Ip Address: What You Need to Know About it

An Internet Protocol (IP) address is a logical address assigned to devices participating in a network that utilizes the IP for communication between nodes. Although normally stored as binary numbers, an IP address is usually displayed in forms or notations that are readable by humans.

Every time someone requests a webpage or sends emails, a part of the information includes the IP address. At the other end, the recipient can see the IP address of the one that sent an email or requested an HTML webpage.

In short, the role of an IP address is characterized as a name that indicates what we are looking for, an address where one can be able to locate it, and the route that one needs to get there, without any further hassle.

The original designers of the IP address came up with a 32-bit Internet Protocol version 4 (IPv4), which is still widely used today. But due to the huge growth of the Internet, they have developed a new addressing system, the 128-bit Internet Protocol version 6 (IPv6).

An IP address specifies the locations of the sources and destination nodes of the routing system. This is why some of the bits in an IP address are used to comprise a subnetwork. An IP address may be private for use on a Local Area Network (LAN), or for the use on the Internet thus making it public.

The Design

The IP address was earlier intended to be uniquely designed for a single computer or device but this isn2019t always necessary, since some private networks create their own addresses. Besides, some technologies redesigned their system to be able to allow multiple hosts for a single address but its place
depends on the request of the clients in the network.

In an isolated network, one can assign an IP address at random as long as each one is unique but if one is about to connect to a private network, a registered IP address is needed so as not to be hassled with duplicates.

In the early stages of Internet protocol, the administrators interpreted IP address as a structure of host and network number.

The Parts

The IP address has two parts, which is the identifier of the particular network and the device within that network. On the Internet though, especially when administrators ping IP, only the network part is important because it is the only one that is looked at.

The Classes and Their Formats

Networks vary in size and that is why there are four formats of IP addresses:

* Default Network - The IP address of 0.0.0.0 is used for the default network.

* **Class A** - This class is for very large networks, such as a major international company might have. IP addresses with a first octet from 1 to 126 are part of this class.The other three octets are used to identify each host. This means that there are 126 Class A networks each with 16,777,214 (224 -2) possible hosts for a total of 2,147,483,648 (231) unique IP addresses. Class A networks account for half of the total available IP addresses. In Class A networks, the high order bit value (the very first binary number) in the first octet is always 0.

Net
Host or Node
115.24.53.107

* Loopback - The IP address 127.0.0.1 is used as the loopback address. This means that it is used by the host computer to send a message back to itself. It is commonly used for troubleshooting and network testing.

* **Class B** - Class B is used for medium-sized networks. A good example is a large college campus. IP addresses with a first octet from 128 to 191 are part of this class. Class B addresses also include the second octet as part of the Net identifier. The other two octets are used to identify each host. This means that there are 16,384 (214) Class B networks each with 65,534 (216 -2) possible hosts for a total of 1,073,741,824 (230) unique IP addresses. Class B networks make up a quarter of the total available IP addresses. Class B networks have a first bit value of 1 and a second bit value of 0 in the first octet.
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* **Class C** - Class C addresses are commonly used for small to mid-size businesses. IP addresses with a first octet from 192 to 223 are part of this class. Class C addresses also include the second and third octets as part of the Net identifier. The last octet is used to identify each host. This means that there are 2,097,152 (221) Class C networks each with 254 (28 -2) possible hosts for a total of 536,870,912 (229) unique IP addresses. Class C networks make up an eighth of the total available IP addresses. Class C networks have a first bit value of 1, second bit value of 1 and a third bit value of 0 in the first octet.
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* **Class D** - Used for multicasts, Class D is slightly different from the first three classes. It has a first bit value of 1, second bit value of 1, third bit value of 1 and fourth bit value of 0. The other 28 bits are used to identify the group of computers the multicast message is intended for. Class D accounts for 1/16th (268,435,456 or 228) of the available IP addresses.
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* **Class E** - Class E is used for experimental purposes only. Like Class D, it is different from the first three classes. It has a first bit value of 1, second bit value of 1, third bit value of 1 and fourth bit value of 1. The other 28 bits are used to identify the group of computers the multicast message is intended for. Class E accounts for 1/16th (268,435,456 or 228) of the available IP

addresses.
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Host or Node
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 * Broadcast - Messages that are intended for all computers on a network are sent as broadcasts. These messages always use the IP address 255.255.255.255.

The address class format is indicated by the first few bits of the IP address itself.
Usually, the IP address is written as four decimal numbers each of them representing 8 bits and is separated by periods. This form is more technically known as
the dotted quad notation.
To put it bluntly, an IP address is a 32-bit number that identifies either the sender or receiver of certain information. When you use the command ping IP,
this is usually sent in packets that pass through routes across the Internet.