



EIGRP Support for Route Map Filtering

First Published: May 17, 2004

Last Updated: May 2, 2008

The EIGRP Support for Route Map Filtering feature enables Enhanced Interior Gateway Routing Protocol (EIGRP) to interoperate with other protocols by filtering inbound and outbound traffic based on complex route map options. In addition to the existing route map facility, several extended filtering options are introduced to provide EIGRP-specific match choices.

Finding Feature Information in This Module

Your Cisco IOS software release may not support all of the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To reach links to specific feature documentation in this module and to see a list of the releases in which each feature is supported, use the “[Feature Information for EIGRP Support for Route Map Filtering](#)” section on [page 8](#).

Finding Support Information for Platforms and Cisco IOS and Catalyst OS Software Images

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

Contents

- [Information About EIGRP Support for Route Map Filtering, page 2](#)
- [How to Configure EIGRP Support for Route Map Filtering, page 2](#)
- [Configuration Examples for EIGRP Support for Route Map Filtering, page 6](#)
- [Additional References, page 7](#)
- [Command Reference, page 7](#)
- [Feature Information for EIGRP Support for Route Map Filtering, page 8](#)



Americas Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

© 2004–2008 Cisco Systems, Inc. All rights reserved.

Information About EIGRP Support for Route Map Filtering

To implement EIGRP route map filtering, you should understand the following concept:

- [EIGRP Route Map Support, page 2](#)

EIGRP Route Map Support

EIGRP support for route map filtering enables EIGRP to interoperate with other protocols by filtering inbound and outbound traffic based on route map options. Additional EIGRP-specific match choices are introduced to allow flexibility in fine-tuning EIGRP network operations.

EIGRP now supports the route map filtering capability that exists for other routing protocols to filter routes being redistributed into their protocol. For more details about understanding and configuring route maps, see the Enabling Policy Routing section of the “[Configuring IP Routing Protocol-Independent Features](#)” chapter of the *Cisco IOS IP Routing Protocols Configuration Guide*.

New match options allow EIGRP to filter internal and external routes based on source protocols, to match a metric against a range, and to match on an external protocol metric.

EIGRP can be configured to filter traffic using a route map and the **redistribute** or **distribute-list** commands. Using a route map with the **redistribute** command allows routes that are redistributed from the routing table to be filtered with a route map before being admitted into an EIGRP topology table. Routes that are dynamically received from, or advertised to, EIGRP peers can be filtered by adding a route map option to the **distribute-list** command.

A route map may be configured with both the **redistribute** and the **distribute-list** commands in the same routing process. When a route map is used with a **distribute-list** command that is configured for inbound or outbound filtering, route packets that are learned from or advertised to EIGRP peers can be processed with the route map to provide better control of route selection during the route exchange process. Redistribution serves as a mechanism to import routes into the EIGRP topology table from a routing table. A route map configured with the **redistribute** command adds flexibility to the redistribution capability and results in a more specific redistributed route selection.

In summary, demands for EIGRP to interoperate with other protocols and flexibility in fine-tuning network operation necessitate the capability to filter traffic using a route map.

How to Configure EIGRP Support for Route Map Filtering

This section contains the following tasks:

- [Configuring EIGRP Metrics Using a Route Map, page 2](#) (required)
- [Verifying EIGRP Metrics, page 5](#) (optional)

Configuring EIGRP Metrics Using a Route Map

Perform this task configure EIGRP metrics using a route map. In the Detailed Steps below, the EIGRP metrics used for filtering are configured within a route map. The first match clause defines EIGRP routes that contain an external protocol metric between 400 and 600 inclusive; the second match clause defines EIGRP external routes that match a source protocol of BGP and the autonomous system 45000. When

the two match clauses are true, a tag value of the destination routing protocol is set to 5. This route map can be used with the **distribute-list** command, see the “[Configuring EIGRP Metrics Using a Route Map: Examples](#)” section on page 6 for an example configuration.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **route-map** *map-tag* [**permit** | **deny**] [*sequence-number*]
4. **match metric** {*metric-value* | **external** *metric-value*} [**+-** *deviation-number*]
5. **match source-protocol** *source-protocol* [*autonomous-system-number*]
6. **set tag** *source-protocol* [*autonomous-system-number*]
7. **exit**
8. **router eigrp** *as-number*
9. **network** *ip-address*
10. **distribute-list route-map** *map-tag* **in**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	route-map <i>map-tag</i> [permit deny] [<i>sequence-number</i>] Example: Router(config)# route-map metric_range	Enters route-map configuration mode.

