Classful Subnetting in a Nutshell

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Address Class	First Octet Range	Number of Possible Networks	Number of Hosts per Network
Class A	0 to 127	128 (2 are reserved)	16,777,214
Class B	128 to 191	16,348	65,534
Class C	192 to 223	2,097,152	254

Background

- In the early days of the Internet, IP addresses were allocated to organizations based on request rather than actual need.
- When an organization received an IP network address, that address was associated with a **"Class", A, B, or C.**
- This is known as **Classful IP Addressing**
- The **first octet** of the address determined what class the network belonged to and which bits were the network bits and which bits were the host bits.
- There were **no** subnet masks.
- It was not until 1992 when the IETF introduced CIDR (Classless Interdomain Routing), making the address class meaning less.
- This is known as **Classless IP Addressing**.
- Classless IP Addressing is where the first octet
- For now, all you need to know is that today's networks are classless, except for some things like the **structure of Cisco's IP routing table** and for those networks that still use Classful routing protocols.

Current technology - **Classless IP Addressing**

- The **subnet mask** determines the network portion and the host portion.
- Value of first octet does NOT matter (older classful IP addressing)
- Hosts and Classless Inter-Domain Routing (CIDR).
- Classless IP Addressing is what is used within the Internet and in most internal networks.

Older technology - **Classful IP Addressing**

- **Value of first octet** determines the network portion and the host portion.
- Used with classful routing protocols like RIPv1.
- The Cisco IP Routing Table is structured in a classful manner.

Class	First Bits	First Octet	Network Bits	Host Bits
A	0	0 – 127	8	24
B	10	128 - 191	16	16
C	110	192 - 223	24	8
D	1110	224 – 239		
E	1111	240 -		

Subnetting: See Classless Subnetting in a Nutshell

- Major Network Mask is replaced with default Classful mask
- **Class A:** First octet of 0 – 127 has a default Classful mask of 255.0.0.0
- **Class B:** First octet of 128 – 191 has a default Classful mask of 255.255.0.0
- **Class C:** First octet of 192 - 223 has a default Classful mask of 255.255.255.0