Course Name: A Level (2nd Sem)   Subject: DCN

Topic: Introduction to Wireless LANs   Date: 28-05-20

IEEE 802.11:

IEEE has defined the specifications for a wireless LAN, called IEEE 802.11, which covers the physical and data link layers.

Architecture:

The standard defines two kinds of services: the basic service set (BSS) and the extended service set (ESS).

Basic Service Set:

- IEEE 802.11 defines the **Basic Service Set (BSS)** as the building block of a wireless LAN.
- A basic service set is made of stationary or mobile wireless stations and an optional central base station, known as the **Access Point (AP)**. Figure shows two sets in this standard.
- The BSS without an AP is a stand-alone network and cannot send data to other BSSs. It is called an **ad hoc architecture**.
- In this architecture, stations can form a network without the need of an AP; they can locate one another and agree to be part of a BSS. A BSS with an AP is sometimes referred to as an **infrastructure network**.

BSS: Basic service set
AP: Access point

Ad hoc network (BSS without an AP)   Infrastructure (BSS with an AP)
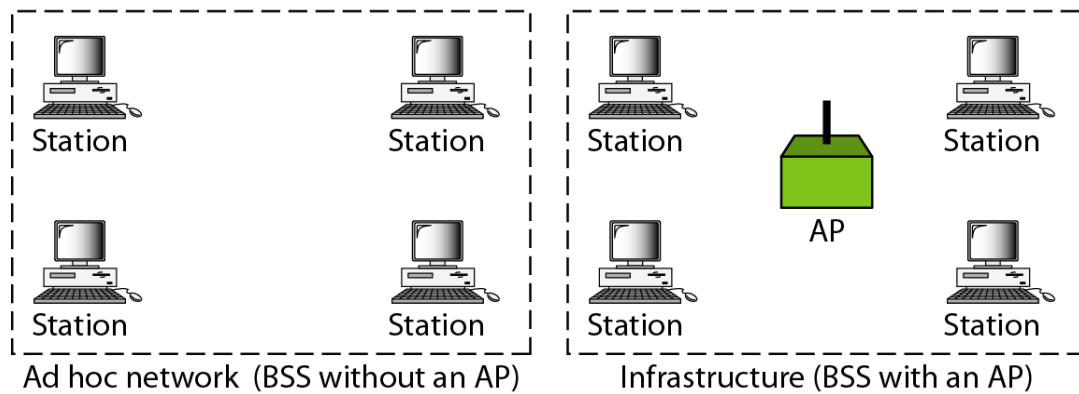
Extended Service Set:

- An **Extended Service Set (ESS)** is made up of two or more BSSs with APs.
- In this case, the BSSs are connected through a distribution system, which is usually a wired LAN.
- The distribution system connects the APs in the BSSs. IEEE 802.11 does not restrict the distribution system; it can be any IEEE LAN such as an Ethernet. The extended service set uses two types of stations: **Mobile** and **Stationary**.
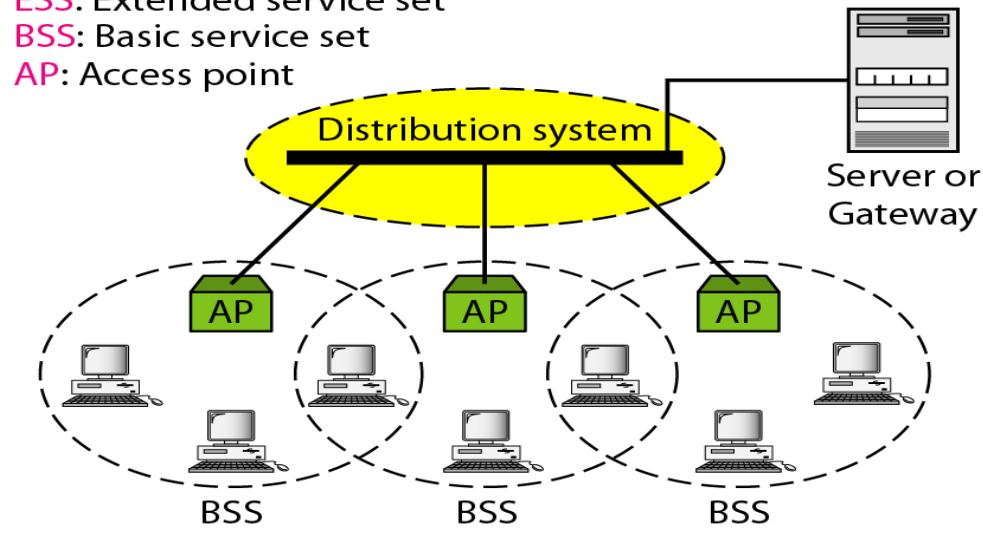
- The mobile stations are normal stations inside a BSS. The stationary stations are AP stations that are part of a wired LAN. Figure shows an ESS.

ESS: Extended service set
BSS: Basic service set
AP: Access point

- When BSSs are connected, the stations within reach of one another can communicate without the use of an AP. However, communication between two stations in two different BSSs usually occurs via two APs.
- The idea is similar to communication in a cellular network if we consider each BSS to be a cell and each AP to be a base station. A mobile station can belong to more than one BSS at the same time.

Station Types:

- IEEE 802.11 defines three types of stations based on their mobility in a wireless LAN: **No-transition**, **BSS-transition** and **ESS-transition** mobility.
- A station with **no-transition** mobility is either stationary (not moving) or moving only inside a BSS.
- A station with **BSS-transition** mobility can move from one BSS to another, but the movement is confined inside one ESS.
- A station with **ESS-transition** mobility can move from one ESS to another.

Exercises:

A. **What is the difference between a BSS and an ESS?**
B. **Discuss the three types of mobility in a wireless LAN.**