-list [*name*]

Syntax Description	<i>name</i> (Optional) Name of the community list. The name can be any case-sensitive, alphanumeric string up to 63 characters.
--------------------	---

Command Default	None
-----------------	------

Command Modes	Any command mode
---------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples	<p>This example shows how to display the prefix lists:</p> <pre>switch(config)# show ip prefix-list</pre>
----------	---

Related Commands	Command	Description
	ip prefix-list	Configures a BGP prefix list.

show ip process

To display formation about the IP process, use the **show ip process** command.

show ip process [**vrf** *vrf-name*]

Syntax Description	vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
--------------------	----------------------------	---

Command Default	None
-----------------	------

Command Modes	Any command mode
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Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples	<p>This example shows details about the IP process:</p> <pre>switch(config)# show ip process</pre>
----------	---

Related Commands	Command	Description
	show running-config	Displays the running configuration information.

show ip rip

To display the configuration and status of the Routing Information Protocol (RIP), use the **show ip rip** command in any mode.

show ip rip [*instance-tag*] [**vrf** *vrf-name*]

Syntax Description

<i>instance-tag</i>	(Optional) RIP instance. The instance tag can be a maximum of 20 alphanumeric characters.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

No default behavior or values

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Examples

This example shows how to display the RIP configuration information:

```
switch(config-if)# show ip rip
```

Related Commands

Command	Description
show ip rip interface	Displays RIP information for an interface.
show ip rip neighbor	Displays RIP neighbor information.
show ip rip policy statistics	Displays RIP policy statistics.
show ip rip route	Displays RIP route information.
show ip rip statistics	Displays RIP statistics.

show ip rip interface

To display interface entry information from the Routing Information Protocol (RIP) topology table, use the **show ip rip interface** command in any mode.

show ip rip interface [*type slot/port*] [**vrf** *vrf-name*]

Syntax Description

interface <i>type slot/port</i>	(Optional) Specifies the interface.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

This command has no default settings.

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Examples

This example shows how to display the neighbor information for a specified interface from the RIP topology table:

```
switch(config-if)# show ip rip interface ethernet 1/2
```

Related Commands

Command	Description
show ip rip	Displays RIP information.
show ip rip neighbor	Displays RIP neighbor information.
show ip rip policy statistics	Displays RIP policy statistics.
show ip rip route	Displays RIP route information.
show ip rip statistics	Displays RIP statistics.

show ip rip neighbor

To display the neighbor information from the Routing Information Protocol (RIP) topology table, use the **show ip rip neighbor** command in any mode.

show ip rip neighbor [*interface-type instance*] [**vrf** *vrf-name*]

Syntax Description

<i>interface-type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>instance</i>	(Optional) Physical interface instance.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

No default behavior or values

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Examples

This examples shows how to display neighbor information from the RIP topology table:

```
switch# configure terminal
switch(config)# interface ethernet 1/5
switch(config-if)# no switchport
switch(config-if)# show ip rip neighbor
switch(config-if)#
```

Related Commands

Command	Description
show ip rip	Displays RIP information.
show ip rip interface	Displays RIP information for an interface.
show ip rip policy statistics	Displays RIP policy statistics.
show ip rip route	Displays RIP route information.
show ip rip statistics	Displays RIP statistics.

show ip rip policy statistics

To display the policy statistics for the Routing Information Protocol (RIP), use the **show ip rip policy statistics** command in any mode.

show ip rip policy statistics redistribute {bgp *id* | direct | eigrp *id* | ospf *id* | static} [vrf *vrf-name*]

Syntax Description

redistribute	Displays the routes that RIP redistributed from other routing protocols.
bgp	Displays policy statistics for the Border Gateway Protocol (BGP).
direct	Displays policy statistics for directly connected routes only.
eigrp	Displays policy statistics for Enhanced Interior Gateway Routing Protocol (EIGRP).
ospf	Displays policy statistics for Open Shortest Path First (OSPF) protocol.
static	Displays policy statistics for IP static routes.
<i>id</i>	For the bgp keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the eigrp keyword, an EIGRP instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the ospf keyword, an OSPF instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

No default behavior or values.

