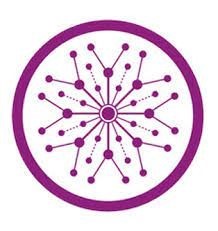
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**Superior University Gold Campus**

**CN LAB 9 Task**

Difference between Subnetting & Supernetting

**Program:**

BS DATA SCIENCE

**Course Name:**

(Computer Network LAB)

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**Difference between Subnetting and Supernetting**

**1. Subnetting**

Subnetting is the process of dividing a larger network into smaller, more manageable subnetworks (**subnets**). This helps optimize network performance, enhance security, and efficiently use IP addresses.

**Purpose:**

* To segment a large network into smaller sections.
* To reduce broadcast traffic and enhance security.

**Example:**

* Imagine you are given a network with the IP range **192.168.1.0/24** (256 addresses, from **192.168.1.0** to **192.168.1.255**).
* You need to divide this network into 4 subnets for different departments (e.g., HR, Finance, IT, and Sales).

By **subnetting**, the IP range can be divided into 4 smaller subnets:

* **Subnet 1 (HR)**: **192.168.1.0/26** (64 addresses)
* **Subnet 2 (Finance)**: **192.168.1.64/26** (64 addresses)
* **Subnet 3 (IT)**: **192.168.1.128/26** (64 addresses)
* **Subnet 4 (Sales)**: **192.168.1.192/26** (64 addresses)

Each subnet will have its own broadcast domain, making the network more efficient and secure.

**2. Supernetting**

Supernetting is the opposite of subnetting. It involves **combining multiple smaller networks** into a single larger network. This is also known as **route aggregation** and is often used to simplify routing tables and reduce overhead.

**Purpose:**

* To combine multiple networks into one larger network.
* To reduce the number of routing table entries.

**Example:**

* Imagine you have 4 smaller networks:
  + **192.168.1.0/24**
  + **192.168.2.0/24**
  + **192.168.3.0/24**
  + **192.168.4.0/24**

Instead of managing routes for each network individually, you can **supernet** them into a single block:

* **Supernet**: **192.168.0.0/22** (includes 1024 addresses, from **192.168.0.0** to **192.168.3.255**)

This reduces the number of routes and simplifies the network.

**Key Differences Between Subnetting and Supernetting**

| **Aspect** | **Subnetting** | **Supernetting** |
| --- | --- | --- |
| **Definition** | Dividing a larger network into smaller subnets. | Combining smaller networks into a larger network. |
| **Purpose** | Efficient use of IPs and improved security. | Simplifying routing and reducing routing table size. |
| **Network Size** | Breaks down a single network. | Aggregates multiple networks. |
| **CIDR Notation** | Moves subnet mask to a **higher value** (e.g., /24 to /26). | Moves subnet mask to a **lower value** (e.g., /24 to /22). |
| **Example** | Split **192.168.1.0/24** into smaller subnets. | Combine **192.168.1.0/24** and **192.168.2.0/24** into one block. |

**Practical Analogy**

* **Subnetting**: Breaking a large hotel into smaller floors (e.g., HR floor, IT floor). Each floor is isolated, but part of the same building.
* **Supernetting**: Combining multiple nearby hotels into a single large resort, managed as one entity.