

WLAN – IEEE 802.11



By

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IEEE 802 Projects

- ✓ IEEE 802.1 High Level Interface
- ✓ IEEE 802.2 LLC (Logical Link Control)
- ✓ IEEE 802.3 CSMA/CD (Carrier Sense Multiple Access with Collision Detection)
- ✓ IEEE 802.4 Token-Bus
- ✓ IEEE 802.5 Token-Ring

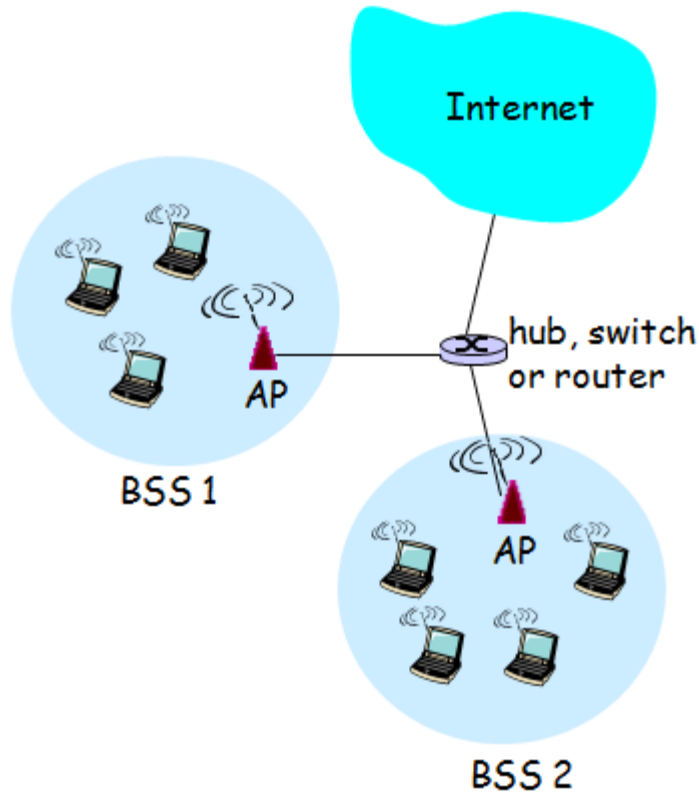
IEEE 802 Projects

- ✓ IEEE 802.6 DQDB (Distributed Queue Dual Bus)
- ✓ IEEE 802.7 Broadband Technical Advisory Group
- ✓ IEEE 802.8 Fiber Optic Technical Advisory Group
- ✓ IEEE 802.9 Integrated Voice and Data LAN Working Group
- ✓ IEEE 802.10 LAN Security Working Group
- ✓ **IEEE 802.11 Wireless LAN**
- ✓ IEEE 802.12 Demand-Priority (100VG-AnyLAN)
- ✓ IEEE 802.14 Hybrid Fiber Coaxial Network

IEEE 802.11 Wireless LAN Standards

- ✓ 802.11b (Current Generation)
 - ✓ Standard for 2.4GHz ISM band (bw 80 MHz)
 - ✓ Frequency hopped spread spectrum
 - ✓ 1.6-10 Mbps, 500 ft range
- ✓ 802.11a (Emerging Generation)
 - ✓ Standard for 5GHz NII band (bw 300 MHz)
 - ✓ OFDM with time division
 - ✓ 20-70 Mbps, variable range
 - ✓ Similar to HiperLAN in Europe
- ✓ 802.11g (New Standard)
 - ✓ Standard in both 2.4 GHz and 5 GHz bands
 - ✓ OFDM (multicarrier modulation)
 - ✓ Speeds up to 54 Mbps

