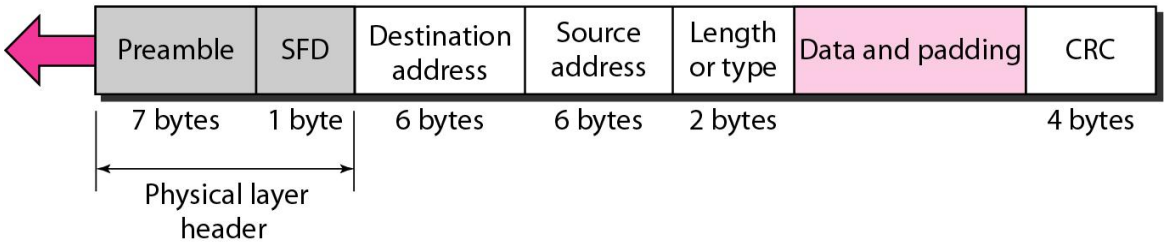
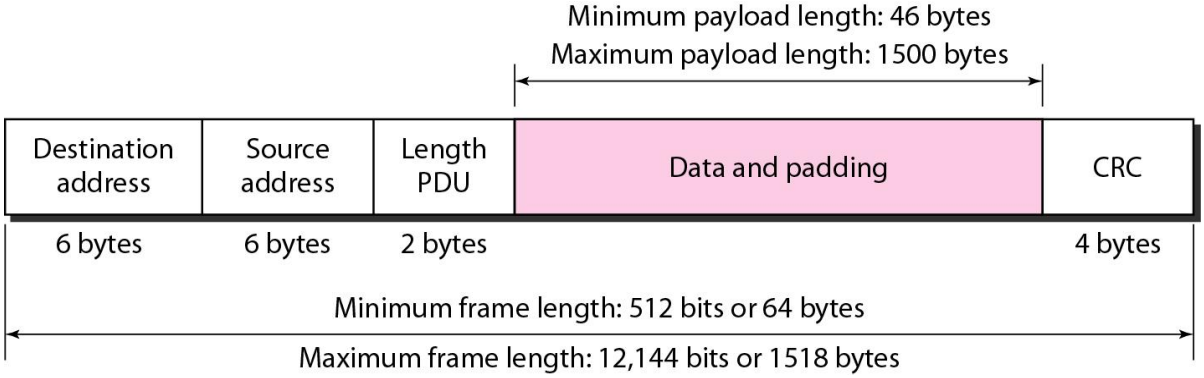
IEEE 802.3 (Wired LAN) MAC frame:

Preamble: 56 bits of alternating 1s and 0s.

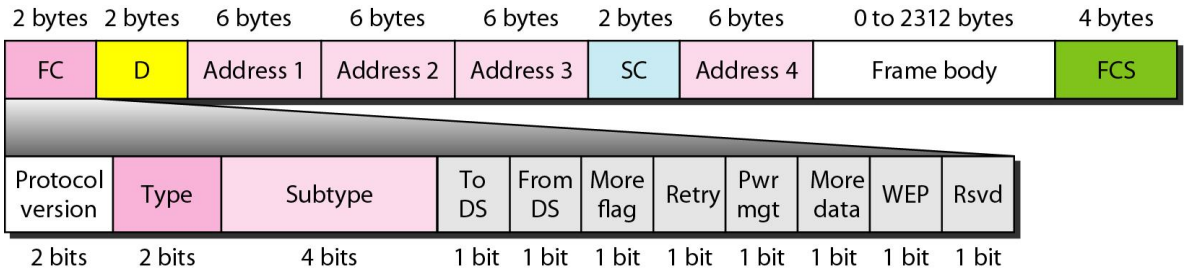
SFD: Start frame delimiter, flag (10101011)



Minimum and maximum lengths:



IEEE 802.11 (wireless LAN) frame format:



FC: Frame Control

D: duration of the transmission that is used to set the value of NAV

SC: sequence control: defines the sequence number of the frame to be used in flow control

