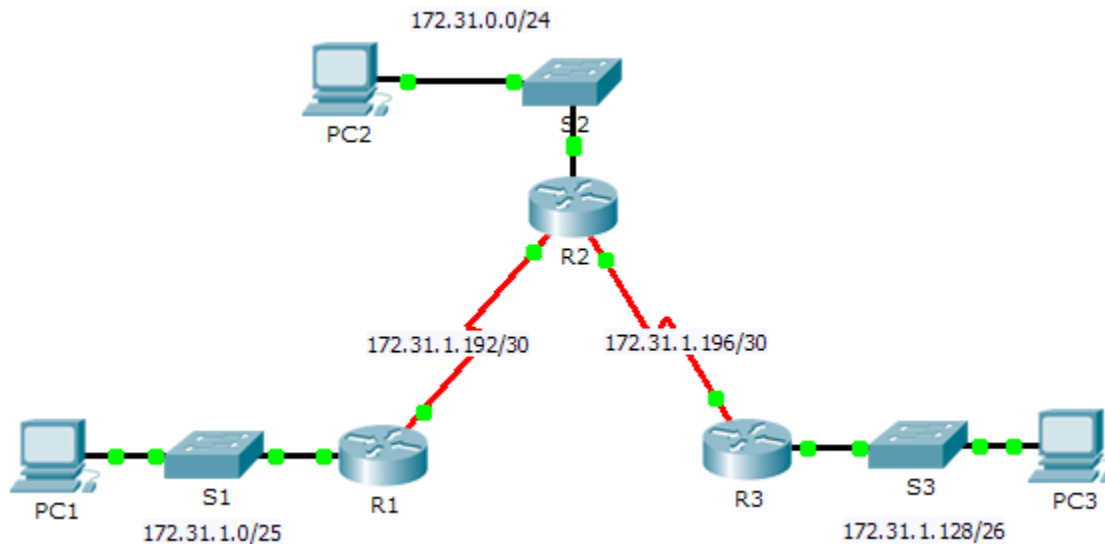


# Packet Tracer - Configuring IPv4 Static and Default Routes

## 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              |               |
| <b>Part 1 Total</b>  |                   | <b>10</b>       |               |
| Part 2: Configure Static and Default Routes                          | Step 1            | 7               |               |
|  | Step 2            | 7               |               |
|  | Step 3            | 3               |               |
|  | Step 4            | 10              |               |
|  | Step 5            | 3               |               |
| <b>Part 2 Total</b>  |                   | <b>30</b>       |               |
| <b>Packet Tracer Score</b>   |                   | <b>60</b>       |               |
| <b>Total Score</b>   |                   | <b>100</b>      |               |