



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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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

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 |
|--------|--|---|
| Step 1 | enable Example: Device> enable | Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted. |
| Step 2 | configure terminal Example: Device# configure terminal | Enters global configuration mode. |
| Step 3 | router isis [<i>area-tag</i>] Example: Device(config)# router isis tag13 | Enables the IS-IS routing protocol, specifies an IS-IS process, and enters router configuration mode. |
| Step 4 | net <i>net1</i> Example: Device(config-router)# net 49.0000.0000.0100.00 | Configures an IS-IS network entity table (NET) for the routing process. |
| Step 5 | metric-style wide Example: 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). |

| | Command or Action | Purpose |
|----------------|---|---|
| Step 6 | interface [<i>type number</i>] Example: <pre>Device(config-router)# interface GigabitEthernet 0/0/0</pre> | Configures an interface and enters interface configuration mode. |
| Step 7 | ipv6 address { <i>ipv6-address/prefix-length</i> <i>prefix-name sub-bits/prefix-length</i> } Example: <pre>Device(config-if)# ipv6 address 2005::1/64</pre> | Configures an IPv6 address based on an IPv6 general prefix and enables IPv6 processing on an interface. |
| Step 8 | ipv6 router isis [<i>area-tag</i>] Example: <pre>Device(config-if)# ipv6 router isis area1</pre> | Configures an IS-IS routing process for IPv6 on an interface and attaches an area designator to the routing process. |
| Step 9 | isis ipv6 tag <i>tag-value</i> Example: <pre>Device(config-if)# isis ipv6 tag 200</pre> | Configures an administrative tag value that will be associated with an IPv6 address prefix and applied to an IS-IS LSP. |
| Step 10 | end Example: <pre>Device(config-if)# end</pre> | (Optional) Saves configuration commands to the running configuration file and returns to privileged EXEC mode. |
| Step 11 | show isis database verbose Example: <pre>Device# show isis database verbose</pre> | (Optional) Displays details about the IS-IS link-state database, including the route tag. <ul style="list-style-type: none"> • Enter this command if you want to verify the tag. |

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 | enable Example: Device> enable | Enables privileged EXEC mode. • Enter your password if prompted. |
| Step 2 | configure terminal Example: Device# configure terminal | Enters global configuration mode. |
| Step 3 | router isis [area-tag] Example: 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. |
| Step 4 | address-family ipv6 Example: Device(config-router)# address-family ipv6 | Enters address family configuration mode. |
| Step 5 | ipv6 route priority high tag tag-value Example: Device(config-router-af)# ipv6 route priority high tag 200 | Assigns a high priority tag to an IS-IS IPv6 prefix. |
| Step 6 | exit Example: Device(config-router-af)# exit | (Optional) Exits address family configuration mode, and returns to router configuration mode. |
| Step 7 | exit Example: Device(config-router)# exit | (Optional) Exits router configuration mode, and returns to global configuration mode. |

Using an IS-IS IPv6 Administrative Tag to Redistribute Routes

SUMMARY STEPS

1. enable
2. configure terminal
3. router isis [area-tag]
4. address-family ipv6

5. **redistribute isis** *[process-id]* {**level-1** | **level-2**} **into** {**level-1** | **level-2**} [**distribute-list** *list-name*] [**route-map** *map-tag*]
6. **exit**
7. **exit**
8. **route-map** *map-tag* [**permit** | **deny**] [*sequence-number*]
9. **match tag** *tag-value* [...*tag-value*]
10. **exit**

DETAILED STEPS

| | Command or Action | Purpose |
|---------------|--|---|
| Step 1 | enable Example: <pre>Device> enable</pre> | Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted. |
| Step 2 | configure terminal Example: <pre>Device# configure terminal</pre> | Enters global configuration mode. |
| Step 3 | router isis [<i>area-tag</i>] Example: <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. |
| Step 4 | address-family ipv6 Example: <pre>Device(config-router)# address-family ipv6</pre> | Enters address family configuration mode. |
| Step 5 | redistribute isis <i>[process-id]</i> { level-1 level-2 } into { level-1 level-2 } [distribute-list <i>list-name</i>] [route-map <i>map-tag</i>] Example: <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. |
| Step 6 | exit Example: <pre>Device(config-router-af)# exit</pre> | (Optional) Exits address family configuration mode, and returns to router configuration mode. |
| Step 7 | exit Example: <pre>Device(config-router)# exit</pre> | (Optional) Exits router configuration mode, and returns to global configuration mode. |

| | Command or Action | Purpose |
|----------------|---|---|
| Step 8 | route-map <i>map-tag</i> [permit deny] [<i>sequence-number</i>] Example: <pre>Device(config)# route-map match-tag</pre> | 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"> • This command causes the router to enter route-map configuration mode. |
| Step 9 | match tag <i>tag-value</i> [... <i>tag-value</i>] Example: <pre>Device(config-route-map)# match tag 100</pre> | Matches routes tagged with the specified tag numbers. <ul style="list-style-type: none"> • 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. |
| Step 10 | exit Example: <pre>Device(config-route-map)# exit</pre> | (Optional) Exits route-map configuration mode, and returns to global configuration mode. |

Using an IS-IS IPv6 Administrative Tag to Configure Routes

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **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**]
4. **router isis** [*area-tag*]
5. **address-family ipv6**
6. **redistribute isis** [*process-id*] {**level-1** | **level-2**} **into** {**level-1** | **level-2**} [**distribute-list** *list-name*] [**route-map** *map-tag*]
7. **exit**
8. **exit**
9. **route-map** *map-tag* [**permit** | **deny**] [*sequence-number*]
10. **set tag** *tag-value*
11. **exit**

