SNS College of Engineering
Coimbatore - 641107

UNIT II

LINK LAYER

Services, ARP, DLC Protocols, HDLC, PPP, Media Access

Control, Wired LANs: Ethernet, Wireless

LANs: IEEE 802.11, Bluetooth, Connecting devices: Hubs,
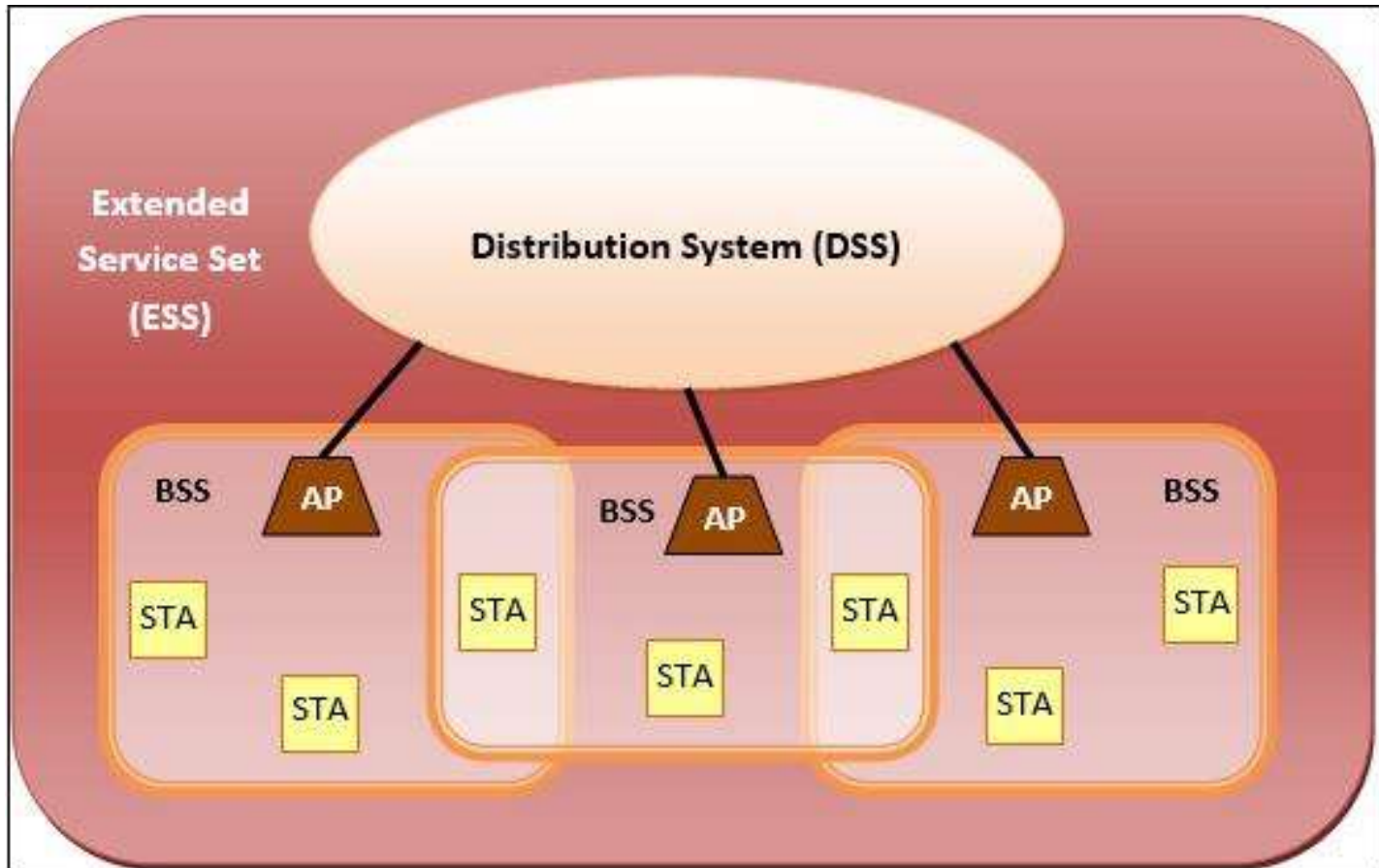
Routers, Switches.

