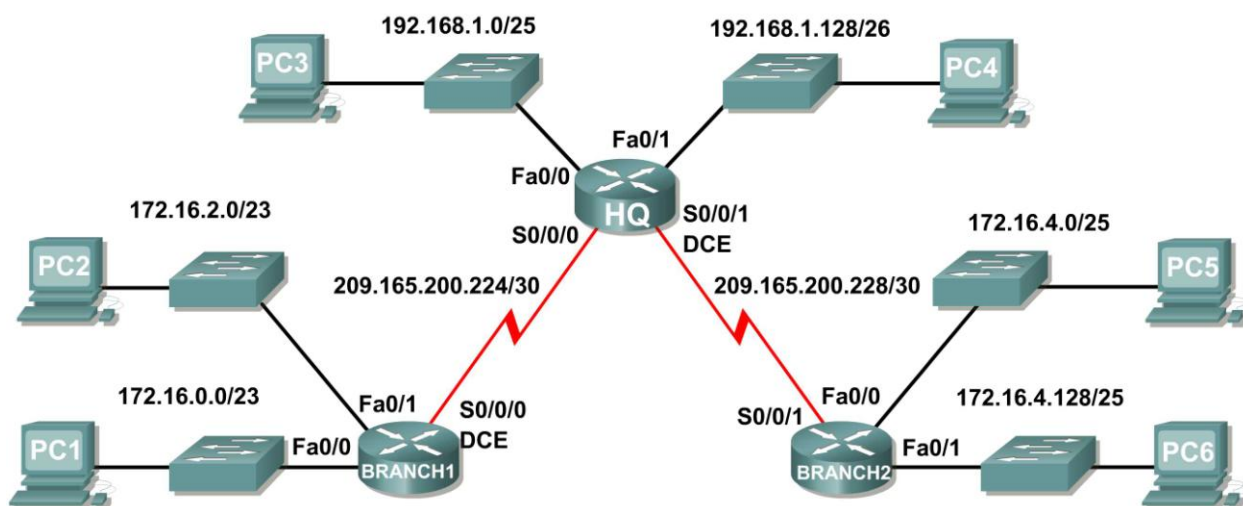


Lab 7.5.3: RIPv2 Troubleshooting Lab

Topology Diagram



Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
HQ	Fa0/0	192.168.1.1	255.255.255.128	N/A
	Fa0/1	192.168.1.129	255.255.255.192	N/A
	S0/0/0	209.165.200.225	255.255.255.252	N/A
	S0/0/1	209.165.200.229	255.255.255.252	N/A
BRANCH1	Fa0/0	172.16.0.1	255.255.254.0	N/A
	Fa0/1	172.16.2.1	255.255.254.0	N/A
	S0/0/0	209.165.200.226	255.255.255.252	N/A
BRANCH2	Fa0/0	172.16.4.1	255.255.255.128	N/A
	Fa0/1	172.16.4.129	255.255.255.128	N/A
	S0/0/1	209.165.200.230	255.255.255.252	N/A
PC1	NIC	172.16.0.10	255.255.254.0	172.16.0.1
PC2	NIC	172.16.2.10	255.255.254.0	172.16.2.1
PC3	NIC	192.168.1.10	255.255.255.128	192.168.1.1
PC4	NIC	192.168.1.138	255.255.255.192	192.168.1.129
PC5	NIC	172.16.4.10	255.255.255.128	172.16.4.1
PC6	NIC	172.16.4.138	255.255.255.128	172.16.4.129

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.
- 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:

- RIPv2 routing is configured on the BRANCH1 router.
- RIPv2 routing is configured on the BRANCH2 router.
- RIPv2 routing is configured on the HQ router.
- RIP updates must be disabled on the BRANCH1, BRANCH2, and HQ LAN interfaces.

