VLSM Quick Guide

Variable Length Subnet Masking Made Simple

■ What is VLSM?

VLSM (Variable Length Subnet Masking) allows you to use different subnet masks within the same network, creating subnets of different sizes to match actual requirements.

Why use VLSM?
• Efficient IP address usage (no waste)
• Right-sized subnets for each department
• Saves money (fewer IP addresses needed)
• Required skill for Network+ exam

■ VLSM Design Process (5 Steps)

Step 1: List Requirements
Write down all departments and their host requirements
Step 2: Sort by Size (LARGEST FIRST)
Critical: Always start with the largest subnet!
Step 3: Assign Subnets
Match each requirement to appropriate subnet mask
Step 4: Calculate Ranges
Determine network, usable IPs, and broadcast for each
Step 5: Verify No Overlaps
Ensure subnets don't overlap (common exam trap!)

■ Complete VLSM Example

Given: Network 192.168.1.0/24

Requirements:
• Sales department: 50 hosts
• Engineering: 25 hosts
• HR: 10 hosts
• IT: 5 hosts
• 2 point-to-point WAN links: 2 hosts each

Solution (Sorted Largest to Smallest):

Dept	Hosts	Mask	Network	Usable Range	Broadcast
Sales	50	/26	192.168.1.0	.1 - .62	.63
Engineering	25	/27	192.168.1.64	.65 - .94	.95
HR	10	/28	192.168.1.96	.97 - .110	.111
IT	5	/29	192.168.1.112	.113 - .118	.119
WAN Link 1	2	/30	192.168.1.120	.121 - .122	.123
WAN Link 2	2	/30	192.168.1.124	.125 - .126	.127

■ VLSM Quick Reference

Hosts Needed	Use Mask	Provides	Wastes
2	/30	2 hosts	0
3-6	/29	6 hosts	0-3
7-14	/28	14 hosts	0-7
15-30	/27	30 hosts	0-15
31-62	/26	62 hosts	0-31
63-126	/25	126 hosts	0-63
127-254	/24	254 hosts	0-127

■■ Common VLSM Mistakes to Avoid

■ **Starting with smallest subnet first** → Always start with LARGEST
■ **Forgetting to sort by size** → You'll run out of address space
■ **Overlapping subnets** → Double-check ranges don't overlap
■ **Using exact host count** → Remember: need 2^n - 2 (for network/broadcast)
■ **Wasting addresses** → Match subnet size closely to requirements
■ **Pro Tip:** Always add 10-20% growth room to requirements!