35

|  |  |
| --- | --- |
| **Number of bits in the subnet** | /26 |
| **Number of bits borrowed from host bits** | 2 |
| **New IP mask (Binary)** | 11111111.11111111.11111111.11000000 |
| **New IP mask (Decimal)** | 255.255.255.192 |
| **Maximum number of usable subnets (Including 0th subnet)** | 4 |
| **Number of usable hosts per subnet** | 62 |
| **Subnet IP address** | 192.168.0.0 |
| **First Host IP address** | 192.168.0.1 |
| **Last Host IP address** | 192.168.0.62 |
| **Broadcast IP Address** | 192.168.0.63 |

25

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| --- | --- |
| **Number of bits in the subnet** | /27 |
| **Number of bits borrowed from host bits** | 3 |
| **New IP mask (Binary)** | 11111111.11111111.11111111.11100000 |
| **New IP mask (Decimal)** | 255.255.255.224 |
| **Maximum number of usable subnets (Including 0th subnet)** | 8 |
| **Number of usable hosts per subnet** | 30 |
| **Subnet IP address** | 192.168.0.64 |
| **First Host IP address** | 192.168.0.65 |
| **Last Host IP address** | 192.168.0.94 |
| **Broadcast IP Address** | 192.168.0.95 |

25

|  |  |
| --- | --- |
| **Number of bits in the subnet** | /27 |
| **Number of bits borrowed from host bits** | 3 |
| **New IP mask (Binary)** | 11111111.11111111.11111111.11100000 |
| **New IP mask (Decimal)** | 255.255.255.224 |
| **Maximum number of usable subnets (Including 0th subnet)** | 8 |
| **Number of usable hosts per subnet** | 30 |
| **Subnet IP address** | 192.168.0.96 |
| **First Host IP address** | 192.168.0.97 |
| **Last Host IP address** | 192.168.0.126 |
| **Broadcast IP Address** | 192.168.0.127 |

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| --- | --- |
| **Number of bits in the subnet** | /27 |
| **Number of bits borrowed from host bits** | 3 |
| **New IP mask (Binary)** | 11111111.11111111.11111111.11100000 |
| **New IP mask (Decimal)** | 255.255.255.224 |
| **Maximum number of usable subnets (Including 0th subnet)** | 8 |
| **Number of usable hosts per subnet** | 30 |
| **Subnet IP address** | 192.168.0.128 |
| **First Host IP address** | 192.168.0.129 |
| **Last Host IP address** | 192.168.0.158 |
| **Broadcast IP Address** | 192.168.0.159 |

15

|  |  |
| --- | --- |
| **Number of bits in the subnet** | /27 |
| **Number of bits borrowed from host bits** | 3 |
| **New IP mask (Binary)** | 11111111.11111111.11111111.11100000 |
| **New IP mask (Decimal)** | 255.255.255.224 |
| **Maximum number of usable subnets (Including 0th subnet)** | 8 |
| **Number of usable hosts per subnet** | 30 |
| **Subnet IP address** | 192.168.0.160 |
| **First Host IP address** | 192.168.0.161 |
| **Last Host IP address** | 192.168.0.189 |
| **Broadcast IP Address** | 192.168.0.190 |

Network Topology:  
For our network we have decided to implement it using an Extended Star Topology. This is a network configuration that combines the properties of the Star and Bus topologies. This topology contains a Backbone Cable, with multiple star topologies connected to it. Every star topology in the extended star topology indicates one network segment or branch. Each of them have their own focal/central point which is typically a switch or a hub.

We have decided to implement the Extended Star Network Topology because:  
1) It can support and handle a large number of branches or segments thus making it an ideal structure for a university campus where there would be various departments (ex: Library, Computer Lab etc.).

2) It allows for easy extension of the network as every segment has a central node. More branches and departments can be added to the backbone cable and more devices can be added to each network segment. Apart from extension, it also makes it very easy to add or remove additional segments. Furthermore, the entire architecture could be very easily modified to cater to the university’s requirements.

3) Each branch of the network is segregated from each other. As a result, in the case that one branch or segment fails, all the others would be unaffected and continue to function properly. This, in turn, improves how well the network can respond to connection and performance demands.

4) Another additional advantage of the branch segregation is that it minimizes the probability of a single point of failure.

5) Due to each segment having a central focal point, high traffic or slow connection in one branch of the university campus will not affect the performance of another branch. This reduces the overall traffic of the network.

6) As the network segments are segregated, every segment can have different security configurations, reducing the risk of data breaches.

7) Every branch of the network having a central node makes it easier to manage, control and troubleshoot every device in the network.

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