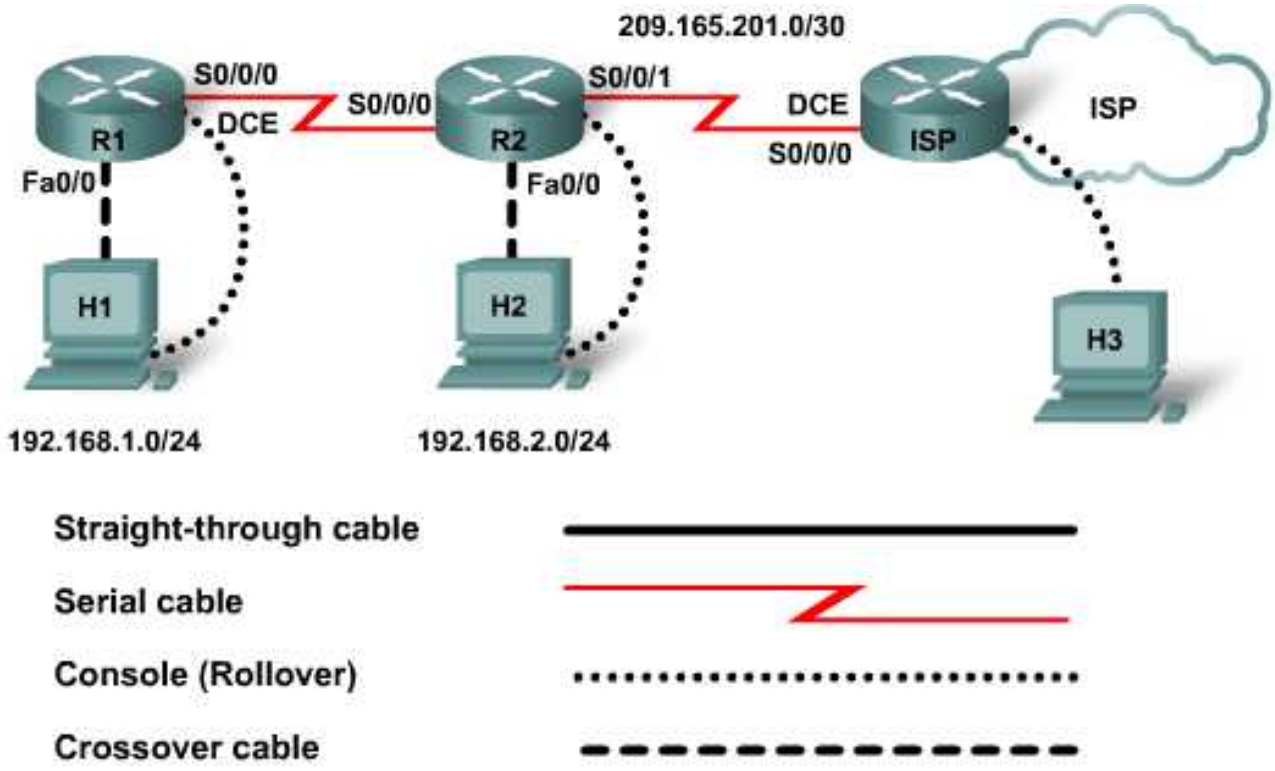
Lab 9.3.4 Troubleshooting EIGRP Default Route Redistribution



Device	Host Name	Fast Ethernet 0/0 IP Address	Serial 0/0/0 IP Address	Serial 0/0/0 Type	Serial0/0/1 IP Address	Enable Secret Password	Enable, vty, and Console Password
Router 1	R1	192.168.1.1/24	172.30.1.1/30	DCE	NA	class	cisco
Router 2	R2	192.168.2.1/24	172.30.1.2/30	DTE	209.165.201.1/30	class	cisco
ISP	ISP	NA	209.165.201.2/30	DCE	NA	class	cisco
PC1	H1	192.168.1.2/24					
PC2	H2	192.168.2.2/24					
PC3	H3	NA					

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Objectives

- Configure EIGRP on routers.
- Discover connectivity issues and implement solutions to network errors.
- Examine the topology tables with the **`show ip eigrp topology`** command.
- Examine the statistics using the **`show ip eigrp traffic`** command.
- Examine routing tables using the **`show ip route`** command.
- Observe routing activity using the **`debug ip eigrp`** command.