Wireless LAN – IEEE 802.11 - Architecture

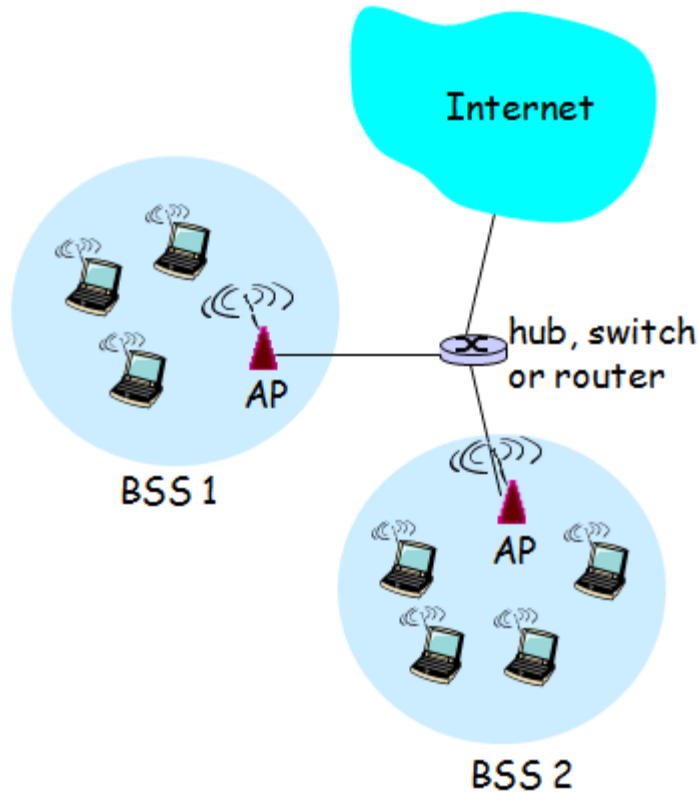


✓ Elements

- ✓ **Wireless host**
- ✓ Communicates with Access Point
- ✓ Laptop, PDA, Smart Phones
- ✓ Run the Applications
- ✓ May be Mobile/ Stationary

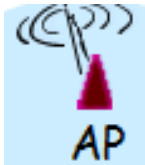


Wireless LAN – IEEE 802.11 - Architecture

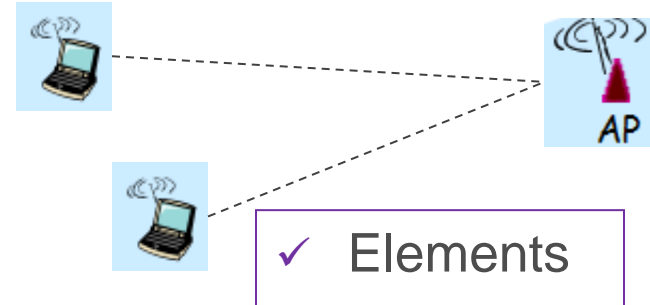
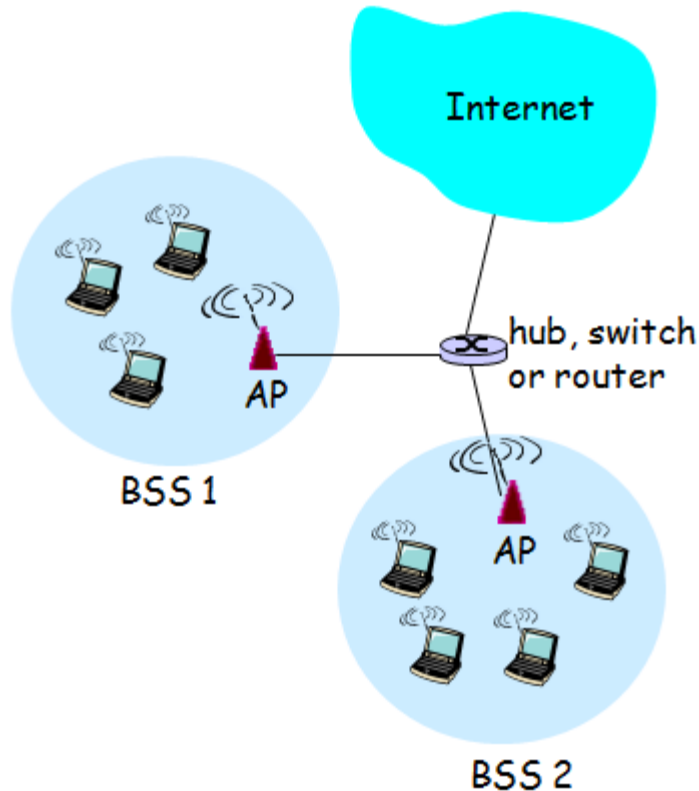