IEEE 802.11

- Wireless LANs are those Local Area Networks that use high-frequency radio waves instead of cables for connecting the devices in LAN.

IEEE 802.11 Architecture

Stations

- **Stations (STA)** − Stations comprise all devices and equipment that are connected to the wireless LAN

- Types:

    – **Wireless Access Pointz (WAP)-** Wireless routers that form the base stations

    – **Client. –** Clients are workstations, computers, laptops, printers, smartphones, etc.

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Basic Service set

Basic Service Set (BSS) –A basic service set is a group of stations communicating at physical layer level

Two categories depending upon the mode of operation

- **Infrastructure BSS –** Here, the devices communicate with other devices through access points.
- **Independent BSS –** Here, the devices communicate on a peer-to-peer basis in an ad hoc manner.
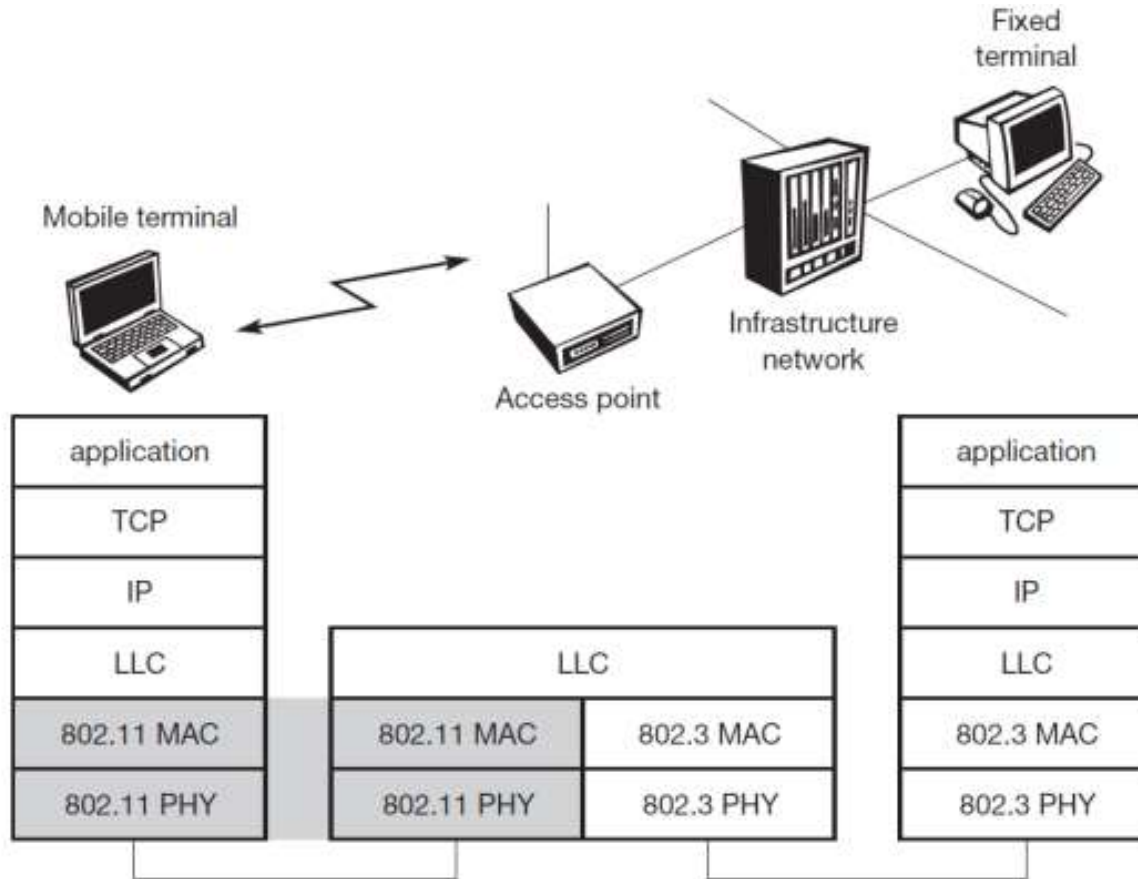
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ESS &DS

- **Extended Service Set (ESS) –** It is a set of all connected BSS.

