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# **DEPARTMENT OF INFORMATION TECHNOLOGY**

## **16IT301 – COMPUTER NETWORKS**

II YEAR IV SEM

**UNIT 2 – DATA LINK LAYER AND MEDIA ACCESS**

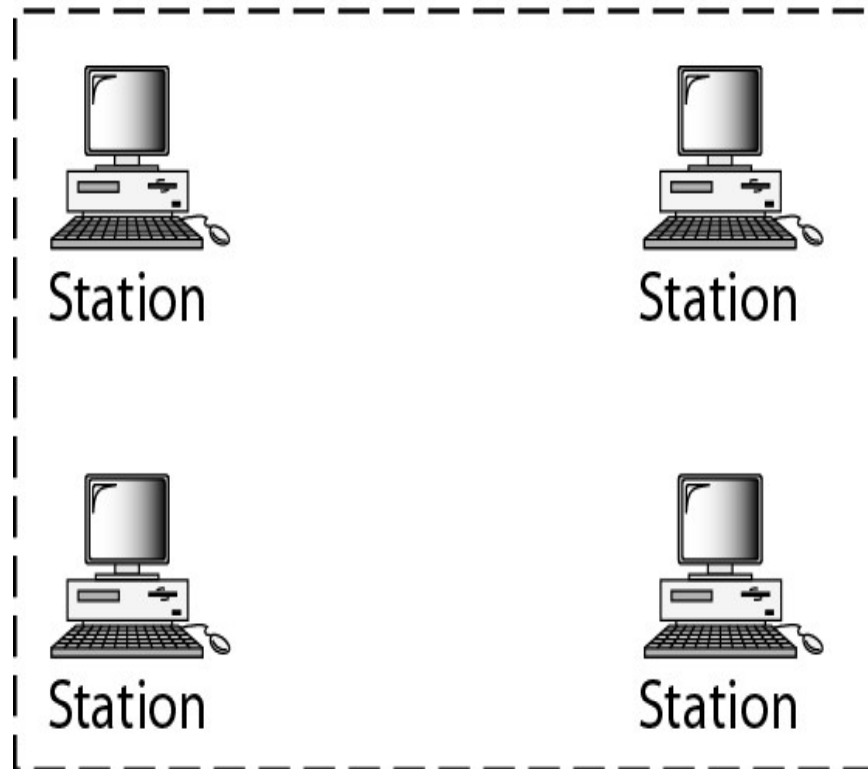
**TOPIC 13 – Wireless LAN (IEEE 802.11)**

has defined the specifications for a wireless LAN, called 802.11, which covers the physical and data link layers.

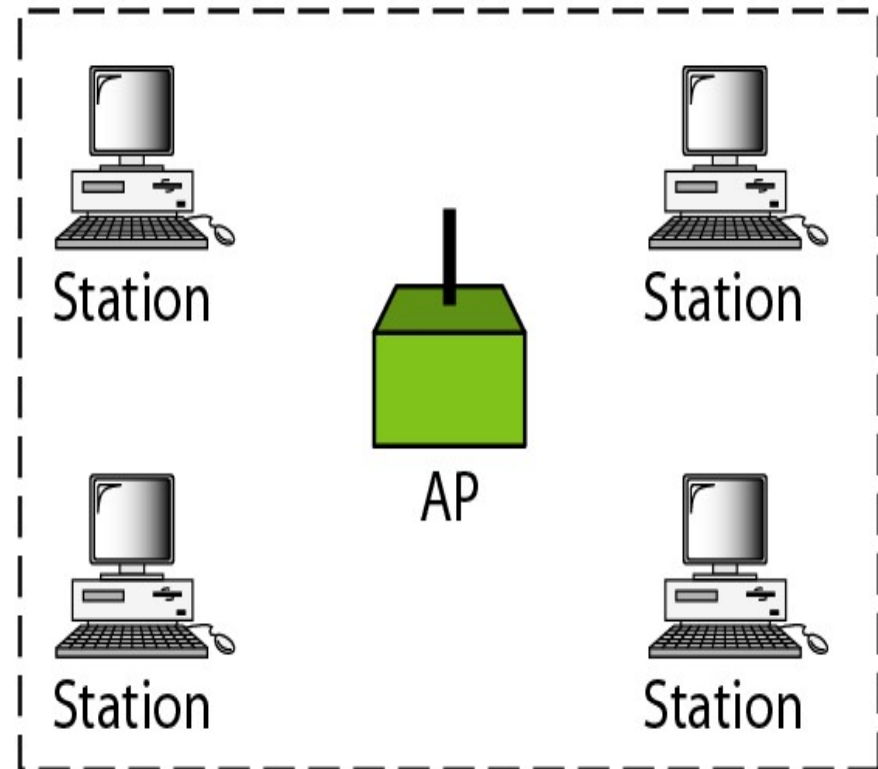
A BSS without an AP is called an ad hoc network  
a BSS with an AP is called an infrastructure network

**BSS:** Basic service set

**AP:** Access point



Ad hoc network (BSS without an AP)



