



**Binary Lesson 6**  
**Subnet Square**

# Class C

## Number of Addresses

- **Class C address: 192.168.1.0 /24**
  - 24 Network bits, 8 Host bits
- **Network: 192.168.1.0**
- **Broadcast: 192.168.1.255**
- **Usable: 192.168.1.1 – 192.168.1.254**
  - 254 usable addresses
  - $256 - 2$
  - $2^8 - 2$

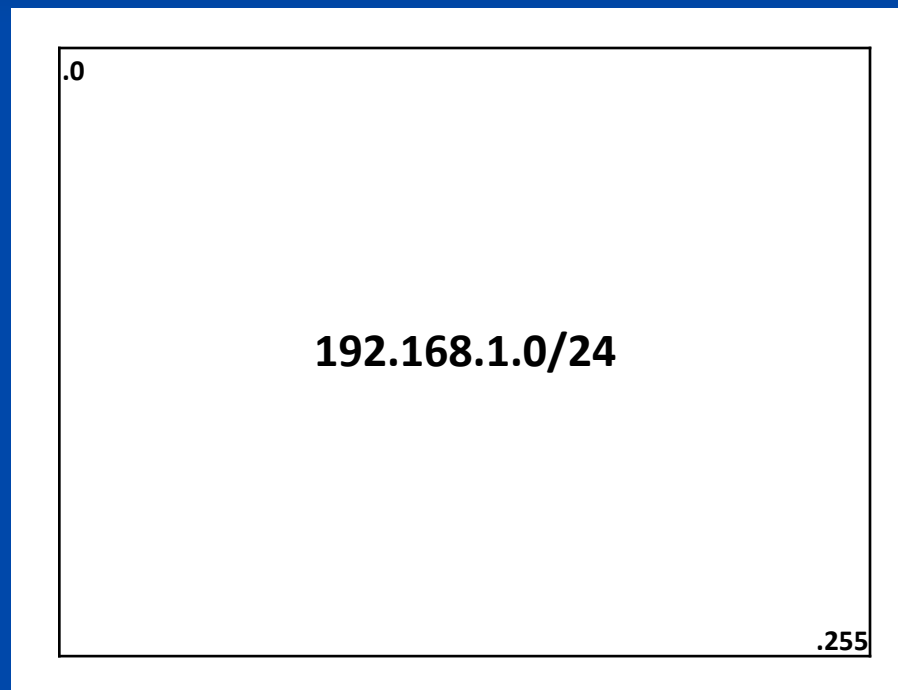
# Class C

- Class C address: 192.168.1.10 /24
- The *subnet mask* is 255.255.255.0
- The network address is 192.168.1.0
- The broadcast address is 192.168.1.255
- In Binary:

IP:	11000000	10101000	00000001	00001010
Sub Msk:	11111111	11111111	11111111	00000000
Net Addr:	11000000	10101000	00000001	00000000
Brdc Add:	11000000	10101000	00000001	11111111

# Whole Square is a /24 network

- Contains 256 addresses, only the first & last shown



# 192.168.1.0 /25

- You can split a class C in half with a /25
  - IP: 192.168.1.10 /25
  - Subnet Mask: 255.255.255.128
  - Network: 192.168.1.0

IP:	11000000	10101000	00000001	00001010
Sub Msk:	11111111	11111111	11111111	10000000
Net Addr:	11000000	10101000	00000001	00000000
Bits to left of line:	NETWORK BITS			HOST BITS

# 192.168.1.0 /25

- There are only 128 addresses in a /25 block

- Network: 192.168.1.0 /25
- 1<sup>st</sup> Usable: 192.168.1.1
- Last Usable: 192.168.1.126
- Broadcast: 192.168.1.127

Net Addr:	11000000	10101000	00000001	00000000
First Use:	11000000	10101000	00000001	00000001
Last Use:	11000000	10101000	00000001	01111110
Broadcst:	11000000	10101000	00000001	01111111

