



# IS-IS IPv6 Administrative Tag

The IS-IS IPv6 Administrative Tag feature allows you to assign a tag to IPv6 prefixes that you can use to apply administrative policies with a route map. For example, you can control routes redistributed between area and domain boundaries and between different routing protocols, or apply policies on Intermediate System-to-Intermediate System (IS-IS) routes.

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## Information About IS-IS IPv6 Administrative Tag

### IS-IS Administrative Tags in IPv6 Prefixes

You can configure an IS-IS administrative tag value for IPv6 prefixes. You can then specify the tag value of IPv6 prefixes that IS-IS inserts into the link-state protocol data units (PDUs) it generates and those that it retrieves from LSPs.

## How to Configure an IS-IS IPv6 Administrative Tag

### Assigning a Tag to an IS-IS IPv6 Prefix

#### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router isis** [*area-tag*]
4. **net** *net1*
5. **metric-style wide**
6. **interface** [*type number*]

7. **ipv6 address** {*ipv6-address/prefix-length* | *prefix-name sub-bits/prefix-length*}
8. **ipv6 router isis** [*area-tag*]
9. **isis ipv6 tag** *tag-value*
10. **end**
11. **show isis database verbose**

## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>router isis</b> [ <i>area-tag</i> ] <b>Example:</b> Device(config)# router isis tag13	Enables the IS-IS routing protocol, specifies an IS-IS process, and enters router configuration mode.
<b>Step 4</b>	<b>net</b> <i>net1</i> <b>Example:</b> Device(config-router)# net 49.0000.0000.0100.00	Configures an IS-IS network entity table (NET) for the routing process.
<b>Step 5</b>	<b>metric-style wide</b> <b>Example:</b> Device(config-router)# metric-style wide	Configures a router running IS-IS so that it generates and accepts only new-style type, length, value objects (TLVs).
<b>Step 6</b>	<b>interface</b> [ <i>type number</i> ] <b>Example:</b> Device(config-router)# interface GigabitEthernet 0/0/0	Configures an interface and enters interface configuration mode.
<b>Step 7</b>	<b>ipv6 address</b> { <i>ipv6-address/prefix-length</i>   <i>prefix-name sub-bits/prefix-length</i> } <b>Example:</b> Device(config-if)# ipv6 address 2005::1/64	Configures an IPv6 address based on an IPv6 general prefix and enables IPv6 processing on an interface.

	Command or Action	Purpose
Step 8	<b>ipv6 router isis</b> [ <i>area-tag</i> ] <b>Example:</b> Device(config-if)# ipv6 router isis areal	Configures an IS-IS routing process for IPv6 on an interface and attaches an area designator to the routing process.
Step 9	<b>isis ipv6 tag</b> <i>tag-value</i> <b>Example:</b> Device(config-if)# isis ipv6 tag 200	Configures an administrative tag value that will be associated with an IPv6 address prefix and applied to an IS-IS LSP.
Step 10	<b>end</b> <b>Example:</b> Device(config-if)# end	(Optional) Saves configuration commands to the running configuration file and returns to privileged EXEC mode.
Step 11	<b>show isis database verbose</b> <b>Example:</b> Device# show isis database verbose	(Optional) Displays details about the IS-IS link-state database, including the route tag. <ul style="list-style-type: none"> <li>• Enter this command if you want to verify the tag.</li> </ul>

## Assigning a High Priority Administrative Tag to an IS-IS IPv6 Prefix

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router isis** [*area-tag*]
4. **address-family ipv6**
5. **ipv6 route priority high tag** *tag-value*
6. **exit**
7. **exit**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.



## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>router isis</b> [ <i>area-tag</i> ] <b>Example:</b> Device(config)# router isis	Configures an IS-IS routing process for IP on an interface, attaches an area designator to the routing process, and enters router configuration mode.
<b>Step 4</b>	<b>address-family ipv6</b> <b>Example:</b> Device(config-router)# address-family ipv6	Enters address family configuration mode.
<b>Step 5</b>	<b>redistribute isis</b> [ <i>process-id</i> ] { <b>level-1</b>   <b>level-2</b> } <b>into</b> { <b>level-1</b>   <b>level-2</b> } [ <b>distribute-list</b> <i>list-name</i> ] [ <b>route-map</b> <i>map-tag</i> ] <b>Example:</b> Device(config-router-af)# redistribute isis level-1 into level-2 route-map IPV6-PERMIT-TAG	Redistributes IPv6 routes from one routing domain into another routing domain using IS-IS as both the target and source protocol.
<b>Step 6</b>	<b>exit</b> <b>Example:</b> Device(config-router-af)# exit	(Optional) Exits address family configuration mode, and returns to router configuration mode.
<b>Step 7</b>	<b>exit</b> <b>Example:</b> Device(config-router)# exit	(Optional) Exits router configuration mode, and returns to global configuration mode.
<b>Step 8</b>	<b>route-map</b> <i>map-tag</i> [ <b>permit</b>   <b>deny</b> ] [ <i>sequence-number</i> ] <b>Example:</b> Device(config)# route-map match-tag	Defines the conditions for redistributing routes from one routing protocol into another or from one IS-IS level to another. <ul style="list-style-type: none"> <li>• This command causes the router to enter route-map configuration mode.</li> </ul>
<b>Step 9</b>	<b>match tag</b> <i>tag-value</i> [... <i>tag-value</i> ]	Matches routes tagged with the specified tag numbers.

	Command or Action	Purpose
	<b>Example:</b>  Device(config-route-map)# match tag 100	<ul style="list-style-type: none"> <li>If you are setting a tag for the first time, you cannot match on tag; this step is an option if you are changing tags.</li> </ul>
<b>Step 10</b>	<b>exit</b>  <b>Example:</b>  Device(config-route-map)# exit	(Optional) Exits route-map configuration mode, and returns to global configuration mode.

## Using an IS-IS IPv6 Administrative Tag to Configure Routes

### SUMMARY STEPS

- enable**
- configure terminal**
- ipv6 route** [*vrf vrf-name*] *ipv6-prefix/prefix-length* {*ipv6-address* | *interface-type interface-number* [*ipv6-address*]} [**nexthop-vrf** [*vrf-name* | **default**]] [*administrative-distance*] [*administrative-multicast-distance* | **unicast** | **multicast**] [*next-hop-address*] [**tag tag**]
- router isis** [*area-tag*]
- address-family ipv6**
- redistribute isis** [*process-id*] {**level-1** | **level-2**} **into** {**level-1** | **level-2**} [**distribute-list** *list-name*] [**route-map** *map-tag*]
- exit**
- exit**
- route-map** *map-tag* [**permit** | **deny**] [*sequence-number*]
- set tag** *tag-value*
- exit**

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b>  <b>Example:</b>  Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b>  <b>Example:</b>  Device# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>ipv6 route</b> [ <i>vrf vrf-name</i> ] <i>ipv6-prefix/prefix-length</i> { <i>ipv6-address</i>   <i>interface-type interface-number</i> [ <i>ipv6-address</i> ]} [ <b>nexthop-vrf</b> [ <i>vrf-name</i>   <b>default</b> ]] [ <i>administrative-distance</i> ]	Establishes a static IPv6 routes.

