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INF-231


VLSM Activity 7: Creating 7 Subnetworks

Base Network: 192.168.10.0/24

Subnet Requirements:
Divide this network into 7 subnets with the following host requirements:
Subnet A → 60 hosts
Subnet B → 30 hosts
Subnet C → 28 hosts
Subnet D → 12 hosts
Subnet E → 6 hosts
Subnet F → 2 hosts
Subnet G → 2 hosts

Table:

| Subnet | Required Hosts | Subnet Mask | CIDR | Network Address | First Host | Last Host | Broadcast |
|--------|---------------|-------------|------|-----------------|------------|-----------|-----------|
| A | 60 | 255.255.255.192 | /26 | 192.168.10.0 | 192.168.10.1 | 192.168.10.62 | 192.168.10.63 |
| B | 30 | 255.255.255.224 | /27 | 192.168.10.64 | 192.168.10.65 | 192.168.10.94 | 192.168.10.95 |
| C | 28 | 255.255.255.224 | /27 | 192.168.10.96 | 192.168.10.97 | 192.168.10.126 | 192.168.10.127 |
| D | 12 | 255.255.255.240 | /28 | 192.168.10.128 | 192.168.10.129 | 192.168.10.142 | 192.168.10.143 |
| E | 6 | 255.255.255.248 | /29 | 192.168.10.144 | 192.168.10.145 | 192.168.10.150 | 192.168.10.151 |
| F | 2 | 255.255.255.252 | /30 | 192.168.10.152 | 192.168.10.153 | 192.168.10.154 | 192.168.10.155 |
| G | 2 | 255.255.255.252 | /30 | 192.168.10.156 | 192.168.10.157 | 192.168.10.158 | 192.168.10.159 |

Explanation:
        I arranged the subnets in descending order of host requirements: A (60), B (30), C (28), D (12), E (6), F (2), G (2). Then for each subnet, I applied the formula $2^n - 2 \geq$ hosts to find the subnet mask: A → /26, B → /27, C → /27, D → /28, E → /29, F → /30, G → /30. Then I started allocating from 192.168.10.0 and continued without overlap, using each block's natural size (/26 = 64, /27 = 32, /28 = 16, /29 = 8, /30 = 4). Lastly, for each subnet, I identified the network address, subnet mask, first host, last host, and broadcast.

Bonus Question

If a new subnet requiring 100 hosts is added, can it still fit inside the original 192.168.10.0/24? Why or why not?

      I cannot fit the new subnet with 100 hosts inside the original 192.168.10.0/24 without changing my current allocations. To get 100 hosts, I added 2 more addresses for the network and broadcast, so I need 102 in total. The smallest block that can handle this is 128 addresses, which is a /25 subnet with 126 usable hosts. In my work, I already used 192.168.10.0 up to 192.168.10.159, leaving only 96 addresses from .160 to .255. Since 96 is less than the 126 I need, the new subnet will not fit. The whole /24 has 256 addresses, so it could fit a /25 if I planned it from the start, but with my current setup I would have to reorganize everything to make space.