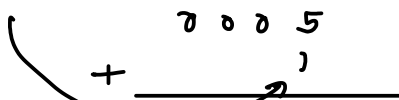




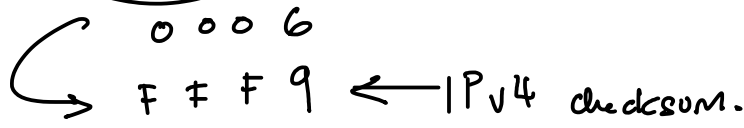
②



0x6 0110  
0x9 1001

③

bitwise complement

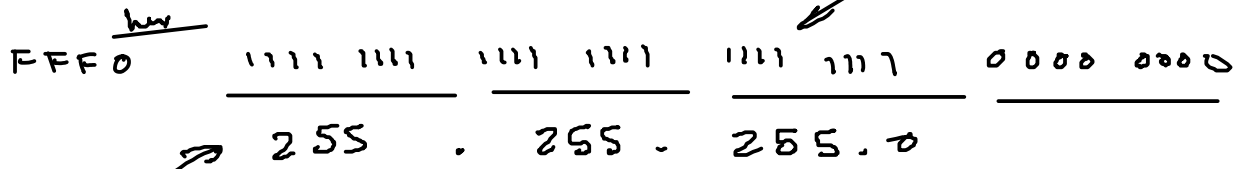


**Exercise 3:** What is the netmask in binary for a /24 network?  
 What is it in decimal? How can the netmask be used to determine if one IP address is on the same network as another? Is the address 192.168.2.200 in the 192.168.2.0/25 network?

netmask

for a

/24 network:



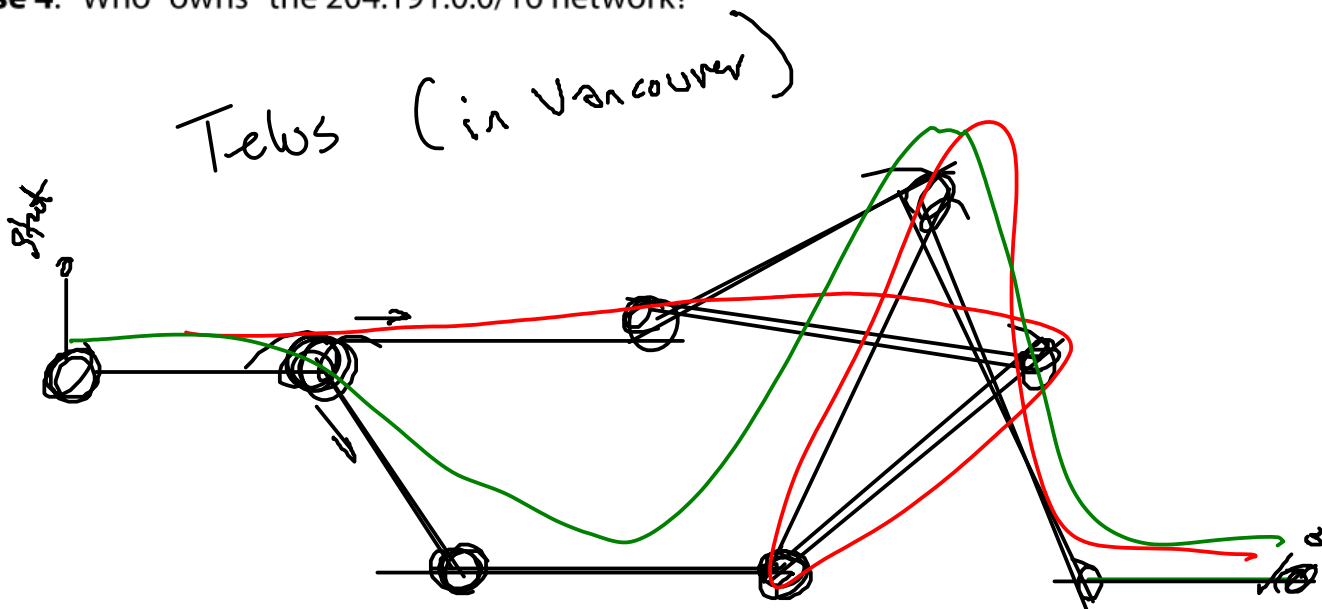
"dotted quad"

$$A_1 \cdot N \stackrel{?}{=} A_2 \cdot N$$

25

**Exercise 4:** Who "owns" the 204.191.0.0/16 network?

Telus (in Vancouver)



**Exercise 5:** For the routing table above, what port ("Interface") would be used by frames with the following destination IP addresses: 127.0.0.255? 192.168.1.1? 192.168.2.1? 204.191.10.32?

