R Commands

This chapter describes the Cisco NX-OS unicast routing commands that begin with the letter R.

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* | **isis** *instance-tag* | **ospf** *instance-tag* | **rip** *instance-tag* | **static**} [**route-map** *map-name*]

> **no redistribute** {**direct** | **eigrp** *instance-tag* | **isis** *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 *instance-tag*	Specifies the name of an EIGRP instance. The instance-tag can be any case-sensitive, alphanumeric string up to 20 characters.	
isis *instance-tag*	Distributes routes from the IS-IS protocol. The instance-tag can be any case-sensitive, alphanumeric string up to 64 characters.	
ospf *instance-tag*	Distributes routes from the OSPF protocol. This protocol is supported in the IPv4 address family. The instance-tag can be any case-sensitive, alphanumeric string up to 64 characters.	
rip *instance-tag*	Distributes routes from the RIP protocol. The instance-tag can be any case-sensitive, alphanumeric string up to 64 characters.	
static	Redistributes IP static routes.	
route-map *map-name*	(Optional) Specifies the identifier of a configured route map. Use a route map to filter which routes are redistributed into EIGRP.	

Defaults   Disabled

Command Modes   Address family configuration
Router configuration
Router VRF configuration

Supported User Roles   network-admin
vdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(2)	Added the **eigrp** keyword.

Usage Guidelines	Use the **redistribute** command to import routes from other routing protocols into BGP. 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 Enterprise Services license.
Examples	This example shows how to redistribute BGP routes into an EIGRP autonomous system:

```
switch(config)# router bgp 64496
switch(config-router) address-family ipv4 unicast
switch(config-router-af)# redistribute eigrp 100
```

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* | **isis** *instance-tag* | **ospf** *instance-tag* | **rip** *instance-tag* | **static**} [**route-map** *map-name*]

> **no redistribute** {**bgp** *as-number* | **direct** | **eigrp** *as-number* | **isis** *instance-tag* | **ospf** *instance-tag* | **rip** *instance-tag* | **static**}

Syntax Description

bgp *as-number*	Distributes routes from BGP. The as-number 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 *id*	Specifies the name of an EIGRP instance. The instance-tag can be any case-sensitive, alphanumeric string up to 20 characters.
isis *instance-tag*	Distributes routes from the IS-IS protocol.
ospf *instance-tag*	Distributes routes from the OSPF protocol. This protocol is supported in the IPv4 address family.
rip *instance-tag*	Distributes routes from the RIP protocol.
static	Redistributes IP static routes.
route-map *map-name*	(Optional) Specifies the identifier of a configured route map. Use a route map to filter which routes are redistributed into EIGRP.

Defaults   Disabled

Command Modes   Address family configuration
Router configuration
Router VRF configuration

Supported User Roles   network-admin
vdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines   Use the **redistribute** command to import routes from other routing protocols into EIGRP. 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 Enterprise Services license.

Examples   This example shows how to redistribute cause BGP routes into an EIGRP autonomous system:

```
switch(config)# router eigrp 209
switch(config-router) address-family ipv4 unicast
switch(config-router-af)# redistribute bgp 64496
```

This example shows how to redistribute the specified IS-IS process routes into an EIGRP autonomous system within a virtual routing and forwarding instance (VRF). The IS-IS routes are redistributed using route map IsIsMap.

```
switch(config)# router eigrp 109
switch(config-router)# vrf Red
switch(config-router-vrf)# redistribute isis 108 route-map IsIsMap
```

Related Commands

Command	Description
default-metric (EIGRP)	Sets the default metrics for routes redistributed into EIGRP.

redistribute (IS-IS)

To redistribute other protocol routes into Intermediate System-to-Intermediate System (IS-IS), use the **redistribute** command. To disable the redistribution, use the **no** form of this command.

redistribute *protocol as-num* [*.as-num*] | *process-tag* **route-map** *name*

no redistribute *protocol as-num* [*.as-num*] | *process-tag* **route-map** *name*

Syntax Description		
	protocol	Source protocol from which routes are being redistributed; see the "Usage Guidelines" section for additional information about valid values.
	as-num	AS number. Range: 1 to 65535
	.as-num	(Optional) AS number. Range: 0 to 65535
	process-tag	Process tag.
	route-map *name*	Prevents distribution of a specific route map.

Defaults   Cisco NX-OS software does not redistribute routes.

Command Modes   Address family configuration
Router configuration

Supported User Roles   network-admin
vdc-admin

Command History	Release	Modification
	4.0(1)	This command was introduced.

Usage Guidelines   The command syntax is supported for IPv4 and IPv6.

The valid values for the *protocol* argument are as follows:

- **bgp** *as-num*[*.as-num*] **route-map** *name*—Specifies the route map for the Border Gateway Protocol (BGP) routes. Range: 1 to 65535. Range: 0 to 65535 for the optional *as-num* argument.

- **direct route-map** *name*—Specifies the route map for the directly connected routes.

- **eigrp** *process-tag* **route-map** *name*—Specifies the route map for the Enhanced Interior Gateway Protocol (EIGRP) routes.

- **isis** *process-tag* **route-map** *name*—Specifies the route map for the ISO IS-IS routes.

- **ospf** *process-tag* **route-map** *name*—Specifies the route map for the Open Shortest Path First (OSPF) routes.

- **rip** *process-tag* **route-map** *name*—Specifies the route map for the Routing Information Protocol (RIP) routes for IPv4.

