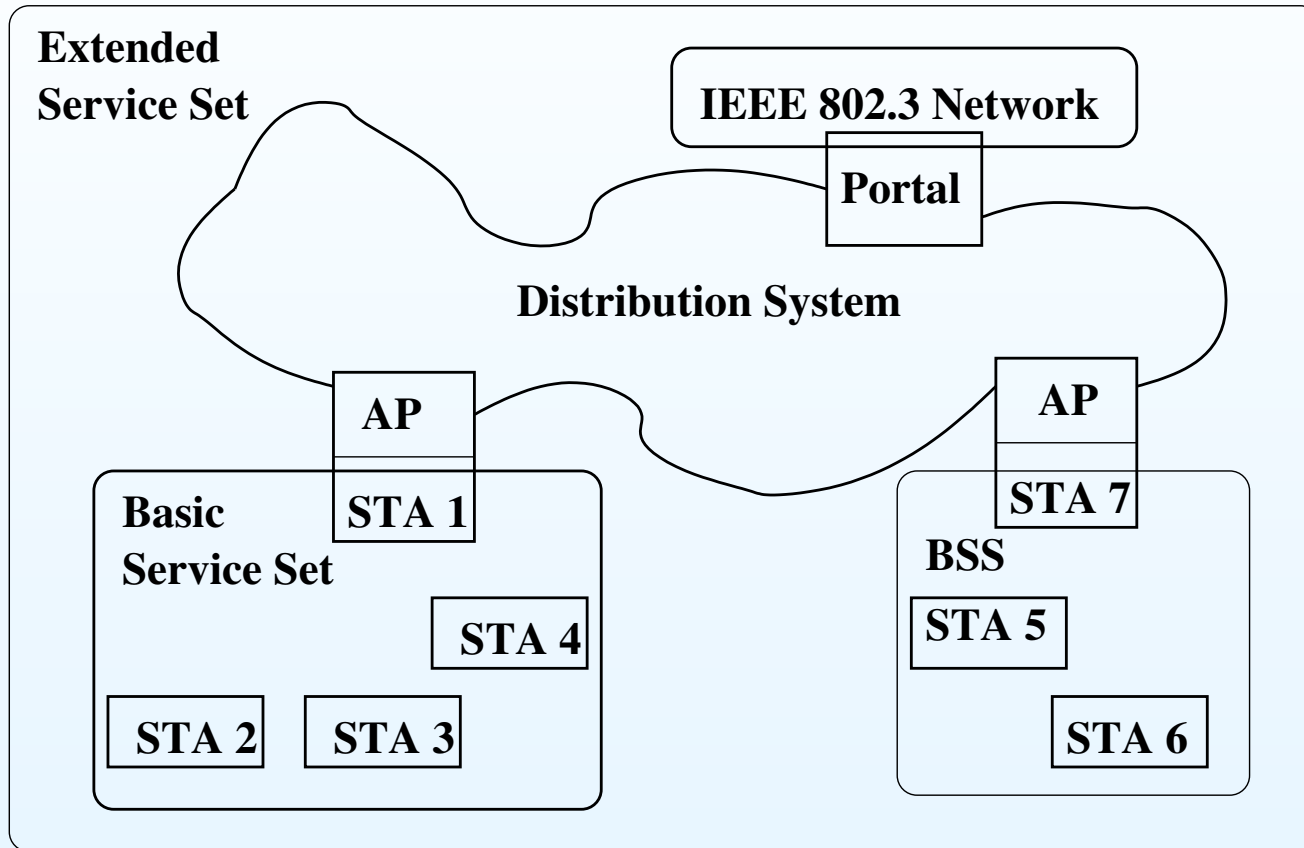


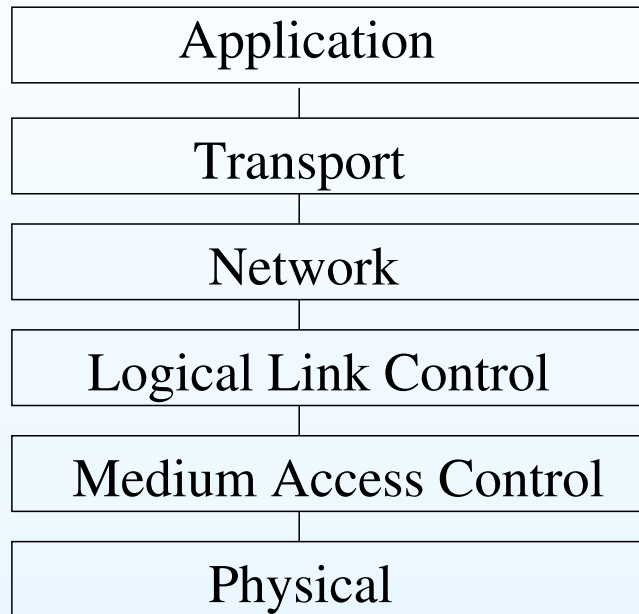
802.11b Wireless



802.11b Architecture

Access Points, Portals, Stations, Basic Service Sets.

802.11 Protocol Stack



- LLC is responsible for station-to-station without routing.
- MAC is concerned with channel access.

Properties

Physical Media - 2.4 - 2.483 GHz ISM band, 4 W maximum nominally, 300 m outdoors, 100 m indoors, but it depends on the antenna.

Signaling Method - Frequency Hopping Spread Spectrum (FHSS) and Direct Sequence Spread Spectrum (DSSS).

Error Control - Every frame has a 32-bit CRC.

Access Method - Multiple Access with Collision Avoidance (MACA) Control.

Frame Format

Control	Duration	Addr 1	Addr 2	Addr 3	Seq Ctrl	Addr 4	Payload	CRC
2 bytes	2	6	6	6	2	6	0-2312	4

IEEE 802.11b Frame Format

- Frame control is the type of frame and sender/frame properties.
- Duration is the expected length in microseconds.
- Sequence Control has a 4-bit fragment number and a 12-bit message number.

Frame Control

Version	Type	Sub Type	To DS	From DS	MF	RT	PM	MD	W	O
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IEEE 802.11b Frame Control

- To DS - Sending to a DS
- From DS - Leaving a DS
- MF - More fragments in this message
- RT - This is a retry frame
- PM - Sender is sleeping
- MD - Sender has more data to send
- W - WEP being used
- O - Strictly ordered service

Access Control

- Ad Hoc mode - two stations communicate directly
- Infrastructure mode - stations communicate through an AP
- Addressing is based on the *To DS* and *From DS* bits.
- 48-bit unique addresses
- AP's can exchange information if needed.

Address Usage

To DS	From DS	Addr1	Addr2	Addr3	Addr4
0	0	Dest Sta	Src Sta	NA	NA
0	1	Dest Sta	Src AP	Src Sta	NA
1	0	Dest AP	Src Sta	Dest Sta	NA
1	1	Dest AP	Src AP	Dest Sta	Src Sta

Management Frames

- There are three frame types, Management, Control and Data
- Management frames
 - Association Request/Reply - can I join your BSS?
 - Reassociation Request/Reply - can I join your BSS but I currently belong to another?
 - Probe Request/Reply - anybody out there?
 - Beacon - AP says "I'm here".
 - Authentication - prove you are allowed.
- Control frames
 - Request to send - Station to AP
 - Clear to send - AP to station
 - Acknowledgement - AP to station