

MAC (or Machine Access Control)

MAC addresses are typically used only to direct packets from one device to the next as data travels on a network.

That means that your computer's network adapter's MAC address travels the network only until the next device along the way. If you have a router, then your machine's MAC address will go no further than that. The MAC address of your router's internet connection will show up in packets sent further upstream, until that too is replaced by the MAC address of the next device – likely either your modem or your ISP's router.

Importance: Used for local network communication (e.g., within Wi-Fi networks) and for controlling access to networks, such as through MAC filtering.

IP address

An IP address is assigned to every device on a network, so that device can be located on that network.

The internet is just a network, after all – albeit a huge one – and every device connected to it has an IP address. The server that houses Ask Leo!, for example, is (currently) at 50.28.23.175. That number is used by the network routing equipment, so when you ask for a page from the site, the request is routed to the right server.

The computers or equipment you have connected to the internet are also assigned IP addresses.

If you're directly connected, your computer will have an IP address that can be reached from anywhere on the internet. If you're behind a router, that router will have the internet-visible IP address, but it will then set up a separate, private network to which your computer is connected, assigning IP addresses out of a private range that is not directly visible on the

internet. Any internet traffic your computer generates must go through the router, and will appear on the internet to have come from that router.

Importance: Identifies devices on the internet or local networks, enabling data to be routed correctly.

IMEI (International Mobile Equipment Identity)

IMEI (International Mobile Equipment Identity) is a 15-17-digit code that is given to every mobile phone. This number is used by service providers to uniquely identify valid devices. Specifically, IMEI code can enable a Global System for Mobile communication (GSM) or Universal Mobile Telecommunications Service (UMTS) network to prevent a misplaced or stolen phone from initiating calls. IMEI is also a part of mobile device management.

Individuals who buy used phones can look up the IMEI number to check and see the phone is valid. Checking the number can also inform users on the country and network from which a device originated, the warranty, carrier information, and more similar details. Both law enforcement and intelligence services could also use an IMEI number in order to track devices within the accuracy of a few meters.

Importance: Helps track lost or stolen devices, block unauthorized devices from networks, and ensure device authenticity.

SSID (service set identifier)

An SSID (service set identifier) is a sequence of characters that uniquely names a Wi-Fi network. An SSID is sometimes referred to as a network name. This name enables stations to connect to the desired network when multiple independent networks operate in the same physical area.

SSIDs are used in home networks and business Wi-Fi networks. They are most commonly seen when connecting mobile devices like laptops or smartphones to a wireless network.

SSIDs can reach up to 32 characters in length. Wireless routers and access points broadcast SSIDs so that users can find and connect to the network. Router manufacturers create default SSIDs, using the manufacturer's name and adding random numbers and letters. To cause less confusion in an area with multiple wireless networks, changing the default SSID to another string of characters is a common practice.

Importance: Helps users identify and connect to the correct wireless network, especially in areas with multiple networks.

DNS (Domain Name System)

The Domain Name System (DNS) is the phonebook of the Internet. Humans access information online through domain names, like nytimes.com or espn.com. Web browsers interact through Internet Protocol (IP) addresses. DNS translates domain names to IP addresses so browsers can load Internet resources.

Each device connected to the Internet has a unique IP address which other machines use to find the device. DNS servers eliminate the need for humans to memorize IP addresses such as 192.168.1.1 (in IPv4), or more complex newer alphanumeric IP addresses such as 2400:cb00:2048:1::c629:d7a2 (in IPv6).

Importance: Simplifies access to websites by allowing users to use domain names instead of numerical IP addresses.