> • **static route-map** *name*—Specifies the route map for the static routes.

Examples   This example shows how to redistribute routes from an IS-IS routing process into a BGP system:

```
switch(config)# router isis firstcompany
switch(config-router)# redistribute bgp 34535 route-map test1
```

This example shows how to disable redistribution:

```
switch(config)# router isis firstcompany
switch(config-router)# no redistribute bgp 34535 route-map test1
```

Related Commands

Command	Description
address-family	Enters the address family mode or a VRF address-family mode.
feature isis	Enables IS-IS on the router.
router isis	Enables IS-IS.

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* | **isis** *instance-tag* | **ospf** *instance-tag* | **rip** *instance-tag* | **static**} [**route-map** *map-name*]

> **no redistribute** {**bgp** *as-number* | **direct** | **eigrp** *as-number* | **isis** *instance-tag* | **ospf** *instance-tag* | **rip** *instance-tag* | **static**}

Syntax Description

bgp *as-number*	(Optional) Distributes routes from BGP. The as-number 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 *id*	Distributes routes from EIGRP. The *instance-tag* argument can be any case-sensitive, alphanumeric string.
isis *instance-tag*	Distributes routes from the IS-IS protocol. The *instance-tag* argument can be any case-sensitive, alphanumeric string.
ospf *instance-tag*	Distributes routes from the OSPF protocol. This protocol is supported in the IPv4 address family. The *instance-tag* argument can be any case-sensitive, alphanumeric string.
static	Redistributes IP static routes, including the default static route.
route-map *map-name*	(Optional) Specifies the identifier of a configured route map. Use a route map to filter which routes are redistributed into EIGRP. The *route-map* argument can be any alphanumeric string.

Defaults   Route redistribution is disabled.

Command Modes   Router configuration
Router VRF configuration

Supported User Roles   network-admin
vdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(2)	Changed the **eigrp** keyword to use a process tag.

Usage Guidelines	Use the **redistribute** command to import routes from other routing protocols into OSPF. You should always use a route map to filter these routes to ensure that OSPF redistributes only the routes that you intend.

You need to 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 Enterprise Services license.

Examples	This example shows how to redistribute BGP routes into an OSPF autonomous system:

```
switch(config)# router ospf 209
switch(config-router)# redistribute bgp 64496
```

This example shows how to redistribute the specified IS-IS process routes into an OSPF autonomous system within a virtual routing and forwarding instance (VRF). The IS-IS routes are redistributed using route map IsIsMap.

```
switch(config)# router ospf 109
switch(config-router)# vrf Red
switch(config-router-vrf)# redistribute isis 108 route-map IsIsMap
```

Related Commands

Command	Description
default-metric (OSPF)	Sets the default metrics for routes redistributed into OSPF.

redistribute (OSPFv3)

To inject routes from one routing domain into Open Shortest Path First version 3 (OSPFv3), 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** | **isis** *instance-tag* | **rip** *instance-tag* | **static**} [**route-map** *map-name*]

> **no redistribute** {**bgp** *as-number* | **direct** | **eigrp** *as-number* | **isis** *instance-tag* | **ospfv3** *instance-tag* | **rip** *instance-tag* | **static**}

Syntax Description

bgp *as-number*	(Optional) Distributes routes from the BGP protocol. The as-number 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 *as-number*	Distributes routes from EIGRP. The *instance-tag* argument can be any case-sensitive, alphanumeric string.
isis *instance-tag*	Distributes routes from the IS-IS protocol. The *instance-tag* argument can be any case-sensitive, alphanumeric string.
static	Redistributes IP static routes, including the default static route.
route-map *map-name*	(Optional) Specifies the identifier of a configured route map. Use a route map to filter which routes are redistributed into EIGRP. The *route-map* argument can be any alphanumeric string.

Defaults Route redistribution is disabled.

Command Modes Address-family configuration

Supported User Roles network-admin
vdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(2)	Changed the **eigrp** keyword to use a process tag.

Usage Guidelines Use the **redistribute** command to import routes from other routing protocols into OSPFv3. You should always use a route map to filter these routes to ensure that OSPFv3 redistributes only the routes that you intend.

You need to configure a default metric to redistribute routes from another protocol into OSPFv3. 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 Enterprise Services license.

Examples This example shows how to redistribute BGP routes into an OSPFv3 autonomous system:

```
switch(config)# router ospfv3 209
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# redistribute bgp 64496
```

Related Commands

Command	Description
default-metric (OSPFv3)	Sets the default metrics for routes redistributed into OSPFv3.

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* | **isis** *id* | **ospf** *id* | **ospfv3** *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).
	isis	Redistributes routes from the Intermediate-System to Intermediate-System (IS-IS) routing protocol.
	ospf	Redistributes routes from the Open Shortest Path First (OSPF) protocol.
	ospfv3	Redistributes routes from the Open Shortest Path First version 3 (OSPFv3) protocol.
	static	Redistributes routes from IP static routes.
	id	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 decimal number, but Cisco NX-OS stores it internally as a string.
		For the **isis** keyword, an IS-IS instance name from which routes are to be redistributed. The value takes the form of a string. You can enter 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 *map-name*	Associates a route map to set the redistribution policy for RIP.

Defaults   Route redistribution is disabled.

Command Modes   Router address-family configuration

Supported User Roles   network-admin
vdc-admin

Command History	Release	Modification
	4.0(1)	This command was introduced.

Usage Guidelines   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.

This command does not require a license.

