



## D Commands

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## 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.
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### Command Default

The default value for *seconds* is our times the interval set by the **hello-interval** command.

### Command Modes

Virtual link configuration

### Command History

Release	Modification
4.0(1)	This command was introduced.

### Usage Guidelines

Use the **dead interval** command in virtual link configuration mode to configure the dead interval advertised in OSPF hello packets. This value must be the same for all networking devices on the virtual link.

You can configure a shorter dead interval (*seconds*) 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 Enterprise 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
```

### Related Commands

Command	Description
<b>hello-interval (OSPF virtual link)</b>	Configures the Interval between hello packets that Cisco NX-OS sends on the virtual link.
<b>show ip ospf virtual-link</b>	Displays OSPF-related information for a virtual link.

## dead-interval (OSPFv3 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 version 3 (OSPFv3) 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**

<b>Syntax Description</b>	<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.
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**Command Default** The default value for *seconds* is our times the interval set by the **hello-interval** command.

**Command Modes** Virtual link configuration

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	4.0(1)	This command was introduced.

**Usage Guidelines** Use the **dead-interval** command in virtual link configuration mode to configure the dead interval advertised in OSPFv3 hello packets. This value must be the same for all networking devices on the virtual link.

You can configure a shorter dead interval (*seconds*) 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 ospfv3 virtual-links** command to verify the dead interval.

This command requires the Enterprise Services license.

### Examples

This example shows how to configure the OSPFv3 dead interval to 20 seconds:

```
switch# configure terminal
switch(config)# ospfv3 201
switch(config-router)# area 99 virtual-link 192.0.2.4
switch(config-router-vlink)# dead-interval 20
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>hello-interval (OSPFv3 virtual link)</b>	Configures the interval between hello packets that Cisco NX-OS sends on the virtual link.
	<b>show ospfv3 virtual-link</b>	Displays OSPFv3-related information for a virtual link.

## default-information originate (EIGRP)

To generate a default route into the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **default-information originate** command in the appropriate configuration mode. 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

<b>always</b>	(Optional) Generates the default route if the route is not in the EIGRP routing information base.
<b>route-map</b> <i>map-name</i>	(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  
 Router configuration  
 Router VRF configuration

### 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 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
```

### Related Commands

Command	Description
<b>address-family</b>	Enters address-family configuration mode.
<b>default-metric</b>	Sets the metric for routes redistributed into EIGRP.
<b>redistribute</b>	Redistributes routes from other routing protocols into EIGRP.

## default-information originate (IS-IS)

To control the origination of a default route, use the **default-information originate** command.

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

Syntax Description	always	(Optional) Specifies always to advertise the default route.
	<b>route-map</b> <i>name</i>	(Optional) Specifies the name of the routing rules route map to announce default routes. The name can be up to 63 characters.

**Command Default** The default route is not redistributed into the IS-IS routing domain.

**Command Modes**  
Router configuration  
VRF configuration

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

**Usage Guidelines** You can force a default route into an IS-IS routing domain. Whenever you specifically configure redistribution of routes into an IS-IS routing domain, by default, the default route is not redistributed into the IS-IS routing domain. The **default-information originate route-map** command generates a default route into IS-IS, which can be controlled by a route map. You can use the route map to identify the level into which the default route is to be announced, and you can specify other filtering options configurable under a route map. You can use a route map to conditionally advertise the default route, depending on the existence of another route in the routing table of the router.

### Examples

This example shows how to always advertise the default route:

```
switch# configure terminal
switch(config)# router isis TEST1
switch(config-router)# default-information originate always
switch(config-router)#
```

This example shows how to specify a route map to conditionally advertise the default route:

```
switch# configure terminal
switch(config)# router isis TEST1
switch(config-router)# default-information originate route-map CORE1
switch(config-router)#
```

Related Commands	Command	Description
	<b>feature isis</b>	Enables IS-IS on the router.
	<b>router isis</b>	Enables IS-IS.

## 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

<b>always</b>	(Optional) Specifies to always advertise the default route regardless of whether the route table has a default route.
<b>route-map map-name</b>	(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

### Command History

Release	Modification
4.0(1)	This command was introduced.

### Usage Guidelines

Use the **default-information originate** command to assign a default route for redistributed routes. Whenever you use the **redistribute** command to redistribute routes into an OSPF routing domain, Cisco NX-OS automatically becomes an Autonomous System Boundary Router (ASBR). However, an ASBR does not, by default, generate a default route into the OSPF routing domain.

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 Enterprise 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
```

### Related Commands

Command	Description
<b>redistribute (OSPF)</b>	Redistributes routes from one routing domain into OSPF.

