



# EIGRP Support for Leaking Routes

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The EIGRP Support for Leaking Routes feature introduces the capability to advertise a component route of a manual summary address that would otherwise be suppressed. Any component subset of the summary address can be leaked. The benefit of route leaking is that the leaked route is more specific than a summarized route and is therefore preferred.

## **Finding Feature Information in This Module**

Your Cisco IOS software release may not support all of the features documented in this module. 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 Route Leaking](#)” section on page 11.

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## Contents

- [Prerequisites for EIGRP Route Leaking, page 2](#)
- [Information About EIGRP Route Leaking, page 2](#)
- [How to Configure EIGRP Route Leaking, page 4](#)
- [Configuration Examples for EIGRP Route Leaking, page 6](#)
- [Additional References, page 6](#)
- [Command Reference, page 7](#)
- [Feature Information for EIGRP Route Leaking, page 11](#)



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## Prerequisites for EIGRP Route Leaking

- This document assumes that your network is configured to run Enhanced Interior Gateway Routing Protocol (EIGRP) and that peering sessions are established.
- You should understand route summarization. For an explanation of route summarization, see *CCNP Self-Study: Advanced IP Addressing* at the following URL:

<http://www.ciscopress.com/articles/article.asp?p=174107&seqNum=38rl=1&rl=1>

## Information About EIGRP Route Leaking

You should understand the following concepts before configuring EIGRP route leaking:

- [EIGRP Automatic Summarization to the Network Level, page 2](#)
- [Benefit of EIGRP Route Leaking, page 2](#)
- [Behavior if EIGRP Route Leaking Is Configured Incompletely, page 3](#)

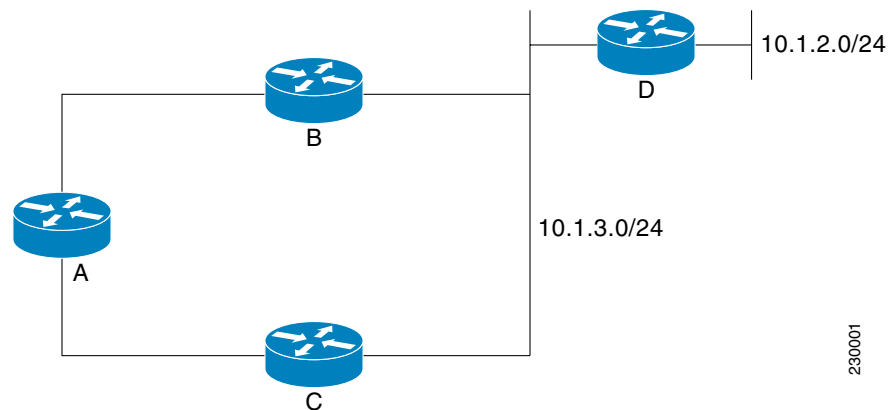
## EIGRP Automatic Summarization to the Network Level

EIGRP summarizes routes to the network level by default. Summarization is controlled by the **auto-summary** command; use the **no** form of this command to enable subnet-level route summarization.

## Benefit of EIGRP Route Leaking

The benefit of route leaking (advertising a route) is that the leaked route is more specific than a summarized route and is therefore the preferred route. By using route leaking, you can prefer one path over another. Suppose you have a network with Routers A, B, and C, as shown in [Figure 1](#).

Figure 1 EIGRP Route Leaking



You want to summarize routes to Router A for destinations within the summary, but you want to prefer the path through Router B for one subnet contained within the summary. Configure Router C to send only the summary 10.1.2.0/23. The longer match of 10.1.3.0/24 that is leaked through Router B is preferred and the 10.1.2.0/23 is available as a backup through Router C.

If we look at Router B, Router B would advertise a summary address of 10.1.2.0/23, as well as the more specific 10.1.3.0/24 permitted in the leak list specified in the **ip summary-address eigrp** command as 10.1.2.0 with a mask of 255.255.254.0 in the following configuration file:

#### Router B

```
interface serial 1
 ip address 10.1.3.4 255.0.0.0
 ip summary-address eigrp 3 10.1.2.0 255.255.254.0 leak-map LEAK-10-1-0
!
router eigrp 3
 network 10.1.0.0 0.0.255.255
 no auto-summary
!
access-list 2 permit 10.1.3.0 255.255.255.0
route-map LEAK-10-1-0 permit
 match ip address 2
```

#### Router C

```
interface serial 1
 ip address 10.1.3.5 255.0.0.0
 ip summary-address eigrp 3 10.1.2.0 255.255.254.0
!
router eigrp 3
 network 10.1.0.0 0.0.255.255
 no auto-summary
```

## Behavior if EIGRP Route Leaking Is Configured Incompletely

The following default behavior occurs if the **ip summary-address eigrp** command is configured using the **leak-map** keyword and either the route map or access list is not configured:

- If the **leak-map** keyword is configured to reference a nonexistent route map, the configuration of this keyword has no effect. The summary address is advertised, but all component routes are suppressed.