	Command or Action	Purpose
Step 4	<p>match metric {<i>metric-value</i> external <i>metric-value</i>} [+- <i>deviation-number</i>]</p> <p>Example: Router(config-route-map)# match metric external 500 +- 100</p>	<p>Specifies a match clause that redistributes EIGRP routes that match an internal or external protocol metric.</p> <ul style="list-style-type: none"> <i>metric-value</i>—Internal protocol metric, which can be an EIGRP five-part metric. The range is from 1 to 4294967295. external—External protocol metric. The range is from 1 to 4294967295. +- deviation-number—(Optional) Represents a standard deviation. The deviation can be any number. There is no default. In this example, EIGRP routes that contain an external protocol metric between 400 and 600 inclusive are redistributed. <p>Note When you specify a metric deviation with the + and - keywords, the router will match any metric that falls inclusively in that range.</p> <p>Note The external protocol metric is not the same as the EIGRP assigned route metric which is a figure computed from EIGRP vectorized metric components (delay, bandwidth, reliability, load, and MTU).</p>
Step 5	<p>match source-protocol <i>source-protocol</i> [<i>autonomous-system-number</i>]</p> <p>Example: Router(config-route-map)# match source-protocol bgp 45000</p>	<p>Specifies a match clause that redistributes EIGRP external routes that match a source protocol.</p> <ul style="list-style-type: none"> <i>source-protocol</i>—Protocol to match. The valid keywords are bgp, connected, eigrp, isis, ospf, rip, and static. There is no default. <i>autonomous-system-number</i>—(Optional) Autonomous system number. The <i>autonomous-system-number</i> argument is not applicable to the connected, static, and rip keywords. The range is from 1 to 65535. There is no default. In this example, EIGRP external routes that match a source protocol of BGP and the autonomous system 45000.
Step 6	<p>set tag <i>tag-value</i></p> <p>Example: Router(config-route-map)# set tag 5</p>	<p>Sets a tag value of the destination routing protocol when all the match criteria of a route map are met.</p> <ul style="list-style-type: none"> In this example, the tag value of the destination routing protocol is set to 5.
Step 7	<p>exit</p> <p>Example: Router(config-route-map)# exit</p>	<p>Exits route map configuration mode and returns to global configuration mode.</p>

	Command or Action	Purpose
Step 8	router eigrp <i>as-number</i>	Configures the EIGRP routing process.
	Example: Router(config)# router eigrp 1	
Step 9	network <i>ip-address</i>	Specifies a network for the EIGRP routing process.
	Example: Router(config-router)# network 172.16.0.0	
Step 10	distribute-list route-map <i>map-tag in</i>	Filters networks received in updates. <ul style="list-style-type: none"> This example uses a route map to filter the networks. The route map named “metric_range” was identified in Step 3 above.
	Example: Router(config)# distribute-list route-map metric_range in	

Verifying EIGRP Metrics

To verify that both the EIGRP metric and the external protocol metrics have been configured, perform the following step.

SUMMARY STEPS

- enable**
- show ip eigrp topology** [*autonomous-system-number* | *ip-address* [*mask*]] [**active** | **all-links** | **detail-links** | **pending** | **summary** | **zero-successors**]

DETAILED STEPS

Step 1 enable

Enables privileged EXEC mode. Enter your password if prompted.

```
Router# enable
```

Step 2 show ip eigrp topology [*autonomous-system-number* | *ip-address* [*mask*]] [**active** | **all-links** | **detail-links** | **pending** | **summary** | **zero-successors**]

Use this command to display the internal EIGRP metrics for a specified IP address, for example:

```
Router# show ip eigrp topology 172.16.1.0/24
```

```
IP-EIGRP (AS 45000): Topology entry for 172.16.1.0/24
  State is Passive, Query origin flag is 1, 1 Successor(s), FD is 2169856
  Routing Descriptor Blocks:
  0.0.0.0 (Serial4/0), from Connected, Send flag is 0x0
    Composite metric is (2169856/0), Route is Internal
    Vector metric:
      Minimum bandwidth is 1544 Kbit
      Total delay is 20000 microseconds
      Reliability is 255/255
      Load is 1/255
      Minimum MTU is 1500
      Hop count is 0
```

In the following example, the external EIGRP metrics for a specified IP address are displayed:

```
Router# show ip eigrp topology 192.168.1.0/24

IP-EIGRP (AS 45000): Topology entry for 192.168.1.0/24
  State is Passive, Query origin flag is 1, 1 Successor(s), FD is 2169856
  Routing Descriptor Blocks:
  0.0.0.0 (Serial4/0), from Connected, Send flag is 0x0
    Composite metric is (2169856/0), Route is External
    Vector metric:
      Minimum bandwidth is 1544 Kbit
      Total delay is 20000 microseconds
      Reliability is 255/255
      Load is 1/255
      Minimum MTU is 1500
      Hop count is 1
      External data:
        Originating router is 10.89.245.1
        AS number of route is 0
        External protocol is Connected, external metric is 0
        Administrator tag is 0 (0x00000000)
```