- **Frame Control** −It is a 2 bytes starting field composed of 11 subfields. It contains control information of the frame. The 11 subfields are −

1. **Version:** It is a 2 bit long field which indicates the current protocol version which is fixed to be 0 for now.
2. **Type:** It is a 2 bit long field which determines the function of frame i.e management(00), control(01) or data(10). The value 11 is reserved.
3. **Subtype:** It is a 4 bit long field which indicates sub-type of the frame like 0000 for association request, 1000 for beacon.
4. **To DS:** It is a 1 bit long field which when set indicates that destination frame is for DS(distribution system).
5. **From DS:** It is a 1 bit long field which when set indicates frame coming from DS.
6. **More frag (More fragments):** It is 1 bit long field which when set to 1 means frame is followed by other fragments.
7. **Retry:** It is 1 bit long field, if the current frame is a retransmission of an earlier frame, this bit is set to 1.
8. **Power Mgmt (Power management):** It is 1 bit long field which indicates the mode of a station after successful transmission of a frame. Set to 1 the field indicates that the station goes into power-save mode. If the field is set to 0, the station stays active.
9. **More data:** It is 1 bit long field which is used to indicates a receiver that a sender has more data to send than the current frame. This can be used by an access point to indicate to a station in power-save mode that more packets are buffered or it can be used by a station to indicate to an access point after being polled that more polling is necessary as the station has more data ready to transmit.
10. **WEP:** It is 1 bit long field which indicates that the standard security mechanism of 802.11 is applied.
11. **Order:** It is 1 bit long field, if this bit is set to 1 the received frames must be processed in strict order.

- **Duration** − It is a 2-byte field that specifies the time period for which the frame and its acknowledgement occupy the channel.

- **Address fields(1 to 4) -** These are 6 bytes long fields which contain standard IEEE 802 MAC addresses (48 bit each). The meaning of each address depends on the DS bits in the frame control field.

To DS	*From DS*	*Address 1*	*Address 2*	*Address 3*	*Address 4*
0	0	Destination	Source	BSS ID	N/A
0	1	Destination	Sending AP	Source	N/A
1	0	Receiving AP	Source	Destination	N/A
1	1	Receiving AP	Sending AP	Destination	Source

Note: Address 1 is always address of next device
Address 2 is always address of previous device
Address 3 is address of final destination if not defined by Address 1
Address 4 is address of original source if not defined by Address 2

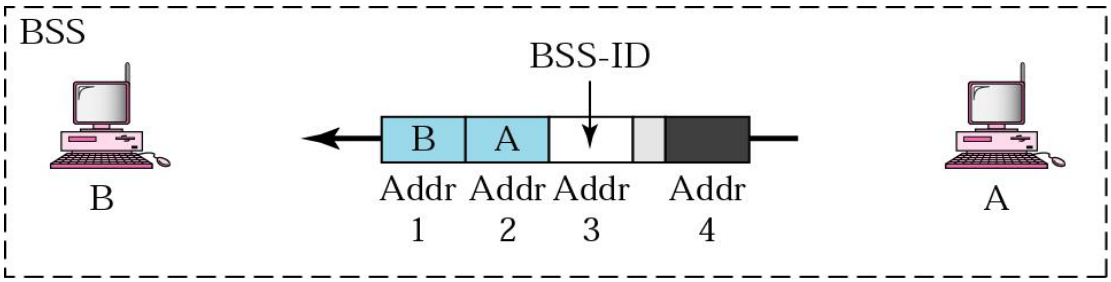
- **Sequence** − It a 2 bytes field that stores the frame numbers. It detects duplicate frames and determines the order of frames for higher layers. Among the 16 bits, the first 4 bits provides identification to the fragment and the rest 12 bits contain the sequence number that increments with each transmission.
- **Data** − This is a variable sized field that carries the payload from the upper layers. The maximum size of data field is 2312 bytes.
- **Frame Check Sequence (FCS)** − It is a 4-byte field containing error detection information.