	Command or Action	Purpose
	<p>[<i>administrative-multicast-distance</i>   <b>unicast</b>   <b>multicast</b>] [<i>next-hop-address</i>] [<b>tag tag</b>]</p> <p><b>Example:</b></p> <pre>Router(config)# ipv6 route 2033::1/64 GigabitEthernet 0/0/0</pre>	
<b>Step 4</b>	<p><b>router isis</b> [<i>area-tag</i>]</p> <p><b>Example:</b></p> <pre>Device(config)# router isis</pre>	Configures an IS-IS routing process for IP on an interface, attaches an area designator to the routing process, and enters router configuration mode.
<b>Step 5</b>	<p><b>address-family ipv6</b></p> <p><b>Example:</b></p> <pre>Device(config-router)# address-family ipv6</pre>	Enters address family configuration mode.
<b>Step 6</b>	<p><b>redistribute isis</b> [<i>process-id</i>] {<b>level-1</b>   <b>level-2</b>} <b>into</b> {<b>level-1</b>   <b>level-2</b>} [<b>distribute-list list-name</b>] [<b>route-map map-tag</b>]</p> <p><b>Example:</b></p> <pre>Device(config-router-af)# redistribute isis level-1 into level-2 route-map IPV6-PERMIT-TAG</pre>	Redistributes IPv6 routes from one routing domain into another routing domain using IS-IS as both the target and source protocol.
<b>Step 7</b>	<p><b>exit</b></p> <p><b>Example:</b></p> <pre>Device(config-router-af)# exit</pre>	(Optional) Exits address family configuration mode, and returns to router configuration mode.
<b>Step 8</b>	<p><b>exit</b></p> <p><b>Example:</b></p> <pre>Device(config-router)# exit</pre>	(Optional) Exits router configuration mode, and returns to global configuration mode.
<b>Step 9</b>	<p><b>route-map map-tag</b> [<b>permit</b>   <b>deny</b>] [<i>sequence-number</i>]</p> <p><b>Example:</b></p> <pre>Router(config)# route-map set-tag</pre>	<p>Defines the conditions for redistributing routes from one routing protocol into another or from one IS-IS level to another.</p> <ul style="list-style-type: none"> <li>• This command causes the router to enter route-map configuration mode.</li> </ul>
<b>Step 10</b>	<p><b>set tag tag-value</b></p> <p><b>Example:</b></p> <pre>Router(config-route-map)# set tag 300</pre>	Sets a tag value of the destination routing protocol.

	Command or Action	Purpose
<b>Step 11</b>	<b>exit</b> <b>Example:</b> Device(config-route-map)# exit	(Optional) Exits route-map configuration mode, and returns to global configuration mode.

## Applying an IS-IS IPv6 Tag to a Summary Prefix

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router isis** [*area-tag*]
4. **address-family ipv6**
5. **ipv6 route** [*vrf vrf-name*] *ipv6-prefix* / *prefix-length* {*ipv6-address* | *interface-type interface-number* [*ipv6-address*]} [**nexthop-vrf** [*vrf-name* | **default**]] [*administrative-distance*] [*administrative-multicast-distance* | **unicast** | **multicast**] [*next-hop-address*] [**tag tag**]
6. **exit**
7. **exit**
8. **router isis** [*area-tag*]
9. **address-family ipv6**
10. **redistribute isis** [*process-id*] {**level-1** | **level-2**} **into** {**level-1** | **level-2**} **distribute-list** *list-name*
11. **summary-prefix** *ipv6-prefix* / *prefix-length* {**level-1** | **level-1-2** | **level-2**} **tag tag-value**
12. **end**
13. **show isis database verbose**

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>router isis</b> [ <i>area-tag</i> ] <b>Example:</b> Device(config)# router isis	Configures an IS-IS routing process for IP on an interface, attaches an area designator to the routing process, and enters router configuration mode.



