

**Submitted By:**

**SharjeelAhmed**

**Roll No:**

**BSDSM-F22-025**

**Submitted to:**

**Sir Rasikh Ali**

**Lab Task 9**

**Difference between Sub-netting and Super-netting**

Subnetting and supernetting are two key concepts in IP addressing that involve dividing or aggregating IP address blocks. Here's a comparison:

| **Aspect** | **Subnetting** | **Supernetting** |
| --- | --- | --- |
| **Definition** | Dividing a larger IP address block into smaller, more manageable sub-networks. | Combining multiple smaller IP address blocks into a single larger block. |
| **Purpose** | To create smaller networks for efficient use of IP addresses and improved traffic management. | To reduce the size of routing tables and aggregate multiple networks for easier management. |
| **Use Case** | Used in organizations to divide a network into departments or geographic regions. | Used by ISPs (Internet Service Providers) to summarize routes and reduce routing table entries. |
| **Routing Tables** | Increases the number of entries in routing tables as more subnets are created. | Reduces the number of entries in routing tables by summarizing multiple routes into one. |
| **CIDR Notation** | Uses smaller subnet masks (e.g., /28, /29) to divide the address space. | Uses larger subnet masks (e.g., /19, /18) to aggregate networks. |
| **IP Address Utilization** | Ensures optimal utilization of IP addresses within a network by segmenting them. | Simplifies routing by representing multiple smaller networks as one larger address block. |
| **Example** | Breaking 192.168.0.0/24 into smaller subnets like 192.168.0.0/26, 192.168.0.64/26, etc. | Combining 192.168.0.0/24 and 192.168.1.0/24 into a single block like 192.168.0.0/23. |
| **Complexity** | Relatively simpler to implement in small networks. | More complex and typically used in large-scale or ISP-level networks. |

**Key Differences:**

1. **Subnetting** reduces a network into smaller, manageable parts, while **supernetting** combines networks for aggregation.
2. Subnetting is common in LAN setups, while supernetting is primarily used in WAN and ISP contexts.
3. Subnetting often increases routing table size, whereas supernetting reduces it.

Both techniques aim to optimize network performance and address utilization but are applied in opposite ways.