

Networking Lab: Subnetting Practice

ZolaXTech · hands-on IPv4 subnetting exercises with a full answer key

Quick Reference: CIDR & Subnet Masks

CIDR	Subnet Mask	# Hosts	# Usable Hosts
/24	255.255.255.0	256	254
/25	255.255.255.128	128	126
/26	255.255.255.192	64	62
/27	255.255.255.224	32	30
/28	255.255.255.240	16	14
/29	255.255.255.248	8	6
/30	255.255.255.252	4	2

Worked Example

Given **192.168.1.0/26**, find the network address, broadcast address, and usable host range.

$/26 = 255.255.255.192 \rightarrow \text{block size} = 256 - 192 = 64$

Network address: 192.168.1.0

Broadcast address: 192.168.1.63 ($0 + 64 - 1$)

Usable host range: 192.168.1.1 – 192.168.1.62

Practice Problems

For each network below, calculate: network address, broadcast address, usable host range, and number of usable hosts. Work them out before checking the answer key on the last page.

- 192.168.10.0 /28
- 10.0.5.0 /27
- 172.16.20.0 /25
- 192.168.100.64 /26
- 10.10.0.0 /22
- 192.168.5.128 /29
- Given a requirement for 50 hosts, what's the smallest CIDR block that fits?
- Given a requirement for 500 hosts, what's the smallest CIDR block that fits?
- You have 192.168.1.0/24 and need 4 equal-sized subnets. What's the new CIDR and what are the 4 network addresses?

10. A host has IP 172.16.5.130 with mask 255.255.255.192. What subnet is it on, and what's the broadcast address for that subnet?

Answer Key

1. 192.168.10.0 /28

Network: 192.168.10.0 | Broadcast: 192.168.10.15 | Usable: .1-.14 (14 hosts)

2. 10.0.5.0 /27

Network: 10.0.5.0 | Broadcast: 10.0.5.31 | Usable: .1-.30 (30 hosts)

3. 172.16.20.0 /25

Network: 172.16.20.0 | Broadcast: 172.16.20.127 | Usable: .1-.126 (126 hosts)

4. 192.168.100.64 /26

Network: 192.168.100.64 | Broadcast: 192.168.100.127 | Usable: .65-.126 (62 hosts)

5. 10.10.0.0 /22

Network: 10.10.0.0 | Broadcast: 10.10.3.255 | Usable: 10.10.0.1-10.10.3.254 (1022 hosts)

6. 192.168.5.128 /29

Network: 192.168.5.128 | Broadcast: 192.168.5.135 | Usable: .129-.134 (6 hosts)

7. 50 hosts

Need $2^n - 2 \geq 50 \rightarrow n = 6$ (62 usable) $\rightarrow /26$

8. 500 hosts

Need $2^n - 2 \geq 500 \rightarrow n = 9$ (510 usable) $\rightarrow /23$

9. /24 into 4 subnets

Borrow 2 bits $\rightarrow /26$. Subnets: 192.168.1.0, 192.168.1.64, 192.168.1.128, 192.168.1.192

10. 172.16.5.130 /26 (255.255.255.192)

Subnet: 172.16.5.128/26 | Broadcast: 172.16.5.191

Tip: the block size (256 minus the last non-255/non-zero octet of the mask) tells you how far apart consecutive network addresses are — use it to skip counting IPs by hand.