Unit-5

19ECS-232

COMPUTER NETWORKS

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**SYLLABUS**

**The Link Layer:** Introduction to the Link Layer, Multiple Access Links and Protocols, Switched Local Area Networks

**Wireless and Mobile Networks:** Introduction, WirelessLinks and Network Characteristics, Wi-Fi: 802.11 Wireless LANs (Architecture and MAC Protocol), Mobile IP

**Link layer**

**-**Data link layer has the responsibility of transferring datagram from one node to adjacent node over communication link, some wired and some wireless.

* **INTRODUCTION TO THE LINK LAYER**

- Any device that runs a link-layer (i.e., layer 2) protocol is referred as a **node**.

* Nodes include hosts, routers, switches, and WiFi access points.

- The communication channels that connect adjacent nodes along the communication path is known as **links**.

- A datagram to be transferred from source host to destination host, it must be moved over each of the individual links in the end-to-end path.

- Over a given link, a transmitting node encapsulates the datagram in a **link-layer frame** and transmits the frame into the link.

**The Services Provided by the Link Layer**

Services that can be offered by a link-layer protocol include:

**-Framing:**

* All link-layer protocols encapsulate each network-layer datagram within a link-layer frame before transmission over the link.
* A frame consists of a data field, in which the network-layer datagram is inserted, and a number of header fields.
* The structure of the frame is specified by the link-layer protocol.

**-Link access**:

* A medium access control (MAC) protocol specifies the rules by which

a frame is transmitted onto the link. For point-to-point links that have a single

sender at one end of the link and a single receiver at the other end of the link, the

MAC protocol is simple. when multiple nodes share a single

broadcast link—the so-called multiple access problem. Here, the MAC protocol

serves to coordinate the frame transmissions of the many nodes.

Reliable delivery. When a link-layer protocol provides reliable delivery service, it

guarantees to move each network-layer datagram across the link without error. A link-layer reliable delivery service is often used for links

that are prone to high error rates, such as a wireless link, with the goal of correcting

an error locally—on the link where the error occurs—rather than forcing an end-toend

retransmission of the data by a transport- or application-layer protocol.

Error detection and correction. The link-layer hardware in a receiving node can

incorrectly decide that a bit in a frame is zero when it was transmitted as a one,

and vice versa. Such bit errors are introduced by signal attenuation and electromagnetic

noise. Error correction

is similar to error detection, except that a receiver not only detects when bit

errors have occurred in the frame but also determines exactly where in the frame

the errors have occurred.