

SUBNETTING QUICK FACTS

Concept	Meaning
Network Address	First Address
Broadcast Address	Last Address
Usable Hosts	Between Network & Broadcast
Prefix	Network Bits
Host Bits	$32 - \text{Prefix}$
Block Size	Addresses per Subnet
Usable Hosts	$2^H - 2$



NETWORK → FIRST |
BROADCAST → LAST

CIDR & SUBNET MASKS

CIDR	Subnet Mask	Addresses	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



/24 → /25 → /26 → /27 =
SUBNETS SMALLER

THE SUBNETTING FORMULA

H

Host Bits

$H = 32 - \text{Prefix}$

2^H

Total Addresses

2^H

2^H - 2

Traditional Usable Hosts

$2^H - 2$

Example: /27

Host Bits = $32 - 27 = 5$

$2^5 = 32$ Addresses

$32 - 2 = 30$ Usable Hosts



/27 = 32 ADDRESSES =
30 USABLE HOSTS

THE FAST SUBNETTING METHOD

Use these 4 steps:

- FIND THE PREFIX**
- FIND THE BLOCK SIZE**
- FIND THE NETWORK**
- FIND BROADCAST + HOST RANGE**



PREFIX → BLOCK SIZE →
NETWORK → BROADCAST

BLOCK SIZE

For the interesting octet:

BLOCK SIZE = 256 - MASK VALUE

Example:

/27 = 255.255.255.224

$256 - 224 = 32$

Subnets therefore increase by 32:

0	32	64	96
128	160	192	224

EXAMPLE 1 — FIND THE SUBNET

IP Address: 192.168.1.70/27

/27 = 255.255.255.224

Block Size = $256 - 224 = 32$

Subnet boundaries:

0	31
32	63
64	95
96	127

← 70 IS HERE

Network	192.168.1.64
First Host	192.168.1.65
Last Host	192.168.1.94
Broadcast	192.168.1.95



70 IS BETWEEN 64 AND 95 →
NETWORK = .64

EXAMPLE 2 — /26 SUBNET

IP Address: 10.10.10.150/26

/26 = 255.255.255.192

Block Size = $256 - 192 = 64$

Subnet boundaries:

0	63
64	127
128	191
192	255

← 150 IS HERE

Network	10.10.10.128
First Host	10.10.10.129
Last Host	10.10.10.190
Broadcast	10.10.10.191



/26 = 64 ADDRESSES =
62 USABLE HOSTS

EXAMPLE 3 — REQUIRED HOSTS

Requirement: 50 Hosts

$2^5 - 2 = 30$ ❌

$2^6 - 2 = 62$ ✅

6 host bits are required:

$32 - 6 = /26$



50 HOSTS → /26 →
62 USABLE HOSTS

EXAMPLE 4 — CREATE 4 SUBNETS

Start with: 192.168.10.0/24

Need 4 equal subnets.

Borrow 2 bits:

$2^2 = 4$ Subnets

/24 + 2 = /26

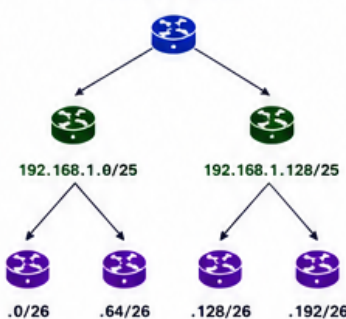
Subnet	Network (/26)	Broadcast
1	192.168.10.0	.63
2	192.168.10.64	.127
3	192.168.10.128	.191
4	192.168.10.192	.255



/24 → BORROW 2 BITS →
FOUR /26 SUBNETS

SUBNETTING VISUAL

192.168.1.0/24



BORROW MORE BITS →
MORE SUBNETS → FEWER HOSTS

PREFIX SHORTCUT

Prefix	Block	Hosts
/25	128	126
/26	64	62
/27	32	30
/28	16	14
/29	8	6
/30	4	2

PREFIX	/25	/26	/27	/28	/29	/30
BLOCK	128	64	32	16	8	4
HOSTS	126	62	30	14	6	2



128 → 64 → 32 → 16 → 8 → 4

SUBNETTING IN 10 SECONDS

For 192.168.5.173/28

/28 → Block Size = 16

0	16	32	48	64	80	96	112
128	144	160	176	192	208	224	240

173 is inside:



Network = 192.168.5.160

Broadcast = 192.168.5.175

Hosts = 192.168.5.161 –
192.168.5.174

KEY POINTS



Find the prefix, then find the block size.



Block size = $256 - \text{subnet mask value in the interesting octet}$.



Network is the first address in the block.



Broadcast is the last address in the block.



Usable hosts are between network and broadcast.



PRACTICE = SPEED + ACCURACY

