

The background features a technical drawing of several interlocking gears on the left side, with numerical markings such as 150, 160, 170, 180, 190, 210, 220, 230, 240, 250, and 260. On the right side, there is a stylized sunburst graphic with a blue circular base and several yellow rays extending outwards. The word "BERITECK" is written in a red, serif font across the middle of the image.

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# IP ADDRESSING

# WHAT IS AN IP ADDRESS?

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An IP address, short for Internet Protocol address, is a **numerical** label assigned to **each** device connected to a computer network that uses the Internet Protocol for communication.

# WHY DO WE NEED IP ADDRESSES?

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IP addresses serve as **unique** identifiers for devices on a network, enabling data routing and communication between devices.

# TYPES OF IP ADDRESSES

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**IPv4:** The most common version, using a **32-bit** address.

**IPv6:** The newer version, utilizing a **128-bit** address, designed to address IPv4 exhaustion.

# IPV4 VS. IPV6 COMPARISON

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- IPv4: Limited address space, potentially leading to address exhaustion.
- IPv6: Expanded address space, supporting a vast number of devices.
- Transition from IPv4 to IPv6 is ongoing.

# STRUCTURE OF AN IP ADDRESS

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An IP address consists of **four** segments, separated by **dots**, with each segment representing 8 bits (**1 byte**).

**NOTE:** Each number in an IPv4 address can range from **0 - 255**

IPv4 example → **192.168.0.1**

# EXAMPLE OF AN IPV6 ADDRESS

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IPv6 example

**2001:0db8:85a3:0000:0000:8a2e:0370:7334**

# PUBLIC VS. PRIVATE IP ADDRESSES

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**Public IP:** Identifies a device on the public internet.

**Private IP:** Used within a private network, not directly accessible from the internet.



# PUBLIC IP ADDRESS CLASSES

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**Class A:** 1-126.xxx.xxx.xxx

**Class B:** 128-191.xxx.xxx.xxx

**Class C:** 192-223.xxx.xxx.xxx

**Class D:** 224-239.xxx.xxx.xxx (used for multicast)

**Class E:** 240-255.xxx.xxx.xxx (reserved for experimental use)



# PRIVATE IP ADDRESS RANGE

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**Class A:** 10.0. 0.0 to 10.255. 255.255.

**Class B:** 172.16. 0.0 to 172.31. 255.255.

**Class C:** 192.168. 0.0 to 192.168. 255.255.

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**PORTS**



# PORTS

A port is a number (door or entry way) used by network devices for connection and communication.

Port numbers range from **0 - 65,535** i.e., **65536 ports**

Port numbers are assigned by the Internet Assigned Numbers Authority (**IANA**)

# TYPES OF PORTS

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**Well-Known Ports (0-1023):** These ports are reserved for standard and widely-used services. For example, HTTP (port 80), HTTPS (port 443), and FTP (port 21) use well-known ports.

**Ephemeral Ports (1024-49151):** Also known as dynamic or private ports, these are typically used for client-side communication. When a client initiates a connection to a server, it selects an ephemeral port to use for the session.

# WELL-KNOWN PORTS

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22 → SSH

23 → Telnet

25 → SMTP

53 → DNS

80 → HTTP

143 → IMAP

443 → HTTPS

20 & 21 → FTP



# PORT SCANNING

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Port scanning is a technique used by hackers to discover open doors or weak points in a network

# WINDOWS SCANNING TOOLS

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**Belarc** → <https://www.belarc.com/>

**Angry IP** → <https://angryip.org/download/>

**Advanced Port Scanner** → <https://www.advanced-port-scanner.com/>



# EXAMPLE OF SCANNING TOOLS

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- **Nessus** <https://www.tenable.com/downloads/nessus?loginAttempted=true>
- **ZAP**
- **Burp Suit**
- **Nikto**
- **Dirb**
- **Dirbuster**
- **NMAP**