Examples   This example shows how to redistribute BGP routes into a RIP process:

```
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# redistribute bgp 64496
```

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.

redistribute maximum-prefix

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

max	Maximum number of prefixes that OSPF will distribute. The range is from 0 to 65536.
threshold	(Optional) Percentage of maximum prefixes that will trigger a warning message. The range is from 1 to 100. The default is 75%.
warning-only	(Optional) Logs a warning message when the maximum number of prefixes is exceeded.
withdraw	(Optional) Withdraws all redistributed routes.
num-retries	(Optional) Number of times OSPF will try to retrieve the redistributed routes. The range is from 1 to 12. The default is 1.
timeout	(Optional) Time between retry attempts. The range is from 60 to 600 seconds. The default is 300.

Defaults   No limit

Command Modes   Router configuration
VRF configuration

Supported User Roles   network-admin
vdc-admin

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines   Use the **redistribute maximum-prefix** command to limit the number of routes redistributed into OSPF. Use the **clear ip ospf redistribute** command if all routes are withdrawn.

This command requires the Enterprise Services license.

Examples   This example shows how to limit the number of redistributed routes into OSPF:

```
switch# config t
switch(config)# router ospfv3 201
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# redistribute bgp route-map FilterExternalBGP
switch(config-router-af)# redistribute maximum-prefix 1000 75
```

Related Commands	Command	Description
	feature ospf	Enables the OSPF feature.
	feature ospfv3	Enables the OSPFv3 feature.

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

max	Maximum number of prefixes that EIGRP will distribute. The range is from 0 to 65536.
threshold	(Optional) Percentage of maximum prefixes that will trigger a warning message. The range is from 1 to 100. The default is 75%.
warning-only	(Optional) Logs a warning message when the maximum number of prefixes is exceeded.
withdraw	(Optional) Withdraws all redistributed routes.
num-retries	(Optional) Number of times EIGRP will try to retrieve the redistributed routes. The range is from 1 to 12. The default is 1.
timeout	(Optional) Time between retry attempts. The range is from 60 to 600 seconds. The default is 300.

Defaults   No limit

Command Modes   Router configuration
VRF configuration

Supported User Roles   network-admin
vdc-admin

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines   Use the **redistribute maximum-prefix** command to limit the number of routes redistributed into IEIGR. Use the **clear ip eigrp redistribute** command if all routes are withdrawn.

Examples   This example shows how to limit the number of redistributed routes into EIGRP:

```
switch# config t
switch(config)# router eigrp 201
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# redistribute bgp route-map FilterExternalBGP
switch(config-router-af)# redistribute maximum-prefix 1000 75
```

Related Commands	Command	Description
	feature eigrp	Enables the EIGRP feature.
	redistribute (EIGRP)	Configures route redistribution for EIGRP.

redistribute maximum-prefix (IS-IS)

To limit the number of routes redistributed into Intermediate System to Intermediate System (IS-IS), 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		
	max	Maximum number of prefixes that IS-IS will distribute. The range is from 0 to 65536.
	threshold	(Optional) Percentage of maximum prefixes that will trigger a warning message. The range is from 1 to 100. The default is 75%.
	warning-only	(Optional) Logs a warning message when the maximum number of prefixes is exceeded.
	withdraw	(Optional) Withdraws all redistributed routes.
	num-retries	(Optional) Number of times IS-IS will try to retrieve the redistributed routes. The range is from 1 to 12. The default is 1.
	timeout	(Optional) Time between retry attempts. The range is from 60 to 600 seconds. The default is 300.

Defaults   No limit

Command Modes   Router configuration
VRF configuration

Supported User Roles   network-admin
vdc-admin

Command History	Release	Modification
	4.2(1)	This command was introduced.

Usage Guidelines   Use the **redistribute maximum-prefix** command to limit the number of routes redistributed into IS-IS. Use the **clear isis redistribute** command if all routes are withdrawn.

Examples   This example shows how to limit the number of redistributed routes into IS-IS:

```
switch# config t
switch(config)# router isis 201
```

```
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# redistribute bgp route-map FilterExternalBGP
switch(config-router-af)# redistribute maximum-prefix 1000 75
```

Related Commands	Command	Description
	feature isis	Enables the IS-IS feature.
	redistribute (IS-IS)	Configures route redistribution for IS-IS.

redistribute static route-map allow

To redistribute the default route, use the **redistribute static route-map allow** command.

redistribute static route-map allow

Syntax Description   This command has no arguments or keywords.

Defaults   None

Command Modes   config-router-af mode

Supported User Roles   network-admin
vdc-admin

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines   This command requires the Enterprise Services license.

Examples   This example shows how to redistributes the default route:

```
switch# configure terminal
switch(config)# route map allow permit
switch(config)# ip route 0.0.0.0 0.0.0.0 null 0
switch(config)# router bgp 100
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# default-information originate
switch(config-router-af)# redistribute static route-map allow
switch(config-router-af)#
```

Related Commands

Command	Description
route map allow permit	Enters router map configuration mode and defines the conditions for redistributing routes.

reference-bandwidth

To change the reference bandwidth used to assign the IS-IS cost, use the **reference-bandwidth** command. To return to the default setting, use the no form of this command.

reference-bandwidth {*gbps* | *mbps*} [*gbps* | **mbps**]

no reference-bandwidth

Syntax Description		
gbps	Reference bandwidth in gigabits per second (gbps). Range: 1 to 4000. Default: 40.	
mbps	Reference bandwidth in megabits per second (mbps). Range: 1 to 4000000. Default: 40000.	
gbps	(Optional) Specifies Gbps.	
mbps	(Optional) Specifies Mbps.	
route-map *name*	Prevents distribution of a specific route map.	