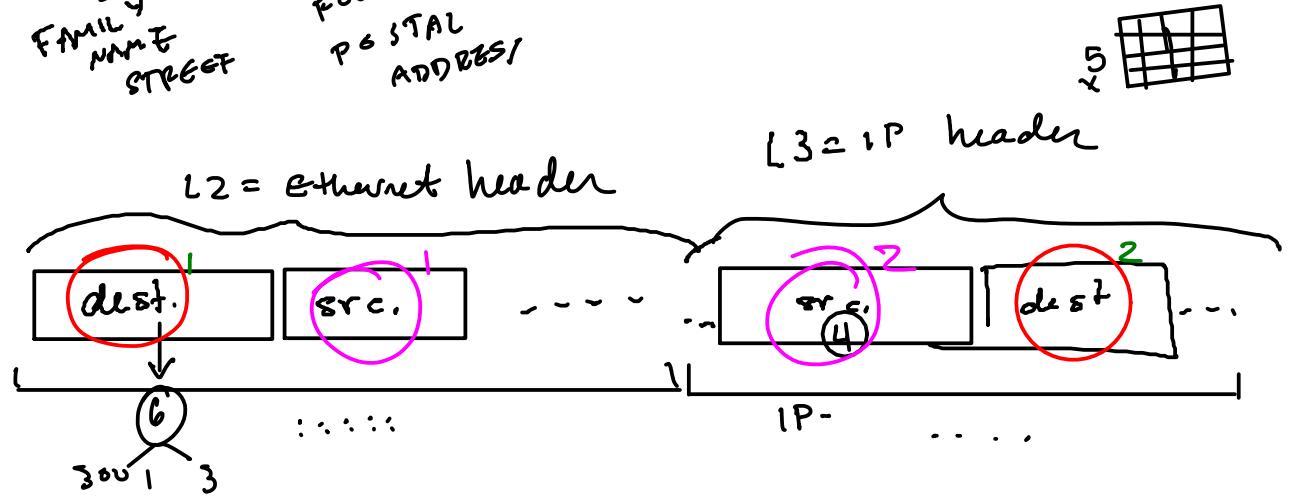
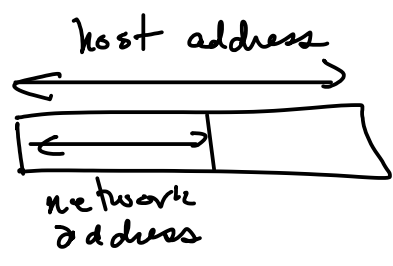
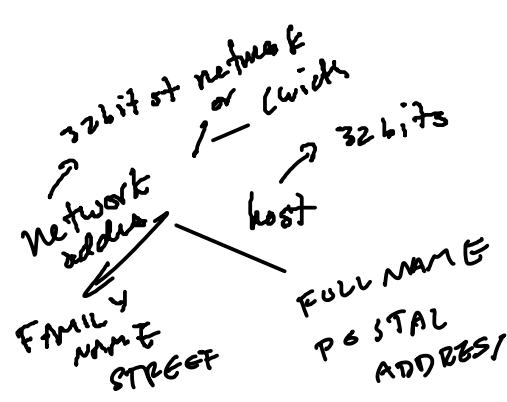
router:

Destination	Gateway	Subnet Mask	Metric	Interface
192.168.1.0	*	255.255.255.0	0	br0 (LAN)
204.191.0.0	*	255.255.0.0	0	vlan1 (WAN)
127.0.0.0	*	255.0.0.0	0	lo
default	204.191.1.1	0.0.0.0	0	vlan1 (WAN)

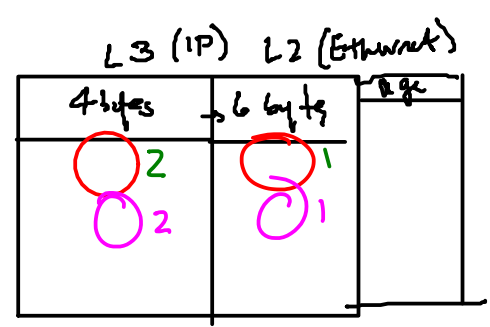
127  
116  
18

255.255.0.0  
11111111 11111111 00000000  
...

