Lecture 9b - Wireless Concepts

Type: Lecture

Materials: Empty

Reviewed: ☑

1. Why Go Wireless?

- **Productivity** is no longer restricted to a fixed work location or a defined time period
- People now expect to be **connected at any time** and place, from the office to the airport or the home
- Users now expect to be able to roam **wirelessly**
- **Roaming** enables a **wireless device** to **maintain Internet** access **without losing a connection**

2. Wireless Media

- **Properties of Wireless Media**
  - Wireless does have some areas of concern including:
    - Coverage area
    - Interference
    - Security
- **Types of Wireless Media**

Wi Fi	• IEEE 802.11 standards
	• Commonly referred to as Wi-Fi.
	• Uses CSMA/CA
	• Variations include:
	  • 802.11a: 54 Mbps, 5 GHz
	  • 802.11b: 11 Mbps, 2.4 GHz
	  • 802.11g: 54 Mbps, 2.4 GHz
	  • 802.11n: 600 Mbps, 2.4 and 5 GHz
	  • 802.11ac: 1 Gbps, 5 GHz
	  • 802.11ad: 7 Gbps, 2.4 GHz, 5 GHz, and 60 GHz

Bluetooth®	• IEEE 802.15 standard • Supports speeds up to 3 Mb/s • Provides device pairing over distances from 1 to 100 meters.
WiMAX	• IEEE 802.16 standard • Provides speeds up to 1 Gbps • Uses a point-to-multipoint topology to provide wireless broadband access.

- **802.11 Wi-Fi Standards**

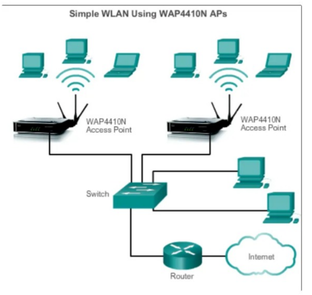
Standard	Maximum Speed	Frequency	Backwards Compatible
802.11a	54 Mbps	5 GHz	No
802.11b	11 Mbps	2.4 GHz	No
802.11g	54 Mbps	2.4 GHz	802.11b
802.11n	600 Mbps	2.4 GHz or 5 GHz	802.11b/g
802.11ac	1.3 Gbps (1300 Mbps)	2.4 GHz and 5.5 GHz	802.11b/g/n
802.11ad	7 Gbps (7000 Mbps)	2.4 GHz, 5 GHz and 60 GHz	802.11b/g/n/ac

3. Comparing WLANs to LANs

Characteristic	802.11 Wireless LAN	802.3 Ethernet LANs
Physical Layer	Radio Frequency (RF)	Cable
Media Access	Collision Avoidance	Collision Detection
Availability	Anyone with a radio NIC in range of an access point	Cable connection required
Signal Interference	Yes	Inconsequential
Regulation	Additional regulation by country authorities	IEEE standard dictates

4. Wireless Devices

- **Wireless NICs:** Wireless deployment requires:
  - End devices with wireless NICs
  - Infrastructure device, such as a wireless router or wireless AP
- **SOHO/Home Wireless Solutions**
  - A home user typically interconnects wireless devices using a small, integrated wireless router.
  - These serve as:
    - access point
    - Ethernet switch
    - router
  - **Each AP** is configured and managed individually.
  - This can become a **problem** when **several APs** are **required**.



- **Business Wireless Solutions**