Defaults Bandwidth is in Mbps.

Command Modes Router configuration
VRF configuration

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	4.0(1)	This command was introduced.

Usage Guidelines If you do not enter the **gbps** or the **mbps** keyword, Mbps is the default.

The cost of interfaces is calculated by comparing the interface bandwidth with a reference bandwidth. The **reference-bandwidth** command configures the reference bandwidth.

Examples This example shows how to set the reference bandwidth to 3500 Gbps:

```
switch(config)# router isis firstcompany
switch(config-router)# reference-bandwidth 3500 gbps
```

This example shows how to return to the default reference bandwidth:

```
switch(config)# router isis firstcompany
switch(config-router)# no reference-bandwidth
```

■ **reference-bandwidth**

Related Commands

Command	Description
feature isis	Enables IS-IS on the router.
router isis	Enables IS-IS.

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	*number*	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.

Defaults None

Command Modes Neighbor configuration

Supported User Roles network-admin
vdc-admin

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines This command requires the Enterprise Services license.

Examples This example shows how to configure the neighbor AS number:

```
switch(config)# router bgp 64496
switch(config-router)# neighbor 10.0.0.100
switch(config-router-neighbor)# remote-as 64497
```

Related Commands

Command	Description
feature bgp	Enables BGP on the router.
neighbor	Configures BGP peers.

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	*seconds*	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.

Defaults 5 seconds

Command Modes Virtual link configuration

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	4.0(1)	This command was introduced.

Usage Guidelines Use the **retransmit-interval** 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 Enterprise Services license.

Examples This example shows how to set the retransmit interval value to 8 seconds:

```
switch(config)# router ospf 109
switch(config-router)# area 33 virtual-link 192.0.2.2
switch(config-router-vrf)# retransmit-interval 8
```

Related Commands	Command	Description
	area virtual-link	Creates a virtual link in an OSPF area.

retransmit-interval (OSPFv3 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	*seconds*	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.

Defaults   5 seconds

Command Modes   Virtual link configuration

Supported User Roles   network-admin
vdc-admin

Command History	Release	Modification
	4.0(1)	This command was introduced.

Usage Guidelines   Use the **retransmit-interval** 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 Enterprise Services license.

Examples   This example shows how to set the retransmit interval value to 8 seconds:

```
switch(config)# router ospfv3 109
switch(config-router)# area 33 virtual-link 192.0.2.2
switch(config-router-vrf)# retransmit-interval 8
```

Related Commands	Command	Description
	area virtual-link	Creates a virtual link in an OSPFv3 area.

rfc1583compatibility

To configure RFC 1583 compatibility as the method used to calculate summary route costs and select AS-external paths, 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.
Defaults	RFC 1583 compatibility is disabled.
Command Modes	Router configuration
Supported User Roles	network-admin vdc-admin

Command History

Release	Modification
5.0(2a)	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.

OSPFv2 on Cisco NX-OS supports RFC 2328. This RFC introduced a different method to calculate route summary costs which is not compatible with the calculation used by RFC1583. RFC 2328 also introduced different selection criteria for AS-external paths. It is important to ensure that all routers support the same RFC. Use the **rfc1583compatibility** command if your network includes routers that are only compliant with RFC1583. The default supported RFC standard for OSPFv2 may be different for Cisco NX-OS and Cisco IOS. You must make adjustments to set the values identically. For more OSPF RFC Compatibility Mode example, see the *Cisco Nexus 7000 Series NX-OS Unicast Routing Configuration Guide, Release 6.x*.

You must configure RFC 1583 compatibility on any virtual routing and forwarding (VRF) that connects to routers running only RFC1583 compatible OSPF.

> **Note**   The default values for Cisco NX-OS might be different from that of Cisco IOS. You should make adjustments to set the values identically.

Examples

This example shows how to specify that the router process is compatible with RFC 1583:

■ **rfc1583compatibility**

```
switch# configure terminal
switch(config)# feature ospf
switch(config)# router ospf Test1
switch(config-router)# rfc1583compatibility
switch(config-router)# vrf A
switch(config-router-vrf)# rfc1583compatibility
```

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

map-tag	Route map name.
deny	(Optional) Specifies that the route or packet is not distributed as follows: • If the match criteria are met for the route map, the route is not redistributed. • With policy routing, the packet is not policy routed and route maps sharing the same map tag name are not examined. If the packet is not policy routed, the normal forwarding algorithm is used.
permit	(Optional) Specifies that the route or packet is distributed as follows: • If the match criteria for this route are met, the route is redistributed as controlled by the set actions. With policy routing, the packet is policy routed. • If the match criteria are not met, the next route map with the same map tag is tested. If a route does not pass any of the match criteria for the set of route maps sharing the same name, it is not redistributed by that set.
sequence-number	(Optional) Number that indicates the position a new route map will have 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.

Defaults

The **permit** keyword is the default.