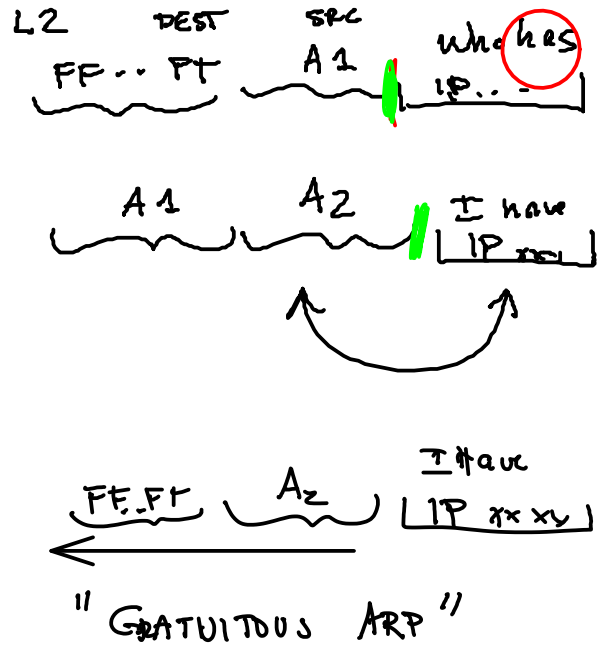
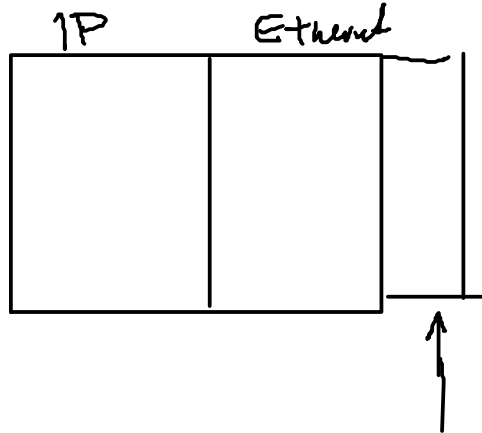
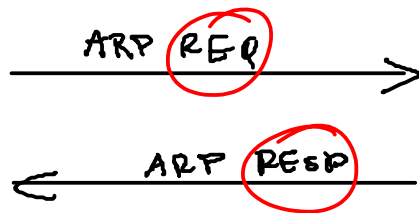
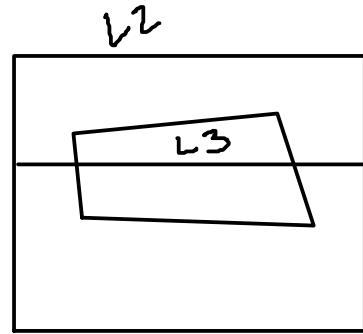
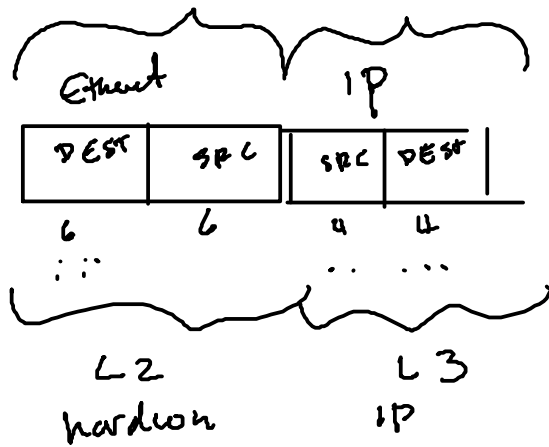
127.0.0.255 → lo port  
 192.168.1.1 → br0 (LAN)  
 192.168.2.1 → vlan1 (WAN) } using gateway machine's L2 address to gateway  
 204.191.10.32 → vlan1 } using L2 address of 204.191.10.32.



