In computer networking a Media Access Control Address (**MAC Address**) is a unique identifier attached to most forms of networking equipment.

MAC addresses are also known as **Hardware Addresses** or **Physical Addresses**. /

Most layer 2 network protocols use one of three numbering spaces managed by the IEEE:

***MAC-48*, *EUI-48, EUI-64***

which are designed to be globally unique. Not all communications protocols

use MAC addresses, and not all protocols require these globally unique identifiers. /

The IEEE claims trademarks on the names "EUI-48" and "EUI-64". (The "EUI" stands for Extended Unique Identifier.) The original IEEE 802 MAC address, now officially called "MAC-48", comes from the Ethernet pecification.

Since the original designers of Ethernet had the foresight to use 12-digit hexadecimal numbers 48 bits in length address space, there are potentially 248 or 81,474,976,710,656 possible MAC addresses./

**Printed Format**

The standard format for printing

MAC-48 addresses in human-readable media is three groups of four hexadecimal digits, separated by dots (.), in transmission order; e.g., 0123.4567.89ab. Very few

products do this. The most common format is six groups

of two hexadecimal digits, separated by colons (:) or hyphens (-), still in

transmission order, as in

01:23:45:67:89:ab or 01-23-45-67-89- ab; this form is also commonly used for EUI-64. By convention, MAC addresses

are usually written in one of the

following two formats:

**MM:MM:MM:SS:SS:SS** OR **MM-MMMM- SS-SS-SS/**

The first half of a MAC address contains the ID number of the Device Manufacturer. These IDs are regulated by an Internet standards body. The second half of a MAC address represents

the serial number assigned to the adapter by the manufacturer.

In the example, 00:A0:C9:14:C8:29

The prefix 00A0C9

indicates the manufacturer is Intel Corporation./

**Why MAC Addresses?**

Networking Architectures generally adopt the OSI model.

In this model, network functionality is subdivided into layers. MAC addresses function at the **Data Link Layer** (layer 2 in the OSI model). They allow computers to uniquely identify

themselves on a network at this relatively low level.

**MAC vs. IP Addressing**

Whereas MAC addressing works at the data link layer, IP addressing functions at the

network layer (layer 3). It's a slight oversimplification, but one can think of IP addressing as supporting the software

implementation and MAC addresses as supporting the hardware implementation of the

network stack. The MAC address generally remains fixed and follows the network device, but the IP address changes as the network device moves from

one network to another.

**How can we see MAC Address?**

If TCP/IP are installed on a system, then execute following command from a Command

Prompt window. click ***Start***, then ***Run***, then type cmd in the

text box.

Type in the Command Prompt Windows.

**ipconfig/all**

The 12-digit Physical Address is the same as

MAC address.

The LAN card will accept only 3 types of MAC

address:

**Unicast**, Frames with destination to the exact

MAC address .

**Broadcast**, Has all 48 bits set to binary 1 (or

Hex FF FF FF FF FF FF). This type of frame is

used when the sender does not know the

destination MAC address it tries to

communicate , so we broadcast to all .

**Multicast**, Addressing to groups of LAN cards

that are related in some way. The LAN cards

have to be configured to know they are part of

a multicast group.