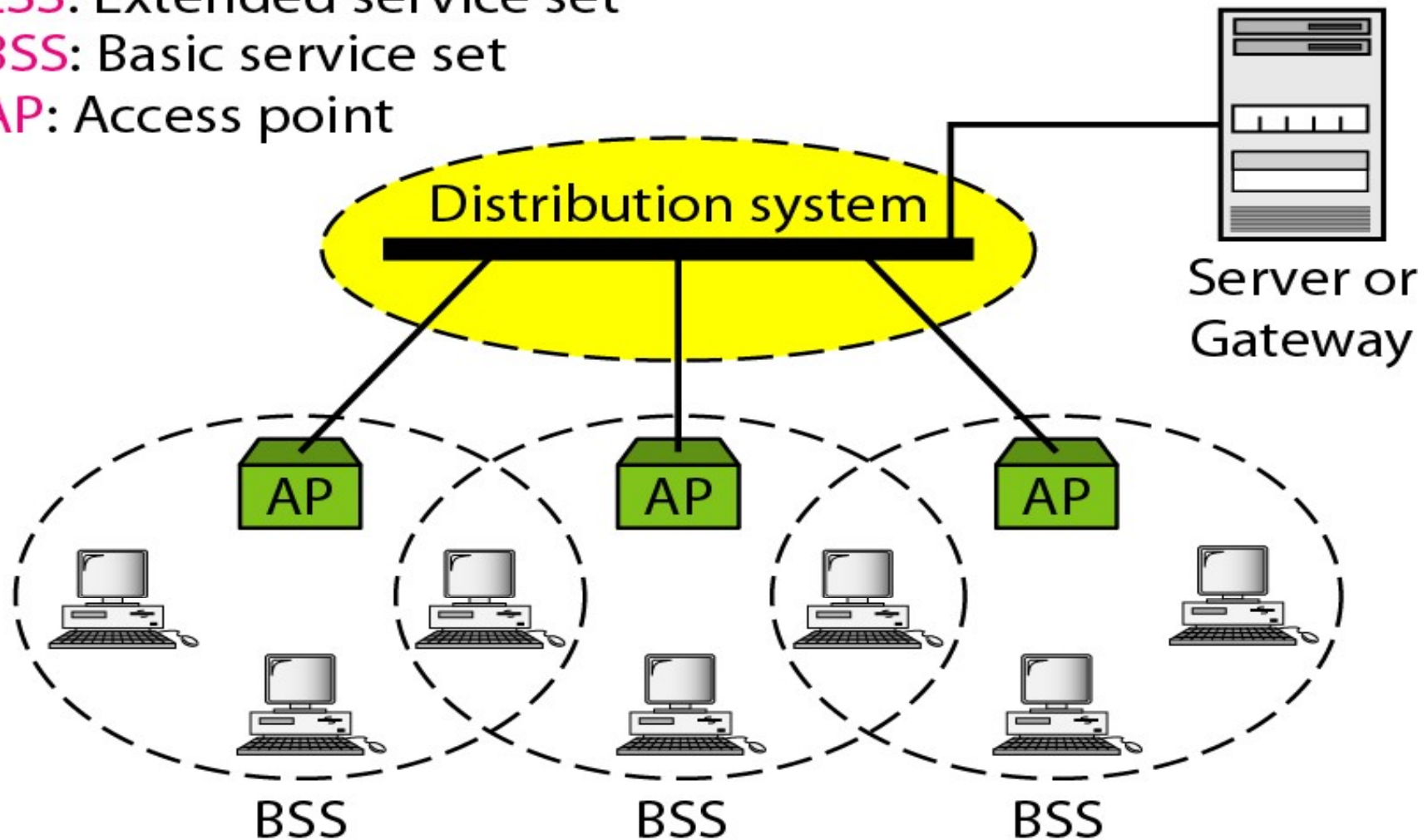
Infrastructure (BSS with an AP)

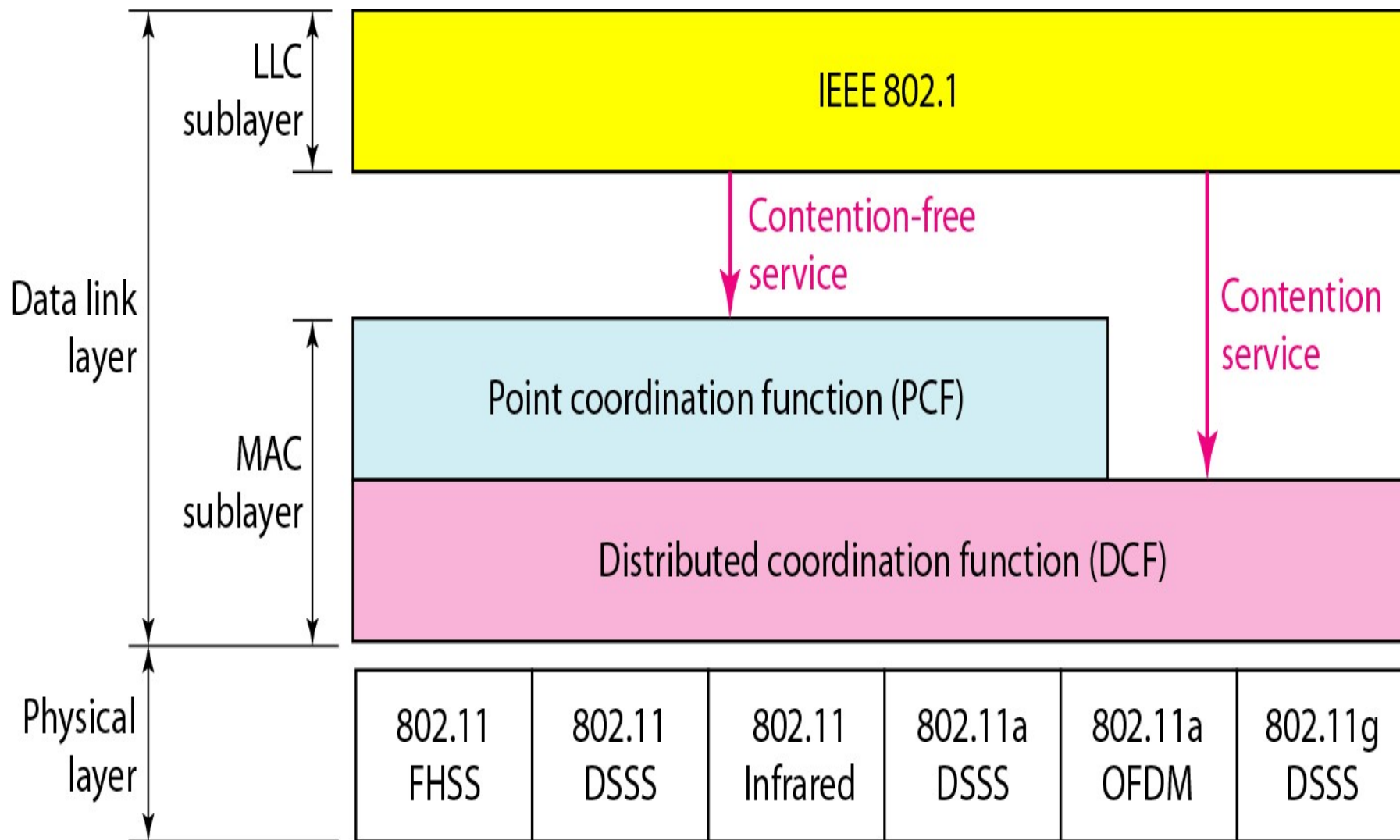
# Extended service sets (ESSs)