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Examples

This example shows how to show policy statistics for EIGRP:

```
switch# show ip rip policy statistics redistribute eigrp 201
```

Related Commands

Command	Description
clear ip rip policy statistics	Clears policy statistics for RIP.
show ip rip	Displays RIP information.
show ip rip interface	Displays RIP information for an interface.
show ip rip neighbor	Displays RIP information for a neighbor.
show ip rip route	Displays RIP route information.
show ip rip statistics	Displays RIP statistics.

show ip rip route

To display route information from the Routing Information Protocol (RIP) topology table, use the **show ip rip route** command in any mode.

show ip rip route [*prefix/length*] [**summary**] [**vrf** *vrf-name*]

Syntax Description

<i>prefix/length</i>	(Optional) IP prefix about which routing information should be displayed.
summary	(Optional) Displays information about summary routes.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

No default behavior or values

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Examples

This example shows how to display route information from the RIP topology table:

```
switch# show ip rip route
```

Related Commands

Command	Description
show ip rip	Displays RIP information.
show ip rip interface	Displays RIP information for an interface.
show ip rip neighbor	Displays RIP information for a neighbor.
show ip rip policy statistics	Displays policy statistics for RIP.
show ip rip statistics	Displays RIP statistics.

show ip rip statistics

To display statistical entry information from the Routing Information Protocol (RIP) topology table, use the **show ip rip statistics** command in any mode.

show ip rip statistics [*interface-type instance*] [**vrf** *vrf-name*]

Syntax Description

<i>interface-type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>instance</i>	(Optional) Either a physical interface instance or a virtual interface instance.
vrf <i>vrf-name</i>	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The <i>vrf-name</i> argument can be specified as any case-sensitive, alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

No default behavior or values.

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Examples

This example shows how to display the RIP statistics:

```
switch# show ip rip statistics
```

Related Commands

Command	Description
show ip rip	Displays RIP information.
show ip rip interface	Displays RIP information for an interface.
show ip rip neighbor	Displays RIP information for a neighbor.
show ip rip policy statistics	Displays policy statistics for RIP.
show ip rip route	Displays RIP route information.

show ip route

To display routes from the unicast Routing Information Base (RIB), use the **show ip route** command.

```
show ip route [all | addr | hostname | prefix | route-type | interface type number | next-hop addr]  
[vrf vrf-name]
```

Syntax Description	all	(Optional) Displays all routes.
	<i>addr</i>	(Optional) IPv4 address. The format is x.x.x.x.
	<i>hostname</i>	Hostname. The <i>name</i> can be any case-sensitive, alphanumeric string up to 80 characters.
	<i>prefix</i>	(Optional) IPv4 prefix. The format is x.x.x.x/length. The length range is from 1 to 32.
	<i>route-type</i>	(Optional) Type of route. Use ? to see the list of types.
	interface <i>type number</i>	(Optional) Displays the routes for an interface. Use ? to see the supported interfaces.
	next-hop <i>addr</i>	(Optional) Displays routes with this next-hop address. The format is x.x.x.x.
	vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples This example shows how to display the route table:

```
switch(config)# show ip route all
```

Related Commands	Command	Description
	clear ip route	Clears entries in the route table.

show ip static-route

To display static routes from the unicast Routing Information Base (RIB), use the **show ip static-route** command.

show ip static-route [**vrf** { *vrf-name* | **all** }]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
all	(Optional) Specifies all virtual router contexts (VRF) name.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Examples

This example shows how to display the static routes:

```
switch(config)# show ip static-route
```

Related Commands

Command	Description
ip route	Configures a static route.

