Chapter 21

Wireless Networking

Episode 21.02

Episode title: **Wi-Fi Standards**

Objective: 2.2 Explain wireless networking technologies.
•Frequencies
 o 6GHz

L3s

- 1:06 - Industrial, scientific, and medical (ISM) radio bands
- 1:20 - Objective term - Frequencies: 2.4 GHz and 5 GHz band
- 2:06 - Objective term - 2.4 GHz band: 2.412 - 2.4884 GHz
- 2:36 - Objective term - Channels
- 3:18 - Objective term - 5 GHz band: 5.150 - 5.875 GHz
- 4:17 - Objective term - 802.11a
- 4:34 - Objective term - 802.11b

L3s

- 4:58 - Objective term - 802.11g

- 5:58 - Objective term - 802.11n (Wi-Fi 4)

- 6:37 - MIMO (multiple in/multiple out)

- 7:10 - Objective term - 802.11ac (Wi-Fi 5)

- 7:23 - Multiuser MIMO (MU-MIMO)

- 8:19 - Objective term - 802.11n (Wi-Fi 4) 802.11ac (Wi-Fi 5)

- 6 GHz band

- 802.11 ax (Wi-Fi 6e and Wi-Fi 7)

@IDM - 6 GHz band and 802.11ax Obj terms?

IEEE 802.11 Standards

Standard	Speed	Band
802.11a	54 Mbps	5 GHz
802.11b	11 Mbps	2.4 GHz
802.11g	54 Mbps	2.4 GHz
802.11n (Wi-Fi 4)	150 Mbps	2.4GHz 5 GHz
802.11ac (Wi-Fi 5)	1+ Gbps	5 GHz
802.11ax (Wi-Fi 6)	9+ Gbps	2.4 GHz 5 GHz 6 GHz

Wi-Fi Bands

2.4 GHz
- Provides a longer range
- Slower data transfer speeds

5 GHz
- Less range than 2.4 GHz
- Faster data transfer speeds

6 GHz
- Offers the least coverage
- Superfast data transfer speeds

Episode 21.04

Episode title:

Wireless Encryption

Objective:

2.3 Compare and contrast wireless security protocols and authentications methods
- Protocols and encryption
  - o WPA3
- Authentication
  - o Kerberos

L3s

- 0:46 - WEP (Wired Equivalent Privacy)
- 1:48 - RC-4
- 2:49 - Objective term - TKIP (Temporal Key Integrity Protocol)
- 3:03 - Objective term - AES (Advanced Encryption Standard)
- 3:58 - Personal/Pre-shared key (PSK)
- 4:17 - Objective term - Remote Authentication Dial-In User Service (RADIUS) server

L3s

- 4:53 - WPA (Wi-Fi Protected Access)

- 5:18 - Objective term - WPA2

- 6:21 - WPA-PSK (personal/pre-shared key)

- 7:10 - WPA uses TKIP; WPA2 uses AES

- 7:44 - WPS (Wi-Fi Protected Setup)

- WPA 3

WPA 3

Implementation types
- WPA 3- Personal
- WPA 3- Enterprise
- Wi-Fi Enhanced Open

WPA 3 Improvements
- Takes more time to hack
- "Forward Secrecy"
- 192-bit mode

Kerberos

Authentication Protocol

- Key distribution center (KDC)
  - Provide authentication service (AS)
  - Ticket granting server (TGS)

Connect to Database

- Connect to LDAP or an Active Directory
- User ID and Passwords are secured

Episode 21.08

Episode title: **Beyond Wi-fi**

Objective:

L3s

OBJ - Storage Area Network (SAN)
SAN is a network of storage devices
NAS is storage on a network
Network Attached Storage (NAS)
Fibre Channel Protocol
Internet SCSI

Network Attached Storage (NAS)

NAS is storage on a network

Storage Area Network (SAN)

Dedicated network that provides data storage services to other networks and network nodes