



M Commands

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

match as-path

To match a BGP autonomous system path access list, use the **match as-path** command in route-map configuration mode. To remove a path list entry, use the **no** form of this command.

```
match as-path name [...name]
```

```
no match as-path name [...name]
```

Syntax Description	
<i>name</i>	Autonomous system path access list. The name can be any alphanumeric string up to 63 characters.
<i>...name</i>	(Optional) Autonomous system path access list. You can configure up to 32 access list names.

Defaults	No path lists are defined.
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Command Modes	Route-map configuration (config-route-map)
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Supported User Roles	network-admin vdc-admin
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Command History	Release	Modification
	4.0(1)	This command was introduced.

Usage Guidelines	The values set by the match as-path command overrides global values.
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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.

This command does not require a license.

Examples

The following 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
```

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Related Commands	Command	Description
	match community	Matches a BGP community.
	match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list, 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 route-type (IP)	Redistributes routes of the specified type.
	match tag	Redistributes routes in the routing table that match the specified tags.
	route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
	set as-path	Modifies an autonomous system path for BGP routes.
	set comm-list	Automatically computes the tag value in a route map configuration.
	set community	Sets BGP community list (for deletion).
	set level (IP)	Indicates where to import routes.
	set local-preference	Specifies a preference value for the autonomous system path.
	set metric (BGP, OSPF, RIP)	Sets the metric value for a routing protocol.
	set metric-type	Sets the metric type for the destination routing protocol.
	set origin (BGP)	Sets the BGP origin code.
	set tag (IP)	Sets the value of the destination routing protocol.
	set vrf	Sets the VRF for next-hop resolution.
	set weight	Specifies the BGP weight for the routing table.

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match community

To match a Border Gateway Protocol (BGP) community, use the **match community** command in route-map configuration mode. To remove the **match community** command from the configuration file and restore the system to its default condition where the software removes the BGP community list entry, use the **no** form of this command.

```
community name [...name] [exact-match]
```

```
no community name [...name] [exact-match]
```

Syntax Description	<i>name</i>	One or more community list names. The name can be any alphanumeric string up to 63 characters. You can configure a maximum of 32 community lists.
	exact-match	(Optional) Indicates that an exact match is required. All of the communities and only those communities specified must be present.

Command Default No community list is matched by the route map.

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

Supported User Roles network-admin
vdc-admin

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

Usage Guidelines A route map can have several parts. Any route that does not match at least one **match** command 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.

Matching that is based on the community list number is one of the types of **match** commands applicable to BGP.

This command does not require a license.

Examples The following example shows how to match two BGP communities:

```
switch(config)# route-map test2
switch(config-route-map)# match community 1 10
```

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The following example shows that the routes matching community list 1 will have the weight set to 200. Any route that has the standard community 109 only will have the weight set to 200.

```
switch(config)# ip community-list standard 1 permit 109
switch(config)# route-map set_weight
switch(config-route-map)# match community 1 exact-match
switch(config-route-map)# set weight 200
```

In the following example, the routes that match community list LIST_NAME will have the weight set to 100. Any route that has the standard community 109 only will have the weight set to 100.

```
switch(config)# ip community-list standard LIST_NAME permit 101
switch(config)# route-map set_weight
switch(config-route-map)# match community LIST_NAME
switch(config-route-map)# set weight 100
```

The following example shows that the routes that match the community list 500. Any route that has expanded community 1 will have the weight set to 150.

```
switch(config)# ip community-list expanded 500 permit [0-9]*
switch(config)# route-map MAP_NAME permit 10
switch(config-route-map)# match community 500
switch(config-route-map)# set weight 150
```

Related Commands

Command	Description
ip community-list	Creates a community list for BGP and controls access to it.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another.
set weight	Specifies the BGP weight for the routing table.

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match ip address

To distribute any routes that have a destination IP network number address that is permitted by a standard access list, an expanded access list, or a prefix list, or to perform policy routing on packets, use the **match ip address** command in route-map configuration mode. To remove the **match ip address** entry, use the **no** form of this command.

```
match ip address { access-list-name [access-list-name...] | prefix-list prefix-list-name
[prefix-list-name...] }
```

```
no match ip address { access-list-name [access-list-name...] | prefix-list prefix-list-name
[prefix-list-name...] }
```

Syntax Description

<i>access-list-name...</i>	Name of a standard or expanded access list. It can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered, up to 32 prefix lists.
prefix-list <i>prefix-list-name...</i>	Distributes routes based on a prefix list. The prefix list name can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered, up to 32 prefix lists.

Defaults

No access list names or prefix lists are specified.

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

The *access-list-name* argument is supported in route-maps for PBR only.

An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the *access-list-name* or the *prefix-list-name* arguments.

Like matches in the same route map subblock are filtered with “or” semantics. If any one match clause is matched in the entire route map subblock, this match is treated as a successful match. Dissimilar match clauses are filtered with “and” semantics. So dissimilar matches are filtered logically. If the first set of conditions is not met, the second match clause is filtered. This process continues until a match occurs or there are no more match clauses.

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

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Redistribution

Use the **route-map** global configuration command, and the **match** and **set** route-map configuration commands, to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria*—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the *set actions*—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must “pass” to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

When you are passing routes through a route map, a route map can have several sections that contain specific **match** clauses. Any route that does not match at least one **match** clause 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

Another purpose of route maps is to enable policy routing. The **match ip address** command allows you to policy route packets based on criteria that can be matched with an expanded access list; for example, a protocol, protocol service, and source or destination IP address. To define the conditions for policy routing packets, use the **ip policy route-map** interface configuration command, in addition to the **route-map** global configuration command, and the **match** and **set** route-map configuration commands. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria*—the conditions under which policy routing occurs. The **set** commands specify the *set actions*—the particular routing actions to perform if the criteria enforced by the **match** commands are met. You might want to policy route packets based on their source, for example, using an access list.

This command does not require a license.

Examples

In the following example, routes that have addresses specified by access list test will be matched:

```
switch(config)# feature pbr
switch(config)# interface ethernet 2/10
switch(config-if)# ip policy route-map chicago
switch(config-if)# exit
switch(config)# route-map chicago
switch(config-route-map)# match ip address test
```

Related Commands

Command	Description
ip policy route-map	Identifies a route map to use for policy routing on an interface.
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match interface (IP)	Distributes any routes that have their next hop out one of the interfaces specified.
match ip next-hop	Redistributes any routes that have a next hop router address passed by one of the access lists specified.

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Command	Description
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match length	Bases policy routing on the Level 3 length of a packet.
match metric (IP)	Redistributes routes with the metric specified.
match route-type (IP)	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set as-path	Modifies an autonomous system path for BGP routes.
set automatic-tag	Automatically computes the tag value.
set community	Sets the BGP communities attribute.
set 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.
set ip next-hop	Indicates where to output packets that pass a match clause of a route map for policy routing.
set level (IP)	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric (BGP, OSPF, RIP)	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag (IP)	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

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match ip multicast

To configure the IPv4 multicast features for the route-map matching, use the **match ip multicast** route-map configuration command. To remove the match, use the **no** form of this command.

match ip multicast {**group** *address/length* | **rp** *address/length* [**rp-type** {**asm** | **bidir**}]}

no match ip multicast

Syntax Description	
group <i>address/length</i>	Specifies the network address and the length of the network mask in bits, in this format: <i>A.B.C.D/length</i> . The network number can be any valid IP address or prefix. The bit mask can be a number from 0 to 32. You can configure both group and rp options.
rp <i>address/length</i>	Specifies the IPv4 rendezvous prefix (RP) and the length of the IPv4 prefix mask in bits, in this format: <i>A.B.C.D/length</i> . The network number can be any valid IPv4 address or prefix. The bit mask can be a number from 0 to 32. You can configure both group and rp options.
rp-type	(Optional) Specifies the multicast rendezvous point type.
asm	Specifies the any-source multicast (ASM) rendezvous point type.
bidir	Specifies the bidirectional (bidir) multicast rendezvous point type.

Command Default None

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

To specify the multicast attributes to match, use the **match ip multicast** command.

Use the **route-map** command to enter route-map configuration mode. Once you enter the **route-map** command, the prompt changes to the following:

```
switch(config-route-map)#
```

Once you enter route-map configuration mode, you can enter the **match ip multicast** command.

You can configure both group and rp options.

This command does not require a license.

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Examples

This examples shows how to specify the group IPv4 prefix and the length of the IPv4 prefix for the neighbors to match:

```
switch(config)# route-map blueberry
switch(config-route-map)# match ip multicast group 192.0.0.0/19
switch(config-route-map)#
```

This examples shows how to specify both the group IPv4 prefix and the rendezvous point the IPv4 prefix for the neighbors to match:

```
switch(config)# route-map raspberry
switch(config-route-map)# match ip multicast group 192.0.0.0/19 rp 209.165.201.0/27
switch(config-route-map)#
```

Related Commands

Command	Description
ip policy route-map	Identifies a route map to use for policy routing on an interface.
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match interface (IP)	Distributes any routes that have their next hop out one of the interfaces specified.
match ip next-hop	Redistributes any routes that have a next hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match length	Bases policy routing on the Level 3 length of a packet.
match metric (IP)	Redistributes routes with the metric specified.
match route-type (IP)	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set as-path	Modifies an autonomous system path for BGP routes.
set automatic-tag	Automatically computes the tag value.
set community	Sets the BGP communities attribute.
set 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.
set ip next-hop	Indicates where to output packets that pass a match clause of a route map for policy routing.
set level (IP)	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric (BGP, OSPF, RIP)	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag (IP)	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

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match ip next-hop prefix-list

To redistribute any IPv4 routes that have a next hop router address passed by one of the access lists specified, use the **match ip next-hop prefix-list** command in route-map configuration mode. To remove the next hop entry, use the **no** form of this command.

```
match ip next-hop prefix-list prefix-list-name [ ...prefix-list-name]
```

```
no match ip next-hop prefix-list prefix-list-name [ ...prefix-list-name]
```

Syntax Description

<i>prefix-list-name</i>	Number or name of a prefix list. It can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered, up to 32 prefix lists.
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Command Default

Routes are distributed freely, without being required to match a next hop address.

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

An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the *prefix-list-name* argument.

Use the **route-map** global configuration command, and the **match** and **set** route-map configuration commands, to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria*—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the *set actions*—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must “pass” to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

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.

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This command does not require a license.

Examples

The following example distributes routes that have a next hop router address passed by prefix list test will be distributed:

```
switch(config)# route-map blue
switch(config-route-map)# match ip next-hop prefix-list test
```

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 route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match route-type (IP)	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set as-path	Modifies an autonomous system path for BGP routes.
set automatic-tag	Automatically computes the tag value.
set community	Sets the BGP communities attribute.
set level (IP)	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric (BGP, OSPF, RIP)	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag (IP)	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

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match ip route-source prefix-list

To redistribute IPv4 routes that have been advertised by routers and access servers at the address specified by the access lists, use the **match ip route-source prefix-list** command in route-map configuration mode. To remove the route-source entry, use the **no** form of this command.

