# Computer Hardware & Networking& Server Configurations (H7E3 04)

## UNIT 05:
## Network devices and protocols


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# TCP AND UDP PORTS

# TCP UDP PORTS

- TCP and UDP use a source and destination port number to keep track of application conversations.

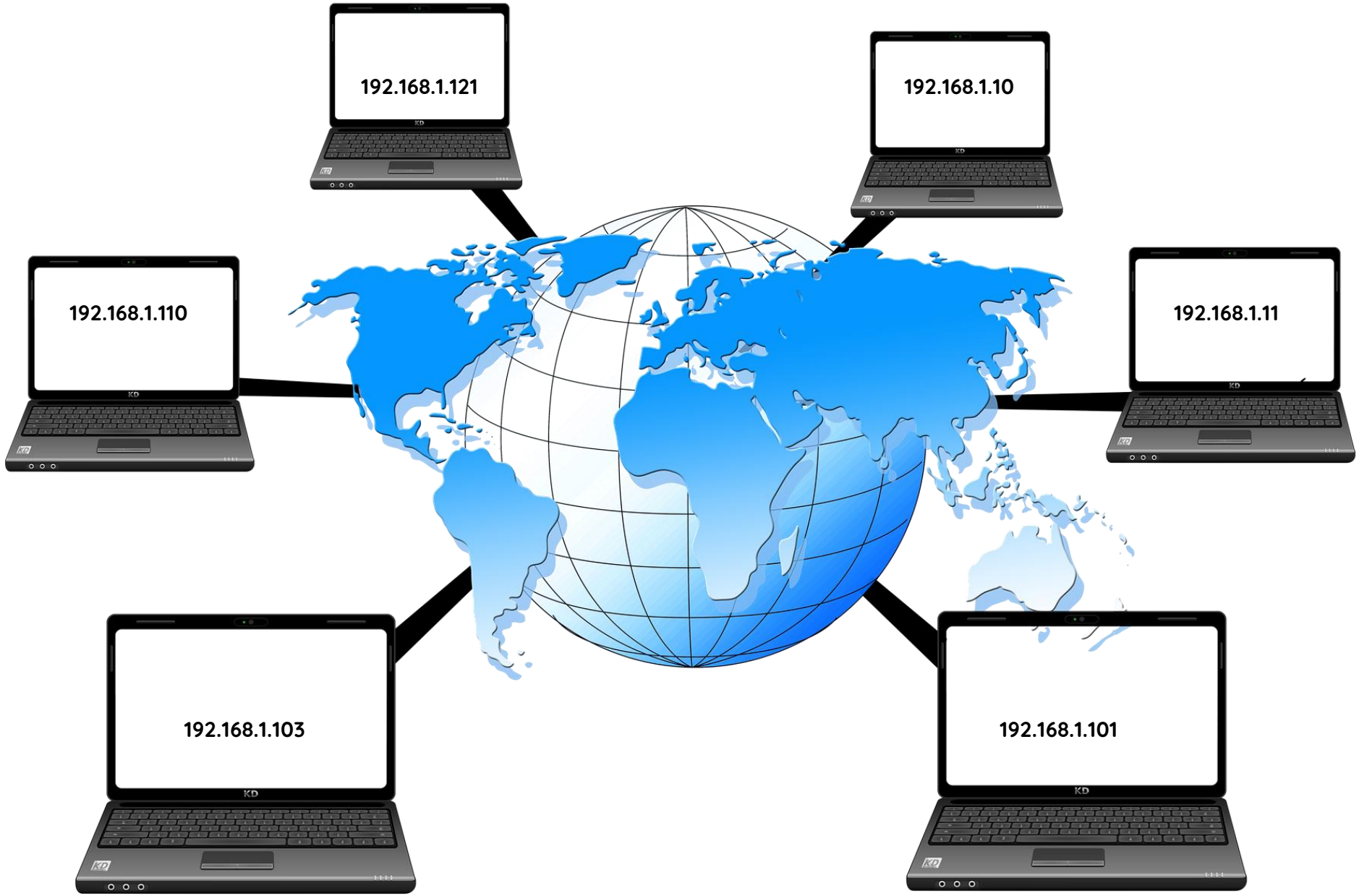
- The destination port number is associated with the destination application on the remote device.

