IEEE standard for LANs

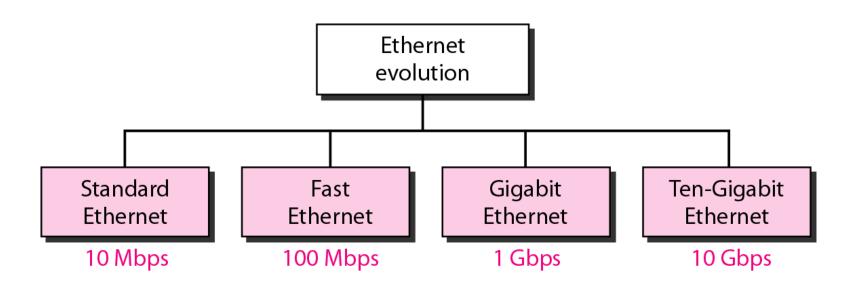LLC: Logical link control
MAC: Media access control

STANDARD ETHERNET

The original Ethernet was created in 1976 at Xerox's Palo Alto Research Center (PARC). Since then, it has gone through four generations. We briefly discuss the *Standard (or traditional) Ethernet* *in this section.*

Topics discussed in this section:
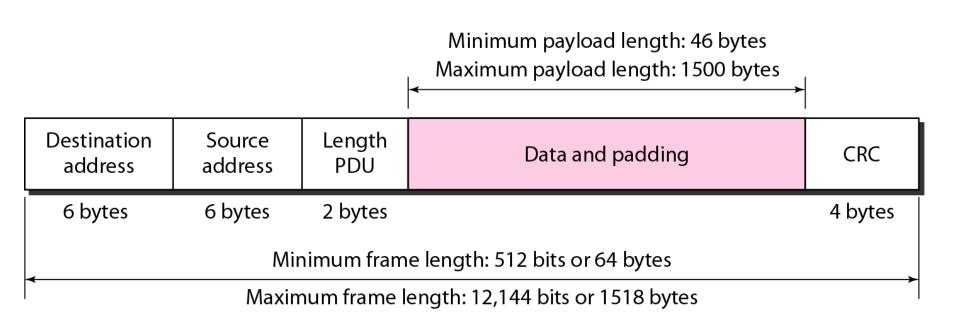
MAC Sublayer
Physical Layer

Ethernet evolution through four generations

Ethernet evolution

| Standard Ethernet | Fast Ethernet | Gigabit Ethernet | Ten-Gigabit Ethernet |
| 10 Mbps | 100 Mbps | 1 Gbps | 10 Gbps |

802.3 MAC frame

Preamble: 56 bits of alternating 1s and 0s.

SFD: Start frame delimiter, flag (10101011)

Minimum and maximum lengths

Minimum payload length: 46 bytes
Maximum payload length: 1500 bytes

Destination address	Source address	Length PDU	Data and padding	CRC
6 bytes	6 bytes	2 bytes		4 bytes

Minimum frame length: 512 bits or 64 bytes
Maximum frame length: 12,144 bits or 1518 bytes

Note

Frame length:
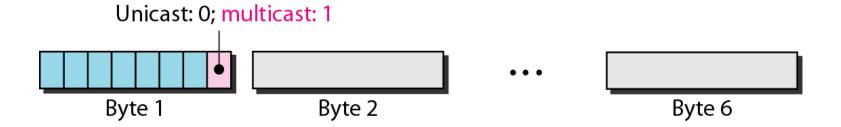Minimum: 64 bytes (512 bits)
Maximum: 1518 bytes (12,144 bits)

13.6

Example of an Ethernet address in hexadecimal notation

06 : 01 : 02 : 01 : 2C : 4B

6 bytes = 12 hex digits = 48 bits

13.7

Unicast and multicast addresses

**The least significant bit of the first byte defines the type of address.
If the bit is 0, the address is unicast; otherwise, it is multicast.**

Note

The broadcast destination address is a special case of the multicast address in which all bits are 1s.