**ESS:** Extended service set

**BSS:** Basic service set

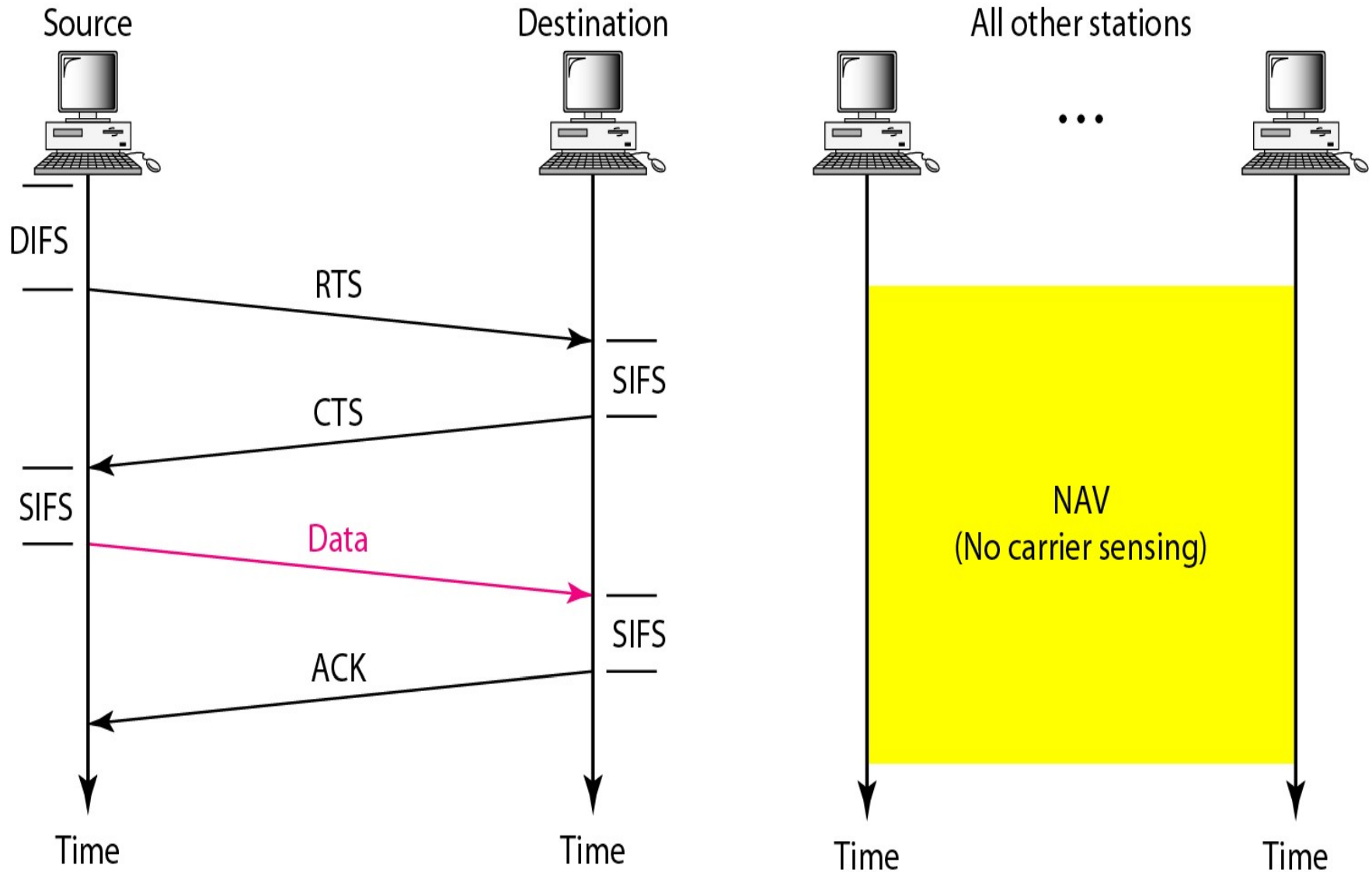
**AP:** Access point



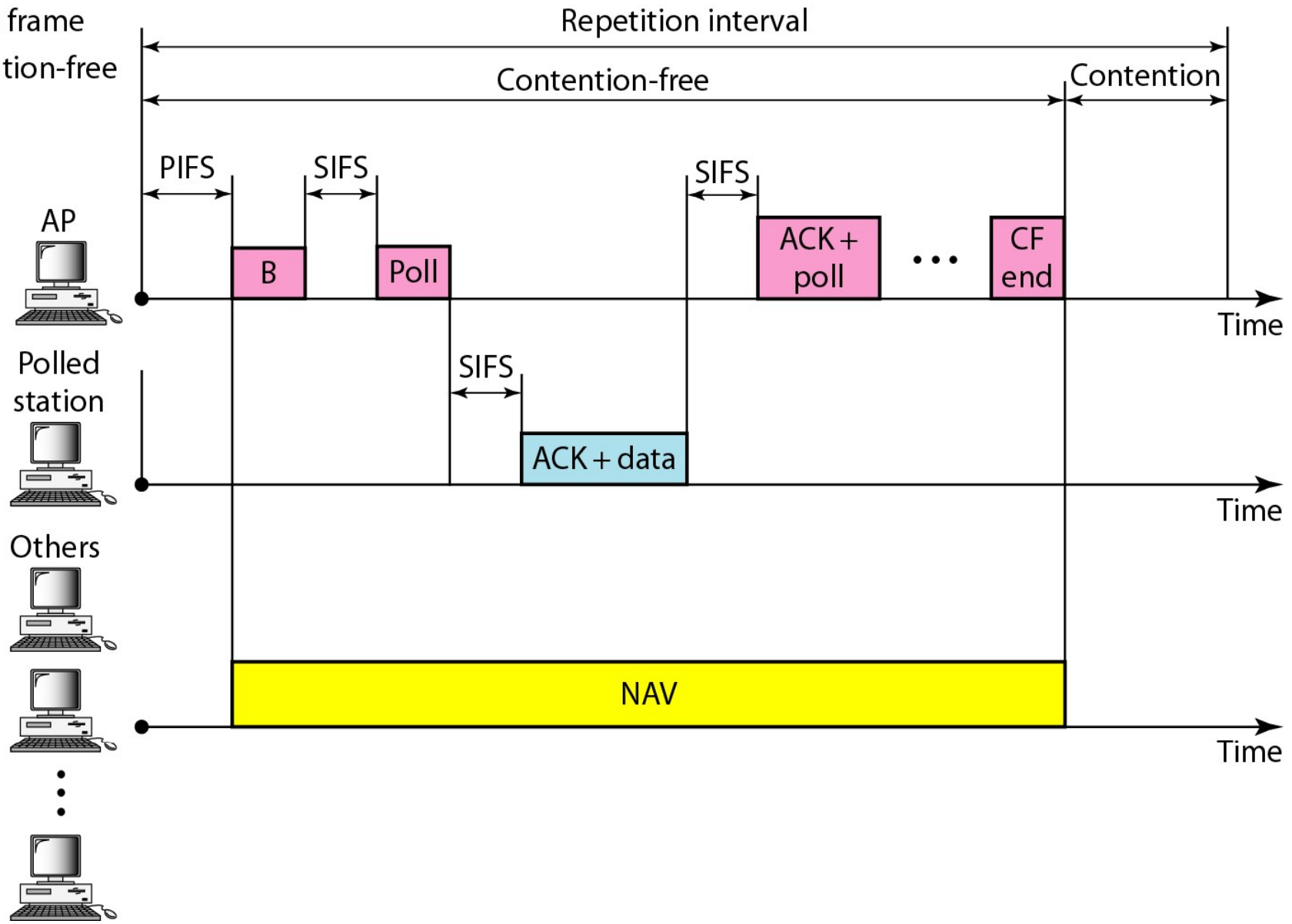