- The source port number is dynamically generated by the sending device.

| Port Number | Protocol | Application | Acronym |
|---|---|---|---|
| 20 | TCP | File Transfer Protocol (Data) | FTP |
| 21 | TCP | File Transfer Protocol (Control) | FTP |
| 22 | TCP | Secure Shell | SSH |
| 23 | TCP | Telnet | - |
| 25 | TCP | Simple Mail Transfer Protocol | SMTP |
| 53 | UDP, TCP | Domain Name Service | DNS |
| 67 | UDP | Dynamic Host Configuration Protocol (Server) | DHCP |

# IP ADDRESS


No 22,
Peradeniya Rd,
Kandy
No 23,
Peradeniya Rd,
Kandy
No 24,
Peradeniya Rd,
Kandy
No 25,
Peradeniya Rd,
Kandy
No 26,
Peradeniya Rd,
Kandy


192.168.1.121
192.168.1.10
192.168.1.110
192.168.1.11
192.168.1.103
192.168.1.101

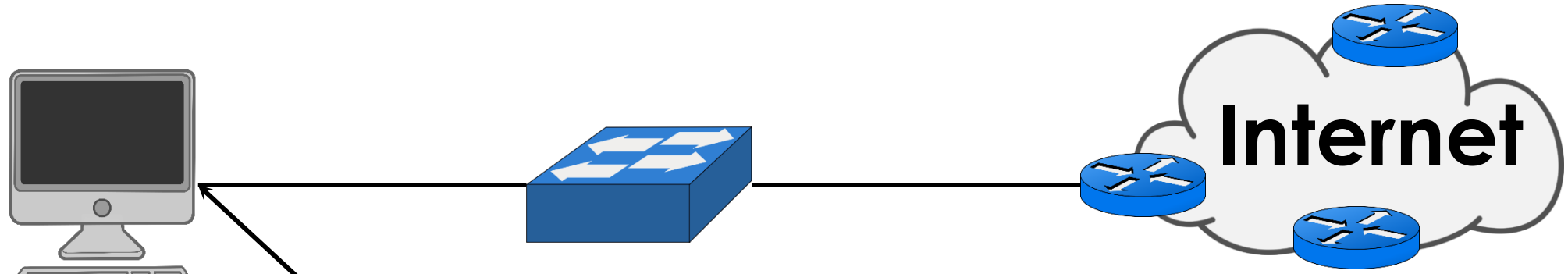
# IP ADDRESS

- One of the most important aspects of communications on an internetwork is the IP addressing scheme.

- IP addressing is the method used to identify hosts and network devices. As the Internet grew over time and the number of hosts connected to it increased, IP addressing schemes had to adapt to cope with the growth.

- While IP addressing schemes have had to adapt, the basic IP address structure for IPv4 remains the same. To send and receive messages on an IP network, every network host must be assigned a unique 32-bit IP address. Because large binary numbers are difficult for people to read and understand, IP addresses are usually displayed in dotted-decimal notation. In dotted-decimal notation, each of the four octets is converted to a decimal number separated by a decimal point. For example, the IP address:

- 11000000.10101000.00000001.01101010
- Is represented as **192.168.1.106** in **dotted-decimal notation.**




32 bit are difficult to read

sc we split them into 4 octets

convert to base - 10

and separate the numbers with dots. we call this dotted-decimal notation.

