

IPV4 and IPV6

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WHAT IS AN IP ADDRESSING ?

An Internet Protocol (IP) address is a unique numerical identifier for every device or network that connects to the internet.

Typically assigned by an internet service provider (ISP), an IP address is an online device address used for communicating across the internet.

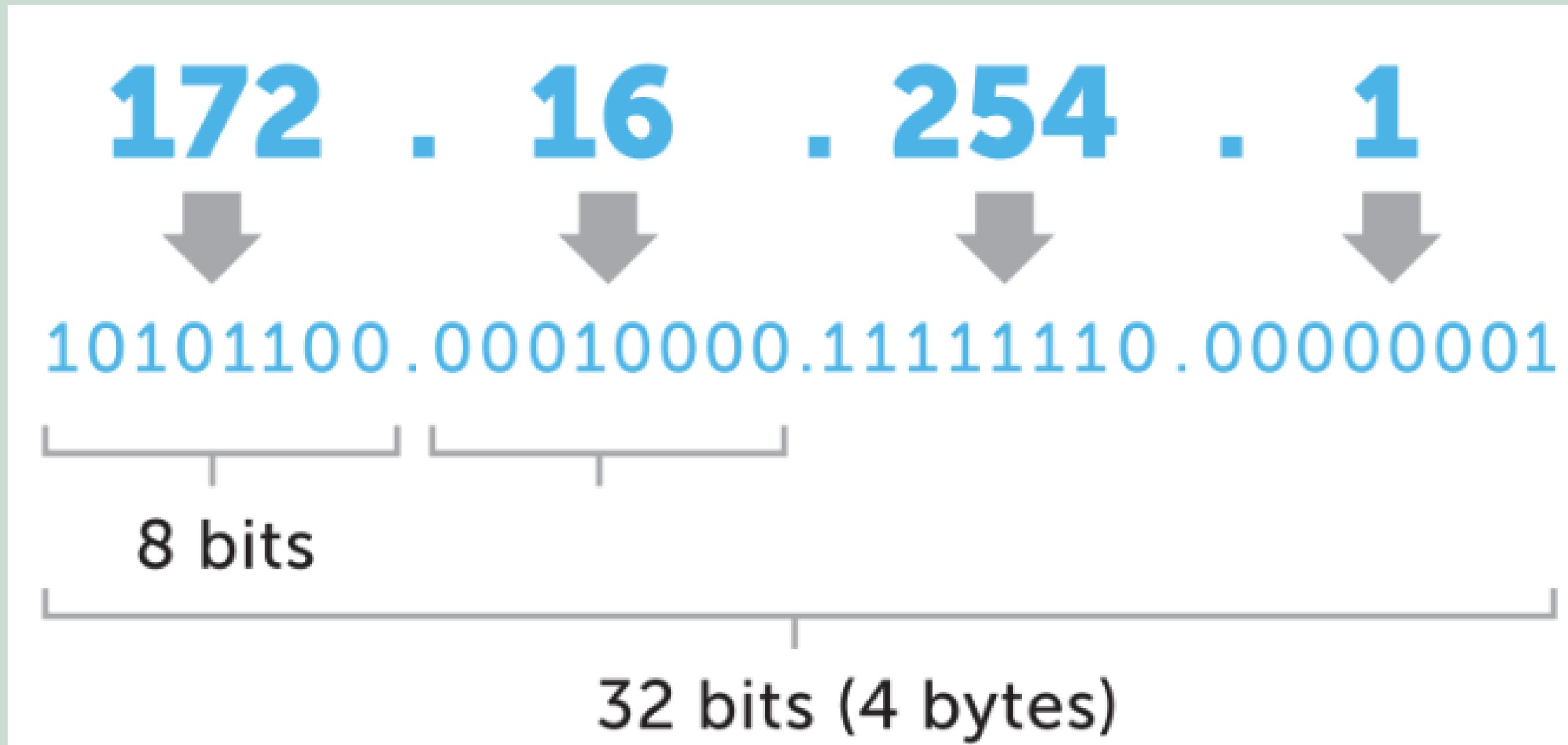
Types of IP Address

- IPv4 (Internet Protocol Version 4)
- IPv6 (Internet Protocol Version 6)

IPV4 :

IPv4 addresses are 32-bit numbers that are typically displayed in dotted decimal notation. A 32-bit address contains two primary parts: the network prefix and the host number. All hosts within a single network share the same network address. Each host also has an address that uniquely identifies it.

IPv4 Address Format :



IPV6 :

- IP version 6 is the new version of Internet Protocol, which is way better than IP version 4 in terms of complexity and efficiency
- IPv6 Address Format is a 128-bit IP Address, which is written in a group of 8 hexadecimal numbers separated by colon (:).
- IPv6 is the most recent version of Internet Protocol (IP). It's designed to supply IP addressing and additional security to support the predicted growth of connected devices in IoT, manufacturing, and emerging areas like autonomous driving.