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 the 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 BRANCH1 router:

```
hostname BRANCH1
!
interface FastEthernet0/0
 ip address 172.16.0.1 255.255.254.0
 duplex auto
 speed auto
 no shutdown
!
interface FastEthernet0/1
 ip address 172.16.2.1 255.255.254.0
 duplex auto
```

```
    speed auto
    no shutdown
!
interface Serial0/0/0
 ip address 209.165.200.226 255.255.255.252
 clock rate 64000
 no shutdown
!
router rip
passive-interface FastEthernet0/0
passive-interface FastEthernet0/1
 network 172.16.0.0
 network 209.165.200.0
!
ip classless
!
line con 0
line vty 0 4
 login
!
end
```

Step 2: Load the following script onto the BRANCH2 router.

```
hostname BRANCH2
!
interface FastEthernet0/0
 ip address 172.16.4.129 255.255.255.128
 duplex auto
 speed auto
 no shutdown
!
interface FastEthernet0/1
 ip address 172.16.4.1 255.255.255.128
 duplex auto
 speed auto
 no shutdown
!
interface Serial0/0/1
 ip address 209.165.200.230 255.255.255.252
 no shutdown
!
router rip
 version 2
passive-interface FastEthernet0/0
passive-interface FastEthernet0/1
 network 209.165.200.0
!
ip classless
!
line con 0
line vty 0 4
 login
!
end
```

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

```
hostname HQ
!
interface FastEthernet0/0
 ip address 192.168.1.1 255.255.255.128
 duplex auto
 speed auto
 no shutdown
!
interface FastEthernet0/1
 ip address 192.168.1.129 255.255.255.192
 duplex auto
 speed auto
 no shutdown
!
interface Serial0/0/0
 ip address 209.165.200.225 255.255.255.252
 no shutdown
!
interface Serial0/0/1
 ip address 209.165.200.229 255.255.255.252
 no shutdown
!
router rip
 version 2
 passive-interface FastEthernet0/0
 passive-interface FastEthernet0/1
 network 192.168.1.0
 network 209.165.200.0
!
ip classless
!
line con 0
line vty 0 4
 login
!
end
```

Task 3: Troubleshoot the BRANCH1 Router

Step 1: Begin troubleshooting at the Host connected to BRANCH1.

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

From the host PC1, is it possible to ping PC3? **no**

From the host PC1, is it possible to ping PC5? **no**

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

Step 2: Examine BRANCH1 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 configuration of the interfaces? **NO**

If there are any problems with the configuration 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? **No**

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

Step 5: Troubleshoot the routing configuration on BRANCH1.

What networks and routes are shown in the routing table?

172.16.0.0/23 is subnetted, 2 subnets
C 172.16.0.0 is directly connected, FastEthernet0/0
C 172.16.2.0 is directly connected, FastEthernet0/1
R 192.168.1.0/24 [120/1] via 209.165.200.225, 00:00:11, Serial0/0/0
209.165.200.0/30 is subnetted, 2 subnets
C 209.165.200.224 is directly connected, Serial0/0/0
R 209.165.200.228 [120/1] via 209.165.200.225, 00:00:11, Serial0/0/0

Are there any problems with the routing table? **No**

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

Are there any problems with the routing table that could be due to errors on other parts of the network?

What networks are included in the RIP updates being sent from BRANCH1?

- **172.16.0.0 /23**
- **172.16.2.0 /23**

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

The Version is set by default in Version 1. It has to be Version 2.

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

Enable----> configure terminal ----> Router rip ----> Version 2

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? **No**

Does the information included in the RIP updates that are sent out indicate any configuration errors? **No**

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

What networks and routes are shown in the routing table?

172.16.0.0/16 is variably subnetted, 4 subnets, 2 masks
C 172.16.0.0/23 is directly connected, FastEthernet0/0
C 172.16.2.0/23 is directly connected, FastEthernet0/1
R 172.16.4.0/25 [120/2] via 209.165.200.225, 00:00:17, Serial0/0/0
R 172.16.4.128/25 [120/2] via 209.165.200.225, 00:00:17, Serial0/0/0
192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
R 192.168.1.0/25 [120/1] via 209.165.200.225, 00:00:17, Serial0/0/0
R 192.168.1.128/26 [120/1] via 209.165.200.225, 00:00:17, Serial0/0/0
209.165.200.0/30 is subnetted, 2 subnets
C 209.165.200.224 is directly connected, Serial0/0/0

R 209.165.200.228 [120/1] via 209.165.200.225, 00:00:17, Serial0/0/0
Step 8: Attempt to ping between the hosts again.

