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	225.255.255.224	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	192.168.72.130	255.255.255.240	192.168.72.129
ASW-2	VLAN 1	192.168.72.98	255.255.255.224	192.168.72.97
ASW-3	VLAN 1	192.168.72.66	255.255.255.224	192.168.72.65
ASW-4	VLAN 1	192.168.72.2	255.255.255.192	192.168.72.1
Host-A	NIC	192.168.72.142	255.255.255.240	192.168.72.129
Host-B	NIC	192.168.72.126	255.255.255.224	192.168.72.97
Host-C	NIC	192.168.72.94	255.255.255.224	192.168.72.65
Host-D	NIC	192.168.72.62	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:

- ASW-1 LAN will require 7 host IP addresses
- ASW-2 LAN will require 15 host IP addresses
- ASW-3 LAN will require 29 host IP addresses
- ASW-4 LAN will require 58 host IP addresses

How many subnets are needed in the network topology?

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

a. Which subnet mask will accommodate the number of IP addresses required for 58 hosts ?
   How many usable host addresses will this subnet support? 62

b. Which subnet mask will accommodate the number of IP addresses required for 29 hosts ?
   How many usable host addresses will this subnet support? 30

c. Which subnet mask will accommodate the number of IP addresses required for 15 hosts ?
   How many usable host addresses will this subnet support? 14

d. Which subnet mask will accommodate the number of IP addresses required for 7 hosts ?
   How many usable host addresses will this subnet support? 14

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 LAN 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 Buidling 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
LAN 1	58	192.168.72.0/26	192.168.72.1	192.168.72.63
LAN 2	29	192.168.72.64/27	192.168.72.65	192.168.72.95
LAN 3	15	192.168.72.96/28	192.168.72.97	192.168.72.127
LAN 4	7	192.168.72.128/29	192.168.72.129	192.168.72.143
WAN	2	192.168.72.144/30	/30 192.168.72.145	192.168.72.147

Step 3: Document the addressing scheme.

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

b. Assign the first usable IP addresses to switches 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 hosts **, including the default gateway.**

Step 3: Configure IP addressing on WAN interfaces **, including the default gateway.**

Step 4: Verify connectivity.

You can only verify connectivity from Host D , ASW-3 , and Buildings 1 & 2 . 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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