# 192.168.1.128 /25

- There are only 128 addresses in a /25 block

- Network: 192.168.1.128 /25

- 1<sup>st</sup> Usable: 192.168.1.129

- Last Usable: 192.168.1.254

- Broadcast: 192.168.1.255

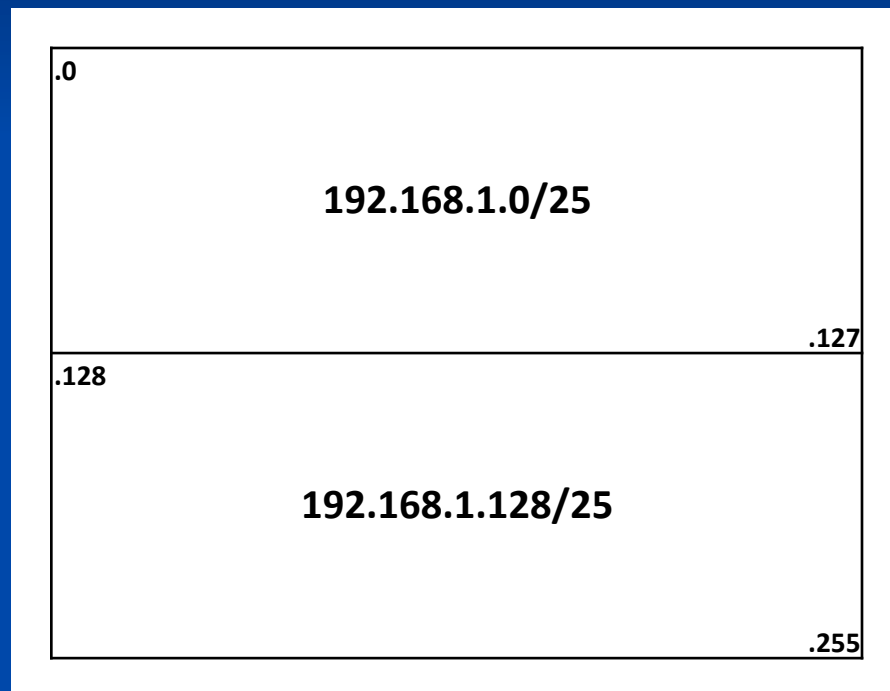
Net Addr: 11000000 10101000 00000001 10000000

First Use: 11000000 10101000 00000001 10000001

Last Use: 11000000 10101000 00000001 11111110

Broadcst: 11000000 10101000 00000001 11111111

# Divided into Two /25 Subnets





# 192.168.1.0 /26

- There are only 64 addresses in a /26 block

- Network: 192.168.1.0 /26
- 1<sup>st</sup> Usable: 192.168.1.1
- Last Usable: 192.168.1.62
- Broadcast: 192.168.1.63

Net Addr:	11000000	10101000	00000001	00000000
Sub Msk:	11111111	11111111	11111111	11000000
First Use:	11000000	10101000	00000001	00000001
Last Use:	11000000	10101000	00000001	00111110
Broadcst:	11000000	10101000	00000001	00111111

# 192.168.1.64 /26

- There are only 64 addresses in a /26 block

- Network: 192.168.1.64 /26
- 1<sup>st</sup> Usable: 192.168.1.65
- Last Usable: 192.168.1.126
- Broadcast: 192.168.1.127

Net Addr:	11000000	10101000	00000001	01000000
Sub Msk:	11111111	11111111	11111111	11000000
First Use:	11000000	10101000	00000001	01000001
Last Use:	11000000	10101000	00000001	01111110
Broadcst:	11000000	10101000	00000001	01111111

# 192.168.1.128 /26

- There are only 64 addresses in a /26 block

- Network: 192.168.1.128 /26
- 1<sup>st</sup> Usable: 192.168.1.129
- Last Usable: 192.168.1.190
- Broadcast: 192.168.1.191

Net Addr:	11000000	10101000	00000001	10000000
Sub Msk:	11111111	11111111	11111111	11000000
First Use:	11000000	10101000	00000001	10000001
Last Use:	11000000	10101000	00000001	10111110
Broadcst:	11000000	10101000	00000001	10111111

# 192.168.1.192 /26

- There are only 64 addresses in a /26 block

- Network: 192.168.1.192 /26
- 1<sup>st</sup> Usable: 192.168.1.193
- Last Usable: 192.168.1.254
- Broadcast: 192.168.1.255

Net Addr:	11000000	10101000	00000001	11000000
Sub Msk:	11111111	11111111	11111111	11000000
First Use:	11000000	10101000	00000001	11000001
Last Use:	11000000	10101000	00000001	11111110
Broadcst:	11000000	10101000	00000001	11111111

# Divided into Four /26 Subnets