Command Modes

Global configuration

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

You must enter the **feature pbr** global configuration mode command to enable PBR before entering the **route-map** 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)#
```

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 expires since entering the submode.

Once you enter the route-map configuration mode, the following keywords are available:

- **continue** *sequence-number*—Continues on a different entry within the route-map. Range: 0 to 65535.

- **description** *description*—Provides a description of the route-map. The description can be any alphanumeric string up to 90 characters.

- **exit**—Exits from the current command mode.

- **match**—Matches the values from the specified routing table. The following keywords and arguments are available:

    – **as-path** *name* [*name*]—Specifies the autonomous system (AS) path access list to match. The name can be any alphanumeric string up to 63 characters. See the **match as-path** command for additional information.

    – **community** *name* [*name* | **exact-match**]—Specifies the BGP community list name to match. See the **match community** command for additional information.

    – **ip**—Configures the IPv4 features. The follow keywords and arguments are available:

    address {*access-list-name* [*access-list-name*] | **prefix-list** *ipv4-list-name* [*ipv4-list-name*]}—Specifies the address of the route or packet to match. See the **match ip address** command for additional information.

    multicast {**group** *address/length* | **rp** *address/length*}—Specifies the multicast attributes to match. See the **match ip multicast** command for additional information.

    next-hop—Matches the next-hop address of route. See the **match ip next-hop** command for additional information.

    route-source—Matches the advertising source address of route. See the **match ip route-source** command for additional information.

    – **ipv6**—Configures the IPv6 features. The follow keywords and arguments are available

    address {*access-list-name* [*access-list-name*] | **prefix-list** *ipv6-list-name* [*ipv6-list-name*]}—Specifies the address of the route or packet to match. See the **match ipv6 address prefix-list** command for additional information.

> ✎ **Note** The IPv6 access-list name is for use in route-maps for PBR only.

    multicast {**group** *address/length* | **rp** *address/length*}—Specifies the multicast attributes to match. See the **match ipv6 multicast** command for additional information.

    next-hop prefix-list—Matches the next-hop address of route. See the **match ipv6 next-hop prefix-list** command for additional information.

    route-source—Matches the advertising source address of route. See the **match ipv6 route-source prefix-list** command for additional information.

    – **length** *minimum-length maximum-length*—Defines the minimum and maximum packet length. See the **match length** command for additional information.

    – **route-type**—Matches the route-type of the route. See the **match route-type** command for additional information.

    – **tag**—Matches the metric of route. See the **match tag** command for additional information.

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

- **no**—Negates a command or set its defaults.

- **set**—Sets the values in the destination routing protocol. The **set** commands specify the routing actions to perform if the criteria enforced by the **match** commands are met. You might want to policy route packets some way other than the obvious shortest path. The following keywords and arguments are available:

    – **as-path**—Prepends a string for a BGP AS-path attribute. See the **set as-path** command for additional information.

    – **comm-list**—Sets the BGP community list (for deletion). See the **set comm-list** command for additional information.

    – **community**—Sets the BGP community attribute. See the **set community** command for additional information.

    – **dampening**—Sets the BGP route flap dampening parameters. See the **set dampening** command for additional information.

    – **forwarding-address**—Sets the forwarding address. See the **set forwarding-address** command for additional information.

    – **ip**—Configures the IP features. The following keywords and arguments are available:

    set ip default next-hop—Indicates where to output packets that pass a match clause of a route map for policy routing and for which the Cisco NX-OS software has no explicit route to a destination. See the **set ip default next-hop** command for additional information.

    set ip next-hop—Indicates where to output packets that pass a match clause of a route map for policy routing. See the **set ip next-hop** command for additional information.

    – **ipv6**—Configures the IPv6 features. The following keywords and arguments are available:

    set ipv6 default next-hop—Indicates where to output packets that pass a match clause of a route map for policy routing and for which the Cisco NX-OS software has no explicit route to a destination. See the **set ipv6 default next-hop** command for additional information.

    set ipv6 next-hop—Indicates where to output packets that pass a match clause of a route map for policy routing. See the **set ipv6 next-hop** command for additional information.

    – **level**—Specifies where to import the route. See the **set level** command for additional information.

    – **local-preference**—Specifies the BGP local preference path attribute. See the **set local-preference** command for additional information.

    – **metric**—Sets the metric for destination routing protocol. See the **set metric** command for additional information.

    – **metric-type**—Sets the type of metric for destination routing protocol. See the **set metric-type** command for additional information.

- **origin**—Specifies the BGP origin code. See the **set origin** command for additional information.
- **tag**—Specifies the tag value for destination routing protocol. See the **set tag** command for additional information.
- **vrf**—Sets the VRF for next-hop resolution. See the **set vrf** command for additional information.
- **weight**—Sets the BGP weight for the routing table. See the **set weight** command for additional information.

Use route maps to redistribute routes or to subject packets to policy routing. Both purposes are described in this section.

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 relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure a second route map section with an explicit match specified.

Policy Routing

Use the **ip policy route-map c**ommand, in addition to the **route-map** command, and the **match** and **set** commands to define the conditions for policy routing packets. The **match** commands specify the conditions under which policy routing occurs. The **set** commands specify the routing actions to perform if the criteria enforced by the **match** commands are met. You might want to policy route packets some way other than the obvious shortest path.

The guidelines for the *sequence-number* argument are as follows:

1. If no entry is defined with the supplied tag, an entry is created with the *sequence-number* argument set to 10.

2. If only one entry is defined with the supplied tag, that entry becomes the default entry for the following **route-map** command. The *sequence-number* argument of this entry is unchanged.

3. If more than one entry is defined with the supplied tag, an error message is printed to indicate that the *sequence-number* argument is required.

If the **no route-map** *map-tag* command is specified (with no *sequence-number* argument), the whole route map is deleted.

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 will be redistributed into OSPF as external link-state advertisements (LSAs) with a metric type of Type 1, and a tag equal to 1.

