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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** |
|  | G0/0 | 192.168.72.129 | 255.255.255.240 | N/A |
| Branch-1 | 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 |
|  | G0/0 | 192.168.72.65 | 255.255.255.224 | N/A |
| Branch-2 | 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 |
| Room-114 | VLAN 1 | 192.168.72.130 | 255.255.255.240 | 192.168.72.129 |
| Room-279 | VLAN 1 | 192.168.72.98 | 255.255.255.224 | 192.168.72.97 |
| Room-312 | VLAN 1 | 192.168.72.66 | 255.255.255.224 | 192.168.72.65 |
| Room-407 | VLAN 1 | 192.168.72.2 | 255.255.255.192 | 192.168.72.1 |
| PC-A | NIC | 192.168.72.142 | 255.255.255.240 | 192.168.72.129 |
| PC-B | NIC | 192.168.72.126 | 255.255.255.224 | 192.168.72.97 |
| PC-C | NIC | 192.168.72.94 | 255.255.255.224 | 192.168.72.65 |
| PC-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.

# Instructions

**Part 1: Examine the Network Requirements**

## Step 1: Determine the number of subnets needed.

You will subnet the network address 192.168.72.0/24. The network has the following requirements:

Room-114 LAN will require 7 host IP addresses

Room-279 LAN will require 15 host IP addresses

Room-312 LAN will require 29 host IP addresses

Room-407 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.

1. Which subnet mask will accommodate the number of IP addresses required for Room-114 ?

255.255.255.240/28

How many usable host addresses will this subnet support?

14 (192.168.72.97 - 192.168.72.110)

1. Which subnet mask will accommodate the number of IP addresses required for Room-279 ?

255.255.255.224 /27

How many usable host addresses will this subnet support?

30 (192.168.72.65 - 192.168.72.94)

1. Which subnet mask will accommodate the number of IP addresses required for Room-312 ?

255.255.255.248 /29

How many usable host addresses will this subnet support?

7 (172.168.72.113 - 172.168.72.118)

1. Which subnet mask will accommodate the number of IP addresses required for Room-407 ?

255.255.255.192 /26

How many usable host addresses will this subnet support?

62 (172.168.72.1 - 172.168.72.62)

1. Which subnet mask will accommodate the number of IP addresses required for the connection between

Branch-1 and Branch-2 ?

255.255.255.252/30

# Part 2: Design the VLSM Addressing Scheme

## Step 1: Divide the 192.168.72.0/24 network based on the number of hosts per subnet.

1. Use the first subnet to accommodate the largest LAN.
2. Use the second subnet to accommodate the second largest LAN.
3. Use the third subnet to accommodate the third largest LAN.
4. Use the fourth subnet to accommodate the fourth largest LAN.
5. Use the fifth subnet to accommodate the connection between Branch1 and Branch2. .

## 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** |
| Room-407 LAN | 58 | 192.168.72.0/26 | 192.168.72.1 | 192.168.72.63 |
| Room-312 LAN | 29 | 192.168.72.64/27 | 192.168.72.65 | 192.168.72.95 |
| Room-279 LAN | 15 | 192.168.72.96/27 | 192.168.72.97 | 192.168.72.127 |
| Room-114 LAN | 7 | 192.168.72.128/28 | 192.168.72.129 | 192.168.72.143 |
| WAN LINK | 2 | 192.168.72.144/30 | 192.168.72.145 | 192.168.72.147 |

## Step 3: Document the addressing scheme.

1. Assign the first usable IP addresses to Branch-1 for the two LAN links and the WAN link.
2. Assign the first usable IP addresses to Branch-2 for the two LAN links. Assign the last usable IP address for the WAN link.
3. Assign the second usable IP addresses to the switches.
4. 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 Branch-1** |  | **router LAN interfaces.** |
| **Step 2: Configure IP addressing on the**  **Room-312** |  | **, switch including the default gateway.** |
| **Step 3: Configure IP addressing on PC-D** |  | **, including the default gateway.** |
| **Step 4: Verify connectivity.**  You can only verify connectivity from |  | Branch1, Room-312, and PC-D. However, you should |

be able to ping every IP address listed in the **Addressing Table**.

**Branch-1**

en

conf t

int g0/0

ip add 192.168.72.129 255.255.255.240

no shut

int g0/1

ip add 192.168.72.97 255.255.255.224

no shut

**Room-312**

en

conf t

int vlan 1

ip add 192.168.72.66 255.255.255.224

no shut

ip def 192.168.72.65

**PC-D**

IP Address: 192.168.72.62

Subnet Mask: 255.255.255.192

Default Gateway: 192.168.72.1