# CSMA/CD and NAV



B: Beacon frame  
CF: Contention-free

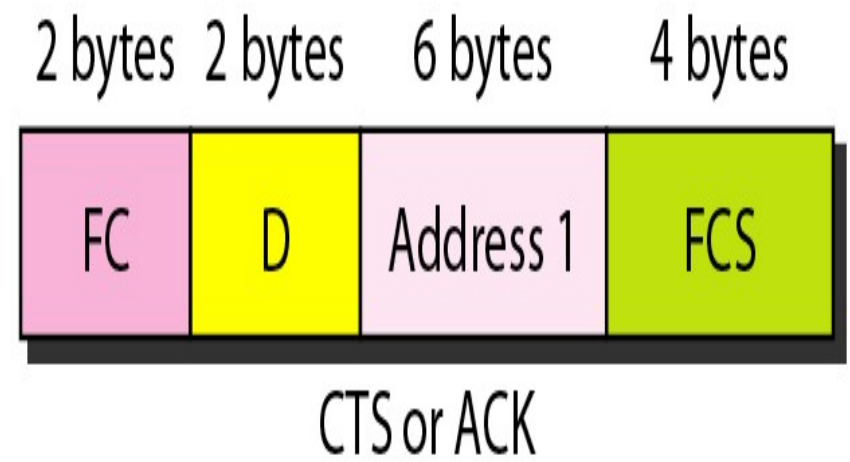
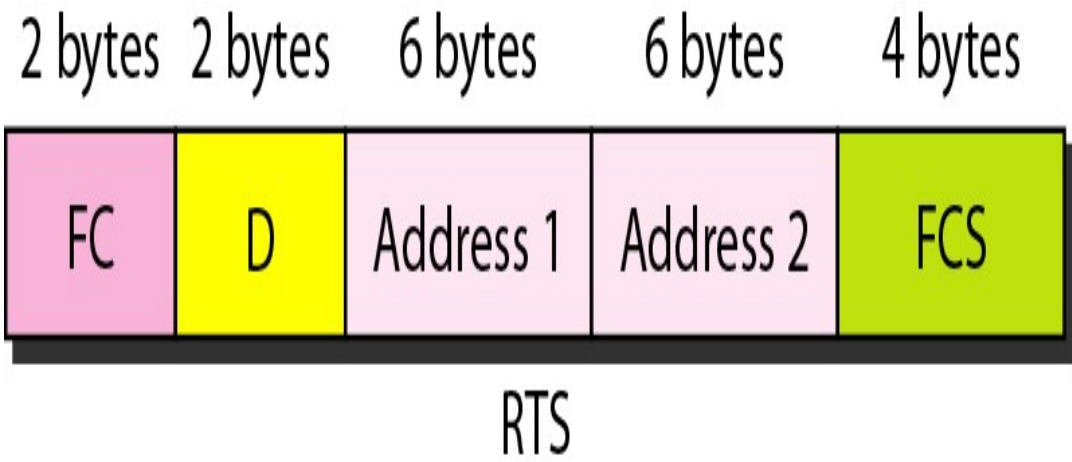