IPv6 Address Format :

128-Bits

2001:4860:4860:0000:0000:0000:0000:8844

48-Bits

16-Bits

64-Bits

Network part

Subnet ID

Client ID

DIFFERENCES BETWEEN IPV4 & IPV6:

IPv4

Deployed 1981

32-bit IP address

4.3 billion addresses

Addresses must be reused and masked

Numeric dot-decimal notation

192.168.5.18

DHCP or manual configuration

IPv6

Deployed 1998

128-bit IP address

7.9x10²⁸ addresses

Every device can have a unique address

Alphanumeric hexadecimal notation

50b2:6400:0000:0000:6c3a:b17d:0000:10a9

(Simplified - 50b2:6400::6c3a:b17d:0:10a9)

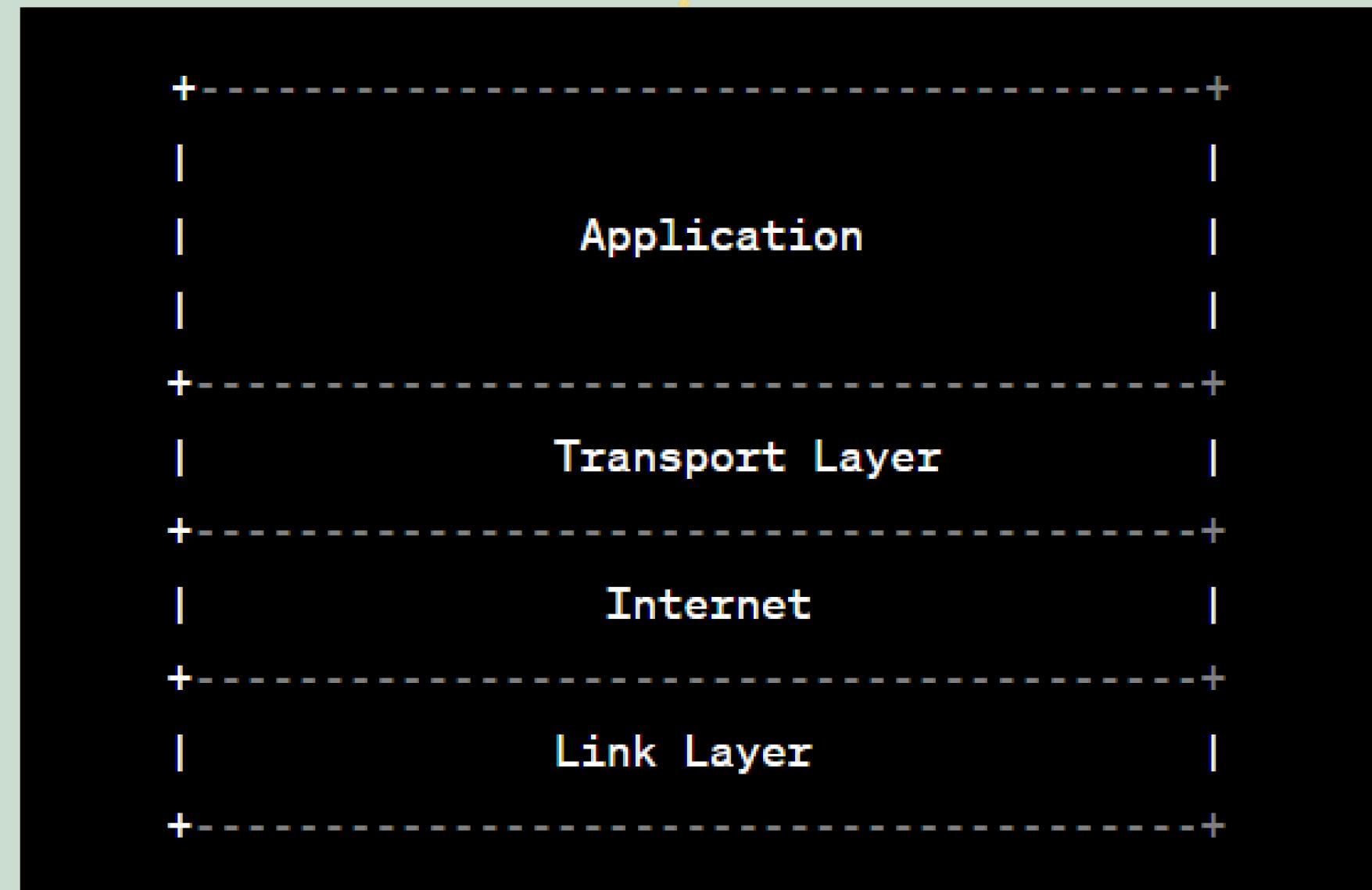
Supports autoconfiguration

BENEFITS OF IPV6 OVER IPV4:

- IPv6 is the latest version of the Internet Protocol, which assigns unique addresses to devices connected to the internet. IPv6 was developed to address the problem of IPv4 address exhaustion, as the number of devices and users on the internet grew exponentially.
- IPv6 has a much larger address space than IPv4, allowing for more devices, networks, and services to be connected. IPv6 also offers some advantages over IPv4, such as improved security, performance, and scalability.

Reserved Ports:

Layers Involved in Communication Process:



The reserved ports within the Transport Layer:

Reserved ports:

Reserved ports, also known as **well-known**

ports.

- These ports are typically used by widely-used protocols and services for communication on the internet.
- The port numbers range from 0 to 1023 and are considered "privileged" ports, meaning that they are restricted and can only be used by the system or applications with administrative privileges.

+-----+		
Reserved Ports		
+-----+		
Well-known ports	(0 - 1023)	
+-----+		
Registered ports	(1024 - 49151)	
+-----+		
Dynamic/Private	(49152 - 65535)	
+-----+		

Registered ports:

Registered ports range from 1024-49151 and are for less commonly used applications.

Dynamic ports:

Dynamic ports range from 49152-65535 and are used for temporary connections and applications.

Port numbers:

Port numbers are used to keep track of application-specific data. They are used by the Transport Layer of the OSI model.

THANK YOU