**Exercise 6:** What pairs of values are stored in an ARP cache? What values from a received frame need to be examined to validate an ARP cache entry?



for a gateway



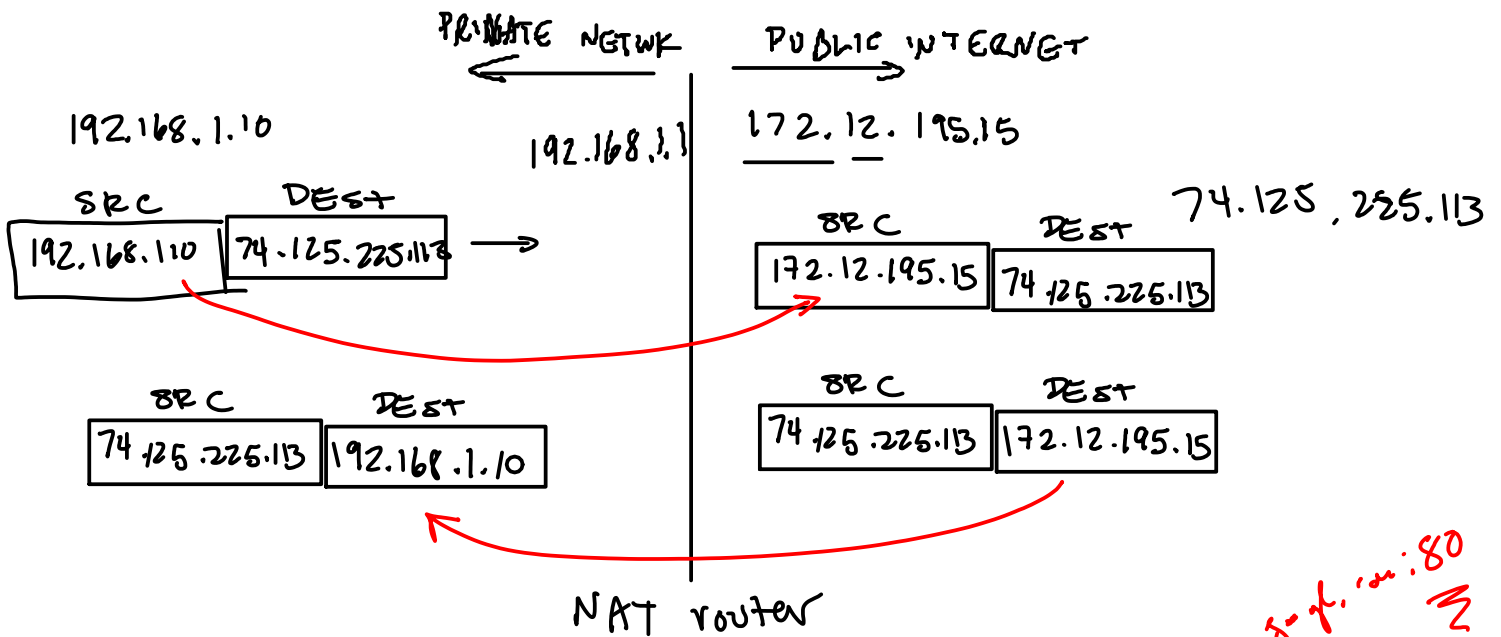
DHCP Response typically contains:

- 1 - <sup>host</sup> IP address
  - 2 - netmask
  - 3 - gateway IP address
  - 4 - DNS server "
- } → network address

**Exercise 7:** When a host boots up, what must it send out first, an ARP request or a DHCP request?

Usually DHCP request first to get an IP address except when IP is manually configured.  
(always for a DHCP server).

**Exercise 8:** A host with a (private) address 192.168.1.10 is behind a NAT router with an (public) address of 172.12.192.15. The host sends a frame to a host at address 74.125.225.113 requesting a web page. Show the source/destination address pairs of the request and response frames on the private and public sides of the router.



www.g-f.com:80

i

**Exercise 9:** Can a host's DNS server be configured using a host name? Why or why not? Assuming a host has an empty DNS cache, what queries would it generate to look up the IP address of the host mx.bcit.ca?

No - need a nameserver to look up the address of the nameserver but this requires a nameserver, ... (and so on)

Two possibilities:

A/ recursive name server (NS):

- ① query root (.) NS for NS of .ca
- ② query .ca NS for NS of bcit.ca
- ③ query bcit.ca NS for A (address) of mx.bcit.ca

B/ - non-recursive query (NS does recursion):

- ① query configured NS for A of mx.bcit.ca  
→ get the answer!

in both cases the query results are cached (saved) for a certain TTL (time to live).