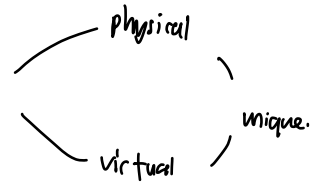


Addressing problem

MAC address for NIC - network interface card.

48 bits



globally unique - Controlled by IEEE.

hard to be unique

first 3 bytes = vendor. ie. 8C EC 4B xx xx xx.

- Some MAC - both senders will receive
- Every node in a given subnet/LAN has to be unique.

all 1s for broadcast.

- your responsibility to ensure 2 senders do not have the same MAC.

Unique to network interface card.
i.e. where the frame will be sent to.

Ethernet - technology for LINK layer

main wired internet technology.

cheap & fast.

Frame

max 1500 bytes. → MTU

min 46 bytes. → ensure a collision will always be detected.

preamble, dest addr, src addr, type, data, crc.

guarantee collision ⇒ return CSMA/CD.

ensure packet move to higher layer is correct.

of upper layer

error detection

↳ drop if error.

multiplexing.

multiple network protocols.

preamble

telling clock frequency

Shared Link.

- Coaxial bus — broadcast LAN — all nodes collide w/ each other.
 - Single point of failure
 - Very slow.

- Star topology — Hub — amplify bits received
 - simulate a bus.
 - cheap, but is a single point of failure but easier to maintain.
 - Slow, high collision, no CSMA/CD.

- Switch
 - Link layer device — can operate on frames.
 - no collision
 - store & forward — how buffer, won't overflow.
 - for all interfaces/ports.
 - enables multiple transmission.
 - Selectively forward frames.
 - transparent. — interface/port do not have their own MAC address.

TTL for router/hosts.

- No TTL → ∴ no loops in network. — spanning tree else buffer overflow.

Switch Forwarding table.

- records sender — location pair
- Straight forward forwarding
- If no entry, broadcast to all others. (avoid sending to sending interface)
- Received a frame for a location that is the same as sender → dropped
 - so duplicate packets won't be sent
- TTL for MAC — interface pairing.

↳ If you move, need to send a packet first to establish new address.

Full duplex cable - no collision from sending & receiving.

Ethernet no IP address.

↳ a way to convert using a table.

↳ ARP Table.

IP addr : MAC addr : TTL.

↳ time after which
will be forgotten.

↳ Create the frame for the next hop

⇒ dest. mac addr for router etc.

⇒ not invisible

VS IP addresses ⇒ end-to-end.

gateway?