✓ Elements

- ✓ **Access Point/ Base Station**
- ✓ Connected with Wired Network
- ✓ Stationary
- ✓ Sends Packets to Wired Networks and Wireless networks
- ✓ Cell Towers

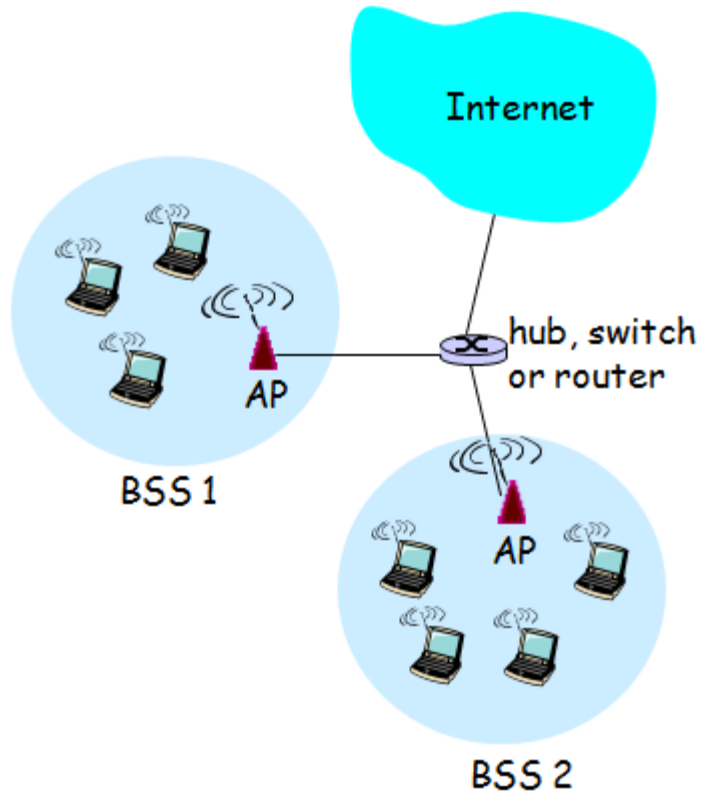


Wireless LAN – IEEE 802.11 - Architecture



- ✓ **Wireless Link**
- ✓ Connects Wireless Host and AP
- ✓ Access Method: CSMA/ CA
- ✓ Various Data Rates
- ✓ Various Transmission Distance