Addressing mechanism: case 1

Frame is going directly from one client to another.

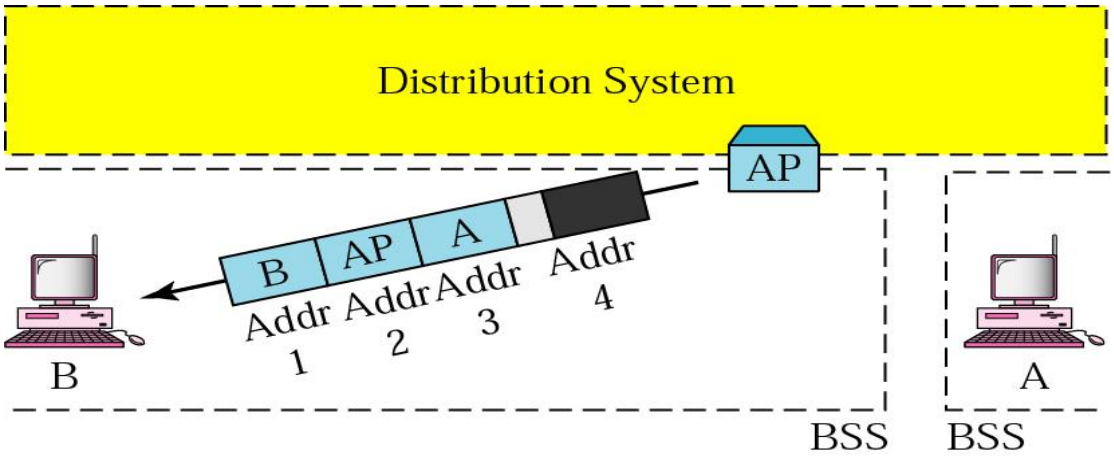
No intervening distribution system.

To DS = 0, From DS = 0



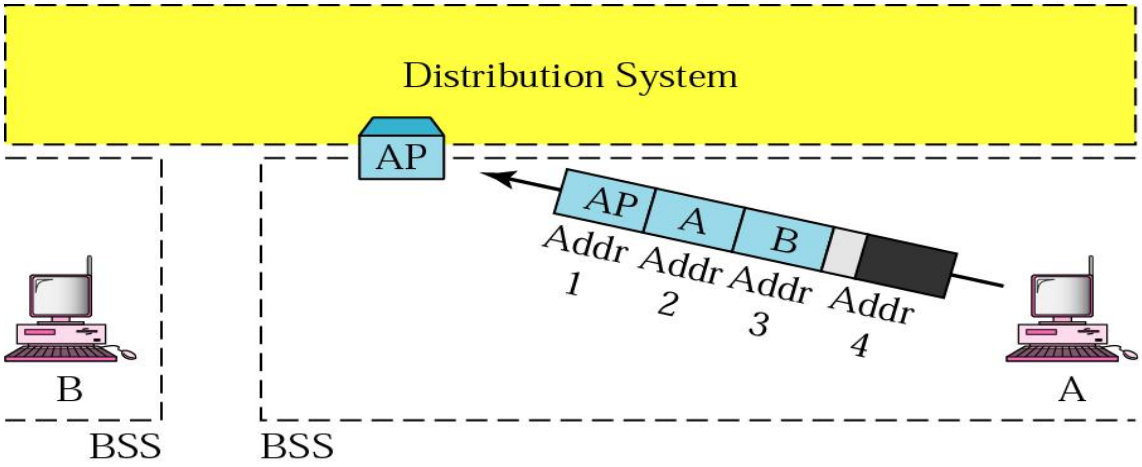
Addressing mechanism: case 2

To DS = 0, From DS = 1 - frame is coming from a DS (Access Point)



Addressing mechanism: case 3

To DS = 1, From DS = 0 - frame is going to a DS (or AP)



Addressing mechanism: case 4

To DS = 1 and From DS = 1