show ip traffic

To display IP traffic information, use the **show ip traffic** command.

show ip traffic

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples	This example shows how to display the IP traffic information: switch(config)# show ip traffic
-----------------	---

Related Commands	Command	Description
	show ip process	Displays information about the IP process.

show ipv6 nd interface

To display neighbor discovery interface information, use the **show ipv6 nd interface** command.

show ipv6 nd interface { **detail** | **ethernet** | **loopback** | **mgmt** | **port-channel** | **vrf** [**all** | **default** | **management**] }

Syntax Description		
detail		Displays ICMPv6-related interface information in detail.
ethernet		Displays the Ethernet IEEE 802.3z.
loopback		Displays the loopback interface.
mgmt		Displays the management interface.
port-channel		Displays the port channel interface.
vrf		Displays information for each virtual routing and forwarding (VRF) instance.
all		(Optional) Displays information for all VRF instances.
default		(Optional) Displays information for the default VRF instance.
management		(Optional) Displays information for the management VRF instance.

Command Default None

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U3(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to display the IPv6 neighbor discovery information for an interface:

```
switch# show ipv6 nd interface
IPv6 Interface Status for VRF "default"
Ethernet1/8, Interface status: protocol-down/link-down/admin-up, iod: 14
  IPv6 address: 2001:db8:c18:1::3
  IPv6 subnet: 2001:db8:c18:1::/64
  IPv6 link-local address: fe80::205:73ff:feff:64ef (default)
  IPv6 virtual addresses configured: none
  IPv6 multicast routing: disabled
  IPv6 report link local: disabled
  IPv6 multicast groups locally joined:
    ff02::1:ff00:3 ff02::2 ff02::1 ff02::1:ffff:64ef
  IPv6 multicast (S,G) entries joined: none
  IPv6 MTU: 1500 (using link MTU)
  IPv6 unicast reverse path forwarding: none
  IPv6 load sharing: none
```

show ipv6 nd interface

```
IPv6 interface statistics last reset: never
IPv6 interface RP-traffic statistics: (forwarded/originated/consumed)
  Unicast packets:      0/0/0
  Unicast bytes:        0/0/0
  Multicast packets:    0/0/0
  Multicast bytes:      0/0/0

switch#
```

Related Commands

Command	Description
show ip interface	Displays IPv6 information for an interface.

show mac-list

To display the entries in a MAC list, use the **show mac-list** command.

show mac-list [*name*]

Syntax Description	<i>name</i> (Optional) MAC list name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
--------------------	--

Command Default	No match values are defined.
-----------------	------------------------------

Command Modes	Global configuration mode
---------------	---------------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Services Services license.
------------------	--

Examples	This example shows how to display information about the Red MAC list: <pre>switch(config)# show mac-list Red</pre>
----------	---

Related Commands	Command	Description
	mac-list	Creates a MAC list.
	match mac-list	Matches a MAC address in a MAC list.

show routing

To display routing information, use the **show routing** command.

show routing [**ip** | **ipv4**] [*address* | *hostname* | *prefix* | *route-type* | **clients** | **hidden-nh** *interface type number* | **next-hop** *addr* | **recursive-next-hop** [*addr*]] [**vrf** *vrf-instance*]

