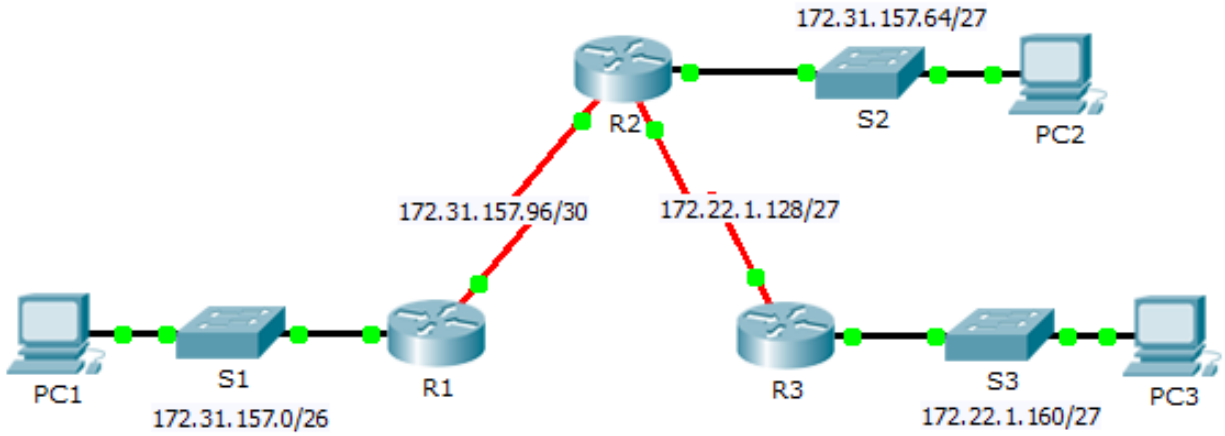
Packet Tracer - Configuring IPv4 Route Summarization - Scenario 1

Topology



Addressing Table

Device	Interface	IPv4 Address	Subnet Mask	Default Gateway
R1	G0/0	172.31.157.1	255.255.255.192	N/A
	S0/0/0	172.31.157.97	255.255.255.252	N/A
R2	G0/0	172.31.157.65	255.255.255.224	N/A
	S0/0/0	172.31.157.98	255.255.255.252	N/A
	S0/0/1	172.22.1.129	255.255.255.224	N/A
R3	G0/0	172.22.1.161	255.255.255.224	N/A
	S0/0/1	172.22.1.158	255.255.255.224	N/A
PC1	NIC	172.31.157.62	255.255.255.192	172.31.157.1
PC2	NIC	172.31.157.94	255.255.255.224	172.31.157.65
PC3	NIC	172.22.1.190	255.255.255.224	172.22.1.161

Objectives

Part 1: Calculate Summary Routes

Part 2: Configure Summary Routes

Part 3: Verify Connectivity

Background

In this activity, you will calculate and configure summary routes. Router summarization, also known as route aggregation, is the process of advertising a contiguous set of addresses as a single address.

Part 1: Calculate Summary Routes

Step 1: Calculate a summary route on R1 to reach LANs on R3.

a. List the 172.22.1.128/27 and 172.22.1.160/27 networks in binary format.

```
172.22.1.128: 10101100.00010110.00000001.10000000
172.22.1.160: 10101100.00010110.00000001.10100000
```

b. Count the left-most matching bits to determine the mask for the summary route. They have 26 left-most bits in common.

```
172.22.1.128: 10101100.00010110.00000001.10000000
172.22.1.160: 10101100.00010110.00000001.10100000
```

c. Copy the matching bits and fill in the remaining bits with zeros to determine the summarized network address.

```
10101100.00010110.00000001.10000000
```

d. What is the summarized network address and subnet mask? 172.22.1.128, 255.255.255.192

Step 2: Calculate a summary route on R3 to reach LANs on R1 and R2.

a. Calculate the summary route for the 172.31.157.0/26, 172.31.157.64/27, and 172.31.157.96/30 networks. List the networks in binary format. Then, count the left-most matching bits to determine the mask for the summary route.

```
10101100.00011111.10011101.00000000
10101100.00011111.10011101.01000000
10101100.00011111.10011101.01100000
```

Remember, any bits to the left of the line change to '1' for subnet mask. Right of the line is for the host addresses.

b. What is the summarized network address and subnet mask? 172.31.157.0, 255.255.255.128

Part 2: Configure Summary Routes

Step 1: Configure a summary route for R1.

Configure the recursive summary route that you calculated in Part 1, Step 1.

Step 2: Configure a summary route for R3.

Configure the directly attached summary route that you calculated in Part 1, Step 2.

Part 3: Verify Connectivity

Verify that all PC hosts and routers can ping other PC hosts and routers in the topology. If not, troubleshoot and correct the issues.