

Version:1.0 StartHTML:0000000107 EndHTML:0000101687

StartFragment:0000000127 EndFragment:0000101669

Packet Tracer - Subnet Scenario 2

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0	172.31.1.1	255.255.255.240	N/A
	S0/0/0	172.31.1.65	255.255.255.240	N/A
R2	G0/0	172.31.1.17	255.255.255.240	N/A
	S0/0/0	172.31.1.78	255.255.255.240	N/A
	S0/0/1	172.31.1.81	255.255.255.240	N/A
R3	G0/0	172.31.1.33	255.255.255.240	N/A
	S0/0/0	172.31.1.94	255.255.255.240	N/A
	S0/0/1	172.31.1.97	255.255.255.240	N/A
R4	G0/0	172.31.1.49	255.255.255.240	N/A
	S0/0/0	172.31.1.110	255.255.255.240	N/A
S1	VLAN 1	172.31.1.2	255.255.255.240	172.31.1.49
S2	VLAN 1	172.31.1.18	255.255.255.240	172.31.1.1
S3	VLAN 1	172.31.1.34	255.255.255.240	172.31.1.18
S4	VLAN 1	172.31.1.50	255.255.255.240	172.31.1.34
PC1	NIC	172.31.1.14	255.255.255.240	172.31.1.1
PC2	NIC	172.31.1.30	255.255.255.240	172.31.1.17
PC3	NIC	172.31.1.46	255.255.255.240	172.31.1.33
PC4	NIC	172.31.1.62	255.255.255.240	172.31.1.49

Objectives

Part 1: Design an IP Addressing Scheme

Part 2: Assign IP Addresses to Network Devices and Verify Connectivity

Scenario

In this activity, you are given the network address of 172.31.1.0 /24 to subnet and provide the IP addressing for the network shown in the Topology. The required host addresses for each WAN and LAN link are labeled in the topology.

Part 1: Design an IP Addressing Scheme

Step 1: Subnet the 172.31.1.0/24 network based on the maximum number of hosts required by the largest subnet.

- Based on the topology, how many subnets are needed?

- b. How many bits must be borrowed to support the number of subnets in the topology table?
- c. How many subnets does this create?
- d. How many usable host addresses does this create per subnet?

Note: If your answer is less than the 14 maximum hosts required for the R3 LAN, then you borrowed too many bits.

- e. Calculate the binary value for the first five subnets. Subnet zero is already shown.

Net 0: 172 . 31 . 1 . 0 0 0 0 0 0 0 0

Net 1: 172 . 31 . 1 . ____ ____ ____ ____ ____ ____ ____ ____

Net 2: 172 . 31 . 1 . ____ ____ ____ ____ ____ ____ ____ ____

Net 3: 172 . 31 . 1 . ____ ____ ____ ____ ____ ____ ____ ____

Net 4: 172 . 31 . 1 . ____ ____ ____ ____ ____ ____ ____ ____

- f. Calculate the binary and decimal value of the new subnet mask.

11111111.11111111.11111111. ____ ____ ____ ____
255 . 255 . 255 . ____

- g. Complete the **Subnet Table**, listing all available subnets, the first and last usable host address, and the broadcast address. The first subnet is done for you. Repeat until all addresses are listed.

Note: You may not need to use all rows.

Subnet Table

Subnet Number	Subnet IP	First Usable Host IP	Last Usable Host IP	Broadcast Address
0	172.31.1.0	172.31.1.1	172.31.1.14	172.31.1.15
1	172.31.1.16	172.31.1.17	172.31.1.30	172.31.1.31
2	172.31.1.32	172.31.1.33	172.31.1.46	172.31.1.47
3	172.31.1.48	172.31.1.49	172.31.1.62	172.31.1.63
4	172.31.1.64	172.31.1.65	172.31.1.78	172.31.1.79
5	172.31.1.80	172.31.1.81	172.31.1.94	172.31.1.95
6	172.31.1.96	172.31.1.97	172.31.1.110	172.31.1.111
7				
8				
9				
10				
11				
12				

13				
14				
15				

Step 2: Assign the subnets to the network shown in the topology.

When assigning the subnets, keep in mind that routing is necessary to allow information to be sent throughout the network.

- a. Assign Subnet 0 to the R1 LAN:
- b. Assign Subnet 1 to the R2 LAN:
- c. Assign Subnet 2 to the R3 LAN:
- d. Assign Subnet 3 to the R4 LAN:
- e. Assign Subnet 4 to the link between
- f. Assign Subnet 5 to the link between
- g. Assign Subnet 6 to the link between

Step 3: Document the addressing scheme.

Complete the **Addressing Table** using the following guidelines:

- a. Assign the first usable IP addresses to routers for each of the LAN links.
- b. Use the following method to assign WAN link IP addresses:
 - For the WAN link between R1 and R2, assign the first usable IP address to R1 and last usable IP address R2.
 - For the WAN link between R2 and R3, assign the first usable IP address to R2 and last usable IP address R3.
 - For the WAN link between R3 and R4, assign the first usable IP address to R3 and last usable IP address R4.
- c. Assign the second usable IP addresses to the switches.
- d. Assign the last usable IP addresses to the hosts.

Part 2: Assign IP Addresses to Network Devices and Verify Connectivity

Most of the IP addressing is already configured on this network. Implement the following steps to complete the addressing configuration.

Step 1: Configure IP addressing on R1 and R2 LAN interfaces.

Step 2: Configure IP addressing on S3, including the default gateway.

Step 3: Configure IP addressing on PC4, including the default gateway.

Step 4: Verify connectivity.

You can only verify connectivity from R1, R2, S3, and PC4. However, you should be able to ping every IP address listed in the **Addressing Table**.