Syntax Description

ip	Specifies the IP address.
ipv4	Specifies the IPv4 address.
<i>address</i>	(Optional) IPv4 address. IPv4 address format is x.x.x.x.
<i>hostname</i>	Hostname. The <i>name</i> can be any case-sensitive, alphanumeric string up to 80 characters.
<i>prefix</i>	(Optional) IPv4 prefix. IPv4 prefix format is x.x.x.x/length.
<i>route-type</i>	(Optional) Type of route. Use ? to see the list of types.
clients	(Optional) Displays the routing clients.
hidden-nh	(Optional) Displays hidden next-hop information.
interface <i>type number</i>	(Optional) Displays the routes for an interface. The interface can be one of the following: <ul style="list-style-type: none"> • mgmt—Management interface. The default management interface is 0. • vlan—VLAN interface. The VLAN interface number is from 1 to 4094.
next-hop <i>addr</i>	(Optional) Displays routes with this next-hop address. The format is x.x.x.x.
recursive-next-hop <i>addr</i>	(Optional) Displays routes with this recursive next-hop address. The format is x.x.x.x.
vrf <i>vrf-instance</i>	(Optional) Specifies the virtual router context (VRF) instance. The VRF can be one of the following: <ul style="list-style-type: none"> • <i>vrf-name</i>—VRF name. The name can be any case-sensitive, alphanumeric string up to 32 characters. • all—Specifies all VRFs. • default—Specifies the default VRF. • management—Specifies the management VRF.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Examples

This example shows how to display the route table:

```
switch(config)# show routing ip
```

Related Commands

Command	Description
clear ip route	Clears entries in the route table.

show routing memory estimate

To display an estimate of routing memory requirements, use the **show routing memory estimate** command.

show routing memory estimate [*routes num-routes* **next-hops** *num-hop-addresses*]

Syntax Description

routes	(Optional) Specifies the unicast Routing Information Base (RIB) memory estimate for the number of routes.
<i>num-routes</i>	Number of routes. The range is from 1000 to 1,000,000.
next-hops	(Optional) Specifies the unicast RIB memory estimate for the number of next hops per route.
<i>num-hop-addresses</i>	Number of next-hop addresses per route. The range is from 1 to 16.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Usage Guidelines

Use the **show routing memory estimate** command to estimate the memory required for a selected number of routes and number of next-hop addresses per route.

This command requires the LAN Enterprise Services license.

Examples

This example shows how to display the route table:

```
switch# show routing memory estimate routes 1000 next-hops 1
```

Related Commands

Command	Description
nexthop route-map	Configures Border Gateway Protocol (BGP) routes that are resolved using only the next hop routes that match specific characteristics.

show routing-context

To display the virtual routing and forwarding (VRF) scope for all EXEC commands, use the **show routing-context** command.

show routing-context

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	EXEC mode
----------------------	-----------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples	This example shows how display the current routing context:
-----------------	---

```
switch# show routing-context
Current Route Context: default
switch#
```

Related Commands	Command	Description
	routing-context vrf	Configures the routing context.

show routing hash

To display the route selected for a particular source and destination address, use the **show routing hash** command.

show routing hash *source-addr dest-addr* [**ip-proto** *ip-protocol*] [*source-l4-port dest-l4-port*] [**vrf** *vrf-name*]

Syntax Description	
<i>source-addr</i>	Source IPv4 address. IPv4 address format is x.x.x.x.
ip-proto <i>ip-protocol</i>	Specifies the IP protocol.
<i>dest-addr</i>	Destination IPv4 address. IPv4 address format is x.x.x.x.
<i>source-l4-port</i>	(Optional) Source port. The range is from 1 to 65535.
<i>dest-l4-port</i>	(Optional) Destination port. The range is from 1 to 65535.
vrf <i>vrf-name</i>	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples

This example shows how to display the route selected to reach 192.168.0.2 from 192.168.0.5:

```
switch# show routing hash 192.168.0.5 192.168.0.2 ip-proto 0x11 10 234
```

Related Commands	Command	Description
	clear ip route	Clears entries in the route table.

show running-config

To display the running configuration, use the **show running-config** command.

show running-config [all]

Syntax Description	all (Optional) Displays all the default and configured information.				
Command Default	Displays only the configured information.				
Command Modes	EXEC mode				
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>5.0(3)U1(1)</td><td>This command was introduced.</td></tr> </table>	Release	Modification	5.0(3)U1(1)	This command was introduced.
Release	Modification				
5.0(3)U1(1)	This command was introduced.				

