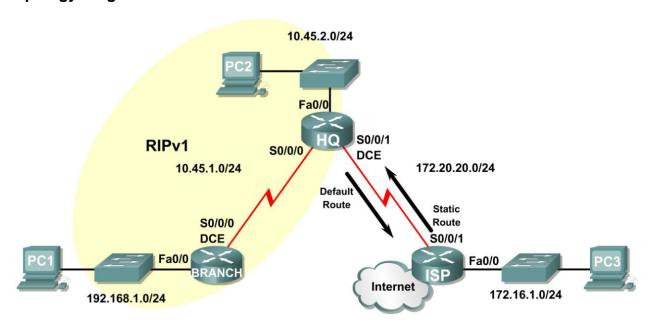# Lab 5.6.3: RIP Troubleshooting

Topology Diagram

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
BRANCH	Fa0/0	192.168.1.1	255.255.255.0	N/A
BRANCH	S0/0/0	10.45.1.254	255.255.255.0	N/A
HQ	Fa0/0	10.45.2.1	255.255.255.0	N/A
HQ	S0/0/0	10.45.1.1	255.255.255.0	N/A
HQ	S0/0/1	172.20.20.254	255.255.255.0	N/A
ISP	FA0/0	172.16.1.1	255.255.255.0	N/A
ISP	S0/0/1	172.20.20.1	255.255.255.0	N/A
PC1	NIC	192.168.1.254	255.255.255.0	192.168.1.1
PC2	NIC	10.45.2.254	255.255.255.0	10.45.2.1
PC3	NIC	172.16.1.254	255.255.255.0	172.16.1.1

Learning Objectives

Upon completion of this lab, you will be able to:

- Cable a network according to the Topology Diagram.
- Erase the startup configuration and reload a router to the default state.
- Load the routers with supplied scripts.

- Discover where convergence is not complete.
- Gather information about the non-converged portion of the network along with any other errors.
- Analyze information to determine why convergence is not complete.
- Propose solutions to network errors.
- Implement solutions to network errors.
- Document the corrected network.

Scenario

In this lab, you will begin by loading configuration scripts on each of the routers. These scripts contain errors that will prevent end-to-end communication across the network. You will need to troubleshoot each router to determine the configuration errors and then use the appropriate commands to correct the configurations. When you have corrected all of the configuration errors, all of the hosts on the network should be able to communicate with each other.

The network should also have the following requirements met:

- RIPv1 routing is configured on the BRANCH router.
- RIPv1 routing is configured on the HQ router.
- RIP updates must be disabled on the BRANCH and HQ LAN interfaces.
- Static default route is configured on the HQ router and shared with the BRANCH router via RIP updates.
- Static routes for all HQ and BRANCH networks are to be configured on the ISP router. The routes must be summarized wherever possible.

Task 1: Cable, Erase, and Reload the Routers.

Step 1: Cable a network.

Cable a network that is similar to the one in the Topology Diagram.

Step 2: Clear the configuration on each router.

Clear the configuration on each of routers using the **erase startup-config** command and then **reload** the routers. Answer **no** if asked to save changes.

Task 2: Load Routers with the Supplied Scripts.

Step 1: Load the following script onto the BRANCH router.

```
hostname BRANCH
!
no ip domain-lookup
!
interface FastEthernet0/0
 ip address 192.168.1.1 255.255.255.0
 duplex auto
 speed auto
 no shutdown
!
interface Serial0/0/0
 ip address 10.45.1.254 255.255.255.0
 clock rate 64000
 no shutdown
!
```

```
router rip
 passive-interface FastEthernet0/0
 network 10.0.0.0
 network 192.168.1.0
!
line con 0
line vty 0 4
 password cisco
 login
!
end
```

Step 2: Load the following script onto the HQ router.

```
hostname HQ
!
no ip domain-lookup
!
interface FastEthernet0/0
 ip address 10.45.2.1 255.255.255.0
 duplex auto
 speed auto
 no shutdown
!
interface Serial0/0/0
 ip address 10.45.1.1 255.255.255.0
 no shutdown
!
interface Serial0/0/1
 ip address 172.20.20.254 255.255.255.0
 clock rate 64000
 no shutdown
!
router rip
 passive-interface FastEthernet0/0
network 10.0.0.0
default-information originate
!
ip route 0.0.0.0 0.0.0.0 Serial0/0/1
!
line con 0
line vty 0 4
 password cisco
 login
!
end
```

