Address Types – (1):

- Physical Address
  - 48-bit Physical address of a system is embedded into its NIC
  - Denoted by Hexadecimal notation
  - Used by Data Link layer
  - In case of a LAN, it is also known as MAC address
  - Easily accessible within a network
  - Uniquely identifies a system on the network
- Logical or Virtual Address
  - Physical addresses on different networks are not easily accessible in an internetwork
  - Logical Address uniquely identifies a system on an internetwork
  - Consists of two parts:
    - Network number – called Prefix, identifies a particular network in an internetwork
    - Host number – called Suffix, identifies a particular host in that network
  - Use by Network layer
  - Address size depends on the network layer protocol (IP)

It is 32 bits for IPv4 and 128 bits for IPv6

- Dotted-Decimal Notation
  - 32-bit logical address is divided into four octets
  - Each octet is indicated by decimal number and separated by a dot

Dotted-decimal numbers range from 0.0.0.0 to 255.255.255.255

**Transport Layer – *Addressing:***

- Identification of a *computer* in an internetwork
  - is done using *logical* address (in Network layer)
- However,

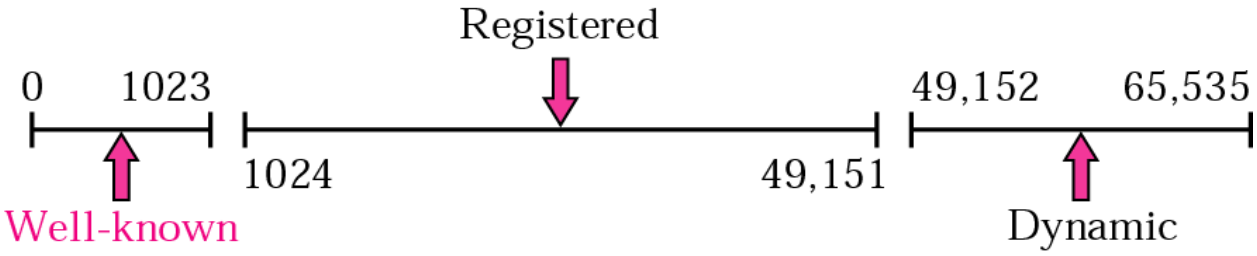
- since a computer may run multiple processes simultaneously,
- it is also essential to uniquely identify a given *process*

◆ Unique identification of a process in a computer

- is done with *transport* layer address…
- because this layer is responsible for *process-to-process* communication

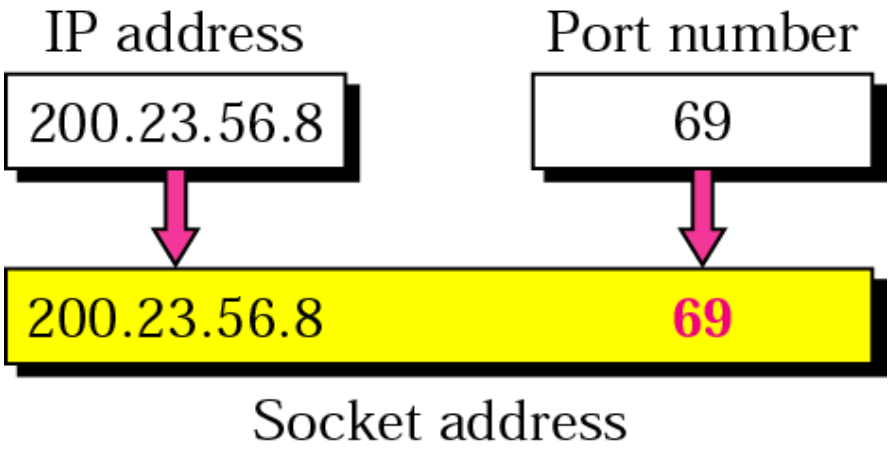
**Port Number Types:**

- Well known (assigned and controlled by IANA – Internet Assigned Number Authority)
- Registered (neither assigned nor controlled; only registered to avoid duplication)
- Ephemeral or Dynamic (neither assigned nor registered; can be used by any process)




**Socket Address:**

- *Socket* refers to an end point
- This is an end point where a process can be accessed
- It is analogous to a socket used for accessing power, music, video etc
- In an internetwork, a socket uniquely defines an end point where a particular process can be accessed




**Basic IP Addressing:**

- Each host connected to the internet is identified by a unique IP address.
- An IP address is a 32-bit quantity.
  - ❖ Expressed as a dotted-decimal notation W.X.Y.Z., where dots are used to separate each of the four octets of the address.
  - ❖ Consists of two logical parts: -
    1. A network number
    2. A host no.
  - ❖ This partition defines the IP address classes.

Dotted Decimal Notation: -

E.g. 66.134.48.126

01000010.10001000.00110000.01111110

**Hierarchical Addressing:**

- A computer on the internet is addressed using a two table: -
  - ❖ Network Number:
    - ❑ Assigned and managed by central authority.
  - ❖ The host number:
    - ❑ Assigned & managed by local network administrator.

- When routing a packet to the destination network, only the network number is looked at.

**Address Classes:**

- Class A defines a large network
- Class B defines a medium-sized network
- Class C defines a small network
- Class D addresses identify groups of hosts for multicasting.
    - Not assigned to an individual node on the network.

**IP Address Classes:**

- There are five defined IP address classes.
    1. Class A UNICAST
    2. Class B UNICAST
    3. Class C UNICAST
    4. Class D MULTICAST
    5. Class E Reserved
- Identified by the first few bits in the IP address.
- There also exits some special purpose IP address.
- The class based addressing is also known as the classfull model.
    1. Different network classes represent different networks to host ratio.
    2. Lend themselves to different network configurations.