Lab 5 - Design and Implement a VLSM Addressing Scheme

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Class:**SE1902**

# Addressing Table

| Device | Interface | IP Address | Subnet Mask | Default Gateway |
| --- | --- | --- | --- | --- |
| blank | G0/0 | 172.19.67.1blank | 255.255.255.224 | N/A |
| GAMMA | G0/1 | 172.19.67.33 | 255.255.255.224 | N/A |
| blank | S0/0/0 | 172.19.67.97Blank | 255.255.255.252 | N/A |
| blank | G0/0 | 172.19.67.65 | 255.255.255.240 | N/A |
| BETA | G0/1 | 172.19.67.81blank | 255.255.255.240 | N/A |
| blank | S0/0/0 | 172.19.67.98 | 255.255.255.252 | N/A |
| GFloor4 | VLAN 1 | 172.19.67.2Blank | 255.255.255.224 | 172.19.67.1 |
| GFloor3 | VLAN 1 | 172.19.67.34 | 255.255.255.224 | 172.19.67.33 |
| BFloor3 | VLAN 1 | 172.19.67.66blank | 255.255.255.240 | 172.19.67.65 |
| BFloor2 | VLAN 1 | 172.19.67.82blank | 255.255.255.240 | 172.19.67.81 |
| Staff-1-11 | NIC | 172.19.67.30blank | 255.255.255.224 | 172.19.67.1 |
| Staff-2-23 | NIC | 172.19.67.62blank | 255.255.255.224 | 172.19.67.33 |
| Student101-87 | NIC | 172.19.67.78blank | 255.255.255.240 | 172.19.67.65 |
| Student115-12 | NIC | 172.19.67.94blank | 255.255.255.240 | 172.19.67.81 |

# Objectives

In this lab you will design a VLSM addressing scheme given a network address and host requirements. You will configure addressing on routers, switches, and network hosts.

* Design a VLSM IP addressing scheme given requirements.
* Configure addressing on network devices and hosts.
* Verify IP connectivity.
* Troubleshoot connectivity issues as required.

# Background / Scenario

You have been asked to design, implement, and test an addressing scheme for a customer. The customer has given you the network address that is suitable for the network, the topology, and the host requirements. You will implement and test your design.

# Instructions

You have been given the network address **172.19.67.0/24** by your customer. The host address requirements are:

# Requirements

Host Requirements:

| LAN | Number of Addresses Required |
| --- | --- |
| GFLoor4 LAN | 19 |
| GFLoor3 LAN | 23 |
| BFLoor3 LAN | 11 |
| BFLoor2 LAN | 7 |
| WAN Link | 2 |

Design Requirements

* Create the addressing design. Follow guidelines provided in the curriculum regarding the order of the subnets.
* The subnets should be contiguous. There should be no unused address space between subnets.
* Provide the most efficient subnet possible for the point-to-point link between the routers.
* Document your design in a table such as the one below.

| Subnet Description | Number of Hosts Needed | Network Address/CIDR | First Usable Host Address | Last Usable Host Address | Broadcast Address |
| --- | --- | --- | --- | --- | --- |
| GFLoor3 LAN | 23 host | 172.19.67.0/27 | 172.19.67.1 | 172.19.67.30 | 172.19.67.31 |
| GFLoor4 LAN | 19 host | 172.19.67.32/27 | 172.19.67.33 | 172.19.67.62 | 172.19.67.63 |
| BFLoor3 LAN | 11 host | 172.19.67.64/28 | 172.19.67.65 | 172.19.67.78 | 172.19.67.79 |
| BFLoor2 LAN | 7 host | 172.19.67.80/28 | 172.19.67.81 | 172.19.67.94 | 172.19.67.95 |
| WAN Link | 2 host | 172.19.67.96/30 | 172.19.67.97 | 172.19.67.98 | 172.19.67.99 |

Configuration Requirements

**Note**:You will configure addressing on **all** devices and hosts in the network.

* Assign the **first usable IP addresses** in the appropriate subnets to [[R1Name]] for the two LAN links and the WAN link.
* Assign the **first usable IP addresses** in the appropriate subnets to [[R2Name]] for the two LANs links. Assign the **last usable IP address** for the WAN link.
* Assign the **second usable IP addresses** in the appropriate subnets to the switches.
* The switch management interface should be reachable from hosts on all of the LANs.
* Assign the **last usable IP addresses** in the appropriate subnets to the hosts.

If the addressing design and implementation are correct, all hosts and devices should be reachable over the network.

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