```
match ip route-source prefix-list prefix-list-name [ ...prefix-list-name ]
```

```
no match ip route-source prefix-list prefix-list-name [ ...prefix-list-name ]
```

Syntax Description	<i>prefix-list-name</i>	Number or name of a prefix list. It can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered, up to 32 prefix lists.
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Defaults	No filtering on route source.
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Command Modes	Route-map configuration (config-route-map)
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Supported User Roles	network-admin vdc-admin
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Command History	Release	Modification
	4.0(1)	This command was introduced.

Usage Guidelines	An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the <i>prefix-list-name</i> argument.
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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.

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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 second route map section with an explicit match specified.

There are situations in which the next hop and source router address of the route are not the same.

This command does not require a license.

Examples

The following example distributes routes that have been advertised by routers and access servers at the addresses specified by access lists 5 and 80:

```
switch(config)# route-map blue
switch(config-route-map)# match ip route-source prefix-list 5 80
```

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 route-type (IP)	Redistributes routes of the specified type.
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 automatic-tag	Automatically computes the tag value.
set community	Sets the BGP communities attribute.
set level (IP)	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric (BGP, OSPF, RIP)	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag (IP)	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

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match ipv6 address

To distribute any routes that have a destination IPv6 network number address that is permitted by a standard access list, an expanded access list, or a prefix list, or to perform policy routing on packets, use the **match ipv6 address** command in route-map configuration mode. To remove the **match** statement from the route map, use the **no** form of this command.

```
match ipv6 address {prefix-list prefix-list-name [prefix-list-name...] | access-list-name
```

```
no match ipv6 address {prefix-list prefix-list-name [prefix-list-name...] | access-list-name}
```

Syntax Description	
<i>access-list-name...</i>	Name of a standard or expanded access list. It can be any alphanumeric string up to 63 characters. You can only use access lists for policy-based routing.
prefix-list <i>prefix-list-name...</i>	Distributes routes based on a prefix list. The prefix list name can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered. You can configure up to 32 prefix lists.

Defaults No access list names or prefix lists are specified.

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 The *access-list-name* argument is supported in route-maps for PBR only.

An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the *prefix-list-name* argument.

Like matches in the same route map subblock are filtered with “or” semantics. If any one match clause is matched in the entire route map subblock, this match is treated as a successful match. Dissimilar match clauses are filtered with “and” semantics. So dissimilar matches are filtered logically. If the first set of conditions is not met, the second match clause is filtered. This process continues until a match occurs or there are no more match clauses.

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

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Redistribution

Use the **route-map** global configuration command, and the **match** and **set** route-map configuration commands, to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria*—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the *set actions*—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must “pass” to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

When you are passing routes through a route map, a route map can have several sections that contain specific **match** clauses. Any route that does not match at least one **match** clause 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.

This command does not require a license.

Examples

In the following example, routes that have addresses specified by access list name red will be matched:

```
switch(config)# feature pbr
switch(config)# route-map blue
switch(config-route-map)# match ipv6 address red
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match interface (IP)	Distributes any routes that have their next hop out one of the interfaces specified.
match ip next-hop	Redistributes any routes that have a next hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match length	Bases policy routing on the Level 3 length of a packet.
match metric (IP)	Redistributes routes with the metric specified.
match route-type (IP)	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set as-path	Modifies an autonomous system path for BGP routes.
set automatic-tag	Automatically computes the tag value.
set community	Sets the BGP communities attribute.

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Command	Description
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.
set ip next-hop	Indicates where to output packets that pass a match clause of a route map for policy routing.
set level (IP)	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric (BGP, OSPF, RIP)	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag (IP)	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

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match ipv6 multicast

To configure the IPv6 multicast features for the route-map matching, use the **match ipv6 multicast** route-map configuration command. To remove the match, use the **no** form of this command.

ip multicast {**group** *address/length* | **rp** *address/length* [**rp-type** {**asm** | **bidir**}]}

Syntax Description		
group <i>address/length</i>	Specifies the network address and the length of the network mask in bits, in this format: <i>A:B::C:D/length</i> . The network number can be any valid IPv6 address or prefix. The range for <i>length</i> is 0 to 0x7FFFFFFF.	You can specify both the group and rp options.
rp <i>address/length</i>	Specifies the IPv6 rendezvous prefix (RP) and the length of the IPv6 prefix mask in bits, in this format: <i>A:B::C:D/length</i> . The network number can be any valid IPv6 address or prefix. The bit mask can be a number from 0 to 32.	You can specify both the group and rp options.
rp-type	(Optional) Specifies the multicast rendezvous point type.	
asm	Specifies the any-source multicast (ASM) rendezvous point type.	
bidir	Specifies the bidirectional (bidir) multicast rendezvous point type.	