- If the **leak-map** keyword is configured, but the access list does not exist or the route map does not reference the access list, the summary address and all component routes are sent.

## How to Configure EIGRP Route Leaking

This section contains the following task:

- [Configuring an EIGRP Summary Address to Leak a Component Route, page 4](#)

### Configuring an EIGRP Summary Address to Leak a Component Route

There might be times when you have summarized routes, but you want a particular route to be advertised. The benefit of route leaking (advertising a route) is that the leaked route is more specific than a summarized route and is therefore the preferred route. Perform this task to leak an EIGRP route that would otherwise be suppressed by a summary route.

In general, leaking an EIGRP route is achieved by defining a standard IP access list (or IP prefix list) to identify the component route as a source address. Then the access list is referenced in a route map (in a **match ip address** command), and the route map is referenced by the **leak-map** keyword in the **ip summary-address eigrp** command.

You can use a single access list to permit all the routes that you want to leak through a single summary.

#### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router eigrp** *as-number*
4. **exit**
5. **access-list** *access-list-number* **permit** *source* [*source-wildcard*] [**log**]
6. **route-map** *map-tag* [**permit** | **deny**] [*sequence-number*]
7. **match ip address** { *access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...* | *access-list-name*] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]
8. **exit**
9. **interface** *type number*
10. **ip summary-address eigrp** *as-number ip-address mask* [*admin-distance*] [**leak-map** *name*]
11. **end**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> 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> Router# configure terminal	Enters global configuration mode.
Step 3	<b>router eigrp as-number</b>  <b>Example:</b> Router(config)# router eigrp 1	Enters router configuration mode to configure an EIGRP process.
Step 4	<b>exit</b>  <b>Example:</b> Router(config-router)# exit	Exits router configuration mode and returns to global configuration mode.
Step 5	<b>access-list access-list-number permit source</b> [source-wildcard] [log]  <b>Example:</b> Router(config)# access-list 1 permit 10.1.1.0 0.0.0.255	Defines a standard access list. <ul style="list-style-type: none"> <li>If the access list is not defined or referenced by the route map, all component routes of the summary address and the summary address will be advertised.</li> </ul>
Step 6	<b>route-map map-tag [permit   deny]</b> [sequence-number]  <b>Example:</b> Router(config)# route-map LEAK-10-1-1 permit 10	Defines a route map. <ul style="list-style-type: none"> <li>If the route map does not exist or does not reference the access list, the summary address will be advertised and all component routes will be suppressed.</li> </ul>
Step 7	<b>match ip address {access-list-number</b> <b>access-list-name [access-list-number...   access-list-name]  </b> <b>access-list-name [access-list-number...  </b> <b>access-list-name]   prefix-list</b> <b>prefix-list-name [prefix-list-name...]}</b>  <b>Example:</b> Router(config-route-map)# match ip address 1	Distributes routes that are defined in an access list or prefix list. <ul style="list-style-type: none"> <li>In this example, access list 1 is referencing the access list in Step 5.</li> </ul>
Step 8	<b>exit</b>  <b>Example:</b> Router(config-route-map)# exit	Exits a configuration mode to the next highest mode in the CLI mode hierarchy.
Step 9	<b>interface type number</b>  <b>Example:</b> Router(config)# interface serial 0/0	Configures the interface.

	Command or Action	Purpose
Step 10	<pre>ip summary-address eigrp as-number ip-address mask [admin-distance] [leak-map name]</pre> <p><b>Example:</b></p> <pre>Router(config-if)# ip summary-address eigrp 1 10.0.0.0 255.0.0.0 leak-map LEAK-10-1-1</pre>	<p>Configures interface-level route summarization.</p> <ul style="list-style-type: none"> <li>The <b>leak-map</b> keyword is configured to reference the route map.</li> <li>In this example, the route map being referenced is LEAK-10-1-1, which is the route map configured in Step 6.</li> </ul>
Step 11	<pre>end</pre> <p><b>Example:</b></p> <pre>Router(config-if)# end</pre>	<p>Exits configuration mode and enters Privileged EXEC mode.</p>

## Configuration Examples for EIGRP Route Leaking

This section contains the following example:

- [EIGRP Route Leaking: Example, page 6](#)

### EIGRP Route Leaking: Example

The following example configures the 10.1.1.0/24 subnet to be leaked through the 10.0.0.0 summary address:

```
Router(config)# router eigrp 1
Router(config-router)# exit
Router(config)# access-list 3 permit 10.1.1.0 0.0.0.255
Router(config)# !
Router(config)# route-map LEAK-10-1-1 permit 10
Router(config-route-map)# match ip address 3
Router(config-route-map)# exit
Router(config)# interface Serial 0/0
Router(config-if)# ip summary-address eigrp 1 10.0.0.0 255.0.0.0 leak-map LEAK-10-1-1
Router(config-if)# end
```

## Additional References

The following sections provide references related to the EIGRP Support for Leaking Routes feature.

