

IPv4 Address Octets



- Each octet in the IP address has a value ranging from 0 to 255

128	64	32	16	8	4	2	1
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128	64	32	16	8	4	2	1
0	0	0	0	0	0	0	0

128	64	32	16	8	4	2	1
1	1	1	1	1	1	1	1

Converting First Octet to Binary



- Let's convert that 192.168.10.15 address to binary, starting with the first octet of 192.
- Write out the binary columns on a piece of paper to do this

128	64	32	16	8	4	2	1
1	1	0	0	0	0	0	0

- $192 - 128 = 64$
- $64 - 64 = 0$
- The first octet is 11000000 in binary
- $128 + 64 = 192$

Converting Second Octet to Binary



- The second octet of 192.168.10.15 is 168

128	64	32	16	8	4	2	1
1	0	1	0	1	0	0	0

- $168 - 128 = 40$
- $40 - 64$ doesn't go
- $40 - 32 = 8$
- $8 - 16$ doesn't go
- $8 - 8 = 0$
- The second octet is 10101000 in binary
- $128 + 32 + 8 = 168$
- The first half of the IP address in binary notation is 11000000.10101000

Converting Decimal to Binary



- Go ahead and stop the video and work out the last 2 octets if you're new to converting IP addresses to binary
- You should be able to show the complete IP address 192.168.10.15 in binary notation
- 11000000.10101000.x.x
- I'll show you the answer on the next slide

Conversion Answer



● 192.168.10.15 = 11000000.10101000.00001010.00001111

128	64	32	16	8	4	2	1
1	1	0	0	0	0	0	0

128	64	32	16	8	4	2	1
1	0	1	0	1	0	0	0

128	64	32	16	8	4	2	1
0	0	0	0	1	0	1	0

128	64	32	16	8	4	2	1
0	0	0	0	1	1	1	1

Subnet Masks



- To set the boundary between logical networks (subnets), the IP address is combined with a subnet mask
- You'll learn about the subnet mask in the next lecture