

# Hardware Addressing

---

- ◆ LAN technologies facilitate sharing of information between all locally connected stations
- ◆ Direct communication between specific pairs of stations is achieved using an *addressing scheme*
- ◆ Each station is assigned a **UNIQUE** *address*:
  - Called a ***Hardware Address*** or a ***MAC Address***
- ◆ An example of an Ethernet MAC address is:
  - **00:40:05:1c:0e:9f**
  - Ethernet MAC addresses are 48-bit long and are usually represented in Hex format; 12 Hex digits, each digit representing 4 bits.

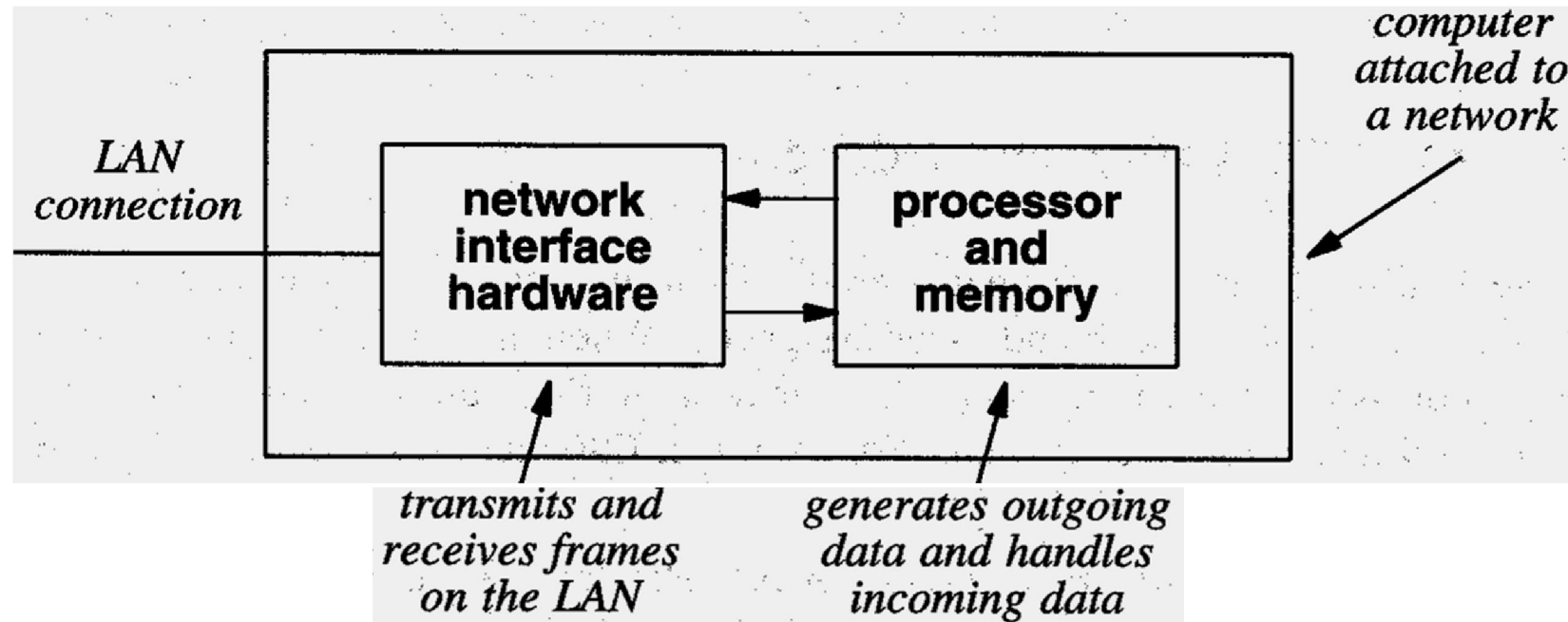
# Hardware Addressing in Frames

---

- ◆ The *header* within each transmitted frame contains the addresses of the *sender* and receiver
- ◆ This allows the LAN interface card (**Network Interface Card** aka **NIC**) to filter out frames without conferring with the CPU:
  - See next slide.
- ◆ The NIC only interrupts the CPU when it has data specific to the station
- ◆ All other frames are discarded

# The Network Interface Card (NIC)

---



# Hardware Addressing Allocation

---

- ◆ Different addressing schemes are employed on different LAN topologies.
- ◆ Each station's address must be unique on the LAN to which it connects.
- ◆ Address allocation falls into three categories:
  - **Static.** The h/w manufacturer sets the address
  - **Dynamic.** Stations sets their address at boot-up
  - **Configurable.** The admin. sets the address

# Types of Communication

---

- ◆ There are three types of communication possible on a LAN:
  - **Unicast:** This is *station-to-station* communication.
  - **Broadcast:** This is *station-to-ALL* stations communications.
  - **Multicast:** This is *station-to-SOME* station communications.
- ◆ Each type of communication requires its own address.

# Types of Communication

---

- ◆ **Unicast** communication requires the use of unique MAC addresses:
  - All NICs are configured with a unique MAC address.
- ◆ **Broadcast** communication requires one address to be recognised by all stations:
  - All NICs are configured to recognise the broadcast address of all ones (FF:FF:FF:FF:FF:FF)
- ◆ **Multicast** communications require one address to be recognised by some stations.