Command Default None

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 To specify the multicast attributes to match, use the **match ipv6 multicast** route-map configuration command. 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) #
```

Once you enter route-map configuration mode, you can enter the **match ipv6 multicast** command.

You can specify both the **group** and **rp** options.

This command does not require a license.

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Examples

This examples shows how to specify the group IPv6 prefix and the length of the IPv6 prefix for the neighbors to match:

```
switch(config)# route-map blueberry
switch(config-route-map)# match ipv6 multicast group 30:0::0:0/12
switch(config-route-map)#
```

This examples shows how to specify both the group IPv6 prefix and the rendezvous point IPv6 prefix for the neighbors to match:

```
switch(config)# route-map red
switch(config-route-map)# match ipv6 multicast group 30:0::0:0/12 rp 2001:0DB8::/48
switch(config-route-map)#
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ipv6 next-hop	Redistributes any routes that have a next hop router address passed by one of the access lists specified.
match ipv6 route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match length	Bases policy routing on the Level 3 length of a packet.
match route-type	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set as-path	Modifies an autonomous system path for BGP routes.
set community	Sets the BGP communities attribute.
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.
set ipv6 next-hop	Indicates where to output packets that pass a match clause of a route map for policy routing.
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 (IP)	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

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match ipv6 next-hop prefix-list

To redistribute any IPv6 routes that have a next hop router address passed by one of the access lists specified, use the **match ip next-hop prefix-list** command in route-map configuration mode. To remove the next hop entry, use the **no** form of this command.

```
match ipv6 next-hop prefix-list name [...name]
```

```
no match ipv6 next-hop prefix-list name [...name]
```

Syntax Description	<i>name...</i>	Prefix list name. It can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered, up to 32 prefix lists.
---------------------------	----------------	---

Command Default	Routes are distributed freely, without being required to match a next hop address.
------------------------	--

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	An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the <i>name</i> argument.
-------------------------	---

Use the **route-map** global configuration command, and the **match** and **set** route-map configuration commands, to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria*—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the *set actions*—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must “pass” to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.



Note A permit route map containing only **set** commands and no **match** commands permits all routes.

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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.

This command does not require a license.

Examples

The following example distributes routes that have a next hop router address passed by prefix list 5 will be distributed:

```
switch(config)# route-map blue
switch(config-route-map)# match ipv6 next-hop prefix-list test
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ipv6 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 length	Bases policy routing on the Level 3 length of a packet.
match route-type	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set as-path	Modifies an autonomous system path for BGP routes.
set community	Sets the BGP communities attribute.
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.
set ipv6 next-hop	Indicates where to output packets that pass a match clause of a route map for policy routing.
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.

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match ipv6 route-source prefix-list

To redistribute IPv6 routes that have been advertised by routers and access servers at the address specified by the access lists, use the **match ipv6 route-source prefix-list** command in route-map configuration mode. To remove the route-source entry, use the **no** form of this command.

```
match ipv6 route-source prefix-list name [...name]
```

```
no match ipv6 route-source prefix-list name [...name]
```

Syntax Description

<i>name...</i>	Prefix list name. It can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered, up to 32 prefix lists.
----------------	---

Defaults

No filtering on route source.

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

An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the *name* argument.

Use the **route-map** global configuration command, and the **match** and **set** route-map configuration commands, to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria*—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the *set actions*—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must “pass” to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

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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 second route map section with an explicit match specified.

There are situations in which the next hop and source router address of the route are not the same.

This command does not require a license.

Examples

The following example distributes routes that have been advertised by routers and access servers at the addresses specified by prefix list test:

```
switch(config)# route-map blue
switch(config-route-map)# match ipv6 route-source prefix-list test
```

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 route-type (IP)	Redistributes routes of the specified type.
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 automatic-tag	Automatically computes the tag value.
set community	Sets the BGP communities attribute.
set level (IP)	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric (BGP, OSPF, RIP)	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag (IP)	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

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match length

To base policy routing on the Level 3 length of a packet, use the **match length** command in route-map configuration mode. To remove the entry, use the **no** form of this command.

match length *minimum-length maximum-length*

no match length *minimum-length maximum-length*

Syntax Description

<i>minimum-length</i>	Minimum Level 3 length of the packet, inclusive, allowed for a match. Range: 0 to 2147483647.
<i>maximum-length</i>	Maximum Level 3 length of the packet, inclusive, allowed for a match. Range: 0 to 2147483647.

Command Default

No policy routing occurs on the length of a packet.

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

In IPv4, use the **ip policy route-map** interface configuration command, the **route-map** global configuration command, and the **match** and **set** route-map configuration commands, to define the conditions for policy routing packets. The **ip policy route-map** command identifies a route map by name. Each **route-map** has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria*—the conditions under which policy routing occurs. The **set** commands specify the *set actions*—the particular routing actions to perform if the criteria enforced by the **match** commands are met.

In IPv4, 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 packet to be routed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

In IPv4, you might want to base your policy routing on the length of packets so that your interactive traffic and bulk traffic are directed to different routers.

This command does not require a license.

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Examples

This example shows how to set the packets 3 to 200 bytes long:

```
switch(config)# route-map blue
switch(config-route-map)# match length 3 200
```

Related Commands

Command	Description
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 ipv6 address	Specifies an IPv6 access list to use to match packets for PBR for IPv6.
match length	Bases policy routing on the Level 3 length of a packet.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
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.
set ipv6 default next-hop	Specifies an IPv6 default next hop to which matching packets will be forwarded.
set ipv6 next-hop	Indicates where to output packets that pass a match clause of a route map for policy routing.
set ipv6 precedence	Sets the precedence value in the IPv6 packet header.

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match route-type

To redistribute routes of the specified type, use the **match route-type** command in route-map configuration mode. To remove the route type entry, use the **no** form of this command.

match route-type {external | internal | level-1 | level-2 | local | nssa-external | type-1 | type-2}

no match route-type {external | internal | level-1 | level-2 | local | nssa-external | type-1 | type-2}

Syntax Description

external	Specifies the external route (Border Gateway Protocol [BGP], Enhanced Interior Gateway Routing Protocol [EIGRP], and Open Shortest Path First [OSPF] type 1/2). You can specify more than one keyword.
internal	Specifies the internal route (including the OSPF intra/inter area). You can specify more than one keyword.
level-1	Specifies the Intermediate System-to-Intermediate System (IS-IS) level-1 route. You can specify more than one keyword.
level-2	Specifies the IS-IS level-2 route. You can specify more than one keyword.
local	Specifies the locally generated route. You can specify more than one keyword.
nssa-external	Specifies the nssa-external route (OSPF type 1/2). You can specify more than one keyword.
type-1	Specifies the OSPF external type 1 route. You can specify more than one keyword.
type-2	Specifies the OSPF external type 2 route. You can specify more than one keyword.

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.

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Usage Guidelines

Use the **route-map** global configuration command, and the **match** and **set** route-map configuration commands, to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria*—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the *set actions*—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must “pass” to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

A route map can have several parts. Any route that does not match at least one **match** clause 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 second route map section with an explicit match specified.

You can specify more than one keyword.

This command does not require a license.

Examples

The following example redistributes internal routes:

```
switch(config)# route-map blueberry
switch(config-route-map)# match route-type internal
```

The following example redistributes internal routes and type-1 OSPF routes:

```
switch(config)# route-map blueberry
switch(config-route-map)# match route-type internal type-1
```

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.

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Command	Description
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.

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match tag

To redistribute routes in the routing table that match the specified tags, use the **match tag** command in route-map configuration mode. To remove the tag entry, use the **no** form of this command.

```
match tag tag-value [...tag-value]
```

```
no match tag tag-value [...tag-value]
```

Syntax Description	<i>tag-value</i>	List of one or more route tag values. Each can be an integer from 0 to 4294967295. You can configure up to 32 tags.
---------------------------	------------------	---

Defaults	No match tag values are defined.
-----------------	----------------------------------

Command Modes	Route-map configuration (config-route-map)
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SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

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

Usage Guidelines	An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the <i>tag-value</i> argument.
-------------------------	--

Use the **route-map** global configuration command, and the **match** and **set** route-map configuration commands, to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria*—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the *set actions*—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must “pass” to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

A route map can have several parts. Any route that does not match at least one **match** clause 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 second route map section with an explicit match specified.

This command does not require a license.

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Examples

The following example redistributes routes stored in the routing table with tag 5:

```
switch(config)# route-map blueberry
switch(config-route-map)# match tag 5
```

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.

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max-lsp-lifetime

To set the maximum time for which link-state packets (LSPs) persist without being refreshed, use the **max-lsp-lifetime** configuration mode command. To restore the default time, use the **no** form of this command.

max-lsp-lifetime *value*

no max-lsp-lifetime

Syntax Description	<i>value</i>	(Optional) Maximum LSP lifetime in seconds. Range: 1 to 65535. Default: 1200.
--------------------	--------------	---

Command Default	The default is 1200 seconds.
-----------------	------------------------------

Command Modes	Router configuration VRF configuration
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SupportedUserRoles	network-admin vdc-admin
--------------------	----------------------------

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

Usage Guidelines	The maximum LSP lifetime must be greater than the LSP refresh interval. This command requires the Enterprise Services license.
------------------	---

Command Default	The following example sets the maximum time that the LSP persists to 11,000 seconds (more than 3 hours):
-----------------	--

```
switch(config)# router isis
switch(config-router)# max-lsp-lifetime 11000
```

Related Commands	Command	Description
	exit	Exits the current configuration mode.
	feature isis	Enables IS-IS on the router.
	no	Negates a command or sets its defaults.
	router isis	Enables IS-IS.

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max-metric router-lsa (OSPF)

To configure the Open Shortest Path First (OSPF) protocol to advertise a maximum metric so that other routers do not prefer the router as an intermediate hop in their shortest path first (SPF) calculations, use the **max-metric router-lsa** command. To disable the advertisement of a maximum metric, use the **no** form of this command.

max-metric router-lsa [**on-startup** [*seconds* | **wait-for bgp tag**]]

no max-metric router-lsa [**on-startup** [*seconds* | **wait-for bgp tag**]]

Syntax Description	
on-startup	(Optional) Configures the router to advertise a maximum metric at startup.
<i>seconds</i>	(Optional) Maximum metric (in seconds) that is advertised for the specified time interval. The configurable range is from 5 to 86400 seconds. The default is 600 seconds.
wait-for bgp tag	(Optional) Advertises a maximum metric until Border Gateway Protocol (BGP) routing tables have converged or the default timer has expired. The default timer is 600 seconds.

Defaults Originates router link-state advertisements (LSAs) with normal link metrics.

Command Modes Router configuration
Router VRF configuration

SupportedUserRoles network-admin
vdc-admin

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

Usage Guidelines Use the **max-metric router-lsa** command to originate LSAs with a maximum metric (LSInfinity: 0xFFFF) through all nonstub links, which allows BGP routing tables to converge without attracting transit traffic (if there are not alternate lower cost paths to the router). The router advertises accurate (normal) metrics after the configured or default timers expire or after BGP sends a notification that routing tables have converged.



Note Directly connected links in a stub network are not affected by the configuration of a maximum or infinite metric because the cost of a stub link is always set to the output interface cost.

You can use the **max-metric router-lsa** command in the following situations:

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- Reloading a router. After a router is reloaded, Interior Gateway Protocols (IGPs) converge very quickly, and other routers may try to forward traffic through the newly reloaded router. If the router is still building BGP routing tables, the packets that are destined for other networks that the router has not learned through BGP may be dropped.
- Introducing a router into a network without routing traffic through it. You may want to connect a router to an OSPF network but not want real traffic to flow through the router if there are better alternate paths. If no alternate paths exist, then this router would still accept transit traffic.
- Gracefully removing a router from a network. This feature allows you to gracefully remove a router from the network by advertising a maximum metric through all links, which allows other routers to select alternate paths for transit traffic to follow before the router is shut down.



Note

You should not save the running configuration of a router that is configured for a graceful shutdown because the router will continue to advertise a maximum metric after it is reloaded.

This command requires the Enterprise Services license.

Examples

The following example shows how to configure a router that is running OSPF to advertise a maximum metric for 100 seconds:

```
switch(config)# router ospf 100
switch(config-router)# max-metric router-lsa on-startup 100
```

The following example shows how to configure a router to advertise a maximum metric until BGP routing tables converge or until the default timer expires (600 seconds):

```
switch(config)# router ospf 100
switch(config-router)# max-metric router-lsa on-startup wait-for bgp bgpTag
```

Related Commands

Command	Description
<code>show ip ospf</code>	Displays general information about OSPF routing processes.

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maximum-paths (BGP)

To control the maximum number of parallel routes that the Border Gateway Protocol (BGP) can support, use the **maximum-paths** configuration mode command. To restore the default number of parallel routes, use the **no** form of this command.

maximum-paths [**ibgp**] *number-paths*

no maximum-paths [**ibgp**] *number-paths*

Syntax Description	ibgp	Configures the maximum interior BGP (iBGP) paths.
	<i>number-paths</i>	Maximum number of parallel routes that an IP routing protocol installs in a routing table. The range is from 1 to 16.

Command Default 8 paths

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 There are no usage guidelines for this command.

Examples The following example shows how to allow a maximum of 16 paths to a destination for a BGP routing process:

```
switch(config)# router bgp 33
switch(config-router)# maximum-paths 16
```

Related Commands	Command	Description
	feature bgp	Enables the BGP feature on the router.
	router bgp	Enables BGP.

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maximum-paths (IS-IS)

To control the maximum number of parallel routes that an IP routing protocol can support, use the **maximum-paths** configuration mode command. To restore the default number of parallel routes, use the **no** form of this command.

maximum-paths *number-paths*

no maximum-paths

Syntax Description	<i>number-paths</i>	Maximum number of parallel routes that an IP routing protocol installs in a routing table. The range is from 1 to 16.
---------------------------	---------------------	---

Command Default	8 paths
------------------------	---------

Command Modes	Router configuration VRF configuration
----------------------	---

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

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

Usage Guidelines	There are no usage guidelines for this command.
-------------------------	---

Examples The following example shows how to allow a maximum of 16 paths to a destination for an IS-IS routing process:

```
switch(config)# router isis 3
switch(config-router)# maximum-paths 16
```

Related Commands	Command	Description
	exit	Exits the current configuration mode.
	feature isis	Enables IS-IS on the router.
	no	Negates a command or sets its defaults.
	router isis	Enables IS-IS.

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maximum-paths (RIP)

To configure the maximum number of equal cost parallel routes that the the Routing Information Protocol (RIP) will install into the routing table, use the **maximum-paths** command in the router address-family configuration mode. To remove the **maximum-paths** command and restore the system to its default condition with respect to RIP, use the **no** form of this command.

maximum-paths *maximum*

no maximum-paths

Syntax Description	<i>maximum</i>	Maximum number of parallel routes that RIP can install in a routing table. The range is from 1 to 16.
--------------------	----------------	---

Defaults	8 paths
----------	---------

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

SupportedUserRoles	network-admin vdc-admin
--------------------	----------------------------

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

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

Examples The following example shows how to allow a maximum of 16 equal cost paths to a destination:

```
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# maximum-paths 16
```

Related Commands	Command	Description
	address-family	Enters address-family configuration mode.

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maximum-paths (EIGRP)

To control the maximum number of parallel routes that the Enhanced Interior Gateway Routing Protocol (EIGRP) can support, use the **maximum-paths** command. To remove the **maximum-paths** command from the configuration file and restore the default, use the **no** form of this command.

maximum-paths *maximum*

no maximum-paths

Syntax Description	<i>maximum</i>	Maximum number of parallel routes that EIGRP can install in a routing table. The range is from 1 to 16 routes.
---------------------------	----------------	--

Defaults	8 paths
-----------------	---------

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

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	4.0(1)	This command was introduced.
	4.0(2)	The default maximum paths was changed to 8 from 16.

Usage Guidelines	Use the maximum-paths command to allow EIGRP to install multiple paths into the routing table for each prefix. Multiple paths are installed for both internal and external routes that are learned in the same autonomous system and that are equal cost (according to the EIGRP best path algorithm).
-------------------------	---

This command requires the Enterprise Services license.

Examples	The following example shows how to allow a maximum of 10 paths to a destination:
-----------------	--

