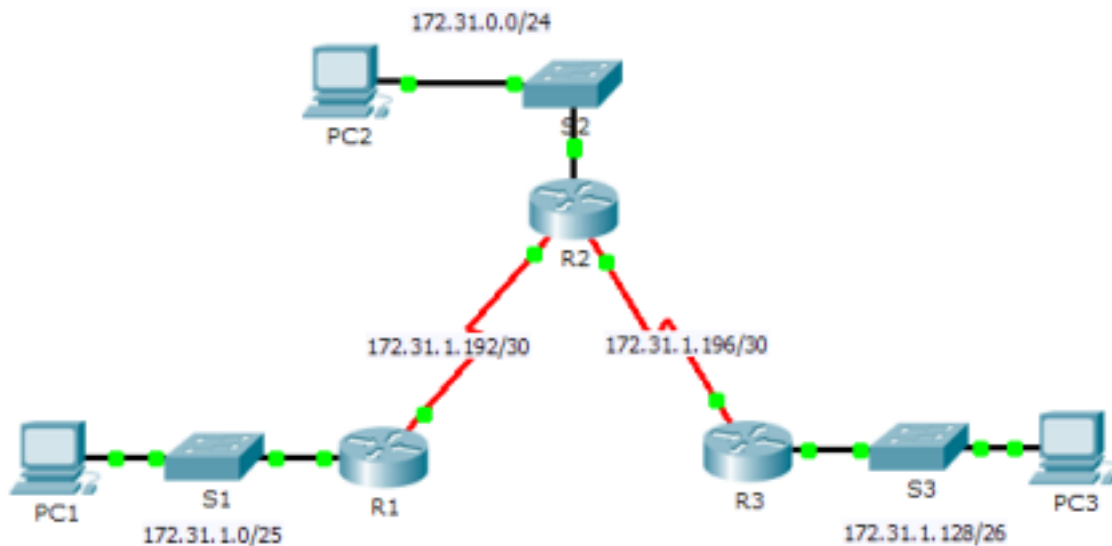


Packet Tracer - Configuring IPv4 Static and Default Routes

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

Packet Tracer - Configuring IPv4 Static and Default Routes

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

- Looking at the topology diagram, how many networks are there in total? **5**
- How many networks are directly connected to R1, R2, and R3? **R1 → 2, R2 → 3, R3 → 2**
 - How many static routes are required by each router to reach networks that are not directly connected?
R1 → 3, R2 → 2, R3 → 3
- Test connectivity to the R2 and R3 LANs by pinging PC2 and PC3 from PC1.
Why were you unsuccessful? **PC 2 and PC 3 belong to another network**

Part 2: Configure Static and Default Routes

Step 1: Configure recursive static routes on R1.

- What is a recursive static route? **A recursive static route is one in which the router is instructed where to deliver the packet (next-hop IP address) In order to get there it must follow the given routing table**
- Why does a recursive static route require two routing table lookups? **One is to find the next-hop IP and another one is to determine how to reach that next hop.**
- Configure a recursive static route to every network not directly connected to R1, including the WAN link between R2 and R3.
- Test connectivity to the R2 LAN and ping the IP addresses of PC2 and PC3.
Why were you unsuccessful? **Because R2 is yet to be configured.**

Step 2: Configure directly attached static routes on R2.

- How does a directly attached static route differ from a recursive static route? **A directly attached static route specifies the outgoing interface on the other hand a recursive static route specifies a next-hop IP which requires an additional lookup to determine the interface.**
- Configure a directly attached static route from R2 to every network not directly connected.
- Which command only displays directly connected networks? **show ip route connected**
- Which command only displays the static routes listed in the routing table? **show ip route static**

- e. When viewing the entire routing table, how can you distinguish between a directly attached static route and a directly connected network? **A directly attached static route is marked with "S" and a directly connected network is marked with "C"**

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Packet Tracer - Configuring IPv4 Static and Default Routes

Step 3: Configure a default route on R3.

- a. How does a default route differ from a regular static route? **A default route handles traffic meant for unknown networks whereas a regular static route directs traffic to a specific network.**
- 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? **with "S" flag pointing it's a manually configured route.**

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. **A fully specified route consists of all the necessary information to reach a destination such as the destination network, the next-hop IP address and the exit interface**
- b. Which command provides a fully specified static route from R3 to the R2 LAN? **ip route 172.31.0.0 255.255.255.0 172.31.1.197 S0/0/1**
- c. Write a fully specified route from R3 to the network between R2 and R1. Do not configure the route; just calculate it. **ip route 172.31.1.192 255.255.255.252 172.31.1.197 S0/0/1**
- d. Write a fully specified static route from R3 to the R1 LAN. Do not configure the route; just calculate it. **ip route 172.31.1.0 255.255.255.128 172.31.1.197 S0/0/1**

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? **show ip route, show ip route connected, show ip route static**

Part 3: Verify Connectivity

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

Packet Tracer - Configuring IPv4 Static and Default Routes

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	