11000000 10101000 00000001 01101010

11000000 | 10101000 | 00000001 | 01101010

192 | 168 | 1 | 106

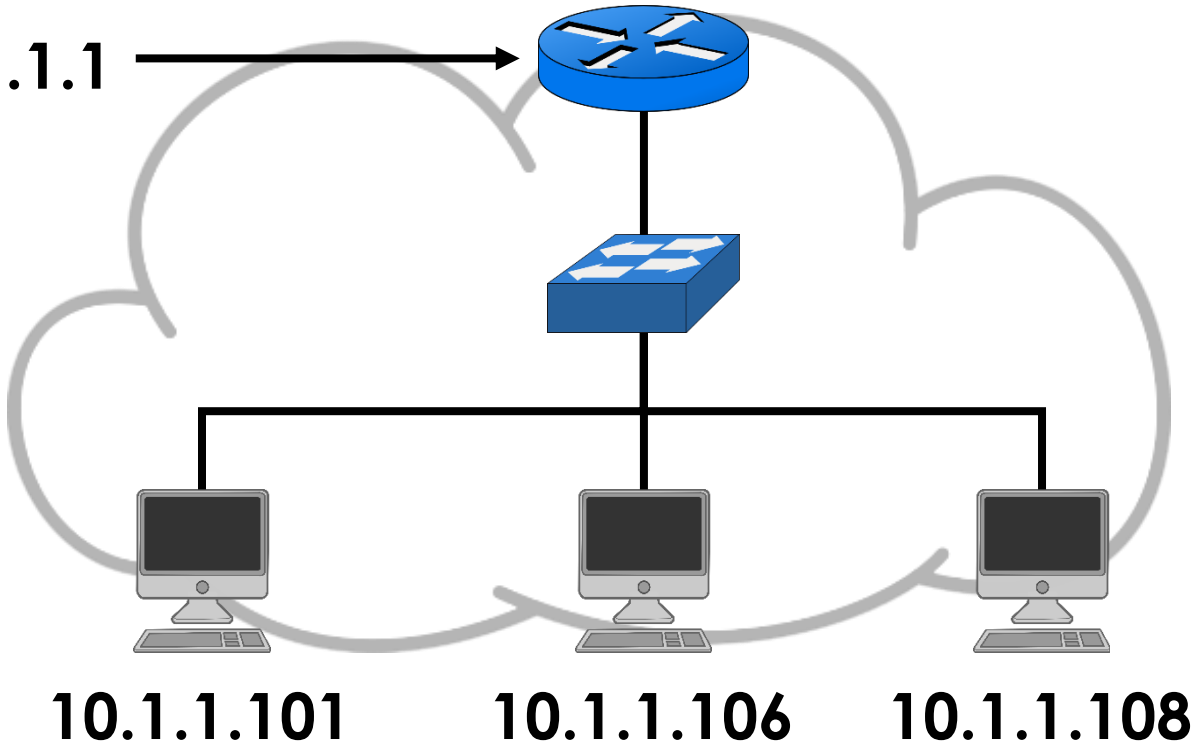
192.168.1.106

- IP addresses are hierarchical. A hierarchy is like a family tree with parents at the top and children connected to them below. For a network, this means that part of the 32-bit number identifies the network (parent), while the rest of the bits identify the host (child). In the early days of the Internet, there were so few organizations needing to connect to the Internet, that networks were assigned by only the first 8 bits (first octet) of the IP address. This left the remaining 24 bits to be used for local host addresses.

- The 8-bit network designation made sense at first, because originally people thought that the Internet would be made up of a few very large universities, governments, and military organizations. Using only 8 bits for the network number enabled the creation of 256 separate networks, each containing over 16 million hosts. It soon became apparent that more organizations, and eventually individuals, were connecting to the Internet to do research and to communicate with others. More networks were required, and a way to assign more network numbers had to be created.