Command	Description
route-map	Defines a filter policy for routes.

## default-information originate (OSPFv3)

To generate a default external route into an Open Shortest Path First version 3 (OSPFv3) 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

<b>always</b>	(Optional) Specifies to always advertise the default route regardless of whether the route table has a default route.
<b>route-map</b> <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

Address-family configuration

### Command History

Release	Modification
4.0(1)	This command was introduced.

### Usage Guidelines

Use the **default-information originate** command to assign a default route for redistributed routes. Whenever you use the **redistribute** command to redistribute routes into an OSPFv3 routing domain, Cisco NX-OS automatically becomes an Autonomous System Boundary Router (ASBR). However, an ASBR does not, by default, generate a default route into the OSPFv3 routing domain.

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 Enterprise Services license.

### Examples

This example shows how to configure the default route redistributed into the OSPFv3 routing domain for the Border Gateway Protocol (BGP):

```
switch# configure terminal
switch(config)# router ospfv3 109
switch(config-router)# redistribute bgp 108 route-map bgpPolicy
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# default-information originate always
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>redistribute (OSPFv3)</b>	Redistributes routes from one routing domain into OSPFv3.
<b>route-map</b>	Defines a filter policy for routes.

## default-information originate (RIP)

To generate a default route into the Routing Information Protocol (RIP), use the **default-information originate** command in router address-family configuration mode. 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

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

### Command Default

This command is disabled by default.

### Command Modes

Router address-family configuration

### Command History

Release	Modification
4.0(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
```

### Related Commands

Command	Description
<b>address-family</b>	Enters address-family configuration mode.
<b>default-metric</b>	Sets the metric for routes redistributed into RIP.
<b>redistribute</b>	Redistributes routes from other routing protocols into RIP.

# default isis passive-interface

To allow all Intermediate System-to-Intermediate System (IS-IS) interfaces to be set as passive by default, use the **default isis passive-interface** command.

**default isis passive-interface** {level-1 | level-1-2 | level-2}

Syntax Description	level-1	(Optional) Suppresses level-1 PDU.
	level-1-2	(Optional) Suppresses level-1 and level-2 PDU.
	level-2	(Optional) Suppresses level-2 PDU.

**Command Default** None

**Command Modes** Interface configuration mode

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 allow all IS-IS interfaces to be set as passive by default:

```
switch# configure terminal
switch(config)# router isis 1
switch(config-router)# passive-interface default level-1
switch(config-router)# exit

switch# configure terminal
switch(config)# interface GigabitEthernet 0/0/0
switch(config-if)# isis passive-interface level-1
switch(config-if)# no isis passive-interface level-1
switch(config-if)# default isis passive-interface level-1
switch(config-if)#
```

Related Commands	Command	Description
	<b>isis passive-interface</b>	Blocks sending of routing updates on an IS-IS interface.
	<b>no isis passive-interface</b>	Re-enables sending of routing updates on an IS-IS interface and activates only those interfaces that need adjacencies.

## 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 1 to 4294967295. The default value is 1492.

### Command Default

bandwidth: 100000  
 delay: 100 (tens of microseconds)  
 reliability: 255  
 loading: 1  
 MTU: 1500

### Command Modes

Address-family configuration  
 Router configuration  
 Router VRF configuration

### Command History

Release	Modification
4.0(1)	This command was introduced.
4.0(3)	Changed the default value for MTU to 1492.

### 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 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 Enterprise 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.

```
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
```

## Related Commands

Command	Description
<b>redistribute</b>	Redistributes routes from one routing domain into another routing domain.

