CIDR (Classless Inter-Domain Routing or Supernetting)

CIDR (Classless Inter-Domain Routing) -- also known as supernetting -- is a method of assigning Internet Protocol (IP) addresses that improves the efficiency of address distribution and replaces the previous system based on Class A, Class B and Class C networks.

The initial goal of CIDR was to slow the increase of routing tables on routers across the internet and decrease the rapid exhaustion of IPv4 addresses.

As a result, the number of available internet addresses has greatly increased.

The original classful network design of the internet included inefficiencies that drained the pool of unassigned IPv4 addresses faster than necessary.

The classful design included the following:

- Class A, with over 16 million identifiers
- Class B, with 65,535 identifiers
- Class C, with 254 host identifiers

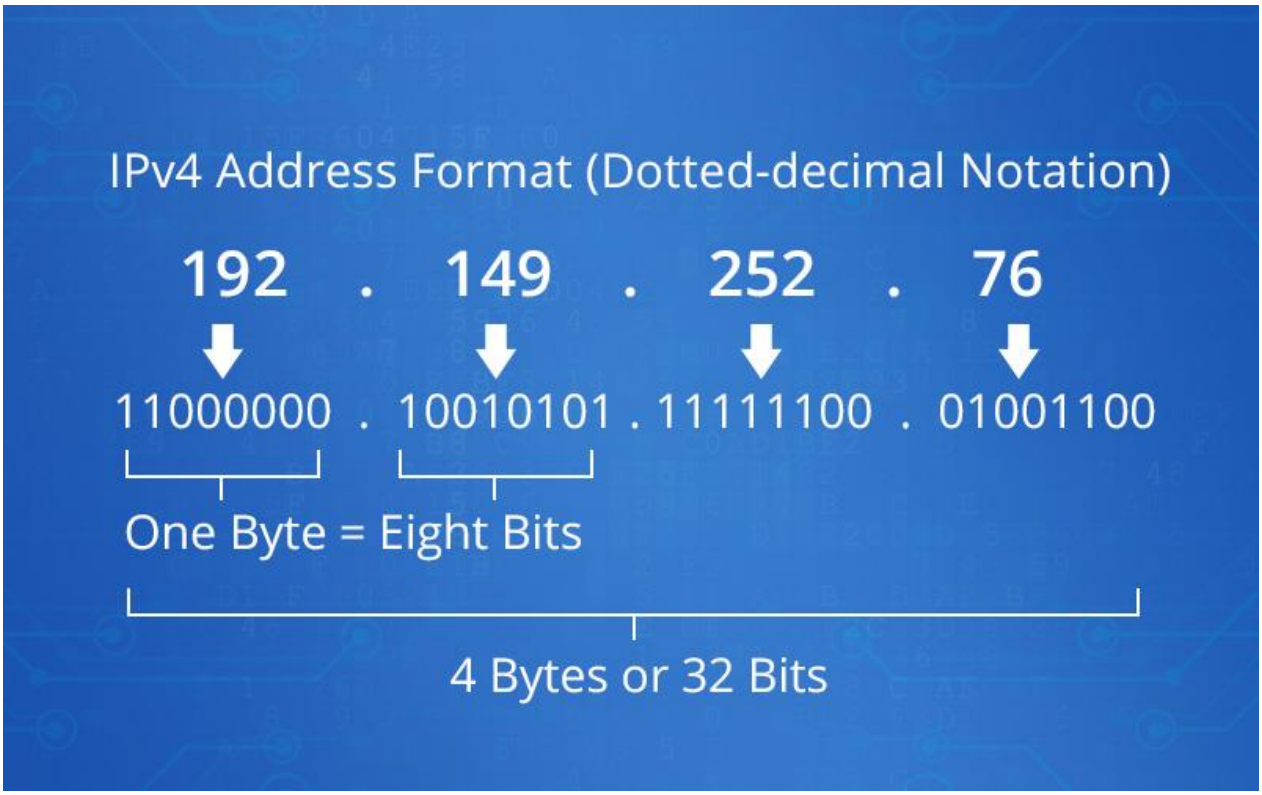
If an organization needed more than 254 host machines, it would be switched into Class B.

However, this could potentially waste over 60,000 hosts if the business didn't need to use them, thus unnecessarily decreasing the availability of IPv4 addresses.

CIDR was introduced by the Internet Engineering Task Force (IETF) in 1993 to fix this problem.

IPv4 vs. IPv6

IPv4	IPv6
Deployed 1981	Deployed 1998
32-bit IP address	128-bit IP address
4.3 billion addresses Addresses must be reused and masked	7.9×10^{28} addresses Every device can have a unique address
Numeric dot-decimal notation 192.168.5.18	Alphanumeric hexadecimal notation 50b2:6400:0000:0000:6c3a:b17d:0000:10a9 (Simplified - 50b2:6400::6c3a:b17d:0:10a9)
DHCP or manual configuration	Supports autoconfiguration



Each hexadecimal digit is 4 bits; a hextet is a 16-bit segment.

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2001:db8:aaaa:1111::100/64

2001 : 0db8 : aaaa : 1111 : 0000 : 0000 : 0000 : 0100
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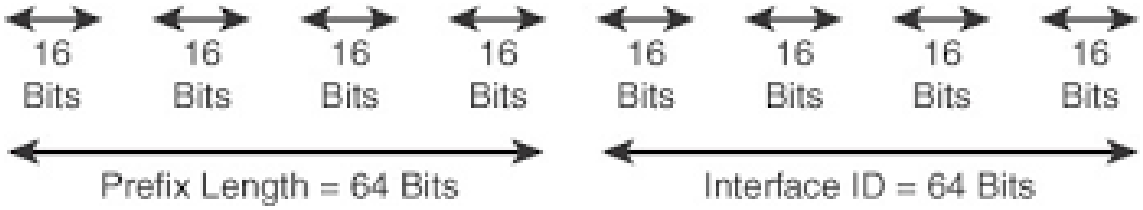

The same CIDR notation can be applied to IPv6 addresses. The only difference would be that IPv6 addresses can contain up to 128 bits.