10.1.1.101

Network Host



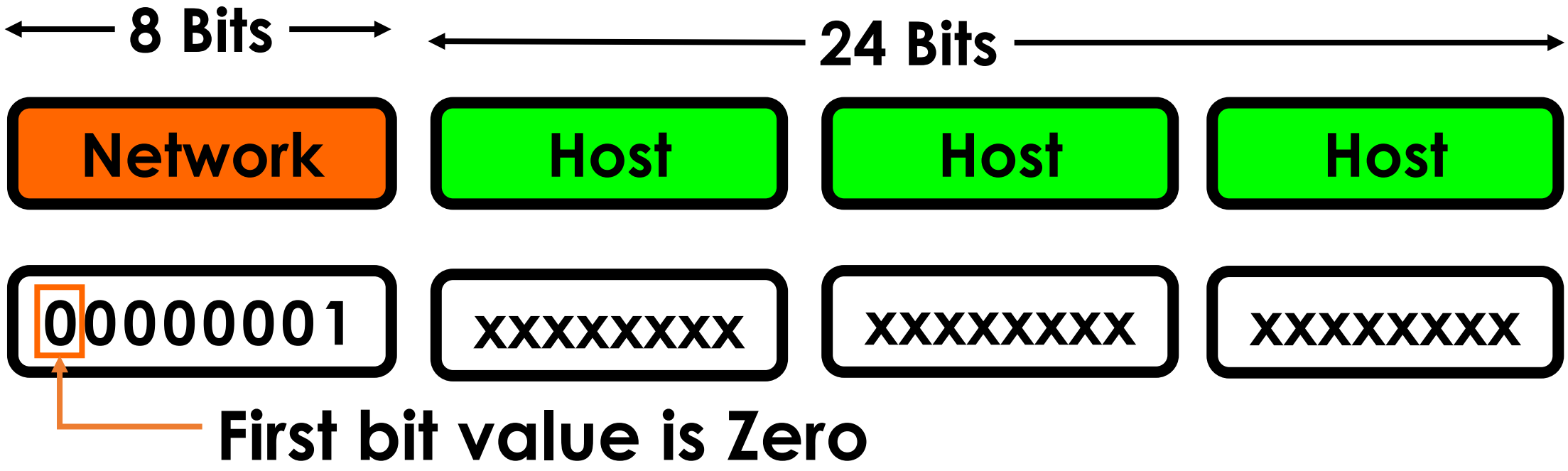

In this example,
the network is identified by the first three octets
and the host by the fourth octet.

- To create more possible network designations, the 32-bit address space was organized into five classes. Three of these classes, A, B, and C, provide addresses that can be assigned to individual hosts or networks. The other two classes, D and E, are reserved for multicast and experimental use.

- Until this change, routers examined only the first 8-bits of an IP address for the network ID. Class B networks; however, use the first 16 bits to identify the network. Class C networks use the first 24 bits to identify the network. With this addition, routers needed to be programmed to look beyond the first 8 bits to identify class B and C networks.

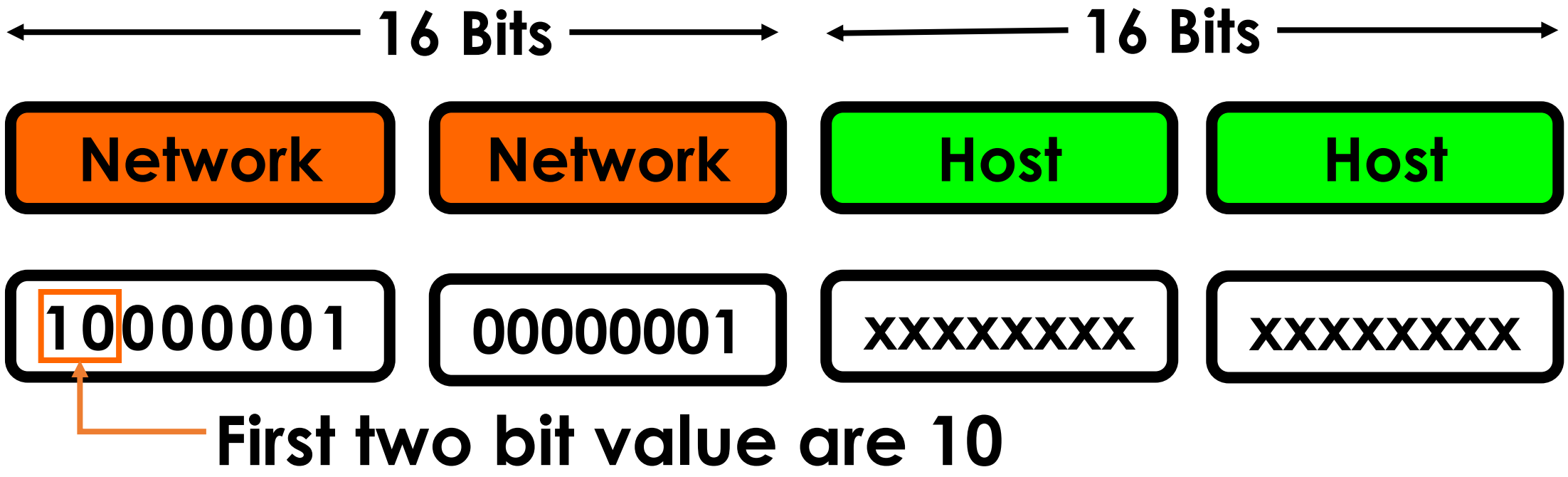
- It was decided to divide the networks in a manner that would make it easy for routers and hosts to determine the correct number of network ID bits. The class of a network is indicated by the values of the first few bits of the IP address, called the high-order bits. If the first bit is 0, the network is a Class A, and the first octet represents the network ID. When the first bit is 1, the router examines the second bit. If that bit is 0, the network is a Class B, and the router uses the first 16 bits for the network ID. If the first three bits are 110, it indicates a Class C address. Class C addresses use the first 24 bits, or three octets, to designate the network. Dividing the original 8-bit network into smaller network classes increased the number of available network designations from 256 to over two million.

