**Name :**

**Abubaker Attique**

**Roll no :**

**P20-0560**

**Section :**

**5-A**

**Lab : 10**

**Task 1: Determine Network Address of the following IP Address**.

IP address: 10.128.240.50/30. Also, determine broadcast and range of host addresses.

**ANS)**

**IP Address:** 10.128.240.50

**Subnet Mask: 255.255.255.252**

10.128.240.50 = 00001010.10000000.11110000.00110010

**255.255.255.232 =11111111.11111111.11111111.11111100**

**AND = 00001010.10000000.11110000.00110000**

**Network Address = 10.128.240.48 (by adding 32and 16)**

**Broadcast =** 00001010.10000000.11110000.00110011 -> **10.128.240.51**

**Range = 49 – 50**

**Number of hosts = 4-2=2**

**Task 2: Determine the network and broadcast addresses and number of hosts bits and hosts for the given IPv4 addresses and prefixes in the following table.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IPv4**  **Address/Prefix** | **Network Address** | **Broadcast Address** | **Total Number**  **of Host Bits** | **Total**  **Number of**  **Hosts** |
| **192.168.100.25/28** | **192.168.100.16** | **192.168.100.21** | **4** | **14** |
| **172.30.10.130/30** | **172.30.10. 128** | **172.30.10.3** | **2** | **2** |
| **10.1.113.75/19** | **10.1.113.0** | **10.1.113.0** | **13** | **8190** |
| **198.133.219.250/24** | **198.133.219.0** | **198.133.219.0** | **8** | **254** |

1. **192.168.100.25/28**

**Ip address = 11000000.10100010.01100100.00011001**

**Subnetmask= 11111111.11111111.11111111.11110000**

**And = 11000000.10100010.01100100.00010000**

**Network Address = 192.168.100.16**

**Broadcast Address = 11000000.10100010.01100100.00011111**

**->192.168.100.21**

1. **172.30.10.130/30**

**Ip address = 10101100.00011110.00001010.10000010**

**Subnetmask = 11111111.11111111.11111111.11111100**

**And = 10101100.00011110.00001010.10000000**

**Network Address = 172.30.10. 128**

**Broadcast Address = 10101100.00011110.00001010.10000011**

* **172.30.10.3**

1. **10.1.113.75/19**

**Ip address =**  **00001010.00000001.01110001.01001011**

**Subnetmask = 11111111.11111111.11100000.00000000**

**And = 00001010.00000001.01100000.00000000**

**Network Address = 10.1.113.0**

**Broadcast Address = 00001010.00000001.01110001.00000000**

**-> 10.1.113.0**

1. **198.133.219.250/24**

**Ip address = 11000110.10000101.11011011.11111010**

**Subnetmask = 11111111.11111111.11111111.00000000**

**And = 198.133.219.0**

**Network Address = 198.133.219.0**

**Broadcast Address = 198.133.219.0**

**Task 3: Network Topology A**

In Part 1, you have been given the 192.168.10.0/24 network address to subnet, with the following topology. Determine the number of networks needed and then design an appropriate addressing scheme.

**Step 1: Determine the number of subnets in Network Topology A.**

a. How many subnets are there? \_\_\_\_2\_\_\_\_\_\_\_

b. How many bits should you borrow to create the required number of subnets? \_\_\_1\_\_\_\_\_\_

c. How many usable host addresses per subnet are in this addressing scheme? \_\_\_\_126\_\_\_\_\_\_\_

d. What is the new subnet mask in dotted decimal format? \_\_\_\_\_\_\_\_255.255.255.128\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

e. How many subnets are available for future use? \_\_\_\_\_\_\_\_0\_\_\_\_\_\_\_

**Step 2: Record the subnet information.**

**Fill in the following table with the subnet information:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Subnet  Number | Subnet Address | First Usable Host Address | Last Usable Host  Address | Broadcast  Address |
| 0 | 192.168.10.0 | 192.168.10.1 | 192.168.10.126 | 192.168.10.127 |
| 1 | 192.168.10.128 | 192.168.10.129 | 192.168.10.254 | 192.168.10.255 |

**Task 4: Network Topology B**

The topology has changed again with a new LAN added to R2 and a redundant link between R1 and R3. Use the 192.168.10.0/24 network address to provide addresses to the network devices. Also provide an IP address scheme that will accommodate these additional devices. For this topology, assign a subnet to each network.

Step 1: Determine the number of subnets in Network Topology B.

a. How many subnets are there? \_\_\_\_\_\_\_4\_\_\_\_

b. How many bits should you borrow to create the required number of subnets? \_\_\_\_2\_\_\_\_\_

c. How many usable host addresses per subnet are in this addressing scheme? \_\_\_\_\_\_62\_\_\_\_\_

d. What is the new subnet mask in dotted decimal format? \_\_\_\_\_\_\_\_\_\_255.255.255.192\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

e. How many subnets are available for future use? \_\_\_\_\_\_0\_\_\_\_\_\_\_\_\_

**Step 2: Record the subnet information.**

Fill in the following table with the subnet information:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Subnet  Number | Subnet Address | First Usable Host Address | Last Usable Host  Address | Broadcast  Address |
| 0 | 192.168.10.0 | 192.168.10.1 | 192.168.10.62 | 192.168.10.63 |
| 1 | 192.168.10.64 | 192.168.10.65 | 192.168.10.126 | 192.168.10.127 |
| 2 | 192.168.10.128 | 192.168.10.129 | 192.168.10.190 | 192.168.10.191 |
| 3 | 192.168.10.192 | 192.168.10.193 | 192.168.10.254 | 192.168.10.255 |