	Command or Action	Purpose
<b>Step 4</b>	<b>address-family ipv6</b> <b>Example:</b> <pre>Device(config-router)# address-family ipv6</pre>	Enters address family configuration mode.
<b>Step 5</b>	<b>ipv6 route [vrf vrf-name] ipv6-prefix / prefix-length {ipv6-address   interface-type interface-number [ipv6-address]} [nexthop-vrf [vrf-name   default]] [administrative-distance] [administrative-multicast-distance   unicast   multicast] [next-hop-address] [tag tag]</b> <b>Example:</b> <pre>Device(config-router-af)# ipv6 route 11:1:1:1:1:1::/96 GigabitEthernet 0/0/0</pre>	Establishes a static IPv6 routes.
<b>Step 6</b>	<b>exit</b> <b>Example:</b> <pre>Device(config-router-af)# exit</pre>	(Optional) Exits address family configuration mode, and returns to router configuration mode.
<b>Step 7</b>	<b>exit</b> <b>Example:</b> <pre>Device(config-router)# exit</pre>	(Optional) Exits router configuration mode, and returns to global configuration mode.
<b>Step 8</b>	<b>router isis [area-tag]</b> <b>Example:</b> <pre>Device(config)# router isis</pre>	Configures an IS-IS routing process for IP on an interface, attaches an area designator to the routing process, and enters router configuration mode.
<b>Step 9</b>	<b>address-family ipv6</b> <b>Example:</b> <pre>Device(config-router)# address-family ipv6</pre>	Enters address family configuration mode.
<b>Step 10</b>	<b>redistribute isis [process-id] {level-1  level-2} into {level-1  level-2} distribute-list list-name</b> <b>Example:</b> <pre>Device(config-router-af)# redistribute static level-2 metric 50</pre>	Redistributes IPv6 routes from one routing domain into another routing domain using IS-IS as both the target and source protocol.
<b>Step 11</b>	<b>summary-prefix ipv6-prefix/ prefix-length {level-1   level-1-2  level-2} tag tag-value</b> <b>Example:</b>	<p>Allows a Level 1-2 router to summarize Level 1 prefixes at Level 2, instead of advertising the Level 1 prefixes directly when the router advertises the summary.</p> <ul style="list-style-type: none"> <li>The <i>ipv6-prefix</i> argument in the <b>summary-prefix</b> command must be in the form documented in RFC</li> </ul>

	Command or Action	Purpose
	<pre>Device(config-router-af)# summary-prefix 11:1:1:1::/64 tag 600</pre>	<p>2373 where the address is specified in hexadecimal using 16-bit values between colons.</p> <ul style="list-style-type: none"> <li>The <i>prefix-length</i> argument is a decimal value that indicates how many of the high-order contiguous bits of the address comprise the prefix (the network portion of the address). A slash mark must precede the decimal value.</li> </ul>
<b>Step 12</b>	<p><b>end</b></p> <p><b>Example:</b></p> <pre>Device(config-router-af)# end</pre>	(Optional) Saves configuration commands to the running configuration file and returns to privileged EXEC mode.
<b>Step 13</b>	<p><b>show isis database verbose</b></p> <p><b>Example:</b></p> <pre>Device# show isis database verbose</pre>	<p>(Optional) Displays details about the IS-IS link-state database, including the route tag.</p> <ul style="list-style-type: none"> <li>Perform this step if you want to verify the tag.</li> </ul>

## Configuration Examples for IS-IS IPv6 Administrative Tag

### Example: Assigning a Tag to an IS-IS IPv6 Prefix

```
Device(config)# router isis
Device(config-router)# net 49.0000.0000.0100.00
Device(config-router)# metric-style wide
Device(config-router)# interface GigabitEthernet 0/0/0
Device(config-if)# ipv6 address 2005::1/64
Device(config-if)# ipv6 router isis
Device(config-if)# isis ipv6 tag 200
Device(config-if)# end
Device# show isis database verbose

IS-IS Level-1 Link State Database:
LSPID          LSP Seq Num  LSP Checksum  LSP Holdtime  ATT/P/OL
Device.00-00   * 0x00000001  0xD27D        1189           0/0/0
  Area Address: 49
  NLPID:        0x8E
  Hostname: Device
  IPv6 Address: 2005::1
  Metric: 10    IPv6 2005::/64
  Route Admin Tag: 200

IS-IS Level-2 Link State Database:
LSPID          LSP Seq Num  LSP Checksum  LSP Holdtime  ATT/P/OL
Device.00-00   * 0x00000001  0xD27D        1189           0/0/0
  Area Address: 49
  NLPID:        0x8E
  Hostname: Device
  IPv6 Address: 2005::1
  Metric: 10    IPv6 2005::/64
```

```
Route Admin Tag: 200
```