### Related Documents

Related Topic	Document Title
EIGRP commands	<ul style="list-style-type: none"> <li><a href="#">Cisco IOS IP Routing Protocols Command Reference, Release 12.4T</a></li> </ul>

Related Topic	Document Title
EIGRP configuration tasks	<ul style="list-style-type: none"> <li>• <i>Cisco IOS IP Routing Protocols Configuration Guide, Release 12.4</i></li> </ul>
Route summarization	<ul style="list-style-type: none"> <li>• <i>CCNP Self-Study: Advanced IP Addressing</i></li> <li>• <i>Enhanced IP Services for Cisco Networks</i></li> </ul>

## Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

## MIBs

MIB	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	<p>To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:</p> <p><a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a></p>

## RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	—

## Technical Assistance

Description	Link
The Cisco Technical Support & Documentation website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, tools, and technical documentation. Registered Cisco.com users can log in from this page to access even more content.	<a href="http://www.cisco.com/techsupport">http://www.cisco.com/techsupport</a>

## Command Reference

This section documents the following modified command only:

- **ip summary-address eigrp**

# ip summary-address eigrp

To configure a summary aggregate address for a specified interface, use the **ip summary-address eigrp** command in interface configuration mode. To disable the summarization, use the **no** form of this command.

**ip summary-address eigrp** *as-number ip-address mask [admin-distance] [leak-map name]*

**no ip summary-address eigrp** *as-number ip-address mask*

## Syntax Description

<i>as-number</i>	Autonomous system number.
<i>ip-address</i>	Summary IP address to apply to an interface.
<i>mask</i>	Subnet mask.
<i>admin-distance</i>	(Optional) Administrative distance. A value from 0 to 255. The default for EIGRP is 90. An administrative distance of 5 is applied to EIGRP summary routes.
<b>leak-map</b> <i>name</i>	(Optional) Route-map reference to configure route leaking through the summary.

## Defaults

No summary addresses are predefined.

## Command Modes

Interface configuration

## Command History

Release	Modification
10.0	This command was introduced.
12.0(7)T	The <i>admin-distance</i> argument was added.
12.3(14)T	The <b>leak-map</b> keyword and <i>name</i> argument were added.

## Usage Guidelines

The **ip summary-address eigrp** command is used to configure interface-level address summarization. EIGRP summary routes are given an administrative distance value of 5. The administrative distance metric is used to advertise a summary without installing it in the routing table.

By default, EIGRP summarizes subnet routes to the network level, even for a single host route. The **no auto-summary** command can be entered to configure subnet level summarization.

### EIGRP Support for Leaking Routes

Configuring the **leak-map** keyword allows the router to advertise a component route that would otherwise be suppressed by the manual summary. Any component subset of the summary can be leaked. A route map and access list must be defined to source the leaked route.

The following default behavior occurs if the **ip summary-address eigrp** command is configured using the **leak-map** keyword and either the route map or access list is not configured:

- If the **leak-map** keyword is configured to reference a nonexistent route map, the configuration of this keyword has no effect. The summary address is advertised, but all component routes are suppressed.
- If the **leak-map** keyword is configured, but the access list does not exist or the route map does not reference the access list, the summary address and all component routes are sent.

## Examples

The following example configures an administrative distance of 95 on Ethernet interface 0/0 for the 192.168.0.0/16 summary address:

```
Router(config)# router eigrp 1
Router(config-router)# exit
Router(config)# interface Ethernet 0/0
Router(config-if)# ip summary-address eigrp 1 192.168.0.0 255.255.0.0 95
```

The following example configures the 10.1.1.0/24 subnet to be leaked through the 10.0.0.0 summary address:

```
Router(config)# router eigrp 1
Router(config-router)# exit
Router(config)# access-list 1 permit 10.1.1.0 0.0.0.255
Router(config)# route-map LEAK-10-1-1 permit 10
Router(config-route-map)# match ip address 1
Router(config-route-map)# exit
Router(config)# interface Serial 0/0
Router(config-if)# ip summary-address eigrp 1 10.0.0.0 255.0.0.0 leak-map LEAK-10-1-1
Router(config-if)# end
```

## Related Commands

Command	Description
<a href="#">auto-summary (EIGRP)</a>	Configures automatic summarization of subnet routes to network-level routes (default behavior).

# Feature Information for EIGRP Route Leaking

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.

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**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 Route Leaking

Feature Name	Releases	Feature Information
EIGRP Support Leaking Routes	12.3(14)T	The EIGRP Support for Leaking Routes feature introduces the capability to advertise a component route of a manual summary address that would otherwise be suppressed. Any component subset of the summary address can be leaked. The benefit of route leaking is that the leaked route is more specific than a summarized route and is therefore preferred.

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