

Lab 8 - Troubleshoot Static and Default Routes

Addressing Table

Device	Interface	IP Addresses
R1	G0/0	172.31.1.1/25
	S0/0/0	172.31.1.194/30
R2	S0/0/0	172.31.1.193/30
	S0/0/1	192.168.1.1/30
R3	G0/0	172.32.0.1/24
	S0/0/0	192.168.1.2/30
	S0/0/1	172.31.1.197/30
R4	G0/0	172.31.1.129/26
	S0/0/1	172.31.1.198/30
PC1	NIC	172.31.1.126/25
PC2	NIC	172.32.0.254/24
Server	NIC	172.31.1.190/26

Objectives

In this activity you will troubleshoot static and default routes and repair any errors that you find.

- Configure IPv4 default routes and static routes to internal LANs
- Troubleshoot IPv4 static and default routes
- Correct IPv4 static and default routes
- Correct IPv4 default routes

Background / Scenario

A newly hired network technician is attempting to preconfigure a simple topology that will be delivered to a customer. The technician has not been able to establish connectivity between the three LANs. You have been asked to troubleshoot the topology and verify connectivity between the hosts on the three LANs over.

Instructions

The subnet masks in this lab are all represented using the prefix length (e.g. /24), also known as "slash notation". When configuring a static route, the dotted decimal version of the subnet mask (e.g. 255.255.255.0) will need to be used instead.

You are expected to be able to convert all of the subnet masks given in the topology from prefix length notation to dotted decimal format. The following questions will ask you to do this.

QUESTION 1: What is the subnet mask for the 172.31.1.0/25 network in dotted decimal format?

QUESTION 2: What is the subnet mask for the 172.31.1.192/30 network in dotted decimal format?

QUESTION 3: What is the subnet mask for the 172.32.0.0/24 network in dotted decimal format?

QUESTION 4: What is the subnet mask for the 172.31.1.128/26 network in dotted decimal format?

Before proceeding, go to the “Lab 8 - Troubleshoot Static and Default Routes - QUESTIONS” quiz on the Moodle page and enter your answers for questions 1-4. Leave the quiz open while you complete the rest of the lab sheet.

Step 1: Configure IPv4 Static Default Routes

The static routes on R1, R3 and R4 have already been configured. You are just required to complete the static routes on R2.

On **R2**, configure an IPv4 default static route specifying the router's **exit interface**. This primary default route should be through router **R1**.

Step 2: Configure IPv4 Static Routes to the Internal LANs

In this part of the lab you will configure static routes from the R2 router to the internal LANs.

- On **R2**, configure a **next hop** IPv4 static route to the **172.32.0.0/24** network through R3.
- On **R2**, configure a static route to the **172.31.1.196/30** network through **R3** using the **exit interface**.
- On **R2**, configure a static route to the **172.31.1.128/26** network through **R3** using the **exit interface**.

Step 3: Locate the problems with the Static Routes on R1, R3 & R4

There are a total of **four** errors in the configuration of the static routes on R1, R3 and R4.

Use the ping and traceroute commands to try to locate the possible problems.

Also, examine the static routes that have been configured on the 3 routers using the **show run** command as well as the current static routes in the routing tables on each router using the **show ip route static**.

QUESTION 5: Based on the **show ip route static** output on R1, are there any errors?

QUESTION 6: Based on the **show ip route static** output on R3, are there any errors?

QUESTION 7: Based on the **show ip route static** output on R4, are there any errors?

Before proceeding, return to the quiz on the Moodle page and enter your answers for questions 5-7. Leave the quiz open while you complete the rest of the lab sheet.

Step 4: Repair the Problems

Configure the devices so that full connectivity exists between the hosts on the LANs over IPv4.

Note: Your task is to establish connectivity using the existing static route design. Changing the types of static routes used will result in a loss of points. In other words, for example, if an existing route uses a *next hop address* rather than an *exit interface* in the routing table entry, any required corrections made should also use a next hop address too.

If you have correctly configured all parts of the lab your activity score should now be showing as 100%. If so, click on “check results” in the activity window. Return to the Moodle quiz one last time and enter the code into the appropriate question box (Q8) of the quiz.

You have completed the lab – please submit the Moodle quiz.