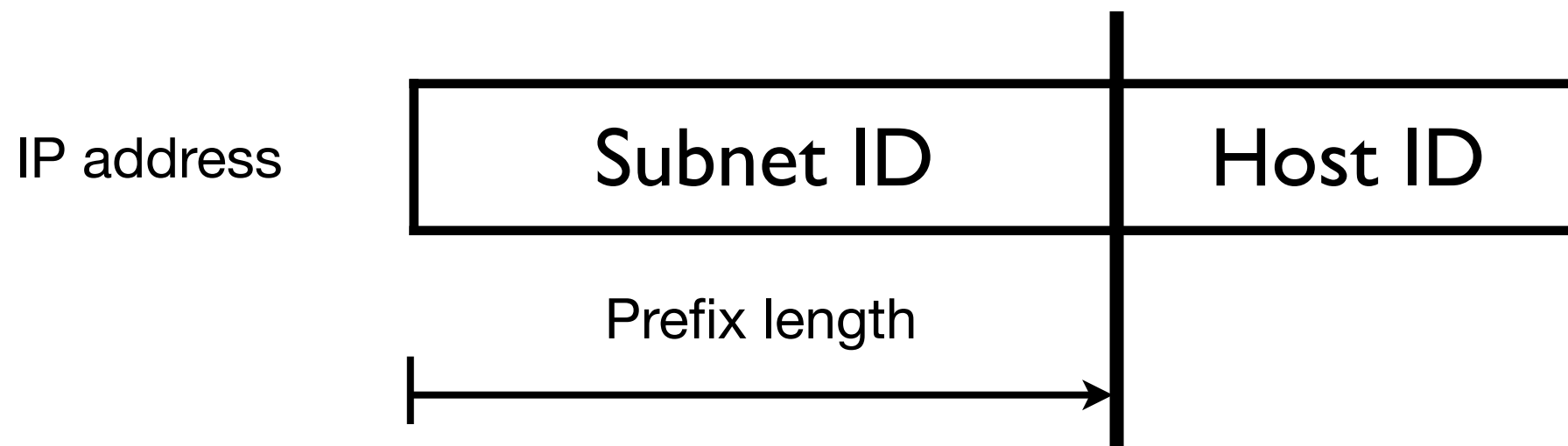


Subnetting

- ▶ **Problem:** deciding whether an IP address is on a local L2 network
- ▶ **Solution:** nodes on a local network (and only those) have IP addresses within a specific range
- ▶ Simplifying HW implementation - **subnets**



IP Prefix - Examples

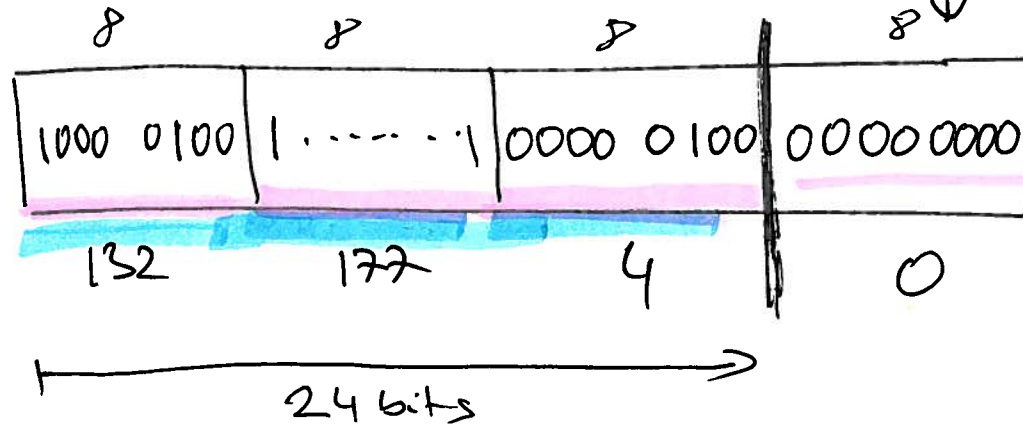
- ▶ Range of **132.177.4.0/24**?
132.177.4.0 → 132.177.4.255
- ▶ Range of **132.177.4.0/22**?
132.177.4.0 → 132.177.7.255
- ▶ Range of **132.177.4.0/26**?
132.177.4.0 → 132.177.4.63
- ▶ Range of **132.177.0.0/16**?
132.177.0.0 → 132.177.255.255
- ▶ Range of **0.0.0.0/0**? (default gateway)
0.0.0.0 → 255.255.255.255

132.177.4.0/24

SUBNET ID

PREFIX LEN.

host id



$$132 = 128 + 4$$

RANGE:

132.177.4.0 - 132.177.4.255

FIRST HOST
LAST HOST

132.177.4.1
132.177.4.254

00...00
00...01

SUBNET ID
FIRST HOST

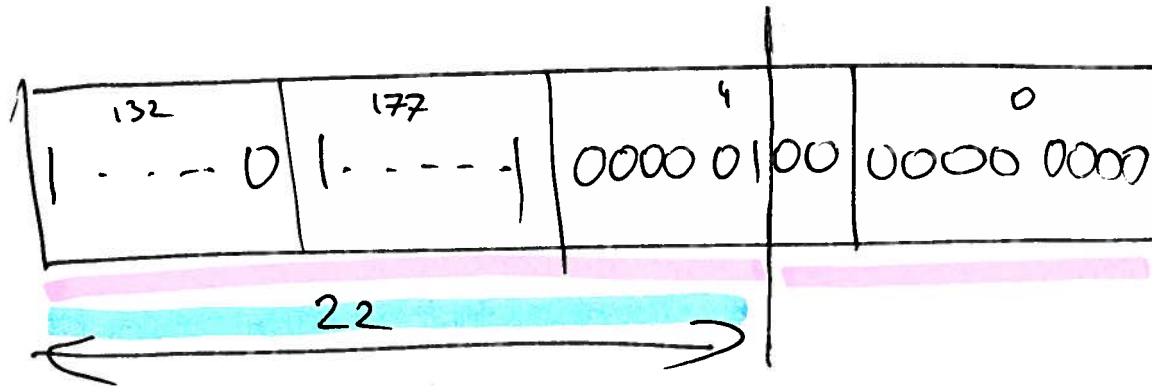
111...10

LAST HOST

11...11

SUBNET
BROADCAST
ADDR.

132.177.4.0 / 22



START (SUBNET ID) 132

177

0000 0100

0000 0000

132.177.4.0

FIRST HOST 132

177

0000 0100

0000 0001

132.177.4.1

LAST HOST 132

177

0000 0111

1111 1110

132.177.7.254

B-CAST 132

177

0000 0111

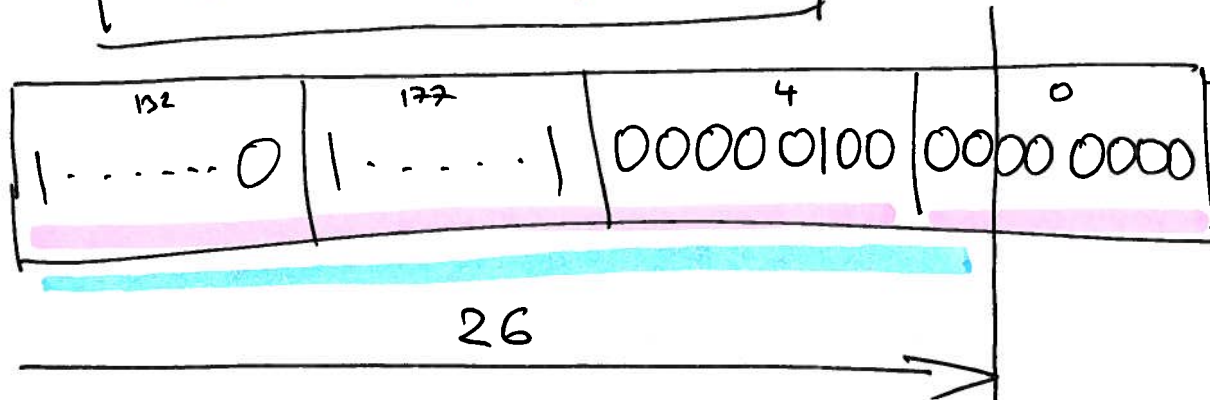
1111 1111

132.177.7.255

7

255

132.177.4.0/26



	SUBNET ID	132	177	4	00 000000	132.177.4.0
FIRST					00 000001	132.177.4.1
LAST					00 111110	132.177.4.62
BROADCAST					00 111111	132.177.4.63

62 63

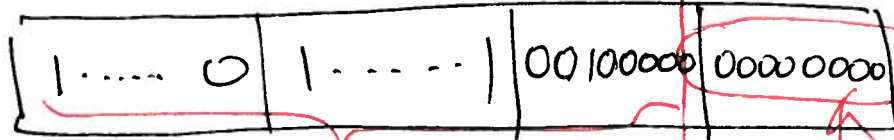
IP Prefix - Examples

- ▶ Prefix for range 132.177.32.0 → 132.177.33.255?
132.177.33.0/23
- ▶ Prefix for range 132.177.2.192 → 132.177.2.223?
132.177.2.192/27
- ▶ Prefix for range 132.177.1.0 → 132.177.2.255?
132.177.1.0/24
and (!)
132.177.2.0/24

PREFIX FOR RANGE:

132.177.32.0 → 132.177.32.255

START



SAME

ALL 0's

END



ALL 1's

23 bits

→ 132.177.32.0 / 23 ←