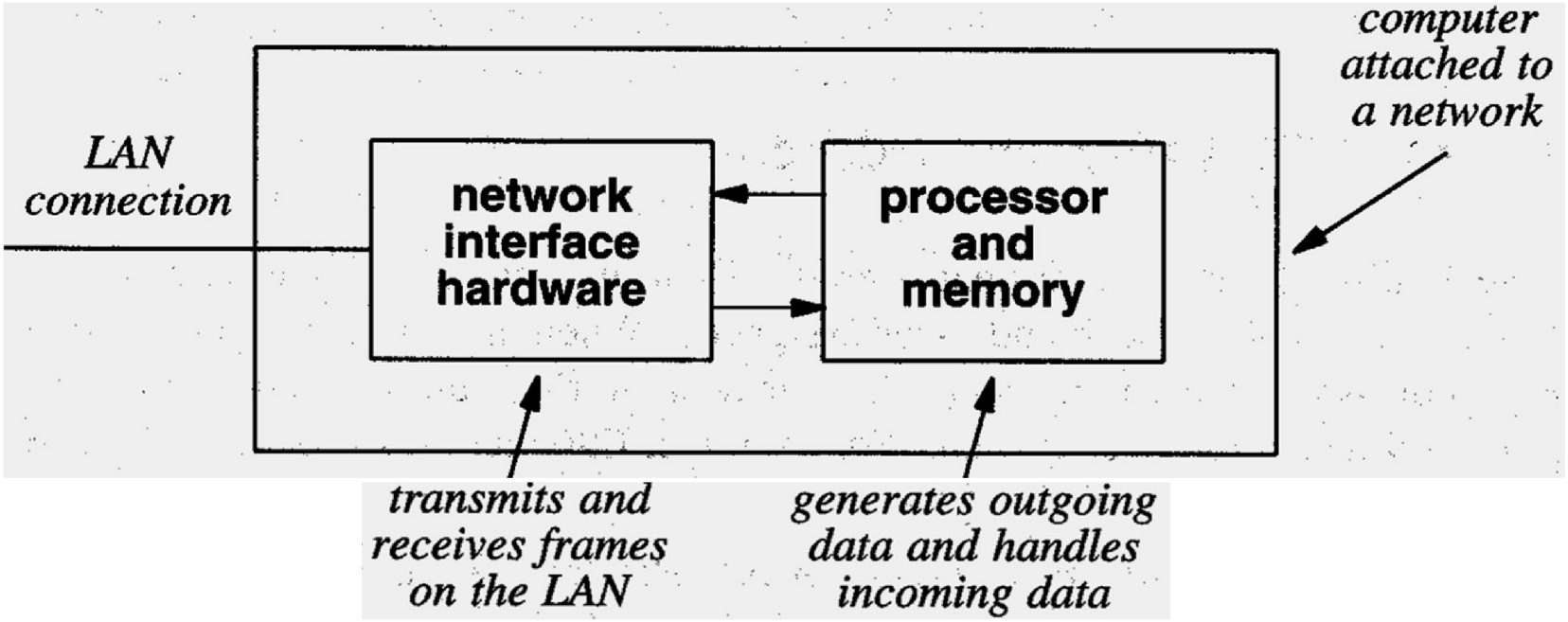
Hardware Addressing

- 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 recognised the broadcast address of all ones (FF:FF:FF:FF:FF:FF)
- **Multicast** communications require one address to be recognised by some stations.