```
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
```

This example for IPv6 shows how to redistribute Routing Information Protocol (RIP) routes with a hop count equal to 1 into Open Shortest Path First (OSPF). These routes will be redistributed into OSPF as external link-state advertisements (LSAs) with a tag equal to 42 and a metric type equal to type1.

```
switch(config)# router 1
switch(config-route-map)# redistribute rip one route-map ripng-to-ospfv3
switch(config)# route-map ripng-to-ospfv3
switch(config-route-map)# match tag 42
switch(config-route-map)# set metric-type type1
```

This example sets the autonomous system path to match BGP autonomous system path access list 20:

```
switch(config)# route-map IGP2BGP
switch(config-route-map)# match as-path 20
```

This example shows how to configure that the routes matching community list 1 will have the weight set to 100. Any route that has community 109 will have the weight set to 100.

```
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
```

This example shows how to configure that the routes matching community list 1 will have the weight set to 200. Any route that has community 109 alone will have the weight set to 200.

```
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
```

This example shows how to configure that the routes match community list LIST_NAME will have the weight set to 100. Any route that has community 101 alone will have the weight set to 100.

```
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
```

route-map (BGP)

To set the Border Gateway Protocol (BGP) route dampening factors, use the **route-map** command. To disable this function, use the **no** form of this command.

half-life reuse suppress max-suppress-time

half-life reuse suppress max-suppress-time

Syntax Description		
	half-life	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. Range: 1 to 45. Default: 15.
	reuse	Routes that are 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.
	suppress	Route that is suppressed when its penalty exceeds this limit. Range: 1 to 20000. Default: 2000.
	max-suppress-time	Maximum time (in minutes) a route can be suppressed. Range: 1 to 255. Default: Four times the *half-life* value. If the *half-life* value is allowed to default, the maximum suppress time defaults to 60 minutes.

Defaults   This command is disabled by default.

Command Modes   Route-map configuration (config-route-map)

Supported User Roles   network-admin
vdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines   Use the **route-map** command, and the **match** and **set** 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 does not require a license.

Examples   This example shows how to set 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(config)# route-map test1 10 permit
switch(config-route-map)#  30 1500 10000 120
```

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, and performs policy routing on packets.
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, or enables policy routing.
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-map allow permit

To enter router map configuration mode and define the conditions for redistributing routes, use the **route-map allow permit** command. To delete the configuration for redistributing routes, use the **no** form of this command.

> **route-map allow permit**
>
> **no route-map allow permit**

Syntax Description　This command has no arguments or keywords.

Defaults　None

Command Modes　Global configuration mode

Supported User Roles　network-admin
vdc-admin

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines　This command requires the Enterprise Services license.

Examples　This example shows how to enter router map configuration mode and define the conditions for redistributing routes:

```
switch# configure terminal
switch(config)# route map allow permit
switch(config)#
```

This example shows how to delete the configuration for redistributing routes:

```
switch(config)# no route map allow permit
switch(config)#
```

Related Commands

Command	Description
router bgp	Enters Border Gateway Protocol (BGP) configuration mode and assigns the autonomous system number to the local BGP speaker.

route-map pbr-statistics

To enable policy-based statistics for a route map, use the **route-map pbr statistics** command. To disable statistics, use the **no** form of this command.

> **route-map** *name* **pbr-statistics**

> **no route-map** *name* **pbr-statistics**

Syntax Description	*name*	Name of the route map. The name can be any alphanumeric string up to 63 characters.

Defaults	None

Command Modes	Any

Supported User Roles	network-admin vdc-admin

Command History	Release	Modification
	4.0(1)	This command was introduced.

Usage Guidelines Use the **route-map pbr-statistics** command to enable policy-based routing statistics. You must enable policy-based routing with the **feature pbr** command before you can enable policy-based routing statistics.

✎
Note This command may fail if the same interface is configured for some other policy such as ACLs.

This command requires the Enterprise Services license.

Examples This example shows how to enable the policy-based routing statistics for a route map:

```
switch(config)# feature pbr
switch(config)# route-map testmap pbr-statistics
```

Related Commands	Command	Description
	clear route-map pbr-statistics	Clears policy-based routing statistics for a route map.

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

as-num	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.
.*as-num*	(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.

Defaults   No BGP routing process is enabled by default.

Command Modes   Address-family configuration
Neighbor address-family configuration
Router BGP configuration

Supported User Roles   network-admin
vdc-admin

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.

Once you enter the router BGP configuration mode, the following parameters are available:

- **address-family**—Configures an address-family (router, neighbor, vrf). See the **address-family (BGP)** command for information.

- **bestpath**—Changes the default bestpath selection algorithm. See the **bestpath** command for information.

- **cluster-id** {*cluster-id* | *cluster-ip-addr*}—Configures the Route Reflector Cluster-ID (router, vrf). Range: 1 to 4294967295. You can enter the cluster identification as a 32-bit quantity or as an IP address. To remove the cluster ID, use the **no** form of this command.

- **confederation** {**identifier** *as-num*[**.***as-num*] | **peer** *as-num*[**.***as-num*]}—Configures the AS confederation parameters as the routing domain confederation AS or the peer AS in the BGP confederation. To remove the confederation identifier, use the **no** form of this command.