- **Distribution System (DS) –** It connects access points in ESS.
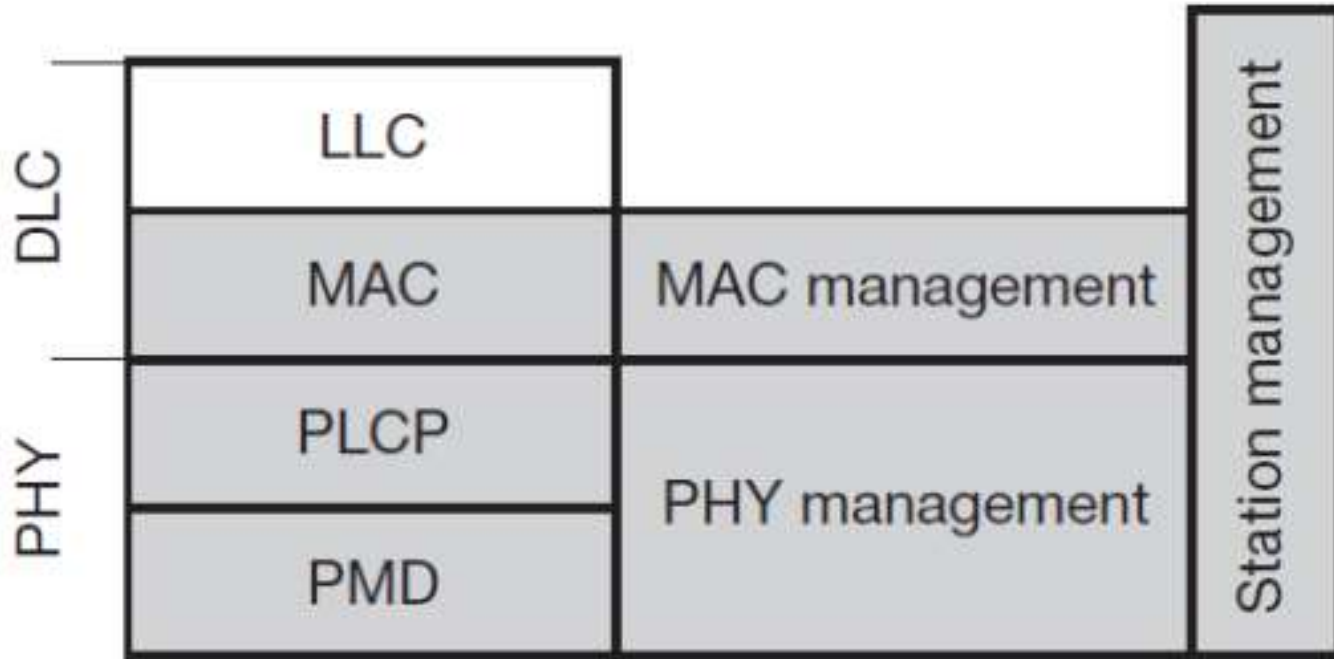
IEEE802.11 Protocol Architecture

IEEE802.11 Protocol Architecture

Contd.,

- The physical layer is subdivided into
  - The physical layer convergence protocol (PLCP)
  - The physical medium-dependent sublayer PMD.

  The basic tasks of the MAC layer comprise medium access, fragmentation of user data, and encryption.

Contd.,

- The PLCP sublayer provides a carrier sense signal, called clear channel assessment (CCA), and a common PHY service access point (SAP)

- Finally, the PMD sublayer handles the modulation and encoding/decoding of signals. The PHY layer (comprising PMD and PLCP) and the MAC layer.

Contd.,

- The main tasks of the PHY management include channel tuning

- Finally, station management interacts with both management layers and is responsible for additional higher-layer functions

Contd.,

- The MAC management supports the association and reassociation of a station to an access point and roaming between different access points

- It also controls authentication mechanisms, encryption, synchronization of a station with regard to an access point, and power management to save battery power.

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Advantages

- It provides clutter-free homes, offices, and other networked places.

- Scalable

- Portable

- Installation and setup is much easier

- The equipment and setup costs are reduced.

Disadvantages

- The signals are noisier with more interference from nearby systems.

- Greater care is needed for encrypting information

- WLANs are slower than wired LANs