Background / Preparation

In this lab, you will learn how to troubleshoot the routing protocol EIGRP using the network shown in the topology diagram. This lab uses an 1841 router and Cisco IOS commands. Any router that meets the interface requirements displayed on the above diagram may be used. For example, router series 800, 1600, 1700, 1800, 2500, 2600, 2800, or any combination can be used.

The information in this lab applies to the 1841 router. Other routers may be used; however, the command syntax may vary. Depending on the router model, the interfaces may differ. For example, on some routers Serial 0 may be Serial 0/0, Serial 0/0/0 and Ethernet 0 may be FastEthernet 0/0. The Cisco Catalyst 2960 switch comes preconfigured and only needs to be assigned basic security information before being connected to a network.

The following resources are required:

- Three Cisco Routers with 2 serial interfaces and 1 FastEthernet interface (preferably the same model number and IOS version)
- One Windows-based PC, with a terminal emulation program
- At least one RJ-45-to-DB-9 connector console cable to configure the routers
- Three 2-part (DTE/DCE) serial cables
- Two crossover cables for the hosts to router connections

NOTE: Make sure that the routers have been erased and have no startup configurations. For instructions on erasing and reloading a switch and a router please refer to the Lab Manual. The Lab Manual can be found and downloaded on the Academy Connection in the Tools section.

NOTE: SDM Enabled Routers – If the startup-config is erased in an SDM enabled router, SDM will no longer come up by default when the router is restarted. It will be necessary to build a basic router configuration using IOS commands. The steps provided in this lab use IOS commands and do not require the use of SDM. If you wish to use SDM for basic router configuration, refer to the instructions provided in the Lab Manual, which can be found and downloaded on the Academy Connection in the Tools section or contact your instructor if necessary.

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Step 1: Connect the equipment

a. Connect the Serial 0/0/0 interface of Router 1 to the Serial 0/0/0 interface of Router 2 using a serial cable.

b. Connect the Serial 0/0/1 interface of Router 2 to the Serial 0/0/0 interface of the ISP router using a serial cable.

c. Connect Host H1 to the console of Router 1 using a rollover cable to perform configurations and use a crossover cable to connect the NIC of H1 to the Fa0/0 of R1.

d. Connect Host H2 to the console of Router 2 using a rollover cable to perform configurations and use a crossover cable to connect the NIC of H2 to the Fa0/0 of R2.

e. Connect Host H3 to the console of ISP using a rollover cable to perform configurations.

Step 2: Load the preconfigurations for R1, R2, and ISP

a. See your instructor to obtain the preconfigurations for this lab.

b. Connect the PC to the console ports of the routers for loading the preconfigurations using a terminal emulation program. Ensure the router is in privileged mode.

c. Transfer the configuration from H1 to Router 1:

1) In the terminal emulation program on H1, choose **Transfer > Send Text File**.

2) Locate the file for the configuration of Router 1 provided by your instructor and choose **Open** to start the transfer of the preconfiguration to Router 1.

3) When the transfer is complete, save the configuration.

d. Repeat the transfer process from H2 to Router 2:

1) In the terminal emulation program on H2, choose **Transfer > Send Text File**.

2) Locate the file for the configuration of Router 2 provided by your instructor, and choose **Open** to start the transfer of the preconfiguration to Router 2.

3) When the transfer is complete, save the configuration.

e. Repeat the transfer process from H3 to ISP:

1) In the terminal emulation program on H3, choose **Transfer > Send Text File**.

2) Locate the file for the configuration of ISP provided by your instructor, and choose **Open** to start the transfer of the preconfiguration to ISP.

3) When the transfer is complete, save the configuration.

Step 3: Configure the hosts with IP address, subnet mask, and default gateway

a. Configure each host with the proper IP address, subnet mask, and default gateway.

