Date .....

=> Understanding of Ethernet

-> Ethernet :- It's a technology used to connect devices like computers, printers, and small gadgets within a network, typically a Local Area Network (LAN)

- It can also be used in large networks like
- Metropolitan Area Network (MAN) and wide Area Networks (WAN)

- How it works :- when you connect a device to an Ethernet port, it becomes part of the local network, allowing it to connect with other device.
- Main features- Ethernet prevents two or more devices from sending data simultaneously, which helps avoid data collisions and keep network secure.

-> Usage of Ethernet

- High speed data transmission :- Ethernet offers fast transfer rates, which is crucial for tasks like video streaming, gaming, and large file transfers.
- security :- Data transmitted over Ethernet is secure because it uses a wired connection, making it less vulnerable to unauthorized access compared to wireless connections.
- Reliability :- Ethernet connections are stable and provide consistent performance, which is essential for critical applications.

-> Types of Ethernet

① Fast Ethernet :

- Cable Type :- Uses twisted pair cables
- Speed :- can transmit data speeds up to 100 mbps

② Gigabit Ethernet :

- Improvement :- A faster version of fast Ethernet
- Speed Range :- can transmit data between 100mbps and 1 Gbps.

③ switched Ethernet:

- Additional Devices: utilizes network devices like switches or hubs.
- speed Range: can transmit data between 100 Mbps (1 Gbps) and 10 Gbps.

→ Ethernet and OSI model

- layer 1 or 7 (Physical layer)
- defines the physical aspects of the network, like cable types, connectors, and signaling methods.
- layer 2 or 6 (Data link layer):
- manages how data is framed, addressed, and transmitted over the network. It uses MAC addresses to identify the source and destination devices.

→ How Ethernet works?

Steps :-

① Acquiring MAC Address :- Every device in the network has a unique MAC (media Access control) address. The first step is to obtain the MAC addresses of both the sender and receiver.

② checking network conditions: The network checks for data security, connection speed, and quality to ensure efficient transmission.

③ Managing Traffic and Errors :- Ethernet monitors network traffic to avoid data collisions. If a collision is detected (using protocols like CSMA), the network takes steps to resolve the issue.