

VLSM stands for **Variable Length Subnet Mask**.

It is a technique used in IP addressing to **divide a network into multiple subnets of different sizes** depending on the number of hosts required in each subnet.

 **Easy Explanation:**

Normally, when you subnet a network, all subnets are of **equal size** (using the same subnet mask). But with **VLSM**, you can use **different subnet masks** within the same network — so you don't waste IP addresses.

 **Example:**

Suppose you have the network: 192.168.10.0/24 (256 IPs)

You need:

- One subnet for 100 hosts
- One subnet for 50 hosts
- One subnet for 20 hosts

With **VLSM**, you can assign:

- 192.168.10.0/25 → 126 usable IPs (for 100 hosts)
- 192.168.10.128/26 → 62 usable IPs (for 50 hosts)
- 192.168.10.192/27 → 30 usable IPs (for 20 hosts)

 Result: Each subnet gets *just enough IPs* — no wastage.

 **In Short:**

Feature Without VLSM With VLSM

Subnet size Same for all Different as needed

IP utilization Wastage Efficient

Flexibility Low High

 **Example Question**

You have a network:

192.168.10.0/24

And you need subnets for the following departments:

Department Hosts Needed

Sales	100
HR	50
IT	20
Admin	10

- ◆ **Step 1: Sort networks by host requirement (largest → smallest)**

Department Hosts

Sales	100
HR	50
IT	20
Admin	10

◆ Step 2: Calculate required subnet sizes

Each subnet must have enough **usable IPs** for the hosts + 2 (for Network & Broadcast).

Hosts Required IPs Nearest Power of 2 Subnet Mask CIDR

100	102	128	255.255.255.128	/25
50	52	64	255.255.255.192	/26
20	22	32	255.255.255.224	/27
10	12	16	255.255.255.240	/28

◆ Step 3: Assign subnets (starting from the base network)

Department	Subnet Address	Mask	Usable Range	Broadcast
Sales	192.168.10.0	/25	192.168.10.1 – 192.168.10.126	192.168.10.127
HR	192.168.10.128	/26	192.168.10.129 – 192.168.10.190	192.168.10.191
IT	192.168.10.192	/27	192.168.10.193 – 192.168.10.222	192.168.10.223
Admin	192.168.10.224	/28	192.168.10.225 – 192.168.10.238	192.168.10.239

Result

All 4 departments get subnets that fit their needs **without wasting IPs**.

 ✓