DETAILED STEPS

| | Command or Action | Purpose |
|---------------|--|--|
| Step 1 | enable Example: <pre>Device> enable</pre> | Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted. |

| | Command or Action | Purpose |
|---------------|---|---|
| Step 2 | configure terminal Example: <pre>Device# configure terminal</pre> | Enters global configuration mode. |
| Step 3 | ipv6 route [vrf <i>vrf-name</i>] <i>ipv6-prefix/prefix-length</i> { <i>ipv6-address</i> <i>interface-type interface-number</i> [<i>ipv6-address</i>]} [next-hop-vrf [<i>vrf-name</i> default]] [<i>administrative-distance</i>] [<i>administrative-multicast-distance</i> unicast multicast] [<i>next-hop-address</i>] [tag tag] Example: <pre>Router(config)# ipv6 route 2033::1/64 GigabitEthernet 0/0/0</pre> | Establishes a static IPv6 routes. |
| Step 4 | router isis [<i>area-tag</i>] Example: <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. |
| Step 5 | address-family ipv6 Example: <pre>Device(config-router)# address-family ipv6</pre> | Enters address family configuration mode. |
| Step 6 | redistribute isis [<i>process-id</i>] { level-1 level-2 } into { level-1 level-2 } [distribute-list <i>list-name</i>] [route-map <i>map-tag</i>] Example: <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. |
| Step 7 | exit Example: <pre>Device(config-router-af)# exit</pre> | (Optional) Exits address family configuration mode, and returns to router configuration mode. |
| Step 8 | exit Example: <pre>Device(config-router)# exit</pre> | (Optional) Exits router configuration mode, and returns to global configuration mode. |
| Step 9 | route-map <i>map-tag</i> [permit deny] [<i>sequence-number</i>] Example: <pre>Router(config)# route-map set-tag</pre> | Defines the conditions for redistributing routes from one routing protocol into another or from one IS-IS level to another. |

| | Command or Action | Purpose |
|----------------|--|---|
| | | <ul style="list-style-type: none"> This command causes the router to enter route-map configuration mode. |
| Step 10 | set tag <i>tag-value</i> Example: <pre>Router(config-route-map)# set tag 300</pre> | Sets a tag value of the destination routing protocol. |
| Step 11 | exit Example: <pre>Device(config-route-map)# exit</pre> | (Optional) Exits route-map configuration mode, and returns to global configuration mode. |

Applying an IS-IS IPv6 Tag to a Summary Prefix

SUMMARY STEPS

- enable**
- configure terminal**
- router isis** [*area-tag*]
- address-family ipv6**
- 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**]
- exit**
- exit**
- router isis** [*area-tag*]
- address-family ipv6**
- redistribute isis** [*process-id*] {**level-1** | **level-2**} **into** {**level-1** | **level-2**} **distribute-list** *list-name*
- summary-prefix** *ipv6-prefix / prefix-length* {**level-1** | **level-1-2** | **level-2**} **tag tag-value**
- end**
- show isis database verbose**

DETAILED STEPS

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

| | Command or Action | Purpose |
|----------------|--|---|
| | Device# configure terminal | |
| Step 3 | router isis <i>[area-tag]</i> Example: 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. |
| Step 4 | address-family ipv6 Example: Device(config-router)# address-family ipv6 | Enters address family configuration mode. |
| Step 5 | ipv6 route <i>[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]</i> Example: Device(config-router-af)# ipv6 route 11:1:1:1:1:1::/96 GigabitEthernet 0/0/0 | Establishes a static IPv6 routes. |
| Step 6 | exit Example: Device(config-router-af)# exit | (Optional) Exits address family configuration mode, and returns to router configuration mode. |
| Step 7 | exit Example: Device(config-router)# exit | (Optional) Exits router configuration mode, and returns to global configuration mode. |
| Step 8 | router isis <i>[area-tag]</i> Example: 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. |
| Step 9 | address-family ipv6 Example: Device(config-router)# address-family ipv6 | Enters address family configuration mode. |
| Step 10 | redistribute isis <i>[process-id] {level-1 level-2} into {level-1 level-2} distribute-list list-name</i> Example: | Redistributes IPv6 routes from one routing domain into another routing domain using IS-IS as both the target and source protocol. |

| | Command or Action | Purpose |
|----------------|---|---|
| | Device(config-router-af)# redistribute static level-2 metric 50 | |
| Step 11 | <p>summary-prefix <i>ipv6-prefix</i> / <i>prefix-length</i> {level-1 level-1-2} level-2} tag <i>tag-value</i></p> <p>Example:</p> <pre>Device(config-router-af)# summary-prefix 11:1:1:1::/64 tag 600</pre> | <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"> The <i>ipv6-prefix</i> argument in the summary-prefix command must be in the form documented in RFC 2373 where the address is specified in hexadecimal using 16-bit values between colons. 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. |
| Step 12 | <p>end</p> <p>Example:</p> <pre>Device(config-router-af)# end</pre> | (Optional) Saves configuration commands to the running configuration file and returns to privileged EXEC mode. |
| Step 13 | <p>show isis database verbose</p> <p>Example:</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"> Perform this step if you want to verify the tag. |

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

```

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

```

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 | Cisco IOS Master Commands List, All Releases |
| 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. | http://www.cisco.com/cisco/web/support/index.html |

Feature Information for IS-IS IPv6 Administrative Tag

| Feature Name | Releases | Feature Information |
|-------------------------------|-----------------------------------|--|
| IS-IS IPv6 Administrative Tag | 15.2(4)M 15.2(4)S 15.2(1)SY | Allows you to assign a tag to IPv6 prefixes that you can use to apply administrative policy with a route map. The following commands were introduced or modified: ipv6 route priority high , isis ipv6 tag , redistribute isis (ipv6) , show isis database verbose , summary-prefix (ipv6 IS-IS) . |