Step 3: Load the following script onto the ISP router.

```
hostname ISP
!
no ip domain-lookup
!
interface FastEthernet0/0
```

```
 ip address 172.16.1.1 255.255.255.0
 duplex auto
 speed auto
 no shutdown
!
interface Serial0/0/1
 ip address 172.20.20.1 255.255.255.0
 no shutdown
!
ip route 10.45.0.0 255.255.252.0 Serial0/0/1
ip route 192.168.1.0 255.255.255.0 Serial0/0/1
!
line con 0
line vty 0 4
 password cisco
 login
!
end
```

Task 3: Troubleshoot the BRANCH Router

Step 1: Begin troubleshooting at the Host connected to the BRANCH router.

From the host PC1, is it possible to ping PC2? _____

From the host PC1, is it possible to ping PC3? _____

From the host PC1, is it possible to ping the default gateway? _____

Step 2: Examine the BRANCH router to find possible configuration errors.

Begin by viewing the summary of status information for each interface on the router.

Are there any problems with the status of the interfaces?

_____

_____

_____

If there are any problems with the status of the interfaces, record any commands that will be necessary to correct the configuration errors.

_____

_____

_____

Step 3: If you have recorded any commands above, apply them to the router configuration now.

Step 4: View summary of the status information.

If any changes were made to the configuration in the previous step, view the summary of the status information for the router interfaces again.

Does the information in the interface status summary indicate any configuration errors? _____

If the answer is **yes**, troubleshoot the interface status of the interfaces again.

Step 5: Troubleshoot the routing configuration on the BRANCH router.

What networks are shown in the routing table?

_____

_____

_____

Are there any problems with the routing table?

_____

_____

_____

If there are any problems with the routing table, record any commands that will be necessary to correct the configuration errors.

_____

_____

_____

What networks are included in the RIP updates?

_____

_____

_____

Are there any problems with the RIP updates that are being sent out from the router?

_____

_____

_____

If there are any problems with the RIP configuration, record any commands that will be necessary to correct the configuration errors.

_____

_____

_____

Step 6: If you have recorded any commands above, apply them to the router configuration now.

Step 7: View the routing information.

If any changes were made to the configuration in the previous steps, view the routing information again.

Does the information in routing table indicate any configuration errors? _____

Does the information included in the RIP updates that are sent out indicate any configuration errors? _____

If the answer to either of these questions is **yes**, troubleshoot the routing configuration again.

What networks are included in the RIP updates?

_____

_____

_____

Step 8: Attempt to ping between the hosts again.

From the host PC1, is it possible to ping PC2? _____

From the host PC1, is it possible to ping PC3? _____

From the host PC1, is it possible to ping the Serial 0/0 interface of the HQ router? _____

Task 4: Troubleshoot the HQ Router

Step 1: Begin troubleshooting at the Host connected to the R2 router.

From the host PC2, is it possible to ping PC1? _____

From the host PC2, is it possible to ping PC3? _____

From the host PC2, is it possible to ping the default gateway? _____

Step 2: Examine the HQ router to find possible configuration errors.

Begin by viewing the summary of status information for each interface on the router.

Are there any problems with the status of the interfaces?

_____

_____

_____

If there are any problems with the status of the interfaces, record any commands that will be necessary to correct the configuration errors.

_____

_____

_____

Step 3: If you have recorded any commands above, apply them to the router configuration now.

Step 4: View the summary of the status information.

If any changes were made to the configuration in the previous step, view the summary of the status information for the router interfaces again.

Does the information in the interface status summary indicate any configuration errors? _____

If the answer is **yes**, troubleshoot the interface status of the interfaces again.

Step 5: Troubleshoot the routing configuration on the BRANCH router.

What networks are shown in the routing table?

