Lecture 14

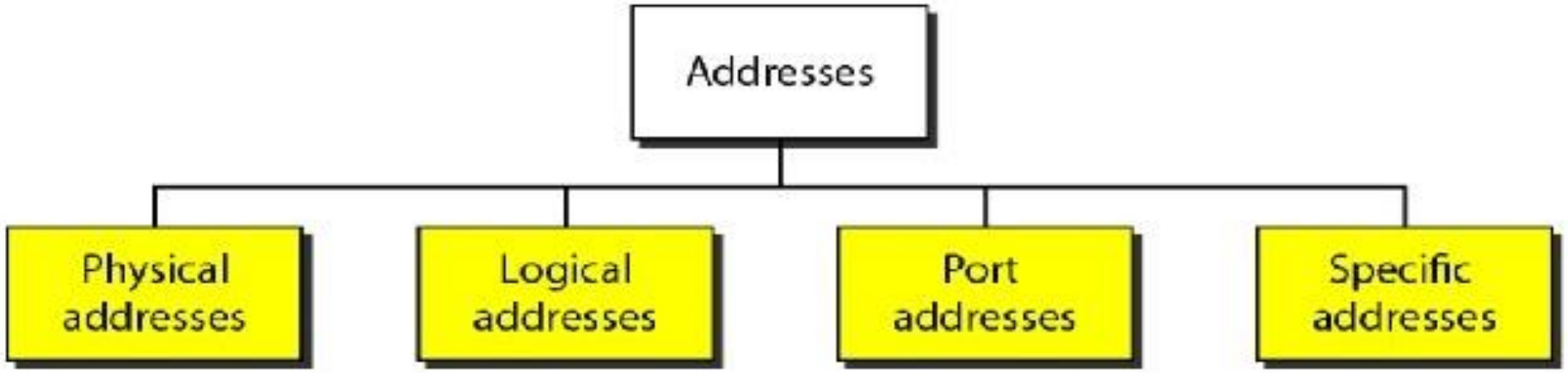
Network Address

What is Network Address ?