# CLASS "A" IP ADDRESS



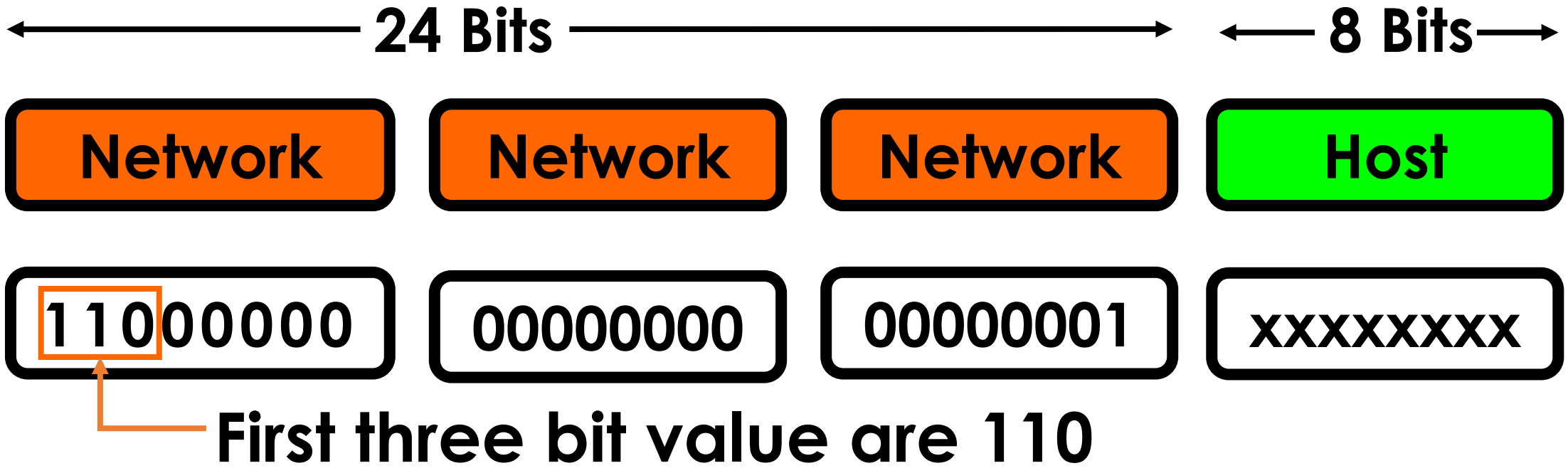

Class A - The first octet denotes the network address, and the last three are host portion. Any IP address where the first bit of the first octet is 0 is a Class A. Class A addresses can have a decimal value within the first octet ranging between 1 and 126. These address are typically used for networks with more than 65,534 host. The Class A address 127 is reserved for loopback testing.