Wireless LAN – IEEE 802.11 - Architecture

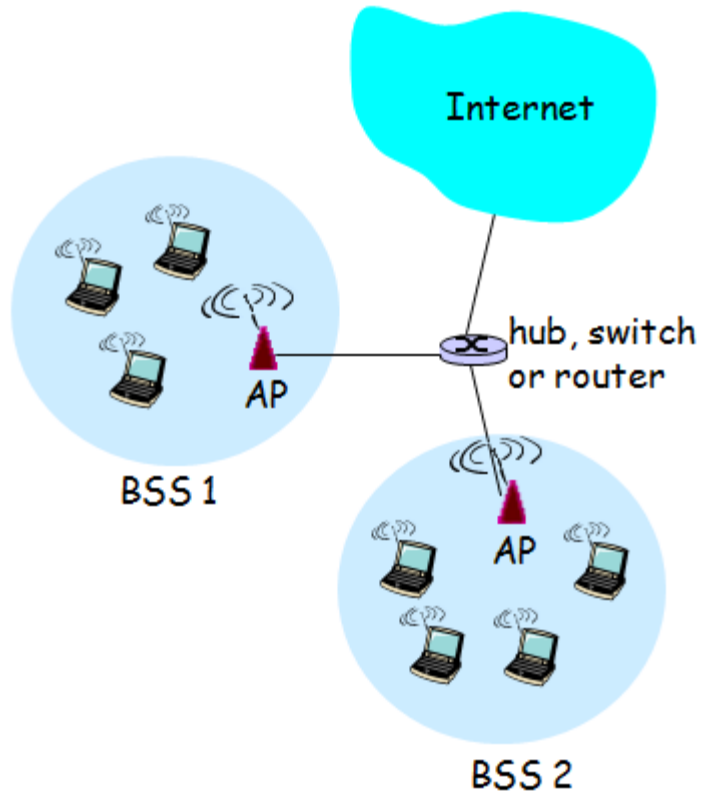


✓ Elements

- ✓ **Basic Service Set**
- ✓ Cell
- ✓ Contains
 - ✓ Wireless Hosts
 - ✓ Access Point



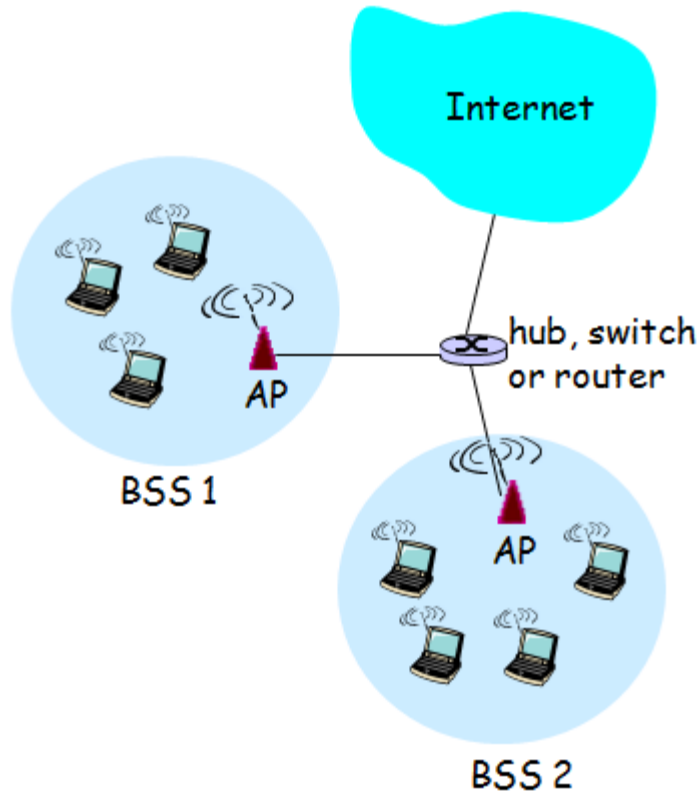
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✓ Channel Frequency

- ✓ **802.11b:**
2.4GHz-2.485GHz spectrum divided into 11 channels at different frequencies
- ✓ AP admin chooses frequency for AP
- ✓ Interference possible:
Channel can be same as that chosen by neighboring AP

Wireless LAN – IEEE 802.11 - Architecture



✓ Wireless Host

- ✓ Must associate with an AP
- ✓ Scans channels, listening for beacon frames containing AP's name (SSID) and MAC address
- ✓ Selects AP to associate with
- ✓ May perform authentication
- ✓ Will typically run DHCP to get IP address in AP's subnet

References

- ✓ Book: Computer Networking: A Top Down Approach Featuring the Internet, 3rd edition. Jim Kurose, Keith Ross Addison-Wesley, July 2004
- ✓ Various Relevant Websites

Thank You