Packet Tracer - Designing and Implementing a VLSM Addressing Scheme

Topology

You will receive one of three possible topologies.

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
Building 1	G0/0	192.168.72.129	255.255.255.240	N/A
	G0/1	192.168.72.97	255.255.255.224	N/A
	S0/0/0	192.168.72.145	255.255.255.252	N/A
Building 2	G0/0	192.168.72.65	255.255.255.224	N/A
	G0/1	192.168.72.1	255.255.255.192	N/A
	S0/0/0	192.168.72.146	255.255.255.252	N/A
ASW-1	VLAN 1	192.168.72.128	255.255.255.240	192.168.72.129
ASW-2	VLAN 1	192.168.72.96	255.255.255.224	192.168.72.96
ASW-3	VLAN 1	192.168.72.64	255.255.255.224	192.168.72.64
ASW-4	VLAN 1	192.168.72.0	255.255.255.192	192.168.72.1
Host A	NIC	192.168.72.130	255.255.255.240	192.168.72.129
Host B	NIC	192.168.72.98	255.255.255.224	192.168.72.97
Host C	NIC	192.168.72.66	255.255.255.224	192.168.72.65
Host D	NIC	192.168.72.2	255.255.255.192	192.168.72.1

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.

Part 1: Examine the Network Requirements

Step 1: Determine the number of subnets needed.

You will subnet the network address 192.168.72.0   . The network has the following requirements:

- ASW1   LAN will require 7   host IP addresses
- ASW2   LAN will require 15   host IP addresses
- ASW3   LAN will require 29   host IP addresses
- ASW4   LAN will require 58   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 ASW1   ?

How many usable host addresses will this subnet support? 14

b. Which subnet mask will accommodate the number of IP addresses required for ASW2   ?

How many usable host addresses will this subnet support? 30

c. Which subnet mask will accommodate the number of IP addresses required for ASW3   ?

How many usable host addresses will this subnet support? 30

d. Which subnet mask will accommodate the number of IP addresses required for ASW4   ?

How many usable host addresses will this subnet support? 62

e. Which subnet mask will accommodate the number of IP addresses required for the connection between Building 1   and Building 2   ?

Part 2: Design the VLSM Addressing Scheme

Step 1: Divide the 192.168.72.0   . 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 Building 1   and Building 2   .

Step 2: Document the VLSM subnets.

Complete the **Subnet Table**, listing the subnet descriptions (e.g. ASW 1   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
ASW 4	58	192.168.72.0	192.168.72.1	192.168.72.63
ASW 3	29	192.168.72.64	192.168.72.65	192.168.72.95
ASW 2	15	192.168.72.96	192.168.72.97	192.168.72.127
ASW 1	7	192.168.72.128	192.168.72.129	192.168.72.143
Serial	2	192.168.72.144	192.168.72.145	192.168.72.147

Step 3: Document the addressing scheme.

a. Assign the first usable IP addresses to ethernet interfaces   for the two LAN links and the WAN link.

b. Assign the first usable IP addresses to ethernet interfaces   for the two LANs 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 Router   LAN interfaces.

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

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

Step 4: Verify connectivity.

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

Suggested Scoring Rubric

Activity Section	Question Location	Possible Points	Earned Points
Part 1: Examine the Network Requirements	Step 1	1	
	Step 2	4	
Part 1 Total		**5**	
Part 2: Design the VLSM Addressing Scheme			
Complete Subnet Table		25	
Document Addressing		40	
Part 2 Total		**65**	
Packet Tracer Score		**30**	
Total Score		**100**	

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