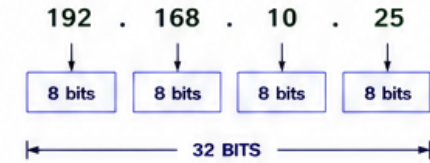


IPv4 QUICK FACTS

Feature	IPv4
Address Length	32 Bits
Format	Dotted Decimal
Octets	4 × 8 Bits
Address Space	232 Addresses
Prefix Notation	CIDR /n
Example	192.168.10.25/24

★ IPv4 = 32 BITS = 4 OCTETS

IPv4 ADDRESS STRUCTURE



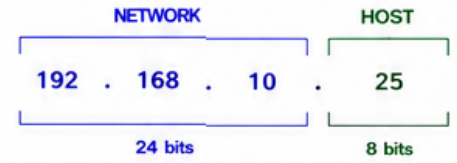
Each octet ranges from: 0 – 255

Example in binary:

192 168 10 25
11000000 . 10101000 . 00001010 . 00011001

NETWORK & HOST PORTIONS

Example: 192.168.10.25/24



Subnet Mask = 255.255.255.0

11111111.11111111.11111111.00000000

NETWORK HOST

★ PREFIX LENGTH = NUMBER OF NETWORK BITS

IPv4 ADDRESS CLASSES

Class	First Octet	Default Mask	Use
A	1 – 126*	/8 (255.0.0.0)	Unicast
B	128 – 191	/16 (255.255.0.0)	Unicast
C	192 – 223	/24 (255.255.255.0)	Unicast
D	224 – 239	—	Multicast
E	240 – 255	—	Reserved

*127.0.0.0/8 is Loopback (not used for normal Class A unicast).

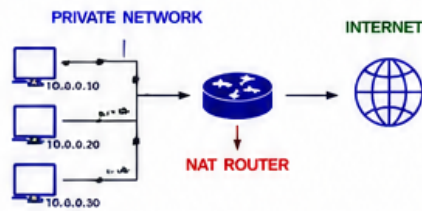
CLASS A	N.H.H.H	/8
CLASS B	N.N.H.H	/16
CLASS C	N.N.N.H	/24

★ CLASSFUL ADDRESSING IS LEGACY — MODERN NETWORKS USE CIDR

PUBLIC vs PRIVATE IPv4

PRIVATE RANGES (RFC 1918)

Range	Prefix
10.0.0.0 – 10.255.255.255	10.0.0.0/8
172.16.0.0 – 172.31.255.255	172.16.0.0/12
192.168.0.0 – 192.168.255.255	192.168.0.0/16



★ PRIVATE IPv4 = NOT GLOBALLY ROUTABLE

SPECIAL IPv4 ADDRESSES

Range / Address	Purpose
0.0.0.0	Unspecified Address
0.0.0.0/0	Default Route
127.0.0.0/8	Loopback
169.254.0.0/16	Link-Local
224.0.0.0/4	Multicast
255.255.255.255	Limited Broadcast

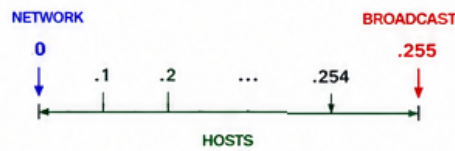
Documentation Ranges (use for examples)

192.0.2.0/24 198.51.100.0/24 203.0.113.0/24

★ KNOW SPECIAL ADDRESSES — THEY HAVE UNIQUE PURPOSES

NETWORK, HOST & BROADCAST

Example: 192.168.10.25/24



Network Address = 192.168.10.0
Host Range = 192.168.10.1 – 192.168.10.254
Broadcast Address = 192.168.10.255

★ NETWORK = FIRST • BROADCAST = LAST

CIDR BASICS

CIDR (Classless Inter-Domain Routing)

192.168.10.25/24

24 Network Bits

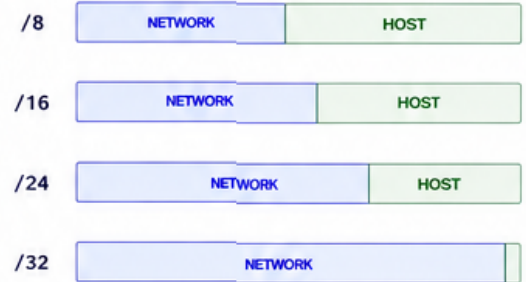
10.10.10.10/8

8 Network Bits

CIDR	Subnet Mask	Addresses
/8	255.0.0.0	16,777,216
/16	255.255.0.0	65,536
/24	255.255.255.0	256
/30	255.255.255.252	4
/32	255.255.255.255	1

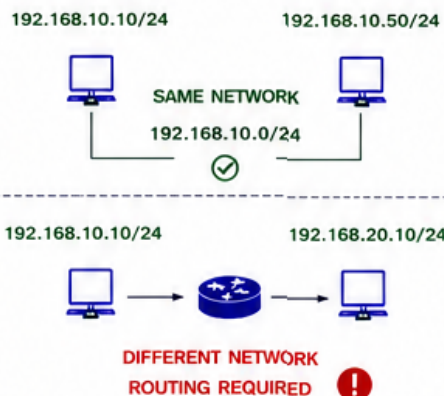
★ LONGER PREFIX → SMALLER NETWORK

CIDR VISUAL



★ /8 → LARGE NETWORK
/32 → SINGLE IPv4 ADDRESS

SAME or DIFFERENT NETWORK?



★ SAME SUBNET → DIRECT COMMUNICATION
DIFFERENT SUBNET → ROUTING REQUIRED

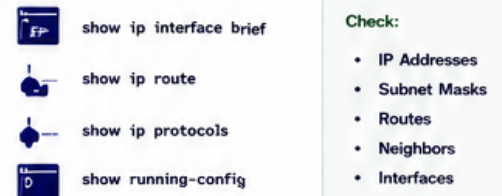
IPv4 ADDRESS ANALYSIS

Example: 172.16.20.130/26

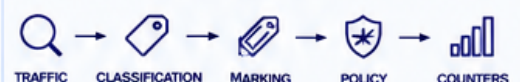


★ UNDERSTAND EACH STEP TO ANALYZE ANY IPv4 SUBNET

VERIFICATION



KEY CHECK FLOW



★ TRAFFIC → CLASSIFICATION → MARKING → POLICY → COUNTERS