* Given an IP add and a subnet mask
  1) Network #
  2) 1st, 2nd, 3rd #
  3) Last #
  4) Broadcast #

192.168.8.0 /25 (?)

255.255.255.128

128	192	224	240	248	252	254	255
128	64	32	16	8	4	2	1
2	4	8	16	32	64	128	*

* 1 bit

192.168.8.111

2 sub family

→ Network 192.168.8.0
Broadcast 192.168.8.127

111 belongs in THIS sub family

→ Network 192.168.8.128
Broadcast 192.168.8.255

* there are certain devices that have static IP address

04/18 Class Notes

Classful Subnet (Default)
255.0.0.0 → Network.Host.Host.Host
255.255.0.0 → Network.Network.Host.Host
255.255.255.0 → Network.Network.Network.Host

Classless Subnet (ignoring the default)
10.10.10.1 /24

Variable Length Subnet Mask means you're moving subnet around; same thing as CIDR (/1 - /32)

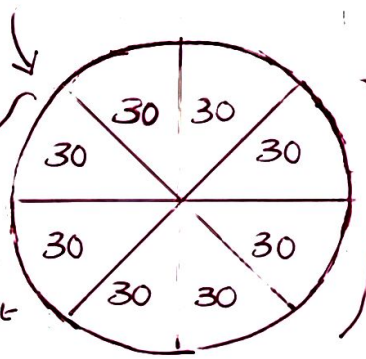
* Classless subnet mask, variable length subnet, and CIDR are similar and they are NOT classful subnets.

* subnet mask help determine which family an IP address is in,

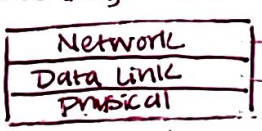
255.248.0.0 /13

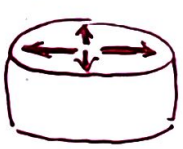
128 | 192 | 224 | 240 | 248 | 252 | 254 | 255
128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 → DEVICES IN EACH SUBNETS
2 | 4 | 8 | 16 | 32 | 64 | 128 | * → SUBNETS

* Every subnets has a network IP address and a broadcast address which CAN NOT be assign to a device, therefore, if /27 has 8 subnets, it cannot be assigned to 32 devices, ONLY 30 devices!



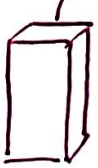
* Gateway is the FIRST device that takes you out on the internet





static or dynamic
ARP "Maps" MAC → IP in LAN (local area network)

DNS "Map" Domain Nm → IP



DHCP DORA

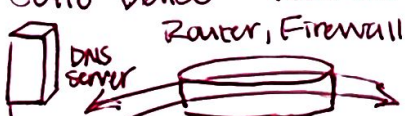
* When you see APIPA, that means you're DHCP server is down. you are NOT on the internet

* ARP and Ping are the only 2 that is in layer 2.5, between layer 2 + 3.

Ethernet Adapter :

Autoconfiguration IPv4 Address:
169.254.97.192 (preffered)
"no network is assigned"

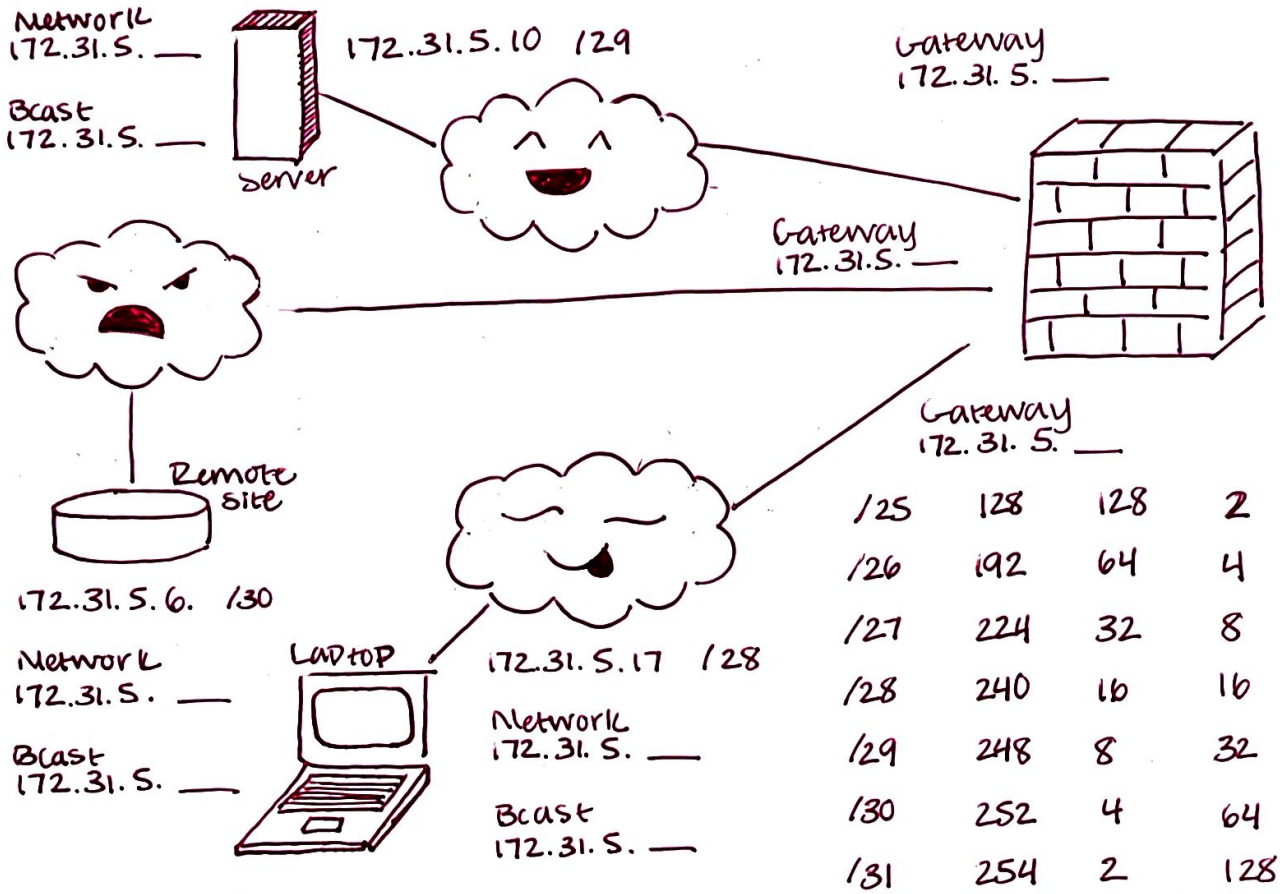
SOHO Device



All-In-One ≅ SOHO Device

DHCP
DNS
NAT

MAC Address Broadcast
FF:FF:FF:FF:FF:FF → static
IP address Broadcast
192.168.5.255 → dynamic (can change)



/25	128	128	2
/26	192	64	4
/27	224	32	8
/28	240	16	16
/29	248	8	32
/30	252	4	64
/31	254	2	128

Mr. Dee's Chart

* IPV6 DOES NOT use broadcast address / domain.
  uses MULTICAST. Prefix FE00::/8
  IPV6 uses
  1). Unicast
  2). Multicast
  3). Anycast