<i>Field</i>	<i>Explanation</i>
Version	Current version is 0
Type	Type of information: management (00), control (01), or data (10)
Subtype	Subtype of each type (see Table 14.2)
To DS	Defined later
From DS	Defined later
More flag	When set to 1, means more fragments
Retry	When set to 1, means retransmitted frame
Pwr mgt	When set to 1, means station is in power management mode
More data	When set to 1, means station has more data to send
WEP	Wired equivalent privacy (encryption implemented)
Rsvd	Reserved

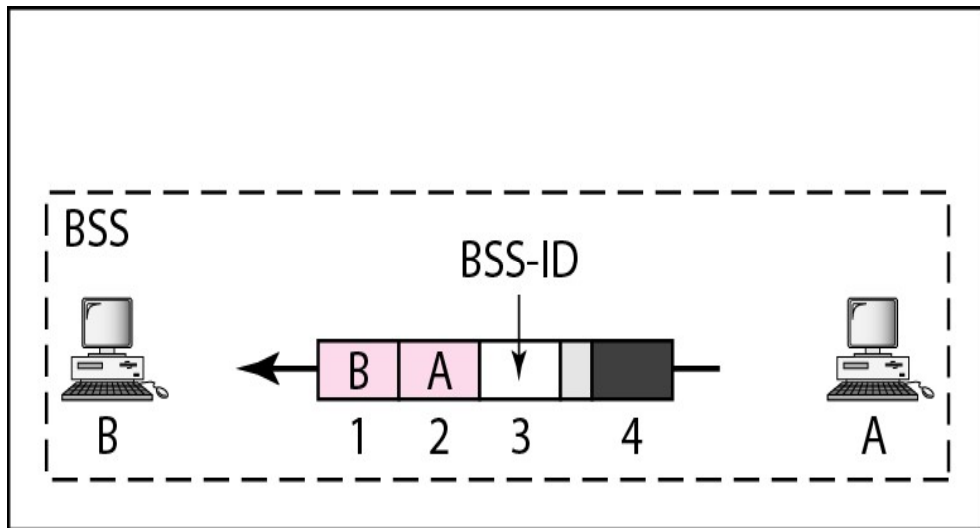
# Control Frames



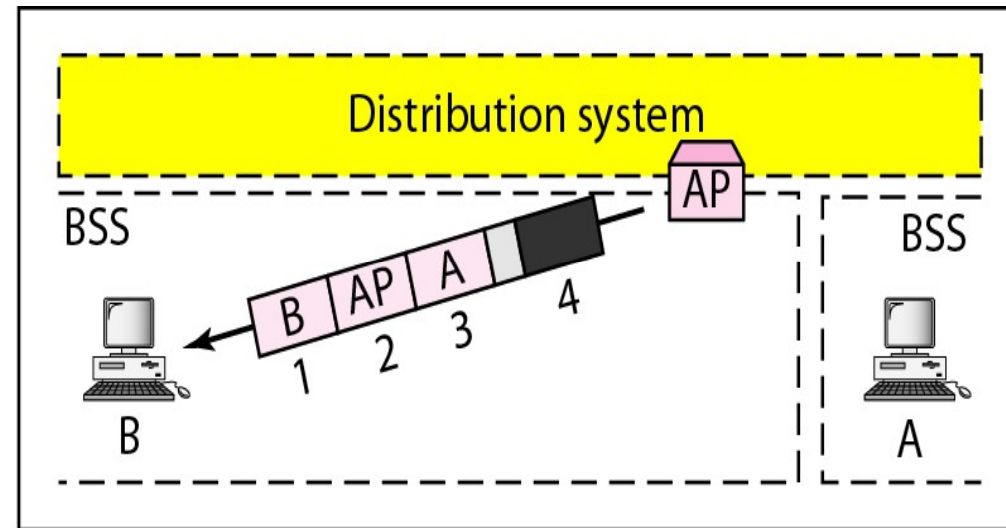
<i>Subtype</i>	<i>Meaning</i>
1011	Request to send (RTS)
1100	Clear to send (CTS)
1101	Acknowledgment (ACK)

<i>To DS</i>	<i>From DS</i>	<i>Address 1</i>	<i>Address 2</i>	<i>Address 3</i>	<i>Address 4</i>
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

