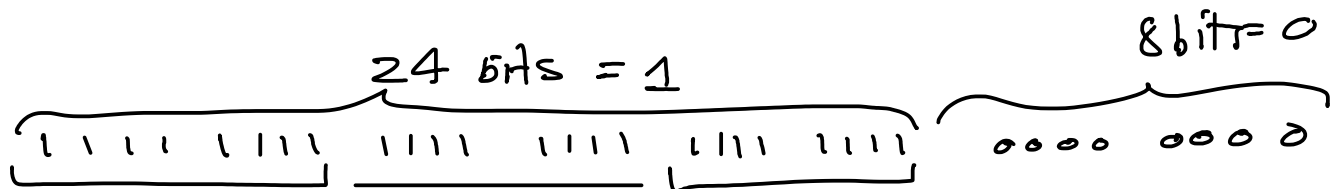# Lecture 16

Exercise 1: What is the difference between IP and "The In-
ternet"? Does a network using IP have to be on the Internet?
Does someone using the Internet have to use IP?

- IP - protocol

  Internet - linked "hosts" all using IP.

- no. we can have private IP-based networks

- yes.

Exercise 2: What is the netmask in binary for a /24 network?
What is it in decimal? How can the netmask be used to deter-
mine 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?

$$24 \text{ bits} = 1 \qquad\qquad 8 \text{ bits} = 0$$

1 1 1 1 1 1 1 1 1   1 1 1 1   1 1 1 1   1 1 1 1 1 1 1 1   0 0 0 0   0 0 0 0

Netmask for a /24 network address.

255. 255. 255. 0

to test for network membership:

$$\left(\underline{IP\ address} \quad \underset{\substack{bitwise \\ and}}{AND} \quad \underline{netmask} \right) \overset{?}{=} network\ address$$

if yes $\Rightarrow$ IP address is in that network.

is 192.168.2.200

in 192.168.2.0   /25 network   ?

24 bits   1 bit

25 bits.

$200 = 100....$ ← IP address & 1000 0000

exclusive OR → $\oplus$ 0   = 000....

not zero

∴ this address is not in that network.

Exercise 3: Who "owns" the 204.191.0.0/16 network?

Networks	
TELUS-204-191-0-0 (NET-204-191-0-0-1)	204.191.0.0 - 204.191.255.255
NET204 (NET-204-0-0-0-0)	204.0.0.0 - 204.255.255.255

Exercise 4: For the routing table above, what port ("Interface") would be used by packets with the following destination IP addresses: 127.0.0.255? 192.168.1.1? 192.168.2.1? 204.191.10.32?

↳ Vlan1

↳ Loopback (lo)

↳ br0 (LAN)

↳ vlan1 (gateway)