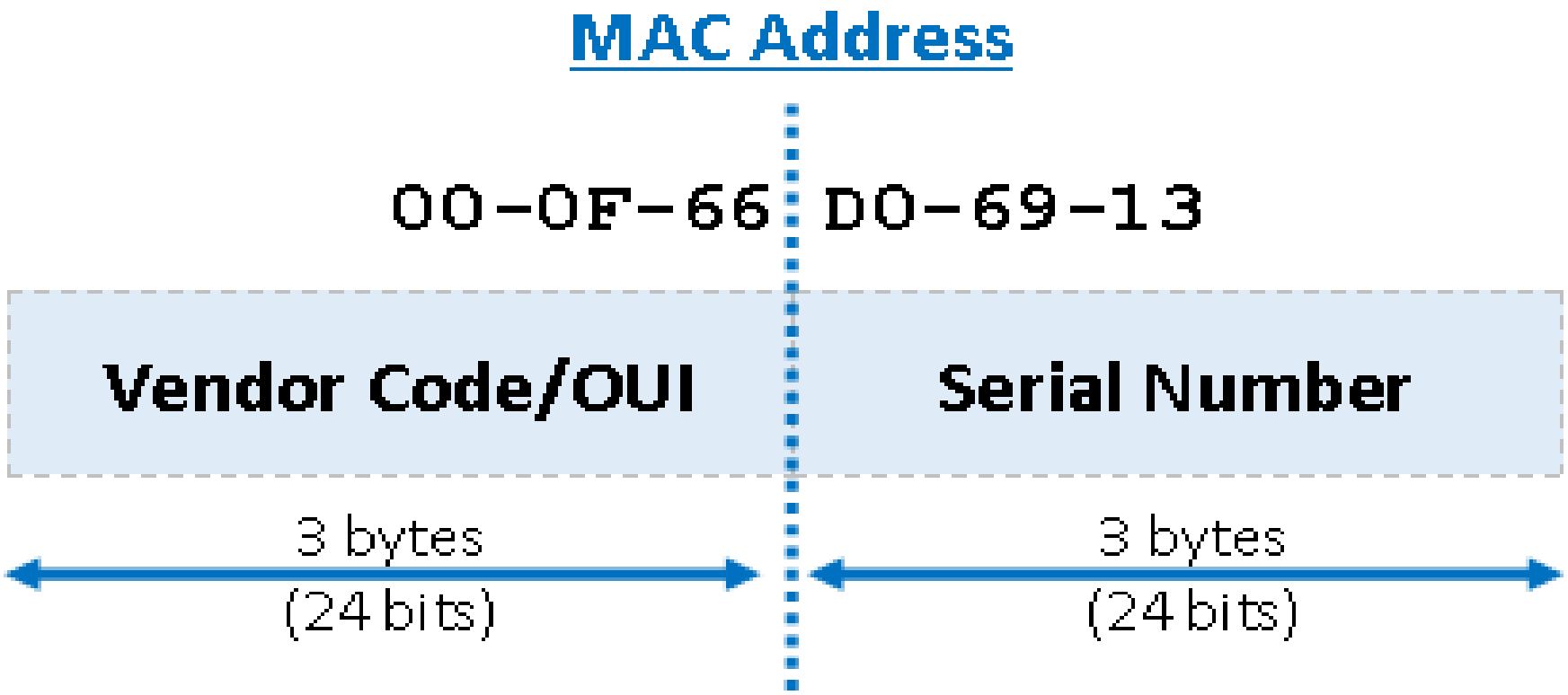
Network Address

A Network Address is a logical or physical address that uniquely identifies a host or a machine in a telecommunication network.

Types of addresses



Physical addresses



Physical Address

Min and max physical address????

Logical Address

Logical address is required to facilitate universal communication in which different types of the physical networks can be involved. In a universal addressing system, every single host will be recognized individually, regardless of any fundamental physical network.
The logical address is also called the IP (Internet Protocol) address.

What is an IP Address

- A way to identify machines on a network
- A unique identifier
- A numerical label
- IPv4 and IPv6

Part of IP Address

- Network part
- Local or Host part

IPv4 Structure (32 bits)

- Four sections
- Each Section is of 8 bits
- Each Section can range from 0 to 255
- Example: 124.0.0.12

Classes of IP Address

Class A	Reserved for Governments
Class B	Reserved for Medium companies
Class C	Reserved for Small companies
Class D	Reserved for Multicasting
Class E	Reserved for Future use

Five Different Classes of IPv4 Addresses

Class	First Octet decimal (range)	First Octet binary (range)	IP range	Subnet Mask	Hosts per Network ID	# of networks
Class A	0 – 127	0XXXXXXX	0.0.0.0-127.255.255.255	255.0.0.0	$2^{24}-2$	2^{7}
Class B	128 – 191	10XXXXXX	128.0.0.0-191.255.255.255	255.255.0.0	$2^{16}-2$	2^{14}
Class C	192 – 223	110XXXXX	192.0.0.0-223.255.255.255	255.255.255.0	$2^{8}-2$	2^{21}
Class D (Multicast)	224 – 239	1110XXXX	224.0.0.0-239.255.255.255			
Class E (Experimental)	240 – 255	1111XXXX	240.0.0.0-255.255.255.255			

Types of IP Address

- Static

  Manually input by network administrator

  Manageable for small networks

  Requires careful checks to avoid duplication

- Dynamic

  e.g., BOOTP, DHCP

  Assigned by server when host boots

  Derived automatically from a range of addresses

  Duration of lase negotiated then address released back to server

Port Address

TCP		UDP	
FTP	20,21	DNS	53
SSH	22	BooTPS/DHCP	67
Telnet	23	TFTP	69
SMTP	25	NTP	123
DNS	53	SNMP	161
HTTP	80		
POP3	110		
IMAP4	143		
HTTPS	443		

Specific Address

For example:
www.abc.com
Email_address@gmail.com, etc.

Thanks