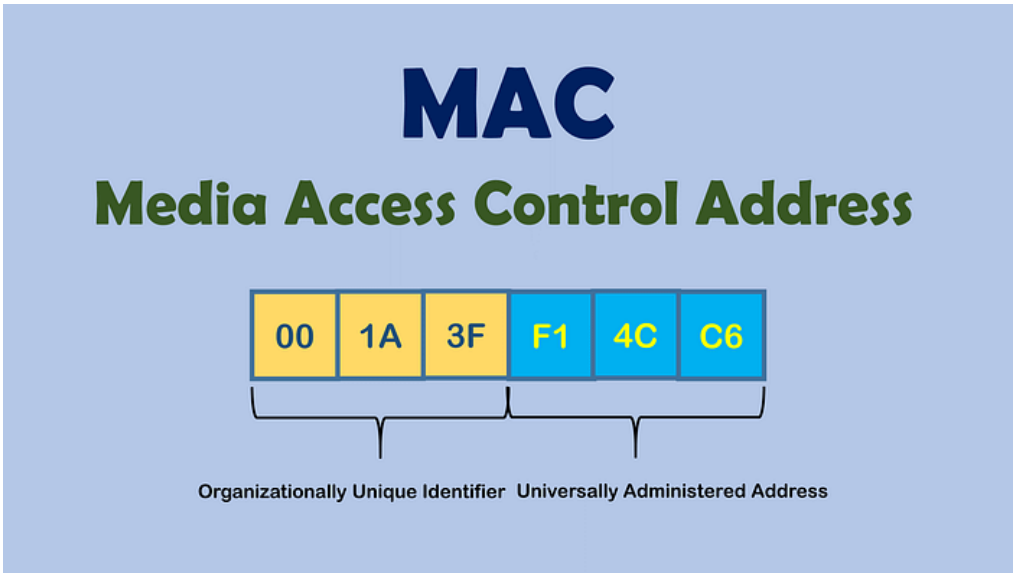
# MAC Address

A **MAC address**, short for **Medium Access Control address**, is a unique identifier assigned to a **network interface controller (NIC)**. It serves as a network address within a specific network segment. Here are some key points about MAC addresses:




1. **Definition**: A MAC address is a **48-bit hardware number** embedded into a network card (also known as a Network Interface Card) during manufacturing. It is also referred to as the **Physical Address** of a network device.

2. **Layer of Operation**: The MAC address operates at the **Data Link Layer** of the network protocol stack

3. **Format**: A MAC address consists of a **12-digit hexadecimal number** (equivalent to a 6-bit binary number). It is commonly represented using **Colon-Hexadecimal notation** (e.g., 00:40:96). The first 6 digits identify the manufacturer (known as the **OUI** or **Organizational Unique Identifier**), while the remaining 6 digits represent the **Network Interface Controller** assigned by the manufacturer
.
4. **Uniqueness**: MAC addresses are **worldwide unique** since millions of network devices exist, and each one needs a distinct identifier.

5. **Types**:

    - **Unicast**: A unicast-addressed frame is sent to a specific NIC. The source machine's MAC address is always unicast.
    - **Multicast**: Multicast addresses allow sending frames to a group of devices.
    - **Examples of OUIs (Manufacturer Identifiers)**:

- Cisco: CC:46:D6
- Google, Inc.: 3C:5A:B4
- Hewlett Packard: 3C:D9:2B
- Huawei Technologies: 00:9A:CD

## Finding the MAC Address on Windows

- Open the Command Prompt by pressing Windows key + S and searching "Command."
- Type "ipconfig /all" and press "Enter."
- Locate the network adapter and find the MAC address next to "Physical Address."

Remember, MAC addresses play a crucial role in ensuring data packets reach the correct devices within a local network