Examples

This example shows how to display the changes that you have made to the running configuration:

```
switch# show running-config

!Command: show running-config
!Time: Thu Jun  3 09:12:13 2010

version 5.0(3)U1(1)
feature telnet
feature bgp
feature interface-vlan
feature hsrp

username admin password 5 $1$qlbQ8Mow$/WpKb1OE1R6BwZU9yfFL51 role network-admin
ip domain-lookup
hostname QS5
hardware profile multicast max-limit 2000
policy-map type network-qos jumbo
  class type network-qos class-default
    mtu 9216
system qos
  service-policy type network-qos jumbo
slot 2
slot 22
slot 39
<--Output truncated-->
switch#
```

This example shows how to display the ternary content addressable memory (TCAM) regions and IP glean throttle settings on a switch that runs Cisco NX-OS Release 5.0(3)U2(1):

```
switch# show running-config | grep 'hardware'
hardware profile tcam region arpacl 128
hardware profile tcam region ifacl 256
hardware profile tcam region racl 256
hardware profile tcam region vac1 512
```

show running-config

```
hardware profile portmode 48x10G+4x40G
hardware ip glean throttle
hardware ip glean throttle maximum 3000
hardware ip glean throttle timeout 500
hardware ip glean throttle syslog 30
switch#
```

This example shows how to display the ECMP running configuration:

```
switch# show running-config | grep "hardware profile ecmp"
hardware profile ecmp auto-recovery threshold 15
switch#
```

Related Commands

Command	Description
copy running-config startup-config	Copies the running configuration to the startup configuration.
show startup-config	Displays the startup configuration.

show running-config arp

To display the Address Resolution Protocol (ARP) configuration in the running configuration, use the **show running-config arp** command.

show running-config arp [all]

Syntax Description	all (Optional) Displays configured and default information.
---------------------------	--


Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples	This example shows how to display the ARP configuration:
	<pre>switch# show running-config arp</pre>
	This example shows how to display the ARP configuration with the default information on a switch that runs Cisco NX-OS Release 5.0(3)U2(1):
	<pre>switch# show running-config arp all !Command: show running-config arp all !Time: Thu Sep 1 05:45:10 2011 version 5.0(3)U2(1) ip arp timeout 1500 ip arp event-history cli size small ip arp event-history snmp size small ip arp event-history client-errors size small ip arp event-history client-event size small ip arp event-history lcache-errors size small ip arp event-history lcache size small ip arp event-history errors size small ip arp event-history ha size small ip arp event-history event size small ip arp event-history packet size small switch#</pre>

Related Commands	Command	Description
	copy running-config startup-config	Copies the running configuration to the startup configuration file.

 show running-config arp

Command	Description
ip arp timeout	Configures an ARP timeout.
show startup-config arp	Displays the ARP startup configuration.

show running-config bfd

To display the running configuration for Bidirectional Forwarding Detection (BFD), use the **show running-config bfd** command.

show running-config bfd [all]

Syntax Description	all (Optional) Displays the full operating information including default settings.
--------------------	---

Command Default	None
-----------------	------

Command Modes	EXEC mode
---------------	-----------

Command History	Release	Modification
	5.0(3)U2(2)	This command was introduced.

Usage Guidelines	This command does not require a license.
------------------	--

Examples	This example shows how to display the running configuration for BFD:
----------	--

```
switch# show running-config bfd

!Command: show running-config bfd
!Time: Fri Sep 30 07:15:05 2011

version 5.0(3)U2(2)
feature bfd


bfd interval 55 min_rx 60 multiplier 3

interface Ethernet1/5
  bfd neighbor src-ip 192.0.1.2 dest-ip 192.0.1.3

switch#
```

This example shows how to display the complete running configuration for BFD:

```
switch# show running-config bfd all
```