Configuration Examples for EIGRP Support for Route Map Filtering

This section contains the following configuration example:

- [Configuring EIGRP Metrics Using a Route Map: Examples, page 6](#)

Configuring EIGRP Metrics Using a Route Map: Examples

The following example shows how to configure a route map to match an EIGRP external protocol metric route with an allowable deviation of 100, a source protocol of BGP, and an autonomous system 45000. When the two match clauses are true, the tag value of the destination routing protocol is set to 5. The route map is used to distribute incoming packets for an EIGRP process.

```
route-map metric_range
  match metric external 500 +- 100
  match source-protocol bgp 45000
  set tag 5
!
router eigrp 1
  network 172.16.0.0
  distribute-list route-map metric_range in
```

The following example shows how to configure a route map to match EIGRP routes with a metric of 110, 200, or an inclusive range of 700 to 800. When the match clause is true, the tag value of the destination routing protocol is set to 10. The route map is used to redistribute EIGRP packets.

```
route-map metric_eigrp
  match metric 110 200 750 +- 50
  set tag 10
!
router eigrp 1
  network 172.21.1.0/24
  redistribute eigrp route-map metric_eigrp
```

Additional References

The following sections provide references related to the EIGRP Support for Route Map Filtering feature.

Related Documents

Related Topic	Document Title
EIGRP overview and configuration	“Configuring EIGRP” module
IP routing commands including syntax, usage guidelines, and examples	<i>Cisco IOS IP Routing Protocols Command Reference</i>

Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	http://www.cisco.com/techsupport

Command Reference

The following commands are introduced or modified in the feature or features documented in this module. For information about these commands, see the *Cisco IOS IP Routing Protocols Command Reference* at http://www.cisco.com/en/US/docs/ios/iproute/command/reference/irp_book.html. For information about all Cisco IOS commands, go to the Command Lookup Tool at <http://tools.cisco.com/Support/CLILookup> or to the *Cisco IOS Master Commands List*.

- **match metric (IP)**
- **match source-protocol**
- **show ip eigrp topology**

Feature Information for EIGRP Support for Route Map Filtering

Table 1 lists the release history for this feature.

Not all commands may be available in your Cisco IOS software release. For release information about a specific command, see the command reference documentation.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS and Catalyst OS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.



Note

Table 1 lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

Table 1 Feature Information for EIGRP Support for Route Map Filtering

Feature Name	Releases	Feature Information
EIGRP Support for Route Map Filtering	12.2(33)SRA 12.2(33)SXH 12.3(8)T	The EIGRP Support for Route Map Filtering feature enables EIGRP to interoperate with other protocols by filtering inbound and outbound traffic based on complex route map options. In addition to the existing route map facility, several extended filtering options are introduced to provide EIGRP-specific match choices. The following commands were introduced or modified by this feature: match metric (IP) , match source-protocol , show ip eigrp topology .

CCDE, CCSI, CCENT, Cisco Eos, Cisco HealthPresence, the Cisco logo, Cisco Lumin, Cisco Nexus, Cisco Nurse Connect, Cisco Stackpower, Cisco StadiumVision, Cisco TelePresence, Cisco WebEx, DCE, and Welcome to the Human Network are trademarks; Changing the Way We Work, Live, Play, and Learn and Cisco Store are service marks; and Access Registrar, Aironet, AsyncOS, Bringing the Meeting To You, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, CCVP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Collaboration Without Limitation, EtherFast, EtherSwitch, Event Center, Fast Step, Follow Me Browsing, FormShare, GigaDrive, HomeLink, Internet Quotient, IOS, iPhone, iQuick Study, IronPort, the IronPort logo, LightStream, Linksys, MediaTone, MeetingPlace, MeetingPlace Chime Sound, MGX, Networkers, Networking Academy, Network Registrar, PCNow, PIX, PowerPanels, ProConnect, ScriptShare, SenderBase, SMARTnet, Spectrum Expert, StackWise, The Fastest Way to Increase Your Internet Quotient, TransPath, WebEx, and the WebEx logo are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0903R)

Any Internet Protocol (IP) addresses used in this document are not intended to be actual addresses. Any examples, command display output, and figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses in illustrative content is unintentional and coincidental.

© 2004–2008 Cisco Systems, Inc. All rights reserved.