```
switch(config)# router eigrp 1
switch(config-router)# maximum-paths 10
```

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maximum-paths (OSPF)

To control the maximum number of parallel routes that Open Shortest Path First (OSPF) can support, use the **maximum-paths** command. To remove the **maximum-paths** command from the configuration file and restore the system to the default, use the **no** form of this command.

maximum-paths *maximum*

no maximum- paths

Syntax Description	<i>maximum</i>	Maximum number of parallel routes that OSPF can install in a routing table. The range is from 1 to 16 routes.
---------------------------	----------------	---

Defaults	8 paths
-----------------	---------

Command Modes	Router configuration Router VRF configuration
----------------------	--

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

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

Usage Guidelines	Use the maximum-paths command to allow OSPF to install multiple paths into the routing table for each prefix. Multiple paths are installed for both internal and external routes that are learned in the same autonomous system and that have an equal cost (according to the OSPF shortest path first algorithm). This command requires the Enterprise Services license.
-------------------------	---

Examples	The following example shows how to allow a maximum of 10 paths to a destination: <pre>switch(config)# router ospf 1 switch(config-router)# maximum-paths 10</pre>
-----------------	--

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maximum-paths (OSPFv3)

To control the maximum number of parallel routes that Open Shortest Path First version 3 (OSPFv3) can support, use the **maximum-paths** command. To remove the **maximum-paths** command from the configuration file and restore the system to the default, use the **no** form of this command.

maximum-paths *maximum*

no maximum-paths

Syntax Description	<i>maximum</i>	Maximum number of parallel routes that OSPFv3 can install in a routing table. The range is from 1 to 16 routes.
---------------------------	----------------	---

Defaults	8 paths
-----------------	---------

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

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

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

Usage Guidelines	Use the maximum-paths command to allow OSPFv3 to install multiple paths into the routing table for each prefix. Multiple paths are installed for both internal and external routes that are learned in the same autonomous system and that have an equal cost (according to the OSPFv3 shortest path first algorithm). This command requires the Enterprise Services license.
-------------------------	---

Examples	This example shows how to allow a maximum of 10 paths to a destination:
-----------------	---

```
switch(config)# router ospfv3 1
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# maximum-paths 10
```

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maximum-prefix

To control how many prefixes can be received from a neighbor, use the **maximum-prefix** command in peer template configuration mode. To disable this function, use the **no** form of this command.

maximum-prefix *maximum* [**threshold**] [**restart** *restart-interval*] [**warning-only**]

no maximum-prefix

Syntax Description		
	<i>maximum</i>	Maximum number of prefixes allowed from the specified neighbor. The number of prefixes that can be configured is limited only by the available system resources on a router. Range: 1 to 300000.
	<i>threshold</i>	(Optional) Integer specifying at what percentage of the maximum-prefix limit the router starts to generate a warning message. Range: 1 to 100. Default: 75.
	restart <i>interval</i>	(Optional) Specifies the time interval (in minutes) that a peering session is reestablished. Range: 1 to 65535.
	warning-only	(Optional) Allows the router to generate a syslog message when the maximum-prefix limit is exceeded, instead of terminating the peering session.

Command Default This command is disabled by default. Peering sessions are disabled when the maximum number of prefixes is exceeded. If you do not configure the restart interval, a disabled session will stay down after the maximum-prefix limit is exceeded.

Command Modes Peer template configuration
Router bgp configuration

SupportedUserRoles network-admin
vdc-admin

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

Usage Guidelines The number of prefixes that can be configured is limited only by the available system resources on a router.

The **maximum-prefix** command allows you to configure a maximum number of prefixes that a Border Gateway Protocol (BGP) routing process will accept from the specified peer. This feature provides a mechanism (in addition to distribute lists, filter lists, and route maps) to control prefixes received from a peer.

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When the number of received prefixes exceeds the maximum number configured, BGP disables the peering session (by default). If the **restart** keyword is configured, BGP will automatically reestablish the peering session at the configured time interval. If the **restart** keyword is not configured and a peering session is terminated because the maximum prefix limit has been exceeded, the peering session will not be reestablished until the **clear ip bgp** command is entered. If the **warning-only** keyword is configured, BGP sends only a log message and continues to peer with the sender.

There is no default limit on the number of prefixes that can be configured with this command. Limitations on the number of prefixes that can be configured are determined by the amount of available system resources.

Examples

In the following example, the maximum prefixes that will be accepted from the 192.168.1.1 neighbor is set to 1000:

```
switch(config)# router bgp 40000
switch(config-router)# network 192.168.0.0
switch(config-router)# maximum-prefix 1000
```

In the following example, the maximum number of prefixes that will be accepted from the 192.168.2.2 neighbor is set to 5000. The router is also configured to display warning messages when 50 percent of the maximum-prefix limit (2500 prefixes) has been reached.

```
switch(config)# router bgp 40000
switch(config-router)# network 192.168.0.0
switch(config-router)# maximum-prefix 5000 50
```

In the following example, the maximum number of prefixes that will be accepted from the 192.168.3.3 neighbor is set to 2000. The router is also configured to reestablish a disabled peering session after 30 minutes.