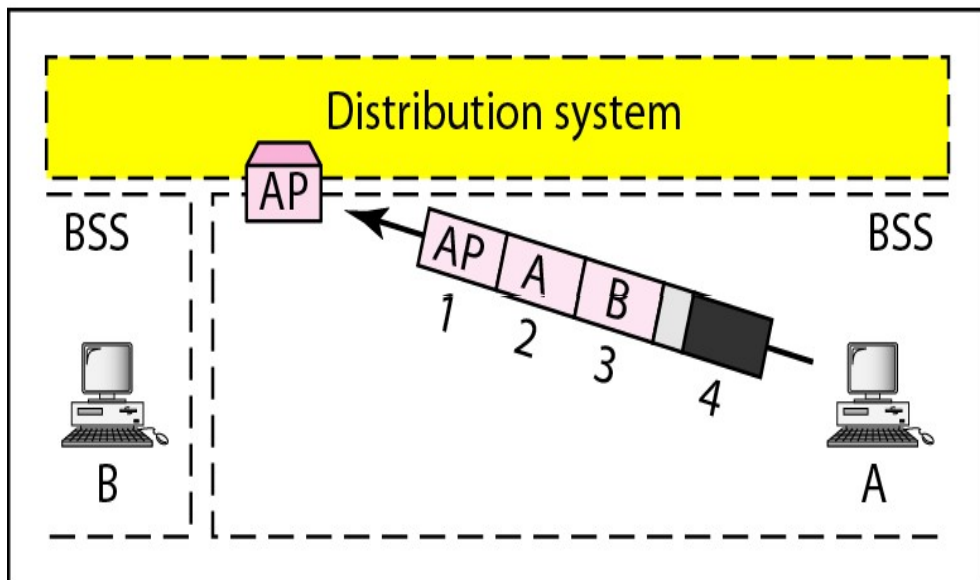
# Handoff mechanisms



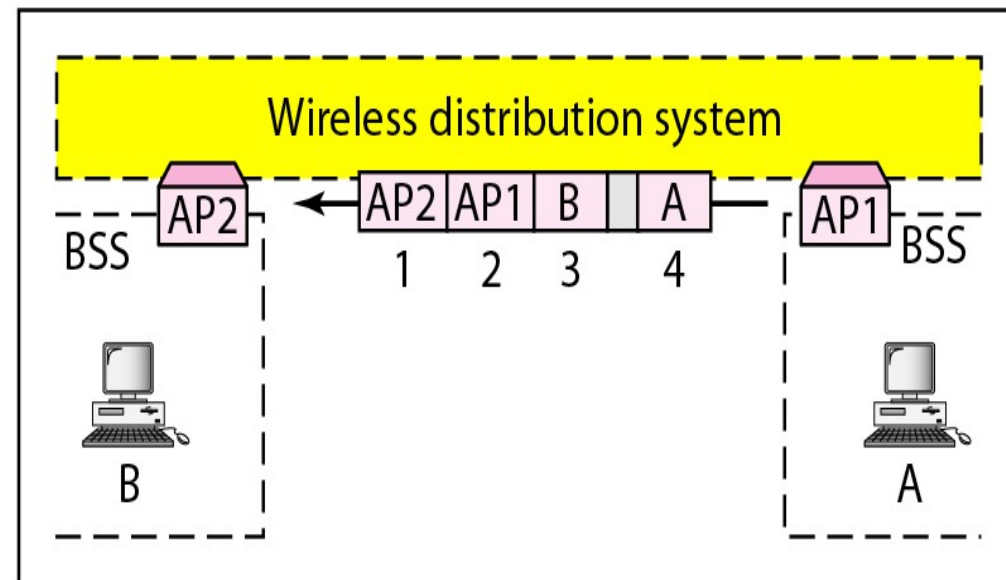
a. Case 1



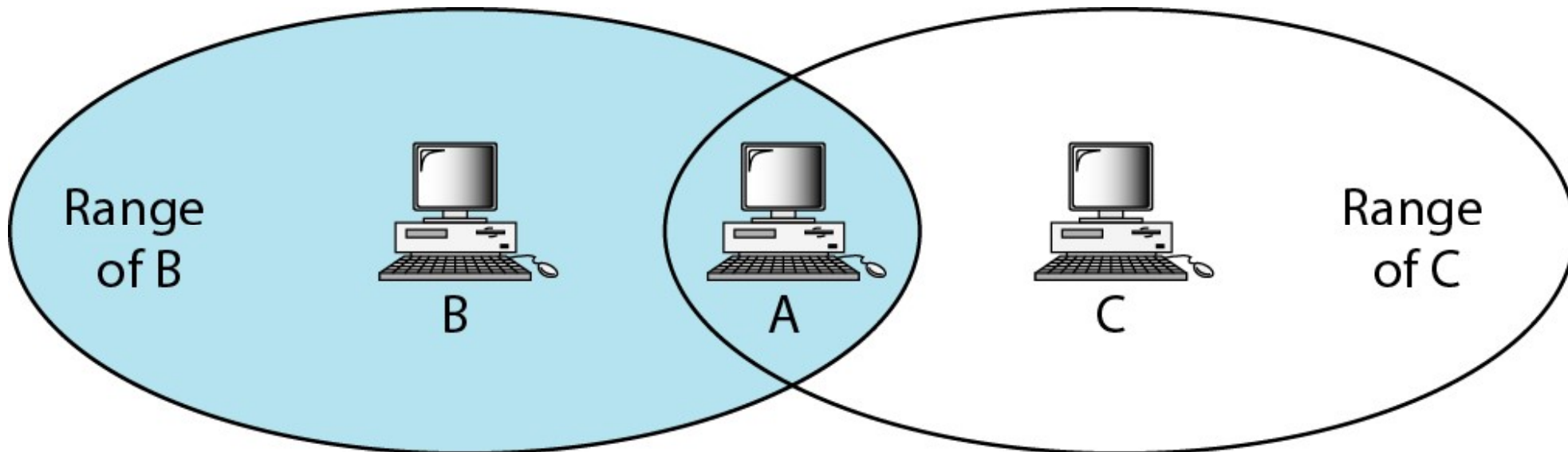
b. Case 2



c. Case 3



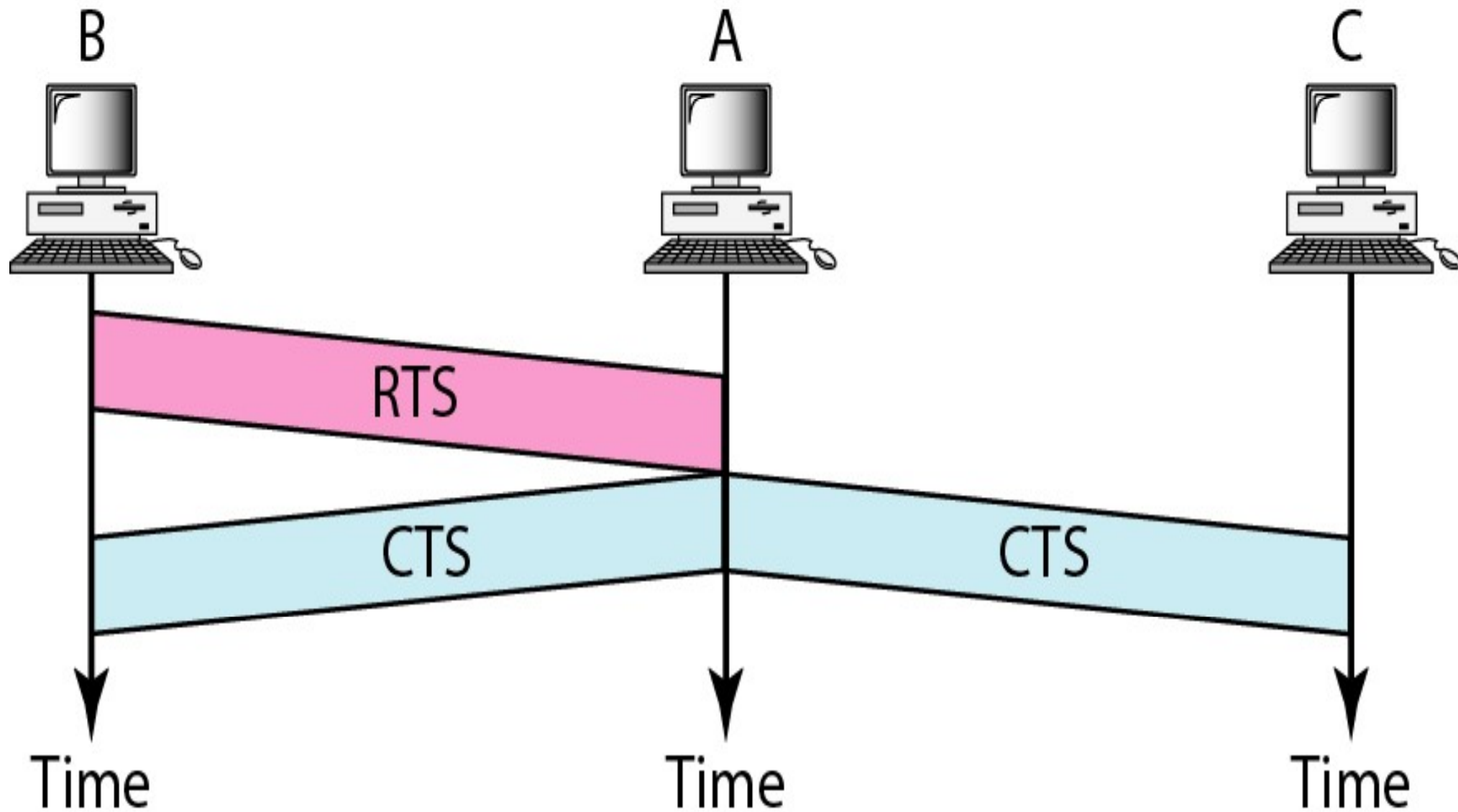
d. Case 4

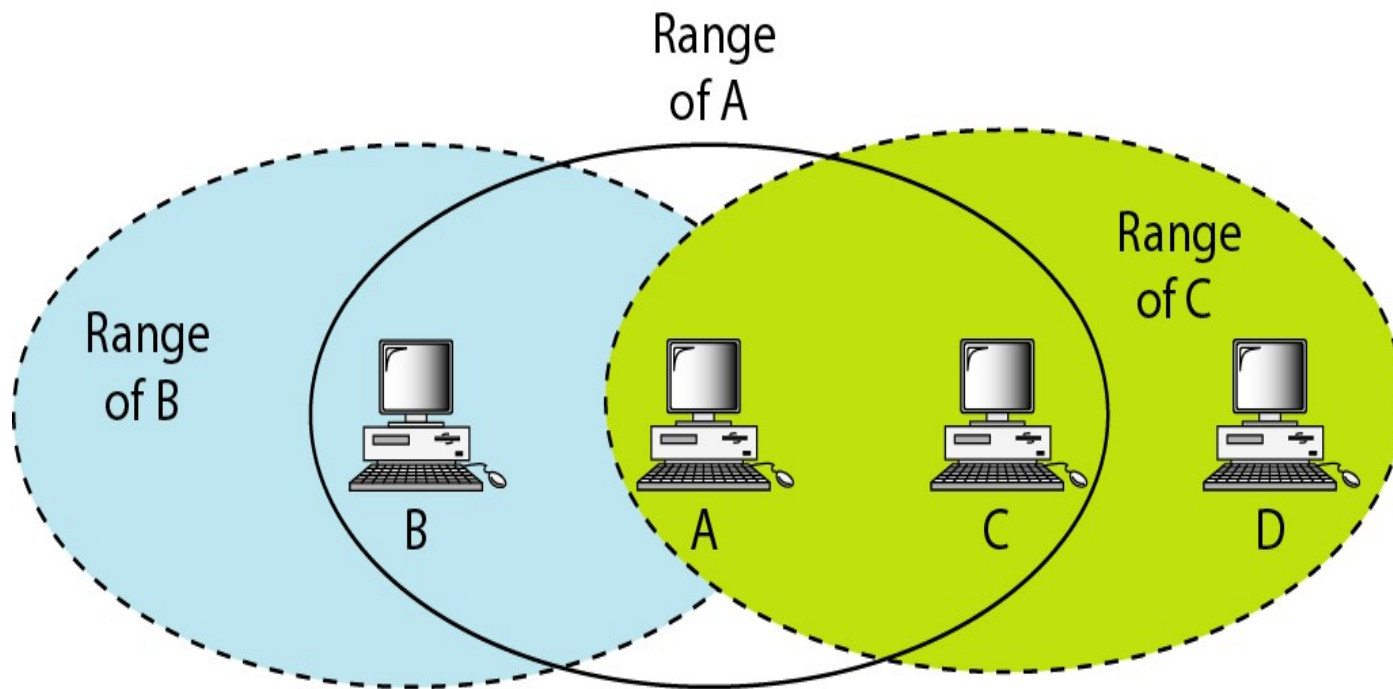


B and C are hidden from each other with respect to A.

The CTS frame in CSMA/CA handshake can prevent collision with a hidden station.