## Example: Assigning a High Priority Administrative Tag to an IS-IS IPv6 Prefix

```
Device(config)# router isis
Device(config-router)# address-family ipv6
Device(config-router-af)# ipv6 route priority high tag 200
```

## Example: Using an IS-IS IPv6 Administrative Tag to Redistribute Routes

```
Device(config)# router isis
Device(config-router)# address-family ipv6
Device(config-router-af)# redistribute isis level-1 into level-2 route-map match-tag
Device(config-router-af)# route-map match-tag
Device(config-route-map)# match tag 100
```

## Example: Using an IS-IS IPv6 Administrative Tag to Configure Routes

```
Device(config)# ipv6 route 2033::1/64 GigabitEthernet 0/0/0
Device(config)# router isis
Device(config-router)# address-family ipv6
Device(config-router-af)# redistribute static level-2 route-map set-tag
Device(config-router-af)# route-map set-tag
Device(config-route-map)# set tag 300
Device(config-route-map)# end
Device# show isis database verbose level-2

Device.00-00      * 0x0000004E   0x9805          1197            0/0/0
  Area Address: 33
  NLPID:         0xCC 0x8E
  Hostname: Device
  IP Address:    10.100.100.20
  IPv6 Address: 2001:DB8::100
  IPv6 Address: 2001:DB8::200
  Metric: 10     IS-Extended route500.01
  Metric: 10     IP 10.100.100.0/24
  Metric: 10     IPv6 2001:DB8::/64
  Metric: 10     IPv6 2001:DB8::/64
  Metric: 10     IPv6-Interarea 11:1:1:1:1:1:1:1/128
  Metric: 20     IPv6-Interarea 2003:DB8::/64
  Metric: 0      IPv6 2033::/64
  Route Admin Tag: 300
```

## Example: Applying an IS-IS IPv6 Administrative Tag to a Summary Prefix

```

Device(config)# router isis
Device(config)# ipv6 route 11:1:1:1:1:1:1:1:/96 GigabitEthernet 0/0/0
Device(config)# router isis
Device(config-router)# address-family ipv6
Device(config-router-af)# redistribute static level-2 metric 50
Device(config-router-af)# summary-prefix 11:1:1:1:1:1:1:1:/64 tag 600
Device(config-route-map)# end
Device# show isis database verbose level-2

IS-IS Level-2 Link State Database:
LSPID                LSP Seq Num  LSP Checksum  LSP Holdtime  ATT/P/OL
Device.00-00        * 0x00000007  0x4AA7        1174          0/0/0
  Area Address: 33
  NLPID:         0xCC 0x8E
  Hostname: Device
  IP Address:    10.100.100.20
  IPv6 Address: 2001:DB8::100
  IPv6 Address: 2001:DB8::200
  Metric: 10      IS-Extended route500.01
  Metric: 10      IP 10.100.100.0/24
  Metric: 10      IPv6 2001:DB8::/64
  Metric: 10      IPv6 2001:DB8::/64
  Metric: 10      IPv6 11:1:1:1:1:1:1:1:/64
    Route Admin Tag: 600
(Summary route 11:1:1:1:1:1:1:1:/64 is advertised with tag 600)
Device(config-router-af)#

```

## Additional References

### Related Documents

Related Topic	Document Title
IPv6 addressing and connectivity	<i>IPv6 Configuration Guide</i>
Cisco IOS commands	<a href="#">Cisco IOS Master Commands List, All Releases</a>
IPv6 commands	<i>Cisco IOS IPv6 Command Reference</i>
Cisco IOS IPv6 features	<i>Cisco IOS IPv6 Feature Mapping</i>

### Standards and RFCs

Standard/RFC	Title
RFCs for IPv6	<i>IPv6 RFCs</i>

**Technical Assistance**

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## Feature Information for IS-IS IPv6 Administrative Tag

