Networking Academy

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Packet Tracer - VLSM Design and Implementation Practice Topology

You will receive one of three possible topologies.

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
Remote-Site1	G0/0	*10.11.48.97*	*255.255.255.240*	N/A
	G0/1	*10.11.48.65*	*255.255.255.224*	N/A
	S0/0/0	*10.11.48.121*	*255.255.255.252*	N/A
Remote-Site2	G0/0	*10.11.48.113*	*255.255.255.248*	N/A
	G0/1	*10.11.48.1*	*255.255.255.192*	N/A
	S0/0/0	*10.11.48.122*	*255.255.255.252*	N/A
Sw1	VLAN 1	*10.11.48.98*	*255.255.255.240*	*10.11.48.97*
Sw2	VLAN 1	*10.11.48.66*	*255.255.255.224*	*10.11.48.65*
Sw3	VLAN 1	*10.11.48.114*	*255.255.255.248*	*10.11.48.113*
Sw4	VLAN 1	*10.11.48.2*	*255.255.255.192*	*10.11.48.1*
User-1	NIC	*10.11.48.110*	*255.255.255.240*	*10.11.48.97*
User-2	NIC	*10.11.48.94*	*255.255.255.224*	*10.11.48.65*
User-3	NIC	*10.11.48.100*	*255.255.255.248*	*10.11.48.113*
User-4	NIC	*10.11.48.62*	*255.255.255.192*	*10.11.48.1*

Objectives

Part 1: Examine the Network Requirements

Part 2: Design the VLSM Addressing Scheme

Part 3: Assign IP Addresses to Devices and Verify Connectivity

Background

In this activity, you are given a /24 network address to use to design a VLSM addressing scheme. Based on a set of requirements, you will assign subnets and addressing, configure devices and verify connectivity.

Instructions

Part 1: Examine the Network Requirements

Step 1: Determine the number of subnets needed.

You will subnet the network address ***10.11.48.0/24***. The network has the following requirements:

- ***Sw1*** LAN will require ***14*** host IP addresses
- ***Sw2*** LAN will require ***30*** host IP addresses
- ***Sw3*** LAN will require ***6*** host IP addresses
- ***Sw4*** LAN will require ***60*** host IP addresses

How many subnets are needed in the network topology?

5

Step 2: Determine the subnet mask information for each subnet.

a. Which subnet mask will accommodate the number of IP addresses required for **Sw1**?
255.255.255.240/28

How many usable host addresses will this subnet support?

14 (10.11.48.97 – 10.11.48.110)

b. Which subnet mask will accommodate the number of IP addresses required for ***Sw2***?

255.255.255.224/27

How many usable host addresses will this subnet support?

30 (10.11.48.65 – 10.11.48.94)

c. Which subnet mask will accommodate the number of IP addresses required for **Sw3**?

255.255.255.248/29

How many usable host addresses will this subnet support?

6 (10.11.48.113 – 10.11.48.118)

d. Which subnet mask will accommodate the number of IP addresses required for ***Sw4***?
255.255.255.192/26

How many usable host addresses will this subnet support?

64 (10.11.48.1 – 10.11.48.62)

e. Which subnet mask will accommodate the number of IP addresses required for the connection between ***Remote-Site1*** and ***Remote-Site2***?

255.255.255.252/30

Part 2: Design the VLSM Addressing Scheme

Step 1: Divide the ***10.11.48.0/24*** network based on the number of hosts per subnet.

a. Use the first subnet to accommodate the largest LAN.

b. Use the second subnet to accommodate the second largest LAN.

c. Use the third subnet to accommodate the third largest LAN.

d. Use the fourth subnet to accommodate the fourth largest LAN.

e. Use the fifth subnet to accommodate the connection between ***Remote-Site1*** and ***Remote-Site2***.

Step 2: Document the VLSM subnets.

Complete the **Subnet Table**, listing the subnet descriptions (e.g. [[S1Name]] LAN), number of hosts needed, then network address for the subnet, the first usable host address, and the broadcast address. Repeat until all addresses are listed.

Subnet Table

Subnet Description	Number of Hosts Needed	Network Address/CIDR	First Usable Host Address	Broadcast Address
Sw4 LAN	***60***	***10.11.48.0/26***	***10.11.48.1***	***10.11.48.63***
Sw2 LAN	***30***	***10.11.48.64/27***	***10.11.48.65***	***10.11.48.95***
Sw1 LAN	***14***	***10.11.48.96/28***	***10.11.48.97***	***10.11.48.111***
Sw3 LAN	***6***	***10.11.48.112/29***	***10.11.48.113***	***10.11.48.119***
WAN Link	***2***	***10.11.48.120/30***	***10.11.48.121***	***10.11.48.123***

Step 3: Document the addressing scheme.

a. Assign the first usable IP addresses to **Remote-Site1**for the two LAN links and the WAN link.

b. Assign the first usable IP addresses to **Remote-Site2** for the two LAN links. Assign the last usable IP address for the WAN link.

c. Assign the second usable IP addresses to the switches.

d. Assign the last usable IP addresses to the hosts.

Part 3: Assign IP Addresses to 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 the Remote-Site1 router LAN interfaces.

Step 2: Configure IP addressing on the Sw3, switch including the default gateway.

Step 3: Configure IP addressing on User-4, including the default gateway.

Step 4: Verify connectivity.

You can only verify connectivity from Remote-Site1, Sw3, and User-4. However, you should be able to ping every IP address listed in the **Addressing Table**.