The **confederation** command is used to configure a single autonomous system number to identify a group of smaller autonomous systems as a single confederation. You can use a confederation to divide a large single autonomous system into multiple subautonomous systems and then group them into a single confederation. The subautonomous systems within the confederation exchange routing information. External peers interact with the confederation as if it is a single autonomous system.

Each subautonomous system is fully meshed within itself and has a few connections to other autonomous systems within the confederation. Next hop, Multi Exit Discriminator (MED), and local preference information is preserved throughout the confederation, allowing you enables to you to retain a single Interior Gateway Protocol (IGP) for all the autonomous systems.

- **enforce-first-as**—Forces BGP to compare an external peer's configured AS number with the first AS in the AS-PATH of the routes received from the peer. In case of mismatch of AS numbers, the peer is sent an error code update notification message. To disable, use the **no** form of this command.

- **exit**—Exits from the current command mode.

- **fast-external-fallover**—Configures a Border Gateway Protocol (BGP) routing process to immediately reset external BGP peering sessions if the link used to reach these peers goes down. To disable BGP fast external fallover, use the **no** form of this command.

  The **fast-external-fallover** command is used to disable or enable fast external fallover for BGP peering sessions with directly connected external peers. The session is immediately reset if link goes down. Only directly connected peering sessions are supported.

  If BGP fast external fallover is disabled, the BGP routing process will wait until the default hold timer expires (three keepalives) to reset the peering session.

- **graceful-restart**—Configures the Graceful Restart functionality (router, vrf). See the **graceful-restart (BGP)** command for additional information.

- **graceful-restart-helper**—Configures the Graceful Restart Helper mode functionality (router, vrf). See the **graceful-restart (BGP)** command for additional information.

- **log-neighbor-changes**—Enables logging of the BGP neighbor resets. To disable the logging of changes in BGP neighbor adjacencies, use the **no** form of this command. The **log-neighbor-changes** command enables logging of BGP neighbor status changes (up or down) and resets for troubleshooting network connectivity problems and measuring network stability. Unexpected neighbor resets might indicate high error rates or high packet loss in the network and should be investigated.

  Using the **log-neighbor-changes** command to enable status change message logging does not cause a substantial performance impact, unlike, for example, enabling per BGP update debugging. If the UNIX syslog facility is enabled, messages are sent to the UNIX host running the syslog daemon so that the messages can be stored and archived. If the UNIX syslog facility is not enabled, the status change messages are retained in the internal buffer of the router, and are not stored to disk. You can set the size of this buffer, which is dependent upon the available RAM, using the **logging buffered** command.

  The neighbor status change messages are not tracked if the bgp log-neighbor-changes command is not enabled, except for the reset reason, which is always available as output of the **show ip bgp neighbors** and **show bgp ipv6 neighbors** commands.

  The **eigrp log-neighbor-changes** command enables logging of Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor adjacencies, but messages for BGP neighbors are logged only if they are specifically enabled with the bgp log-neighbor-changes command.

  Use the **show logging command** to display the log for the BGP neighbor changes.

- **neighbor**—Configures a BGP neighbor (router, vrf). See the **neighbor** command for additional information.

- **no**—Negates a command or set its defaults.
- *router-id*—Specifies the IP address to use as router-id (router, vrf).
- **template**—Enters the template command mode. See the **neighbor** command for additional information.
- **timers**—Configures the BGP-related timers (router, vrf).
  - **bestpath-limit** *interval*—Configures the timeout for first bestpath after restart in seconds. Range: 1 to 3600. Default: 300.
  - **bgp** *interval*—Configures the different BGP keepalive and holdtimes in seconds. Range: 0 to 3600. Default: 60.
  - **prefix-peer-timeout** *interval*—Configures how long a prefix peer is maintained in seconds. Range: 0 to 1200. Default: 300:
- **vrf**—Configures the virtual router context.
  - *vrf-name*—Specifies the VRF name.
  - **management**—Specifies the configurable VRF name.

Examples

This example shows how to configure a BGP process for autonomous system 120:

```
switch(config)# router bgp 120
switch(config-router)#
```

This example shows how to log neighbor changes for BGP in router configuration mode:

```
switch(config# bgp router 40000
switch(config-router)# log-neighbor-changes
```

In This example, the BGP fast external fallover feature is disabled. If the link through which this session is carried flaps, the connection will not be reset.

```
switch(config# bgp router 64496
switch(config-router)# no fast-external-fallover
```

In This example, 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. In the follow example, updates from the 10.100.0.1 peer will be discarded if the first AS number is not 65001.

```
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)#
```

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	*instance-tag*	Name of an EIGRP instance. The instance-tag can be any case-sensitive, alphanumeric string up to 20 characters.

Defaults None

Command Modes Global

Supported User Roles network-admin
vdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines This command requires the Enterprise Services license.