 `show running-config bfd`

Related Commands	Command	Description
	<code>copy running-config startup-config</code>	Copies the running configuration information to the startup configuration file.
	<code>feature bfd</code>	Enabled BFD on the switch.
	<code>show startup-config bfd</code>	Displays the BFD information from the startup configuration file.

show running-config bgp

To display the running configuration for the Border Gateway Protocol (BGP) for IPv4 networks, use the **show running-config bgp** command.

show running-config bgp [all]

Syntax Description	all (Optional) Displays the full operating information including default settings.
--------------------	---

Command Default	None
-----------------	------

Command Modes	EXEC mode
---------------	-----------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
------------------	--

Examples	This example shows how to display the running configuration for BGP:
----------	--

```
switch# show running-config bgp

!Command: show running-config bgp
!Time: Sat May 29 05:07:52 2010

version 5.0(3)U1(1)
feature bgp

router bgp 201
  router-id 192.168.0.14
  address-family ipv4 unicast
    network 192.0.0.0/2
  neighbor 192.168.0.201 remote-as 201
    description Peer Router B
    timers 30 90
  address-family ipv4 unicast
```

```
switch#
```

This example shows how to display the complete running configuration for BGP:

```
switch# show running-config bgp all

!Command: show running-config bgp all
!Time: Sat May 29 05:12:07 2010
```

■ show running-config bgp

```

version 5.0(3)U1(1)
feature bgp

router bgp 201
  router-id 192.168.0.14
  timers bgp 60 180
  timers bestpath-limit 300
  timers prefix-peer-timeout 30
  graceful-restart
  graceful-restart restart-time 120
  graceful-restart stalepath-time 300
  fast-external-fallover
  enforce-first-as
  event-history periodic
  event-history events
  event-history cli
  address-family ipv4 unicast
    network 192.0.0.0/2
    nexthop trigger-delay critical 3000 non-critical 10000
    client-to-client reflection
    distance 20 200 220
  neighbor 192.168.0.201 remote-as 201
    description Peer Router B
    dynamic-capability
    timers 30 90
    address-family ipv4 unicast
      next-hop-third-party

switch#

```

Related Commands

Command	Description
router bgp	Creates a BGP instance.

show running-config eigrp

To display the running configuration for the Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv4 networks, use the **show running-config eigrp** command.

show running-config eigrp

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	EXEC mode
----------------------	-----------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	<p>This example shows how to display the running configuration for EIGRP:</p> <pre>switch# show running-config eigrp</pre>
-----------------	--

Related Commands	Command	Description
	router ospf	Creates an OSPF instance.

show running-config ospf

To display the running configuration for Open Shortest Path First version 2 (OSPFv2) for IPv4 networks, use the **show running-config ospf** command.

show running-config ospf

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	EXEC mode
----------------------	-----------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Usage Guidelines	This command requires the LAN Enterprise Services license.
-------------------------	--

Examples	<p>This example shows how to display the running configuration for OSPF:</p> <pre>switch# show running-config ospf</pre>
-----------------	---

Related Commands	Command	Description
	router ospf	Creates an OSPF instance.

show sockets client

To display information about the sockets clients, use the **show sockets client** command.

show sockets client [**pid** *id*] [**raw** | **tcp** | **udp**] [**detail**]

Syntax Description	pid <i>id</i>	(Optional) Displays the socket client information for a specific process. The <i>id</i> range is from 1 to 65535.
	raw	(Optional) Displays information about the raw client.
	tcp	(Optional) Displays information about the TCP client.
	udp	(Optional) Displays information about the UDP client.
	detail	(Optional) Displays information about the detailed client.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples	This example shows how to display the UDP socket client information:
	switch# show sockets client udp

Related Commands	Command	Description
	clear sockets statistics	Clears socket statistics.
	show sockets connection	Displays information about the socket connection.
	show sockets statistics	Displays information about the socket statistics.

show sockets connection

To display information about the sockets connection, use the **show sockets connection** command.

