Lab 5: Variable length Subnetting

In this lab you will apply a variable length subnetting scheme to a network to meet the needs of the organization

The following network has an IP range of 205.231.165.0/24.



Each network and router connection needs to have the smallest network that can be assigned to reduce broadcast traffic within the network.

Using the Network diagram provided fill in the IP address and subnet masks for all the interfaces and systems. Use CIDR notation for the network masks. Complete the Network Summary Sheet and answer the questions.

|  |  |  |  |
| --- | --- | --- | --- |
| **Router 1** |  | **Router 2** |  |
| S0 |  | S0 |  |
| IP: |  | IP: |  |
| N: |  | N: |  |
| B: |  | B: |  |
| S1 |  | S1 |  |
| IP: |  | IP: |  |
| N: |  | N: |  |
| B: |  | B: |  |
| S2 |  | S2 |  |
| IP: |  | IP: |  |
| N: |  | N: |  |
| B: |  | B: |  |
| S3 |  | S3 |  |
| IP: |  | IP: |  |
| N: |  | N: |  |
| B: |  | B: |  |
| S4 |  |  | |
| IP: |  | **Router 3** |  |
| N: |  | S0 |  |
| B: |  | IP: |  |
|  | | N: |  |
| **Router 4** |  | B: |  |
| S0 |  | S1 |  |
| IP: |  | IP: |  |
| N: |  | N: |  |
| B: |  | B: |  |
| E0 |  | S2 |  |
| IP: |  | IP: |  |
| N: |  | N: |  |
| B: |  | B: |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Router 5** |  | **Router 8** |  |
| S0 |  | S0 |  |
| IP: |  | IP: |  |
| N: |  | N: |  |
| B: |  | B: |  |
| E0 |  | E0 |  |
| IP: |  | IP: |  |
| N: |  | N: |  |
| B: |  | B: |  |
|  | | E1 |  |
| **Router 6** |  | IP: |  |
| S0 |  | N: |  |
| IP: |  | B: |  |
| N: |  |  | |
| B: |  | **Router 9** |  |
| E0 |  | S0 |  |
| IP: |  | IP: |  |
| N: |  | N: |  |
| B: |  | B: |  |
| E1 |  | E0 |  |
| IP: |  | IP: |  |
| N: |  | N: |  |
| B: |  | B: |  |
|  | |
| **Router 7** |  |
| S0 |  |
| IP: |  |
| N: |  |
| B: |  |
| E0 |  |
| IP: |  |
| N: |  |
| B: |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Network 1** | | | **Network 4** | | | **Network 5** | | |
| Network ID: | |  | Network ID: | |  | Network ID: | |  |
| Broadcast IP: | |  | Broadcast IP: | |  | Broadcast IP: | |  |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| **Network 2** | | | IP: |  | | IP: |  | |
| Network ID: | |  | IP: |  | | IP: |  | |
| Broadcast IP: | |  | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| **Network 3** | | | IP: |  | | IP: |  | |
| Network ID: | |  | **Network 7** | | | IP: |  | |
| Broadcast IP: | |  | Network ID: | |  | IP: |  | |
| IP: |  | | Broadcast IP: | |  | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | **Network 8** | | | IP: |  | |
| IP: |  | |  | |  | IP: |  | |
| **Network 6** | | |  | |  | IP: |  | |
| Network ID: | |  | IP: |  | | IP: |  | |
| Broadcast IP: | |  | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | | IP: |  | |
| IP: |  | | IP: |  | |  | | |
| IP: |  | | IP: |  | |
| IP: |  | |  | | |

**Network Summary Sheet for VLS Assignment**

Identify your networks (eg. R1 to R2), list the number of IPs needed, the number of IPs in the assigned block, the subnet mask, and calculate the IP utilization in each subnet.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Network Name | IPs needed | IPs allocated | Subnet Mask | Network ID  Broadcast | Assignable Range | IP Utilization |
| 1 |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |
| 9 |  |  |  |  |  |  |  |
| 10 |  |  |  |  |  |  |  |
| 11 |  |  |  |  |  |  |  |
| 12 |  |  |  |  |  |  |  |
| 13 |  |  |  |  |  |  |  |
| 14 |  |  |  |  |  |  |  |
| 15 |  |  |  |  |  |  |  |
| 16 |  |  |  |  |  |  |  |
| 17 |  |  |  |  |  |  |  |
| 18 |  |  |  |  |  |  |  |