**Packet Tracer - Subnetting Scenario**

**Addressing Table**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Device** | **Interface** | **IP Address** | **Subnet Mask** | **Default Gateway** |
| R1 | G0/0 | 192.168.100.1 | 255.255.255.224 | N/A |
| G0/1 | 192.168.100.33 | 255.255.255.224 | N/A |
| S0/0/0 | 192.168.100.129 | 255.255.255.224 | N/A |
| R2 | G0/0 | 192.168.100.65 | 255.255.255.224 | N/A |
| G0/1 | 192.168.100.97 | 255.255.255.224 | N/A |
| S0/0/0 | 192.168.100.158 | 255.255.255.224 | N/A |
| S1 | VLAN 1 | 192.168.100.2 | 255.255.255.224 | 192.168.100.1 |
| S2 | VLAN 1 | 192.168.100.34 | 255.255.255.224 | 192.168.100.33 |
| S3 | VLAN 1 | 192.168.100.66 | 255.255.255.224 | 192.168.100.65 |
| S4 | VLAN 1 | 192.168.100.98 | 255.255.255.224 | 192.168.100.97 |
| PC1 | NIC | 192.168.100.30 | 255.255.255.224 | 192.168.100.1 |
| PC2 | NIC | 192.168.100.62 | 255.255.255.224 | 192.168.100.33 |
| PC3 | NIC | 192.168.100.94 | 255.255.255.224 | 192.168.100.65 |
| PC4 | NIC | 192.168.100.126 | 255.255.255.224 | 192.168.100.97 |

**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 192.168.100.0/24 to subnet and provide the IP addressing for the network shown in the topology. Each LAN in the network requires enough space for, at least, 25 addresses for end devices, the switch and the router. The connection between R1 to R2 will require an IP address for each end of the link.

**Part 1:     Design an IP Addressing Scheme**

**Step 1:     Subnet the 192.168.100.0/24 network into the appropriate number of subnets.**

a.     Based on the topology, the subnets needed are 5.

b.    The bits must be borrowed to support the number of subnets in the topology table are 3.

c.      this subnet creates 8 subnets.

d. the usable hosts that create per subnet are 30.

**Note:**If your answer is less than the 25 hosts required, then you borrowed too many bits.

e.     Calculate the binary value for the first five subnets. The first subnet is already shown.

Net 0: 192 . 168 . 100 . 0 0 0 0 0 0 0 0

Net 1: 192 . 168 . 100 . 0 0 1 0 0 0 0 0

Net 2: 192 . 168 . 100 . 0 1 0 0 0 0 0 0

Net 3: 192 . 168 . 100 . 0 1 1 0 0 0 0 0

Net 4: 192 . 168 . 100 . 1 0 0 0 0 0 0 0

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

11111111.11111111.11111111. 11100000

255 . 255 . 255 . 224

g.    Fill in the **Subnet Table**,listing the decimal value of all available subnets, the first and last usable host address, and the broadcast address. Repeat until all addresses are listed.

**Note:** You may not need to use all rows.

**Subnet Table**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Subnet Number** | **Subnet Address** | **First Usable Host Address** | **Last Usable Host Address** | **Broadcast Address** |
| 0 | 192.168.100.0 | 192.168.100.1 | 192.168.100.30 | 192.168.100.31 |
| **1** | 192.168.100.32 | 192.168.100.33 | 192.168.100.62 | 192.168.100.63 |
| **2** | 192.168.100.64 | 192.168.100.65 | 192.168.100.94 | 192.168.100.95 |
| **3** | 192.168.100.96 | 192.168.100.97 | 192.168.100.126 | 192.168.100.127 |
| **4** | 192.168.100.128 | 192.168.100.129 | 192.168.100.158 | 192.168.100.159 |
| **5** | 192.168.100.160 | 192.168.100.161 | 192.168.100.190 | 192.168.100.191 |
| **6** | 192.168.100.192 | 192.168.100.193 | 192.168.100.222 | 192.168.100.223 |
| **7** | 192.168.100.224 | 192.168.100.225 | 192.168.100.254 | 192.168.100.255 |
| **8** |  |  |  |  |
| **9** |  |  |  |  |
| **10** |  |  |  |  |