## 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 20.

### Command Modes

Router configuration

### Command History

Release	Modification
4.0(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 Enterprise 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
```

### Related Commands

Command	Description
<b>redistribute (OSPF)</b>	Redistributes routes from another routing domain into OSPF.

## default-metric (OSPFv3)

To set default metric values for the Open Shortest Path First version 3 (OSPFv3) 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*

<b>Syntax Description</b>	<i>metric-value</i>	Default metric value appropriate for the specified routing protocol. The range is from 1 to 1677214.
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**Command Default** The metric for redistributed, connected, and static routes is set to 20.

**Command Modes** Address-family configuration

<b>Command History</b>	Release	Modification
	4.0(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 directly connected routes. A default metric helps to redistribute routes with incompatible metrics. Whenever external route metrics do not convert to an OSPFv3 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 Enterprise Services license.

### Examples

This example shows how to configure OSPFv3 to redistribute RIP and BGP and set the default metric to 10:

```
switch# configure terminal
switch(config)# router ospfv3 201
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# default-metric 10
switch(config-router-af)# exit
switch(config-router)# redistribute rip 109 route-map FilterRip
switch(config-router)# redistribute bgp 4 route-map FilterBgp
```

<b>Related Commands</b>	Command	Description
	<b>redistribute (OSPFv3)</b>	Redistributes routes from another routing domain into OSPFv3.

## 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

*value*: 1

### Command Modes

Router address-family configuration

### Command History

Release	Modification
4.0(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 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.

This command does not require a license.

### Examples

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:

```
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
```

### Related Commands

Command	Description
<b>address-family</b>	Enters address-family configuration mode.
<b>default-information originate</b>	Generates a default route for routes redistributed into RIP.
<b>redistribute</b>	Redistributes routes from one routing domain into another routing domain.

# 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 <i>up-time</i>	Downs the object track state change for an up condition. The range is from 0 to 180 seconds.
	down <i>down-time</i>	Downs 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
	4.2(4)	This command was introduced.

**Usage Guidelines** Use the **delay** command to delay when object tracking detects an up or down state change for a tracked object or track list. This delay helps 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
```

Related Commands	Command	Description
	<b>track</b>	Configures a tracked object or track list.

## delay minimum

To delay 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	
<b>delay minimum</b> <i>min-delay</i>	Specifies the 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.
<b>reload</b> <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

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

**Usage Guidelines** Use **delay minimum** command to delay HSRP initialization either after a reload or after an interface comes up. This 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(config)# configure terminal
switch(config)# interface ethernet 0
switch(config)# ip address 172.16.6.5 255.255.255.0
switch(config)# hsrp 1
switch(config)# delay minimum 3 reload 10
switch(config)# ip 172.16.6.100
```

Related Commands	Command	Description
	<b>feature hsrp</b>	Enables HSRP configuration.

## disable-peer-as-check (BGP)

To disable checking the peer autonomous system number (ASN) during route advertisement, use the **disable-peer-as-check** command.

### disable-peer-as-check

#### Syntax Description

This command has no arguments or keywords.

#### Command Default

Checking the ASN during route advertisement is enabled.

#### Command Modes

config-router-vrf-neighbor-af mode

#### Command History

Release	Modification
6.2(2)	This command was introduced.

#### Usage Guidelines

This command requires the MPLS Services license.

#### Examples

This example shows how to disable checking the peer ASN during a route advertisement:

```
switch# configure terminal
switch(config)# feature bgp
switch(config)# feature-set mpls
switch(config)# feature mpls l3vpn
switch(config)# feature bgp
switch(config)# router bgp 1.1
switch(config-router)# neighbor 33.0.1.63 remote-as 100
switch (config-router-vrf-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# neighbor 33.0.1.63 remote-as 100
switch(config-router-vrf-neighbor)# address-family ipv4 unicast
switch(config-router-vrf-neighbor-af)# disable-peer-as-check
switch(config-router-vrf-af)#
```

#### Related Commands

Command	Description
<b>address-family ipv4 unicast</b>	Enters address family configuration mode for configuring routing sessions that use standard IPv4 address prefixes.
<b>allowas-in</b>	Allows duplicate autonomous system number (ASN) in the AS path. Configure this parameter in the VPN address family configuration mode at the PE spokes and at the neighbor mode at the PE hub.
<b>neighbor</b>	Adds an entry to the BGP or multiprotocol BGP neighbor table for this VRF.

# discard-route

For Cisco NX-OS to automatically configure a discard route for the summary address to prevent routing black holes and route loops, use the **discard-route** command. To prevent the discard routes from being created, use the **no** form of this command.