# Use of nonmasking to prevent medium station problem



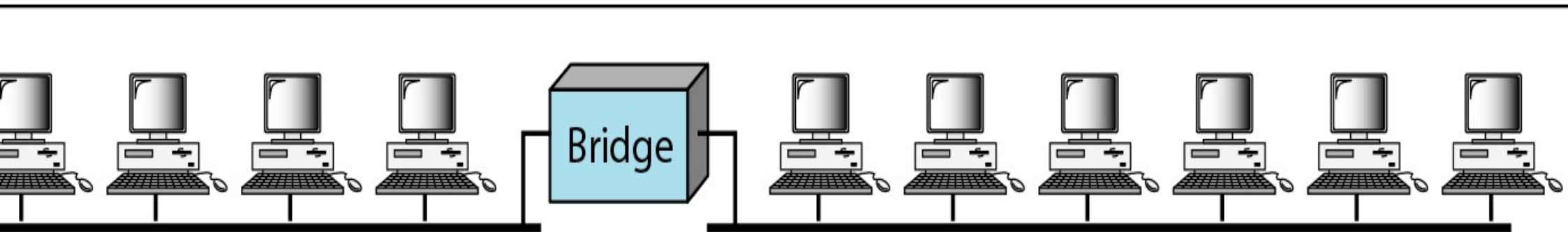
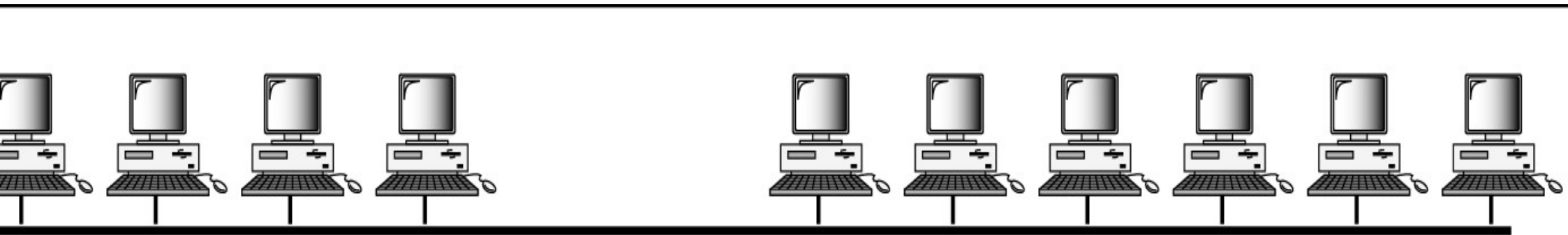


C is exposed to transmission from A to B.



# PHY Standards

<i>IEEE</i>	<i>Technique</i>	<i>Band</i>	<i>Modulation</i>	<i>Rate (Mbps)</i>
802.11	FHSS	2.4 GHz	FSK	1 and 2
	DSSS	2.4 GHz	PSK	1 and 2
		Infrared	PPM	1 and 2
802.11a	OFDM	5.725 GHz	PSK or QAM	6 to 54
802.11b	DSSS	2.4 GHz	PSK	5.5 and 11
802.11g	OFDM	2.4 GHz	Different	22 and 54



wireless ad-hoc network \_\_\_\_\_

access point is not required

access point is must

nodes are not required

all nodes are access points

which multiple access technique is used by IEEE 802.11 standard for

?

FDMA

TDMA/CA

ALOHA

CDMA/CD

What is Wired Equivalent Privacy (WEP)?

security algorithm for ethernet

security algorithm for wireless networks

security algorithm for usb communication

*Thank You*