show sockets connection [**pid** *id*] [**local** *address* | **foreign** *address* | **raw** | **tcp** | **udp**] [**detail**]

Syntax Description

pid <i>id</i>	(Optional) Displays the socket client information for a specific process. the <i>id</i> range is from 1 to 65535.
local <i>address</i>	(Optional) Displays information about all the TCP connections with the specified local address. The <i>address</i> can be an IPv4 address.
foreign <i>address</i>	(Optional) Displays information about all the TCP connections with the specified foreign address. The <i>address</i> can be an IPv4 address.
raw	(Optional) Displays information about the raw client.
tcp	(Optional) Displays information about the TCP client.
udp	(Optional) Displays information about the UDP client.
detail	(Optional) Displays information about the detailed client.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.0(3)U1(1)	This command was introduced.

Examples

This example shows how to display the TCP socket connection information:

```
switch# show sockets connection tcp
```

Related Commands

Command	Description
clear sockets statistics	Clears the socket statistics.
show sockets client	Displays information about the socket client.
show sockets statistics	Displays the socket statistics.

show sockets statistics

To display the socket statistics, use the **show sockets statistics** command.

show sockets statistics [**all** | **raw** | **rawsum** | **tcp** | **tcpsum** | **udp** | **udpsum**]

Syntax Description	all	(Optional) Displays all the socket statistics.
	raw	(Optional) Displays the socket statistics for the raw IPv4 protocol socket statistics.
	rawsum	(Optional) Displays a summary of the socket statistics for the raw IPv4 protocol socket statistics.
	tcp	(Optional) Displays the socket statistics for the TCP IPv4 protocol.
	tcpsum	(Optional) Displays a summary of the socket statistics for the TCP IPv4 protocols.
	udp	(Optional) Displays the socket statistics for the UDP IPv4 protocol.
	udpsum	(Optional) Displays a summary of the socket statistics for the UDP IPv4 protocols.

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples	<p>This example shows how to display the TCP socket statistics:</p> <pre>switch# show sockets statistics tcp</pre>
-----------------	--

Related Commands	Command	Description
	clear sockets statistics	Clears socket statistics.
	show sockets client	Displays information about the socket client.
	show sockets connection	Displays information about the socket connection.

show startup-config arp

To display the Address Resolution Protocol (ARP) configuration in the startup configuration, use the **show startup-config arp** command.

show startup-config arp [all]

Syntax Description	all (Optional) Displays configured and default information.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	Any command mode
----------------------	------------------

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples	<p>This example shows how to display the ARP startup configuration:</p> <pre>switch# show startup-config arp</pre>
-----------------	--

Related Commands	Command	Description
	copy running-config startup-config	Copies the running configuration to the startup configuration file.
	ip arp timeout	Configures an ARP timeout.
	show running-config arp	Displays the ARP running configuration.

show startup-config bfd

To display the startup configuration information for Bidirectional Forwarding Detection (BFD), use the **show startup-config bfd** command.

show startup-config bfd [all]

Syntax Description	all (Optional) Displays the full operating information including default settings.
--------------------	---

Command Default	None
-----------------	------

Command Modes	EXEC mode
---------------	-----------

Command History	Release	Modification
	5.0(3)U2(2)	This command was introduced.

Usage Guidelines	This command does not require a license.
------------------	--

Examples	<p>This example shows how to display the running configuration for BFD:</p> <pre>switch# show startup-config bfd</pre> <p>This example shows how to display the complete startup configuration for BFD:</p> <pre>switch# show startup-config bfd all</pre>
----------	--

Related Commands	Command	Description
	copy running-config startup-config	Copies the running configuration information to the startup configuration file.
	feature bfd	Enabled BFD on the switch.
	show running-config bfd	Displays the BFD running configuration information.

show track

To show information about object tracking, use the **show track** command.

show track [*object-id*] [**interface** | **ip route**] [**brief**]

Syntax Description	<i>object-id</i>	(Optional) Tracking ID. The range can be from 1 to 500.
	interface	(Optional) Displays information about tracked interfaces.
	ip route	(Optional) Displays information about tracked IP routes.
	brief	(Optional) Displays brief information about tracked objects.