_____

_____

_____

Are there any problems with the routing table?

_____

_____

_____

If there are any problems with the routing table, record any commands that will be necessary to correct the configuration errors.

_____

_____

_____

What networks are included in the RIP updates?

_____

_____

_____

Are there any problems with the RIP updates that are being sent out from the router?

_____

_____

_____

If there are any problems with the RIP configuration, record any commands that will be necessary to correct the configuration errors.

_____

_____

_____

_____

Step 6: If you have recorded any commands above, apply them to the router configuration now.

Step 7: View the routing information.

If any changes were made to the configuration in the previous steps, view the routing information again.

Does the information in routing table indicate any configuration errors? _____

Does the information included in the RIP updates that are sent out indicate any configuration errors? _____

If the answer to either of these questions is **yes**, troubleshoot the routing configuration again.

What networks are included in the RIP updates?

_____

_____

_____

Step 8: Verify that the HQ router is sending a default route to the BRANCH router.

Is there a default route in the BRANCH routing table? _____

If not, what commands are needed to configure this on the HQ router?

_____

_____

_____

Step 9: If you have recorded any commands above, apply them to the HQ router configuration now.

Step 10: View the BRANCH routing table.

If any changes were made to the configuration in the previous step, view the BRANCH routing table again.

Is there a default route in the BRANCH routing table? _____

If the answer is **no**, troubleshoot the RIP configuration again.

Step 11: Attempt to ping between the hosts again.

From the host PC2, is it possible to ping PC1? _____

From the host PC2, is it possible to ping the Serial 0/1 interface of the ISP router? _____

From the host PC1, is it possible to ping PC3? _____

Task 5: Troubleshoot the ISP Router

Step 1: Begin troubleshooting at the Host connected to the ISP router.

From the host PC3, is it possible to ping PC1? _____

From the host PC3, is it possible to ping PC2? _____

From the host PC3, is it possible to ping the default gateway? _____

Step 2: Examine the ISP router to find possible configuration errors.

Begin by viewing the summary of status information for each interface on the router.

Are there any problems with the status of the interfaces?

_____

_____

_____

If there are any problems with the status of the interfaces, record any commands that will be necessary to correct the configuration errors.

_____

_____

_____

Step 3: If you have recorded any commands above, apply them to the router configuration now.

Step 4: View the summary of the status information.

If any changes were made to the configuration in the previous step, view the summary of the status information for the router interfaces again.

Does the information in the interface status summary indicate any configuration errors? _____

If the answer is **yes**, troubleshoot the interface status of the interfaces again.

Step 5: Troubleshoot the static routing configuration on the ISP router.

Begin by viewing the routing table.

What networks are shown in the routing table?

_____

_____

_____

_____

Are there any problems with the routing configuration?

_____

_____

If there are any problems with the routing configuration, record any commands that will be necessary to correct the configuration errors.

_____

_____

_____

Step 6: If you have recorded any commands above, apply them to the router configuration now.

Step 7: View the routing table.

If any changes were made to the configuration in the previous step, view the routing table again.

Does the information in the routing table indicate any configuration errors? _____

If the answer is **yes**, troubleshoot the routing configuration again.

Step 8: Attempt to ping between the hosts again.

From the host PC3, is it possible to ping PC1? _____

From the host PC3, is it possible to ping PC2? _____

From the host PC3, is it possible to ping the WAN interface of the BRANCH router? _____

Task 6: Reflection

There were a number of configuration errors in the scripts that were provided for this lab. Use the space below to write a brief description of the errors that you found.

_____

_____

_____

_____

_____

_____

_____

_____

Task 7: Documentation

On each router, capture output from the following commands to a text (.txt) file and save for future reference:

- **show running-config**
- **show ip route**
- **show ip interface brief**
- **show ip protocols**

If you need to review the procedures for capturing command output, refer to Lab 1.5.1.

Task 8: Clean Up

Erase the configurations and reload the routers. Disconnect and store the cabling. For PC hosts that are normally connected to other networks (such as the school LAN or to the Internet), reconnect the appropriate cabling and restore the TCP/IP settings.