

Computer Networks

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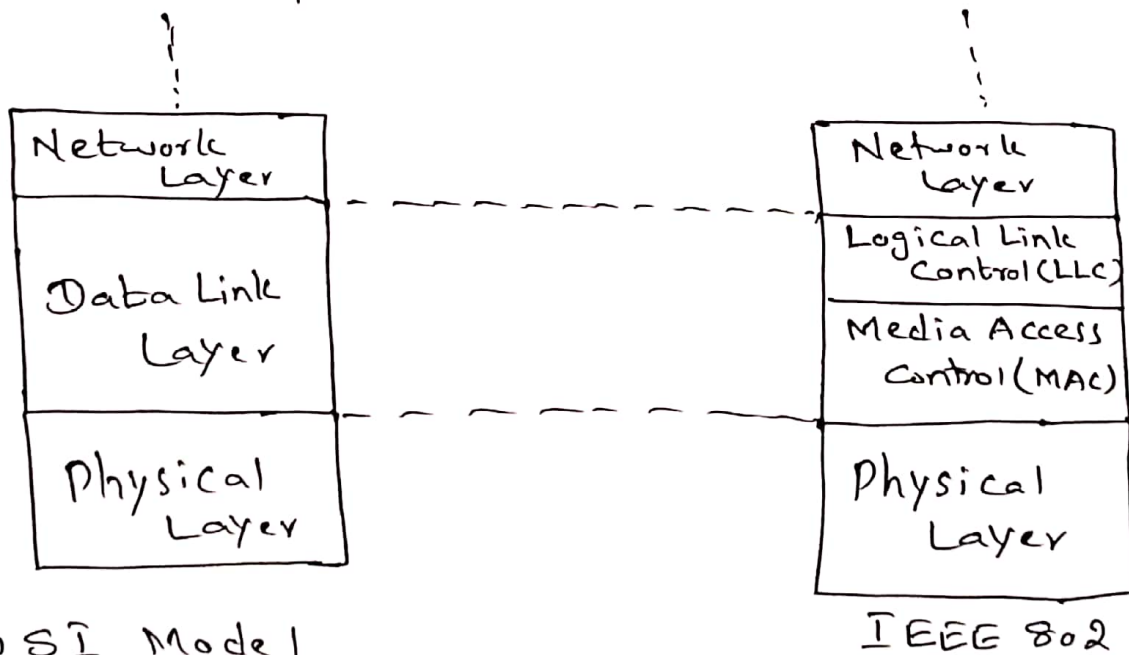
Unit-2 (Left over Topics)

Introduction to IEEE:

Institution of Electrical and Electronic Engineers (IEEE) developed several standards for LANs. These standards are called IEEE 802/Project 802.

IEEE 802:

IEEE 802 defined certain standards for LAN. This project deals with Physical Layer and Data Link Layer standards.

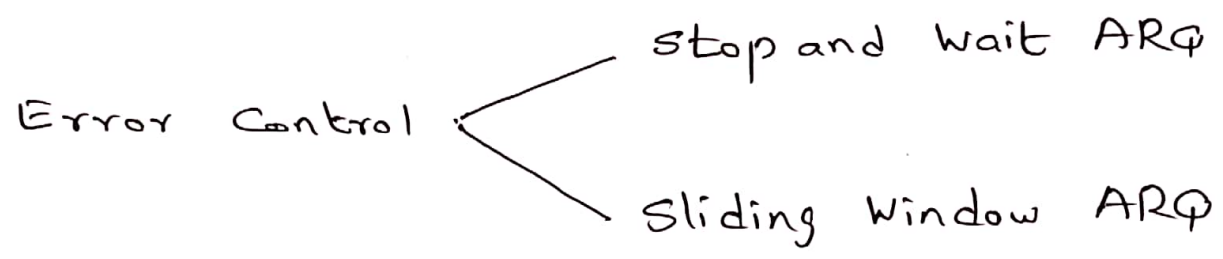
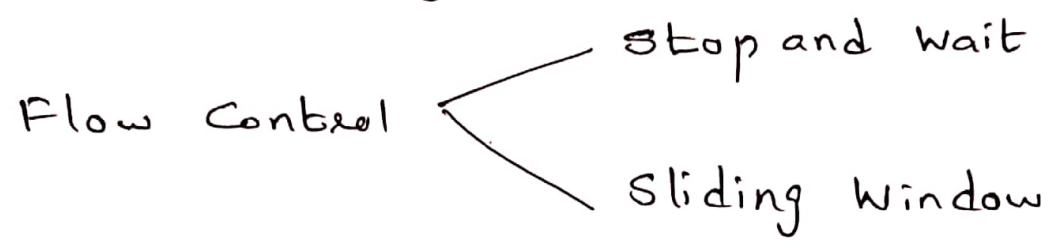


IEEE 802 divides Data Link Layer into two sublayers

- Logical Link Control (LLC)
- Media Access Control (MAC)

Data Link Layer performs Framing, Flow Control & Error Control.