```
discard-route {internal | external}
no discard-route {internal | external}
```

Syntax Description	
<b>internal</b>	(Optional) Specifies internal route.
<b>external</b>	(Optional) Specifies external route.

**Command Default** Enabled

**Command Modes** config-router mode

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 automatically configure a discard route for the summary address to prevent routing black holes and route loops:

```
switch# configure terminal
switch(config)# router ospf 201
switch(config-router)# area 0.0.0.10 range 10.3.0.0/16
switch(config-router)# summary-address 10.5.0.0/16 tag 2
switch(config-router)# no discard-route internal
switch(config-router)#
```

This example shows how to prevent the discard routes from being created:

```
switch(config-router)# no discard-route internal
```

Related Commands	Command	Description
	<b>router ospf</b>	Configures an Open Shortest Path First (OSPF) routing instance.

## 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 reset to default, 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  
 Router configuration  
 Router VRF configuration

### Command History

Release	Modification
4.0(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, the higher the value, the lower the 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 Enterprise 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
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>show ip eigrp</b>	Displays information about the Enhanced Interior Gateway Routing Protocol (EIGRP) running on the router.

## distance (IS-IS)

To define an administrative distance for routes that are inserted into the routing table, use the **distance** configuration mode command. To return the administrative distance to its default distance definition, use the **no** form of this command.

**distance** *value*  
**no distance**

### Syntax Description

<i>value</i>	Administrative distance. Range: 1 to 255. Default: 115.
--------------	---

### Command Default

The default route is not redistributed into the IS-IS routing domain.

### Command Modes

Router configuration  
 VRF configuration

### Command History

Release	Modification
4.0(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, the higher the value, the lower the trust rating. An administrative distance of 255 means the routing information source cannot be trusted at all and should be ignored.

This command requires the Enterprise Services license.

### Examples

This example shows how to set the administrative distance to 90:

```
switch# configure terminal
switch(config)# router isis TEST1
switch(config-router)# distance 90
```

### Related Commands

Command	Description
<b>feature isis</b>	Enables IS-IS on the router.
<b>net</b>	Specifies the Network Entity Title (NET) for an IS-IS process.
<b>router isis</b>	Enables IS-IS.

## 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

<i>distance</i>	Administrative distance for all routes local to this OSPF process. The range is from 1 to 255.
-----------------	--

### Command Default

110

### Command Modes

Router configuration

### Command History

Release	Modification
4.0(1)	This command was introduced.

### Usage Guidelines

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

This command requires the Enterprise 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)# router ospf 2
switch(config-router)# distance 20
```

## distance (OSPFv3)

To define the Open Shortest Path First version 3 (OSPFv3) route administrative distance, use the **distance** command. To restore the default, use the **no** form of this command.

**distance** *distance*  
**no distance**

### Syntax Description

<i>distance</i>	Administrative distance for all routes local to this OSPFv3 process. The range is from 1 to 255.
-----------------	--

### Command Default

110

### Command Modes

Address-family configuration

### Command History

Release	Modification
4.0(1)	This command was introduced.

### Usage Guidelines

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

This command requires the Enterprise Services license.

### Examples

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

```
switch# configure terminal
switch(config)# router ospfv3 1
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# distance 200
```

## distance (RIP)

To define the administrative distance assigned to routes discovered by the Routing Information Protocol (RIP), use the **distance** command in the router address-family configuration mode. 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 0 to 255.
-----------------------	---

### Command Default

*admin-distance*: 120

### Command Modes

Router address-family configuration

### Command History

Release	Modification
4.0(1)	This command was introduced.

### Usage Guidelines

Use the **distance** command to change the preference of RIP routes over other protocol routes. 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 at all and should be ignored.

The following table lists default administrative distances.