Command Default Display information for all tracked objects.

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples This example shows how to display information about tracked interfaces:

```
switch# show track interface
```

This example shows how to display information about tracked IP routes:

```
switch# show track ip route
```

This example shows how to display brief information about tracked objects:

```
switch# show track brief
```

Related Commands	Command	Description
	track interface	Tracks the state of an interface.
	track ip route	Tracks the state of an IP route.

show vlan id counter

To display the counters for a VLAN interface, use the **show vlan id counter** command.

show vlan id *vlan-number* **counter**

Syntax Description	
vlan-number	VLAN ID. The range is from 1-3967 to and from 4048- to 4093. You specify a VLAN ID in this format: 1-4094 or range: 1-5, 10 or 2-5,7-19.

Defaults	None
----------	------


Command Modes	Any command mode
---------------	------------------

Command History	Release	Modification
	5.0(3)U3(1)	This command was introduced.

Usage Guidelines	This command does not require a license.
------------------	--

Examples	This example shows how to display the counters for a VLAN interface:
----------	--

```
switch# show vlan 10 counters
Vlan Id                               :10
L2 Unicast Octets                      :--
L2 Unicast Packets                     :--
L2 Multicast Octets                    :--
L2 Multicast Packets                   :--
L2 Broadcast Octets                    :--
L2 Broadcast Packets                   :--
L2 Unknown Octets                      :--
L2 Unknown Packets                     :--
L3 Routed Octets In                    :--
L3 Routed Packets In                   :--
L3 Routed Octets Out                   :--
L3 Routed Packets Out                   :--
L3 Multicast Octets In                  :--
L3 Multicast Packets In                 :--
L3 Multicast Octets Out                 :--
L3 Multicast Packets Out                 :--
L3 Unicast Octets In                   :--
L3 Unicast Packets In                   :--
L3 Unicast Octets Out                   :--
L3 Unicast Packets Out                   :--
Total Octets In                         :140903
Total Packets In                         :1447
Total Octets Out                         :252600
Total Packets Out                         :3606
switch#
```

 show vlan id counter**Related Commands**

Command	Description
show interface vlan counter	Displays the counters for an interface VLAN.

show vrrp

To show information about the Virtual Router Redundancy Protocol (VRRP), use the **show vrrp** command.

show vrrp [**detail** | **statistics** | **summary**] [**interface** *if-number*] [**vr** *id*] [**backup** | **init** | **master**]

Syntax Description	detail	(Optional) Displays detailed information about VRRP.
	statistics	(Optional) Displays VRRP statistics.
	summary	(Optional) Displays the VRRP summary.
	interface <i>if-number</i>	(Optional) Displays information about VRRP on an interface. Use ? to see a list of supported interfaces.
	vr <i>id</i>	(Optional) Displays information about VRRP for a group. The <i>id</i> range is from 1 to 255.
	backup	(Optional) Displays information about VRRP groups in the backup state.
	init	(Optional) Displays information about VRRP groups in the init state.
	master	(Optional) Displays information about VRRP groups in the master state.

Command Default Display information for all VRRP groups.

Command Modes Any command mode

Command History	Release	Modification
	5.0(3)U1(1)	This command was introduced.

Examples This example shows how to display information about VRRP:

```
switch(config)# show vrrp
```


This example shows how to display the detailed configuration information about VRRP:

```
switch(config)# show vrrp detail
```

This example shows how to display information about a specific virtual router:

```
switch# show vrrp vr 1
```

Related Commands	Command	Description
	clear vrrp	Clears VRRP statistics.
	feature vrrp	Enables the VRRP feature.

 show vrrp