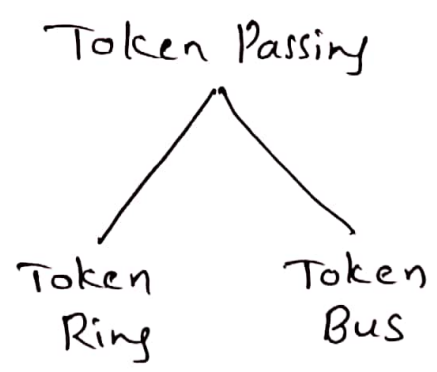
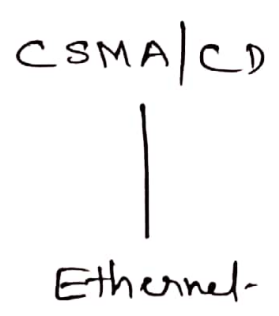
Logical Link Control: The concepts of Flow Control, Error Control and some part of Framing are the duties of Logical Link Control.



LLC sublayer provides a single data link control protocol for all LANs

Media Access Control: MAC provides the concept of Framing along with LLC. MAC provides different protocols for the different LANs.

It uses the following methods.



CSMA/CD - Carrier Sense Multiple Access/Collision Detection

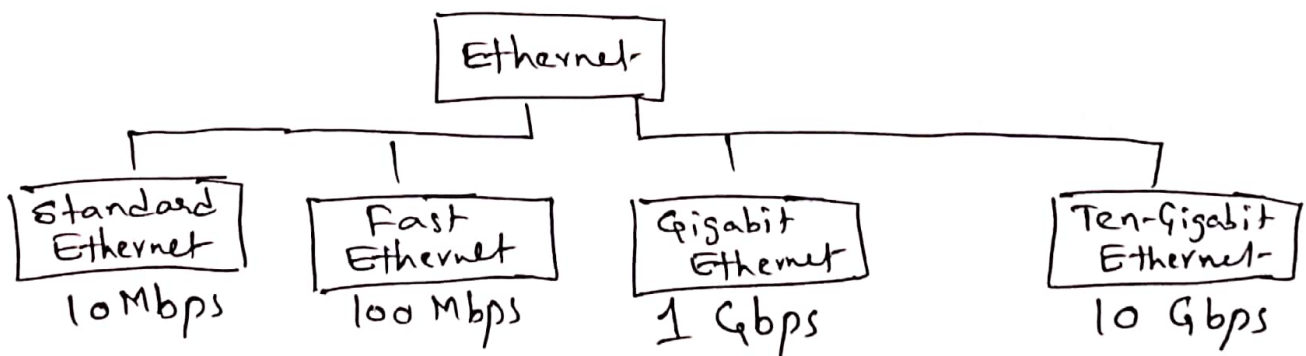
The Various IEEE standards are:

- IEEE 802.1 - Internetworking (LAN) ✓
- IEEE 802.2 - LLC
- IEEE 802.3 - Ethernet ✓
- IEEE 802.4 - Token Bus
- IEEE 802.5 - Token Ring
- IEEE 802.6 - MAN
- IEEE 802.7 - Broadband LAN using Coaxial Cable
- IEEE 802.8 - Fiber Optics
- IEEE 802.9 - Integrated Services LAN
- IEEE 802.10 - LAN Security
- IEEE 802.11 - WLAN ✓
(Wifi)
- IEEE 802.12 - 100 Base VG (Voice Grade)
- IEEE 802.13 - Reserved for Fast Ethernet Development ✓
- IEEE 802.14 - Cable Modems
- IEEE 802.15 - Wireless PAN (Personal Area Network)
(Es. Bluetooth)

(IEEE 802.3)

Ethernet: Ethernet is a multi-access network in which set of nodes share a common link. The original concept of Ethernet was developed in Xerox (1976)

Ethernet has gone through four generations



Standard Ethernet:

A standard Ethernet has the following fields in MAC sub-layer.

Preamble	SFD	Dest. Addr	Source Addr.	Length	Data	CRC
7 Bytes	1 Byte	6 Bytes	6 Bytes	2 Bytes	46 to 1500 Bytes	4 Bytes

- (i) Preamble: It is a 7 Bytes field of alternating 0s and 1s that provides bit synchronization
- (ii) Start Frame Delimiter: This one byte field contains bit pattern that warns the stations that this is the last chance for synchronization.
- (iii) Destination Address: It contains Physical Address of Destination
- (iv) Source Address: It contains Physical Address of Sender.
- (v) Length: This field tells how many bytes are present in the data field.
- (vi) Data: It contains 46 to 1500 Bytes of data.
- (vii) CRC: It contains Error Detection Information.

Addressing:

Every device on Ethernet has NIC Address. Examples of devices of Mobile, Printer etc. Ethernet Address has 6 Byte Hexadecimal Address.

Examples of Address:

1A: 2B: 3C: 4D: 5E: 6F

91: 99: 08: 61: 52: 05