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

From the host PC1, is it possible to ping PC4? **yes**

From the host PC1, is it possible to ping the Serial 0/0/1 interface of the HQ router? **yes**

Task 4: Troubleshoot HQ

Step 1: Begin troubleshooting at the host PC3.

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

From the host PC3, is it possible to ping PC5? **no**

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

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 configuration of the interfaces? **No**

If there are any problems with the configuration 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: Troubleshoot the routing configuration on HQ.

What networks and routes are shown in the routing table?

192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.1.0/25 is directly connected, FastEthernet0/0
C 192.168.1.128/26 is directly connected, FastEthernet0/1
209.165.200.0/30 is subnetted, 2 subnets
C 209.165.200.224 is directly connected, Serial0/0/0
C 209.165.200.228 is directly connected, Serial0/0/1

Are there any problems with the routing table?

No routes to Branc1 Lan and Branch2 Lan.

If there are any problems with the routing table, record any commands that will be necessary to correct the configuration errors. **No**

What networks are included in the RIP updates?

- **192.168.1.0 /24**
- **209.165.200.224 /30**

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

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

Step 5: If you have recorded any commands above, apply them to the router configuration now.

Step 6: 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 on HQ? _____

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

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

Step 7: 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 PC5? _____

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

Task 5: Troubleshoot BRANCH2

Step 1: Begin troubleshooting at the Host PC5.

From the host PC5, is it possible to ping PC6? no

From the host PC5, is it possible to ping PC1? no

From the host PC3, is it possible to ping the default gateway? no

Step 2: Examine BRANCH2 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 configuration of the interfaces?

Wrong Ip addresses to interface Fa0/0 and Fa0/1

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

• configure terminal
• interface FastEthernet0/0
• no ip address
• interface FastEthernet0/1
• no ip address
• interface FastEthernet0/0
• ip address 172.16.4.1 255.255.255.128
• no shutdown
• interface FastEthernet0/1
• ip address 172.16.4.129 255.255.255.128
• no shutdown

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? No

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

Step 5: Troubleshoot the routing configuration on BRANCH2.

Begin by viewing the routing table.

What networks and routes are shown in the routing table?

172.16.0.0/25 is subnetted, 2 subnets
C 172.16.4.0 is directly connected, FastEthernet0/1
C 172.16.4.128 is directly connected, FastEthernet0/0
R 192.168.1.0/24 [120/1] via 209.165.200.229, 00:00:13, Serial0/0/1
209.165.200.0/30 is subnetted, 2 subnets
R 209.165.200.224 [120/1] via 209.165.200.229, 00:00:13, Serial0/0/1
C 209.165.200.228 is directly connected, Serial0/0/1

Step 6: Examine the routes that are being sent out in the routing updates from BRANCH2.

Are there any problems with these routing updates?

No network of Branch2 Lan in the routing updates.

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

- **configure terminal**
- **router rip**
- **network 172.16.0.0**

Step 7: If you have recorded any commands above, apply them to the router configuration now.

Step 8: Attempt to ping the hosts again.

From the host PC5, is it possible to ping PC6? **yes**

From the host PC5, is it possible to ping PC1? **yes**

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

From the HQ router, is it possible to ping PC1? **yes**

From the HQ router, is it possible to ping PC5? **yes**

Step 9: Examine the routing updates that are being received on BRANCH2.

What networks are being received in the RIP updates?

- **172.16.0.0 /16**
- **192.168.1.0 /24**
- **209.165.200.224 /30**

Are there any problems with these routing updates?

Problem with auto-summary. Auto summary has to be disabled.

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

- **configure terminal**
- **router rip**
- **no auto-summary**

Do these commands need to be applied only to BRANCH2, or do they also need to be applied to any other routers in the network? **Yes**

Step 10: If you have recorded any commands above, apply them to the router configuration now.

Step 11: View the routing information.

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

Does the information in routing table or routing updates indicate any configuration errors? **No**

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

Step 12: Attempt to ping between the hosts again.

From the host PC5, is it possible to ping PC6? **yes**

From the host PC5, is it possible to ping PC1? **yes**

From the host PC5, is it possible to ping PC3? **yes**

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

From the HQ router, is it possible to ping PC1? **yes**

From the HQ router, is it possible to ping PC5? **yes**

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 the following command output 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.