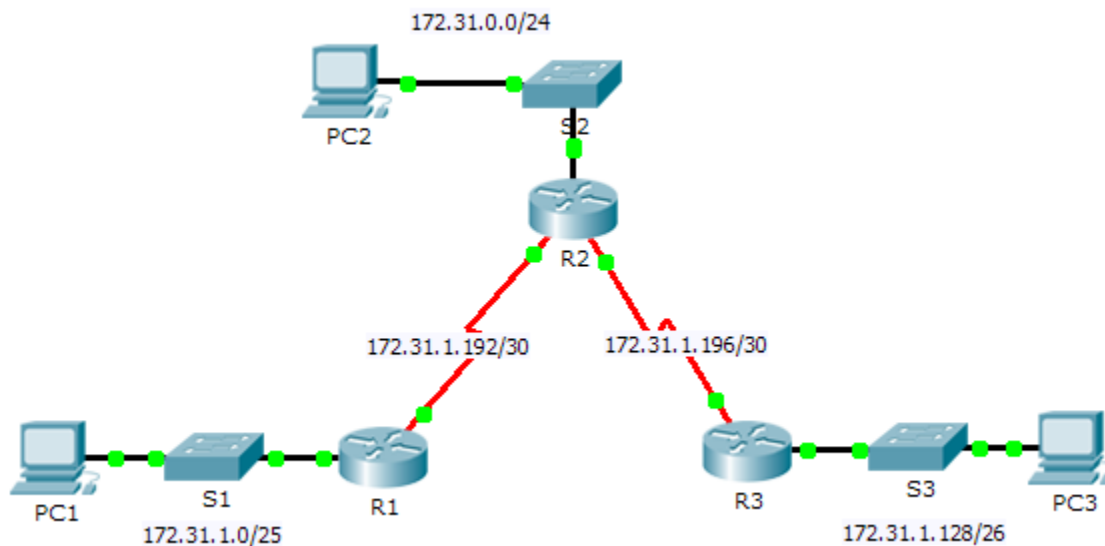


Packet Tracer - Configuring IPv4 Static and Default Routes

Topology



Addressing Table

| Device | Interface | IPv4 Address | Subnet Mask | Default Gateway |
|--------|-----------|--------------|-----------------|-----------------|
| R1 | G0/0 | 172.31.1.1 | 255.255.255.128 | N/A |
| | S0/0/0 | 172.31.1.194 | 255.255.255.252 | N/A |
| R2 | G0/0 | 172.31.0.1 | 255.255.255.0 | N/A |
| | S0/0/0 | 172.31.1.193 | 255.255.255.252 | N/A |
| | S0/0/1 | 172.31.1.197 | 255.255.255.252 | N/A |
| R3 | G0/0 | 172.31.1.129 | 255.255.255.192 | N/A |
| | S0/0/1 | 172.31.1.198 | 255.255.255.252 | N/A |
| PC1 | NIC | 172.31.1.126 | 255.255.255.128 | 172.31.1.1 |
| PC2 | NIC | 172.31.0.254 | 255.255.255.0 | 172.31.0.1 |
| PC3 | NIC | 172.31.1.190 | 255.255.255.192 | 172.31.1.129 |

Objectives

Part 1: Examine the Network and Evaluate the Need for Static Routing

Part 2: Configure Static and Default Routes

Part 3: Verify Connectivity

Background

In this activity, you will configure static and default routes. A static route is a route that is entered manually by the network administrator to create a reliable and safe route. There are four different static routes that are used in this activity: a recursive static route, a directly attached static route, a fully specified static route, and a default route.

Part 1: Examine the Network and Evaluate the Need for Static Routing

- a. Looking at the topology diagram, how many networks are there in total?
- b. How many networks are directly connected to R1, R2, and R3?
- c. How many static routes are required by each router to reach networks that are not directly connected?
- d. Test connectivity to the R2 and R3 LANs by pinging PC2 and PC3 from PC1.
Why were you unsuccessful?

Part 2: Configure Static and Default Routes

Step 1: Configure recursive static routes on R1.

- a. What is recursive static route?
- b. Why does a recursive static route require two routing table lookups?
- c. Configure a recursive static route to every network not directly connected to R1, including the WAN link between R2 and R3.
- d. Test connectivity to the R2 LAN and ping the IP addresses of PC2 and PC3.
Why were you unsuccessful?

Step 2: Configure directly attached static routes on R2.

- a. How does a directly attached static route differ from a recursive static route?
- b. Configure a directly attached static route from R2 to every network not directly connected.
- c. Which command only displays directly connected networks?
- d. Which command only displays the static routes listed in the routing table?
- e. When viewing the entire routing table, how can you distinguish between a directly attached static route and a directly connected network?

Step 3: Configure a default route on R3.

- a. How does a default route differ from a regular static route?
- b. Configure a default route on R3 so that every network not directly connected is reachable.
- c. How is a static route displayed in the routing table?

Step 4: Document the commands for fully specified routes.

Note: Packet Tracer does not currently support configuring fully specified static routes. Therefore, in this step, document the configuration for fully specified routes.

- a. Explain a fully specified route.
- b. Which command provides a fully specified static route from R3 to the R2 LAN?
- c. Write a fully specified route from R3 to the network between R2 and R1. Do not configure the route; just calculate it.
- d. Write a fully specified static route from R3 to the R1 LAN. Do not configure the route; just calculate it.

Step 5: Verify static route configurations.

Use the appropriate **show** commands to verify correct configurations.

Which **show** commands can you use to verify that the static routes are configured correctly?

Part 3: Verify Connectivity

Every device should now be able to ping every other device. If not, review your static and default route configurations.

Suggested Scoring Rubric

| Activity Section | Question Location | Possible Points | Earned Points |
|--|-------------------|-----------------|---------------|
| Part 1: Examine the Network and Evaluate the Need for Static Routing | a - d | 10 | |
| Part 1 Total | | 10 | |
| Part 2: Configure Static and Default Routes | Step 1 | 7 | |
| | Step 2 | 7 | |
| | Step 3 | 3 | |
| | Step 4 | 10 | |
| | Step 5 | 3 | |
| Part 2 Total | | 30 | |
| Packet Tracer Score | | 60 | |
| Total Score | | 100 | |