# Difference between MAC Address and IP Address

Both [MAC Address](https://www.geeksforgeeks.org/computer-network-introduction-mac-address/) and [IP Address](https://www.geeksforgeeks.org/ip-addressing-introduction-and-classful-addressing/) are used to uniquely define a device on the internet. NIC Card’s Manufacturer provides the MAC Address, on the other hand, Internet Service Provider provides IP Address.

The main difference between MAC and IP address is that MAC Address is used to ensure the physical address of the computer. It uniquely identifies the devices on a network. While IP addresses are used to uniquely identifies the connection of the network with that device takes part in a network.

Let’s see the difference between MAC Address and IP Address:

| S.NO | MAC Address | IP Address |
| --- | --- | --- |
| 1. | MAC Address stands for Media Access Control Address. | IP Address stands for Internet Protocol Address. |
| 2. | MAC Address is a six byte hexadecimal address. | IP Address is either a four-byte (IPv4) or an eight-byte (IPv6) address. |
| 3. | A device attached with MAC Address can retrieve by ARP protocol. | A device attached with IP Address can retrieve by RARP protocol. |
| 4. | NIC Card’s Manufacturer provides the MAC Address. | Internet Service Provider provides IP Address. |
| 5. | MAC Address is used to ensure the physical address of a computer. | IP Address is the logical address of the computer. |
| 6. | MAC Address operates in the data link layer. | IP Address operates in the network layer. |
| 7. | MAC Address helps in simply identifying the device. | IP Address identifies the connection of the device on the network. |
| 8. | MAC Address of computer cannot be changed with time and environment. | IP Address modifies with the time and environment. |
| 9. | MAC Addresses can’t be found easily by a third party. | IP Addresses can be found by a third party. |
| 10. | It is a 48-bit address that contains 6 groups of 2 hexadecimal digits, separated by either hyphens (-) or colons(.).  Example:  00:FF:FF:AB:BB:AA  or  00-FF-FF-AB-BB-AA | IPv4 uses 32-bit addresses in dotted notations, whereas IPv6 uses 128-bit addresses in hexadecimal notations.  Example:  IPv4 192.168.1.1  IPv6  FFFF:F200:3204:0B00 |
| 11. | No classes are used for MAC addressing. | IPv4 uses A, B, C, D, and E classes for IP addressing. |
| 12. | MAC Address sharing is not allowed. | In IP address multiple client devices can share the IP address. |