Examples This example shows how to configure a routing process for EIGRP:

```
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 isis

To configure a routing process and enter router configuration mode for Intermediate System to Intermediate System (IS-IS), use the **router isis** command. To turn off the IS-IS routing process, use the **no** form of this command.

router isis *instance-tag*

no router isis *instance-tag*

Syntax Description		
instance-tag	Instance name. The name can be any alphanumeric string up to 20 characters.

Defaults None

Command Modes Global

Supported User Roles network-admin
vdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines This command requires the Enterprise Services license.

Examples This example shows how to configure a routing process for IS-IS:

```
switch(config)# router isis test1
switch(config-router)#
```

Related Commands

Command	Description
default-information	Controls the distribution of a default route.
distance	Configures the administrative distance.
maximum-paths	Configures the maximum number of equal-cost paths.
redistribute	Configures route redistribution for IS-IS.

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	*instance-tag*	Internally used identification parameter for an OSPF routing instance. It is locally assigned and can be any word or positive integer. The *instance-tag* argument can be any alphanumeric string.

Defaults   No OSPF routing instance is defined.

Command Modes   Global configuration

Supported User Roles   network-admin
vdc-admin

Command History	Release	Modification
	4.0(1)	This command was introduced.

Usage Guidelines   Use the **router ospf** command to specify multiple OSPF routing instances in each router.

This command requires the Enterprise Services license.

Examples   This example shows how to configure a basic OSPF instance:

```
switch(config)# router ospf 12
```

router ospf p1

To configure an Open Shortest Path First (OSPF) process tag, use the **router ospf p1** command. To terminate an OSPF process tag, use the **no** form of this command.

router ospf p1

no router ospf p1

Syntax Description	This command has no arguments or keywords.
Defaults	None.
Command Modes	Global configuration
Supported User Roles	network-admin vdc-admin

Command History

Release	Modification
4.0	This command was introduced.

Usage Guidelines   This command requires the Enterprise Services license.

Examples   This example shows how to configure an Open Shortest Path First (OSPF) process tag:

```
switch(config)# router ospf p1
switch(config)#
```

router ospfv3

To configure an Open Shortest Path First version 3 (OSPFv3) routing instance, use the **router ospfv3** command. To terminate an OSPFv3 routing process, use the **no** form of this command.

router ospfv3 *instance-tag*

no router ospfv3 *instance-tag*

Syntax Description	*instance-tag*	Internally used identification parameter for an OSPFv3 routing instance. It is locally assigned and can be any word or positive integer. The *instance-tag* argument can be any alphanumeric string.

Defaults   No OSPFv3 routing instance is defined.

Command Modes   Global configuration

Supported User Roles   network-admin
vdc-admin

Command History	Release	Modification
	4.0(1)	This command was introduced.

Usage Guidelines   Use the **router ospfv3** command to specify multiple OSPFv3 routing instances in each router.

This command requires the Enterprise Services license.

Examples   This example shows how to configure a basic OSPFv3 instance:

```
switch(config)# router ospfv3 12
```

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.

Defaults   No RIP routing process is defined.

Command Modes   Global configuration

Supported User Roles   network-admin
vdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.

Examples   This example shows how to begin the RIP routing process:

```
switch(config)# router rip Enterprise
```

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

router-id	32-bit router ID value specified in four-part, dotted-decimal notation.

Defaults
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
Router configuration
Router VRF configuration

Supported User Roles
network-admin
vdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines
Use the **router-id** command to manually specify a unique 32-bit numeric value for the router ID. This action ensures that EIGRP can function regardless of the interface address configuration.

This command requires the Enterprise Services license.

Examples
This example shows how to assign the IP address of 192.0.2.1 to the EIGRP process 1:

```
switch(config)# router eigrp 1
switch(config-router) address-family ipv4
switch(config-router-af)# router-id 192.0.2.1
```

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.

Defaults   If this command is not configured, OSPF chooses an IPv4 address as the router ID from one of its interfaces.

Command Modes   Router configuration

Supported User Roles   network-admin
vdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines   Use the **router-id** command to manually specify a unique 32-bit numeric value for the router ID.

If this command is used on an OSPF instance that has neighbors, the connections to the neighbors are re-established and the new router ID is available immediately for use by OSPF.

This command requires the Enterprise Services license.

Examples   This example shows how to configure the router ID:

```
switch(config)# router ospf 12
switch(config-router)# router-id 192.0.2.1
```

Related Commands

Command	Description
router ospf	Configures the OSPF routing process.

router-id (OSPFv3)

To use a fixed router ID for an Open Shortest Path First version 3 (OSPFv3) instance, use the **router-id** command. To revert to the previous OSPFv3 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.	

Defaults If this command is not configured, OSPFv3 chooses an IPv4 address as the router ID from one of its interfaces.

Command Modes Router configuration

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	4.0(1)	This command was introduced.

Usage Guidelines Use the **router-id** command to manually specify a unique 32-bit numeric value for the router ID.

If this command is used on an OSPFv3 instance that has neighbors, the connections to the neighbors are re-established and the new router ID is available immediately for use by OSPFv3.

This command requires the Enterprise Services license.

Examples This example shows how to configure the router ID:

```
switch(config)# router ospfv3 12
switch(config-router)# router-id 192.0.2.1
```

Related Commands	Command	Description
	router ospfv3	Configures the OSPFv3 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 revert to default behavior, use the **no** form of this command.

routing-context vrf *vrf-name*

no routing-context vrf *vrf-name*

Syntax Description	*vrf-name*	Name of the VRF instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Defaults   default VRF

Command Modes   EXEC

Supported User Roles   network-admin
vdc-admin

Command History	Release	Modification
	4.0(1)	This command was introduced.

Usage Guidelines   Use the **routing-context vrf** command to set the VRF scope for all EXEC commands (for example, show commands). This 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.

This command does not require a license.

Examples   This example shows how to limit EXEC commands to the management VRF:

```
switch# routing-context vrf management
switch%management#
```

Related Commands	Command	Description
	show routing-context	Displays the current routing context.