Module 3: Network Module 3 PT3

Network Layer - Layer 3 - Packets

DHCP (Dynamic Host Configuration Protocol) server - assigns private IP addresses.
DNS (Domain Name Server) - assigns domain name to public IP Address to a router, firewall, Default gate or all in one device.
NAT (Network Address Translation) - Translate a set of IP Addresses (private) to another set of IP Addresses (public).

Vocabulary and Links

Why do we need both IP Address and MAC Address
What is an IP Address and MAC Address
Why do we need IP Address
ARP Explained
Binary and IP Made Easy
Public vs Private IP Address
Subnet Mask
Calculate network, broadcast and host address
IPv4 Subnetting - Finding the broadcast address of a network

Mr Darryl's Chart
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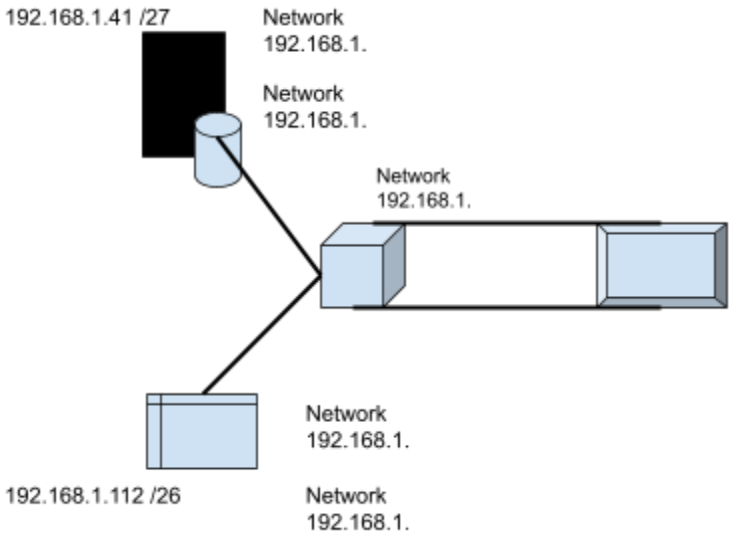
128	64	32	16	8	4	2	1
128	192	224	240	248	252	254	255
2	4	8	16	32	64	128	x

Beyond 128 bits:
128 | 192 | 224 | 240 | 248 | 252 | 254 | 255
# of bits (#number of devices within subnet assignment):
128 | 64 | 32 | 16 | 8 | 4 | 2 | 1
#of Subnet Blocks:
2 | 4 | 8 | 16 | 32 | 64| 128 | x

128	192	224	240	248	252	254	255	IP Address
128	64	32	16	8	4	2	1	
/1	/2	/3	/4	/5	/6	/7	/8	Subnet Mask
/9	/10	/11	/12	/13	/14	/15	/16	
/17	/18	/19	/20	/21	/22	/23	/24	
/25	/26	/27	/28	/29	/30	/31	/32	

10.10.10.200 /27
Find the network ID
200/32 = 6.25 = block 6 of the /27, 224, 32, 8



IP Address Classes
Default Subnet Mask
ARP

MAC Address
Public -vs- Private

Subnet Mask

Class A	255.0.0.0 -> shorthand /8 (same as 255.0.0.0)
Class B	255.255.0.0 -> shorthand /16 (same as 255.255.0.0)
Class C	255.255.255.0 -> shorthand /24 (same as 255.255.255.0)
Class D	Unknown
Class E	Unknown

255 represents the network # while anything else in the IP Address is the host #

Class A IP Address Range - 1.x.x.x — 126(127 loopback address).x.x.x
Class B IP Address Range - 128.x.x.x — 191.x.x.x /16
Class C IP Address Range - 192.x.x.x — 223.x.x.x /24

Example:
IP Address: 115.23.4.1
Subnet Mask: 255.0.0.0

NAT (network address translation) - Translate a set of IP Addresses (private) to another set of IP Addresses (public)

Broadcast - Sending a message to special IP address, 255.255.255.255

APIPA (Automatic Private IP Addressing range) - 169.254.x.x - Didn't get assigned an address from a DHCP Server.

CIDR (Classless Inter-Domain Routing) -

Example:
192.168.8.111

Find the network # and the broadcast.

First Subnet
Network#: 192.168.8.0
Broadcast#: 192.168.8.127

Second Subnet
Network#: 192.168.8.128
Broadcast#: 192.168.8.255