**Table 1: Default Administrative Distances of Routing Protocols**

Routing Protocols	Administrative Distance Value
Connected interface	0
Static route out an interface	0
Static route to next hop	1
EIGRP Summary Route	5
External BGP	20
Internal EIGRP	90
OSPF	110
IS-IS	115
RIP	120
External EIGRP	170

Routing Protocols	Administrative Distance Value
Internal BGP	200
Unknown	255

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
```

### Related Commands

Command	Description
<b>address-family</b>	Enters address-family configuration mode.
<b>redistribute</b>	Redistributes routes from one routing domain into RIP.

# distribute

To distribute routes between specific IS-IS levels, use the **distribute** command. To return to the default setting, use the **no** form of this command.

**distribute** {**level-1** | **level-2**} **into** {**level-1** | **level-2**} {**all** | **route-map** *name*}

## Syntax Description

<b>level-1</b>	Distributes the interarea routes into level-1 of this IS-IS instance.
<b>level-2</b>	Distributes the interarea routes into level-2 of this IS-IS instance.
<b>into</b>	Specifies from one level to another level.
<b>all</b>	Distributes all route levels.
<b>route-map</b> <i>name</i>	Prevents distribution of a specific route-map. The name can be any alphanumeric string up to 63 characters.

## Command Default

The default route is not distributed into the IS-S routing domain. If enabled, IS-IS allows distribution of route between level-1 and level-2 such that optimal inter-area routing could be obtained.

This command requires the Enterprise Services license.

## Command Modes

Router configuration  
VRF configuration

## Command History

Release	Modification
4.0(1)	This command was introduced.

## Usage Guidelines

**level-1** summarizes the IP address into the level-1 area. Only routes redistributed into Level 1 are summarized with the configured address and mask value.

**level-2** summarizes the IP address into the level-2 area. Routes learned by level-1 routing are summarized into the level-2 backbone with the configured address and mask value. Redistributed routes into level-2 IS-IS will be summarized also.

In IS-IS, all areas are stub areas, which means that no routing information is leaked from the backbone (level-2) into areas (level-1). Level-1-only routers use default routing to the closest level-1-level-2 router in their area. This command enables you to redistribute level-2 IP routes into level-1 areas. This redistribution enables level-1-only routers to pick the best path for an IP prefix to get out of the area. This is an IP-only feature, CLNS routing is still stub routing.

For more control and scalability, a distribute list or a route map can control which level-2 IP routes can be redistributed into level-1. This command allows large IS-IS-IP networks to use areas for better scalability.

## Examples

This example distributes level-1 routes into a level-2 network:

```
switch# configure terminal
switch(config)# distribute level-1 into level-2
```

# down-bit-ignore

To disable down bit (DN bit) checking on a provider edge (PE) router, use the **down-bit-ignore** command in OSPF VRF configuration mode. To return to the default setting, use the **no** form of this command.

**down-bit-ignore**  
**no down-bit-ignore**

## Syntax Description

This command has no keywords or arguments.

## Command Default

By default, the down bit (DN bit) checking is enabled. The information from the link-state advertisement (LSA) for which the DN bit is set is ignored during Open Shortest Path First (OSPF) route calculation.

## Command Modes

OSPF VRF configuration

## Command History

Release	Modification
6.2(2)	This command was introduced.

## Usage Guidelines

This command is supported only in the OSPF VRF mode on a PE router. This command is not supported in OSPF VRF mode on a non-PE router.

When a PE receives a type 3, 5, or 7 LSA with the DN bit set from a customer edge (CE) router, the information from the LSA is not used during OSPF route calculation. The DN bit ignore feature enables a PE router to process type-3, type-5, and type-7 LSAs that are received from a CE router when the DN bit is set. When you configure the DN bit ignore feature, the PE router includes these LSAs in OSPF route computation.

The DN bit is used to prevent routing loops in Layer 3 virtual private network (VPN) configurations using OSPF in a PE-CE scenario. The DN bit ignore feature is applicable for only certain topologies, such as a hub and spoke topology of PE routers with multiple virtual routing and forwarding (VRF) CEs connected to the hub PE. You should use this command with caution because it can cause routing loops.