1) H1 should be assigned 192.168.1.2 with a subnet mask of 255.255.255.0 and the default gateway of 192.168.1.1.

2) H2 should be assigned 192.168.2.2 with a subnet mask of 255.255.255.0 and the default gateway of 192.168.2.1.

Can H1 ping the FastEthernet interface of R1? _____

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If the answer is no, troubleshoot as necessary to determine the problem. Use commands such as **`show ip interface brief,`** etc., to identify the problems.

H1 should be able to ping the attached router. If the ping was not successful, troubleshoot further. Check and verify that the workstation has been assigned a specific IP address and default gateway.

Step 4: Check connectivity between hosts H1 and H2

a. Ping from Host H1 to Host H2.

Is the ping successful? _____

If the answer is no, troubleshoot as necessary to determine the problem. Use commands such as **`show ip interface brief`** on R1 and R2 to identify the problems.

Are all necessary interfaces up? _____

b. If no, make the necessary corrections to have all interfaces up.

What must be done? _____

_____

Both workstations should be able to ping the attached router. If the ping was not successful, troubleshoot further. Check and verify that the workstation has been assigned a specific IP address and default gateway.

Step 5: Show the routing tables for each router

From the enable or privileged EXEC mode of both routers, examine the routing table entries, using the **`show ip route`** command on each router.

What are the entries in the R1 routing table?

_____

_____

What are the entries in the R2 routing table?

_____

_____

_____

What is missing from the routing tables? _____

Step 6: Verify that routing updates are being sent

a. Type the commands **`debug ip eigrp`** and **`clear ip route *`** at the privileged EXEC mode prompt of R1. Wait for at least 45 seconds then turn debugging off using the **`undebug all`** command.

Was there any output from the debug commands on R1? _____

What is missing from the debug output on R1? _____

_____

b. On R1, use the **`show ip protocols`** command to determine the problem. Review the topology diagram and the networks that should be associated with each router interface.

What problem is occurring?

_____

_____

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c. On R2, use the **show ip protocols** and **show ip route** commands to determine the problem. Review the topology diagram and the networks that should be associated with each router interface.

What problem is occurring?

_____

_____

d. Make corrections to the configuration as necessary.

Step 7: Show the routing tables for each router

From the enable or privileged EXEC mode of both routers, examine the routing table entries, using the **show ip route** command on each router.

What are the entries in the R1 routing table?

_____

_____

_____

_____

What does **D*EX** mean in the output? _____

What are the entries in the R2 routing table?

_____

_____

_____

_____

What is the address type in the 0.0.0.0 route? _____

What does the **D** mean in the first column of the routing table? _____

What is the administrative distance of 192.168.1.0 network? _____

Step 8: Show the EIGRP topology table entries for each router

a. To view the topology table, issue the **show ip eigrp topology** command on R1.

How many routes are in passive mode? _____

b. To view more specific information about a topology table entry, use an IP address with this command:

```
R1#show ip eigrp topology 192.168.2.0
```

Based on the output of this command, how does R1 know about the 192.168.2.0 network?

_____

_____

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Step 9: Show the EIGRP traffic entries for R1

Issue the **show ip eigrp traffic** command on R1.

What were the results?

_____

_____

_____

Are updates being sent and received? _____

Step 10: Test network connectivity

From H1, is it possible to ping the FastEthernet interface of R2? _____

From H1, is it possible to ping Host H2? _____

From H1, is it possible to ping the S0/0/0 of the ISP? _____

From H2, is it possible to ping the FastEthernet interface of R1? _____

From H2, is it possible to ping Host H1? _____

From H2, is it possible to ping the S0/0/0 of the ISP? _____

If any answer is no, troubleshoot to find the error. Ping again until successful.

Step 11: Reflection

a. What does **ping** test?

_____

_____

b. When should the **show ip protocols** and **show ip eigrp topology** commands be used?

_____

_____

_____

c. When should the **debug ip eigrp** command be used?

_____

_____

_____

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