```
switch(config)# router bgp 40000
switch(config-router)# network 192.168.0.0
switch(config-router)# maximum-prefix 2000 restart 30
```

In the following example, warning messages will be displayed when the maximum-prefix limit (500) for the 192.168.4.4 neighbor is exceeded:

```
switch(config)# router bgp 40000
switch(config-router)# network 192.168.0.0
switch(config-router)# maximum-prefix 500 warning-only
```

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message-digest-key (OSPF virtual link)

To enable Open Shortest Path First (OSPF) Message Digest 5 (MD5) authentication on a virtual link, use the **message-digest-key** command. To remove an old MD5 key, use the **no** form of this command.

```
message-digest-key key-id md5 [0 | 3] key
```

```
no message-digest-key key-id
```

Syntax Description		
	<i>key-id</i>	Identifier in the range from 1 to 255.
	0	Specifies to use an unencrypted password to generate the md5 key.
	3	Specifies to use an encrypted 3DES password to generate the md5 key.
	<i>key</i>	Alphanumeric password of up to 16 bytes.

Defaults Unencrypted

Command Modes Virtual link configuration

SupportedUserRoles network-admin
vdc-admin

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

Usage Guidelines Use the **message-digest-key** command when you configure the MD5 digest authentication mode. Both interfaces on the virtual link must have the same *key* value.

This command requires the Enterprise Services license.

Examples The following example shows how to set key 19 with the password 8ry4222:

```
switch(config-router)# area 22 virtual-link 192.0.2.2
switch(config-router-vlink)# message-digest-key 19 md5 8ry4222
```

Related Commands	Command	Description
	authentication (virtual-link)	Configures the authentication mode on a virtual link.

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policy statistics enable (OSPF)

To enable Open Shortest Path First (OSPF) policy statistics, use the **policy statistics enable** command. To disable policy statistics, use the **no** form of this command.

policy statistics enable

no policy statistics enable

Syntax Description This command has no keywords or arguments.

Defaults Policy statistics are disabled.

Command Modes Router configuration

SupportedUserRoles network-admin
vdc-admin

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

Usage Guidelines Use the **policy statistics enable** command to enable statistics gathering based on route policies applied to this OSPF instance.

This command requires the Enterprise Services license.

Examples The following example shows how to enable policy statistics gathering on OSPF 2:

```
switch(config)# ospf 2
switch(config-router)# policy statistics enable
```

Related Commands	Command	Description
	show ip ospf policy statistics	Shows policy statistics.

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metric maximum-hops

To advertise that those Enhanced Interior Gateway Routing Protocol (EIGRP) routes with a higher hop count than you specified are unreachable, use the **metric maximum-hops** command. To reset the value to the default, use the **no** form of this command.

metric maximum-hops *hops-number*

no metric maximum-hops

Syntax Description	<i>hops-number</i>	Maximum hop count. The range is from 1 to 255 hops.
Defaults	<i>hops-number</i> : 100	
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 metric maximum-hops command to provide a safety mechanism that causes EIGRP to advertise as unreachable routes with a hop count greater than the value assigned to the <i>hops-number</i> argument. This command requires the Enterprise Services license.	
Examples	The following example shows how to configure a hop count to 200: <pre>switch(config)# router eigrp 1 switch(config-router) address-family ipv4 unicast switch(config-router-af)# metric maximum-hops 200</pre>	
Related Commands	Command	Description
	metric weights	Tunes the EIGRP metric calculations.

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metric weights

To tune the Enhanced Interior Gateway Routing Protocol (EIGRP) metric calculations, use the **metric weights** command. To reset the values to their defaults, use the **no** form of this command.

metric weights *tos k1 k2 k3 k4 k5*

no metric weights

Syntax Description	
<i>tos</i>	Type of service (ToS) which must always be zero.
<i>k1 k2 k3 k4 k5</i>	Constants that convert an EIGRP metric vector into a scalar quantity. The arguments are as follows: <ul style="list-style-type: none"> • k1—The range is from 0 to 255. The default is 1. • k2—The range is from 0 to 255. The default is 0. • k3—The range is from 0 to 255. The default is 1. • k4—The range is from 0 to 255. The default is 0. • k5—The range is from 0 to 255. The default is 0.

Defaults	
<i>tos</i>	0
<i>k1</i>	1
<i>k2</i>	0
<i>k3</i>	1
<i>k4</i>	0
<i>k5</i>	0

Command Modes	
	Address-family configuration 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 metric weights command to alter the default behavior of EIGRP routing and metric computation and allow the tuning of the EIGRP metric calculation for a particular ToS. If k5 equals 0, Cisco NX-OS computes the composite EIGRP metric according to the following formula:

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$$\text{metric} = [k1 \times \text{bandwidth} + (k2 \times \text{bandwidth}) / (256 - \text{load}) + k3 \times \text{delay}]$$

If k5 does not equal zero, Cisco NX-OS performs an additional calculation:

$$\text{metric} = \text{metric} \times [k5 / (\text{reliability} + k4)]$$

Use the **bandwidth** command in interface configuration mode to set the bandwidth metric.

Use the **delay** command in interface configuration mode to set the delay.

255 is a reliability of 100 percent or a perfectly stable link. A load of 255 indicates a completely saturated link.

This command requires the Enterprise Services license.

Examples

The following example shows how to set the metric weights to change the default values:

```
switch(config)# router eigrp 1
switch(config-router) address-family ipv4 unicast
switch(config-router-af)# metric weights 0 2 0 2 0 0
```

Related Commands

Command	Description
bandwidth	Sets the EIGRP bandwidth metric in interface configuration mode.
delay	Sets the EIGRP delay metric in interface configuration mode.