# CLASS "B" IP ADDRESS



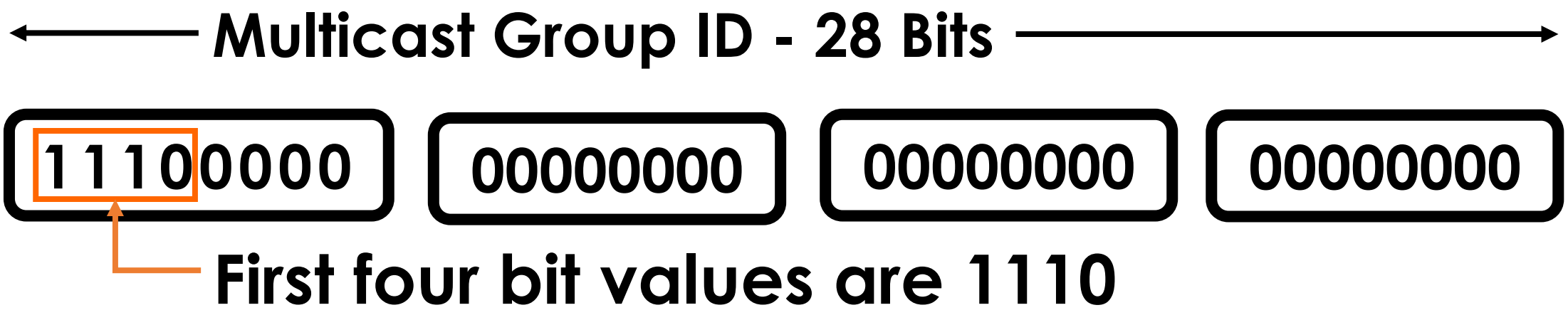

Class B - The first two octets denote the network address, and the last two are the host portion. Any IP address where the first two bits of the first octet are 10 is a Class B. Class B addresses can have a decimal value within the first octet ranging between 128 and 191. These addresses are typically used for networks that have between 255 and 65534 hosts.

# CLASS "C" IP ADDRESS



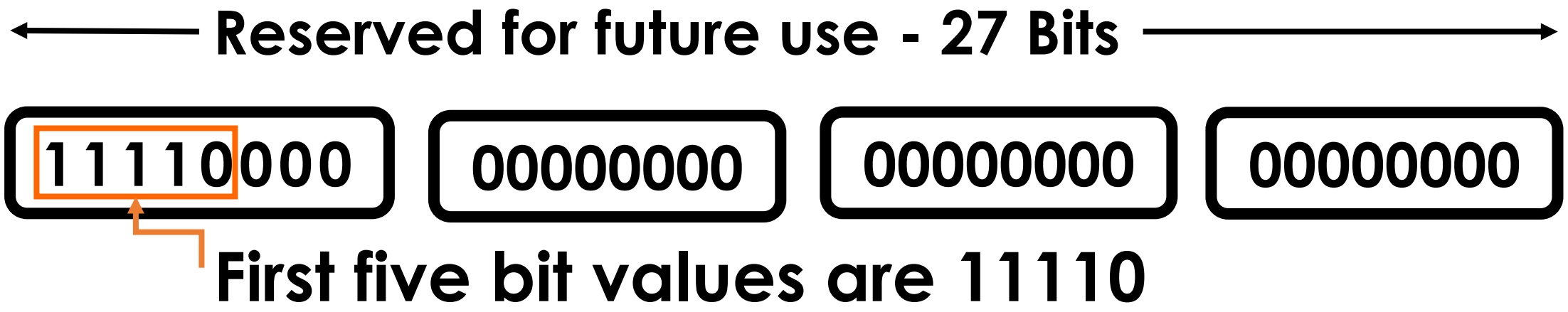

Class c - the first three octets denote the network address, and the last one is the host portion. Any IP address where the first three bits of the first octet are 110 is a class c. Class c addresses can have a decimal value within the first octet ranging between 192 and 223. These address are typically used for networks with 254 or less hosts.

# CLASS “D” IP ADDRESS




Class D - Used for multicast addressing. Any IP address where the first four bits of the first octet are 1110 is a Class D. Class D addresses can have a decimal value between 224 and 239.

# CLASS “E” IP ADDRESS




Class E - Reserved for future experimental usage and broadcasting. Any IP address where the first five bits of the first five bits of the first octet are 11110 is a Class E. Class E addresses can have a decimal value between 240 and 255.

# Contact Me ...

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# THANK YOU