Lecture #1 Introduction to Wireless Networking

1. Define Wireless Network

- Wireless network is an interconnection of many systems capable of providing service to mobile users within a particular geographic region (country or continent)
- In wireless network, data are carried by **Electrical Wave** (e.g., *radio wave*) from one node to another.
- There is **No Physical Cable/Wire** connecting one computer to another

2. What are the components required for Wireless Networking?

- Base station
- Mobile Switching Center (MSC)
- PSTN (Public Telecommunication Switching Network)

3. What are the advantages of wireless networking?

- Mobility
- Installation speed and cost
- Reach of network
- Flexibility/scalability

4. What are the disadvantages of wireless networking?

- Speed
- Security

5. What is the hardware required for Wireless networking?

- Wireless NIC (Wireless Network Interface Card)
- Wireless Access Point (WAP)
- Universal Access Point (UAP)

Example of Wireless Devices

4. What are the types of wireless networking mode?

   a. Ad-hoc Mode

   b. Infrastructure Mode

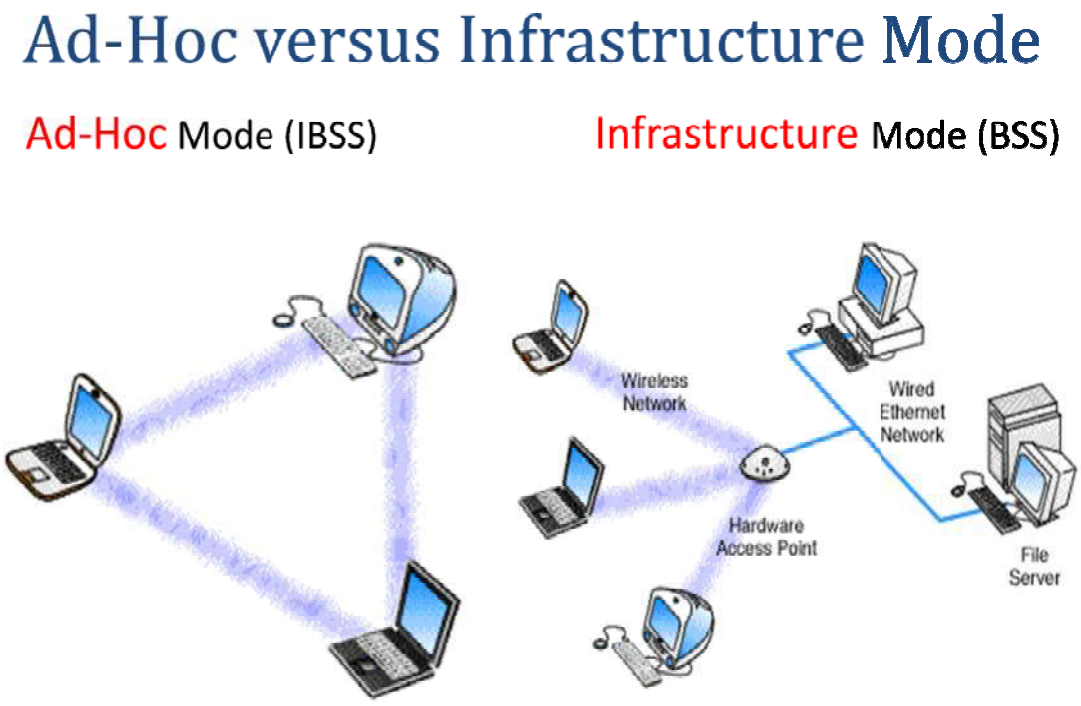
5. What is Ad-hoc Mode?

   - Each wireless node can communicate ***directly*** with each of the other nodes in the network (***without Wireless Access Point***)
   - **Mesh** network topology

- **IBSS (Independent Basic Service Set)**: a group of nodes communicating in ad-hoc mode

6. What is Infrastructure Mode?

- All wireless node communicate to one another **via Wireless Access Point**
- **Star** network topology
- **BSS (Basic Service Set)**: a group of nodes communicating in infrastructure mode.
  - *An BSS has one wireless access point*
- **EBSS (Extended Basic Service Set)**: two or more BSS that can communicate to one another
  - *An EBSS contains two or more wireless access points*



7. What are the types of Wireless Security?

There are three basic wireless security methods available

- **SSID** (Service Set Identification)
- **MAC** Address Filtering
- **Encryption**

8. What are factors affecting the **Speed** of the wireless network?

- The wireless network technology **Standard**
- The **Distance** between sender and receiver,
- **Interference** from other wireless devices or electronic devices
- The **Presence of Solid Object** (especially metal object, electronic appliance) between the sender and receiver

8. What are factors affecting the **Range** of the wireless network?

- The wireless network technology **Standard**
- **Interference** from other wireless devices or electronic devices
- The **Presence of Solid Object** (especially metal object, electronic appliance) between the sender and receiver

9. How can we increase the range of the wireless network?

- Using **"signal booster"**
- Using **Wireless Access Point**
- Using ***MULTIPLE*** **Wireless Access Points**

10. List out the Generation of Mobile Wireless Services.

- First Generation (1G)
  - Mobile voice services
- Second Generation (2G)
  - Primarily voice, some low-speed data
- Generation 2½ (2.5G)
  - Higher data rates than 2G
  - A bridge to 3G
- Third Generation (3G)
  - Seamless integration of voice and data
  - High data rates, full support for packet switched data

11. Draw the black diagram of Cellular System