Introduction to Connecting to the Internet

POTS and Dial-up

Broadband Connections

WANs

Wireless Networking

Video: Introduction to Wireless Networking Technologies
5 min

Reading: Wi-Fi 6
10 min

Reading: Supplemental Reading for Alphabet Soup
10 min

Reading: Supplemental Reading for IoT Data Transfer Protocols
10 min

Video: Wireless Network Configurations
2 min

Video: Wireless Channels
4 min

Video: Wireless Security
2 min

Reading: Protocols & Encryption
10 min

Video: Cellular Networking
1 min

Video: Mobile Device Networks
3 min

Reading: Supplemental Reading for Mobile Device Networks
10 min

Discussion Prompt: Your Daily Connection
10 min

Practice Quiz: Wireless Networking
5 questions

Graded Assessments

Wi-Fi 6

Wi-Fi 6, formerly known as 802.11ax, is one of the largest leaps in Wi-Fi technology since its introduction. This reading will introduce you to the benefits and technology used in Wi-Fi 6.

Benefits of Wi-Fi 6

The Wi-Fi 6 network protocol is faster and more efficient for networks with a larger number of connected devices.

Key benefits of Wi-Fi 6 technology include:

- **Higher data rates:** Band splitting or increased client group sizes allow for uploading and downloading greater amounts of data.
- **Increased band capacity:** Band utilization increased from 80mHz to 160mHz, creating a faster connection from the router to connected devices.
- **Better performance**: The input/output streams are doubled from the 4 by 4 allowed by Wi-Fi 5, to 8 by 8 in Wi-Fi 6, allowing more clients to be grouped.
- **Improved power efficiency**: Devices only connect to the network when sending or receiving data, increasing battery life.

Capabilities of Wi-Fi 6

Wi-Fi 6 technology improves functionality and connectivity.

- **Channel sharing** for better efficiency and shortens the time it takes to send data once a user gives the send command.
- **Target Wake Time (TWT)** improves the network speed and increases battery life by allowing battery-powered devices to sleep when not in use.
- **Multi-user MIMO (Multiple Input, Multiple Output)** wireless technology allows more data to be transferred simultaneously. This ability increases capacity and efficiency in high bandwidth applications like voice calls or video streaming.
- **160 MHz channel utilization** gives more space for transmitting data and increases bandwidth capability.
- **1024 Quadrature amplitude modulation** combines two signals into a single channel, so more data is encoded.
- **Orthogonal Frequency Division Multiple Access (OFDMA)** allows for bandwidth splitting, which is assigned dynamically by the access point to separate devices.
- **Transmit beamforming** is a technique that sends signals that allow for more efficient higher data rates by targeting each connected device.

Wi-Fi 6E extends Wi-Fi 6 into 6 GHz

Wi-Fi 6E is an additional certification for Wi-Fi 6 that has all of the features of Wi-Fi 6 but adds a third 6 GHz band. Wi-Fi 6E has more channels to use to broadcast, including 14 more 80MHz channels and seven more 160MHz channels. The additional channels allow networks with Wi-Fi 6E for better performance even when streaming high-definition video or using virtual reality devices.

Key takeaways

- Wi-Fi technology will continue to change as the needs of companies and users change. Wi-Fi 6 improves the quality of networks with faster speeds and energy-saving technology.
- Wi-Fi 6 uses technologies like channel sharing, Target Wake Time, Multi-user MIMO, channel utilization, amplitude modulation, OFDMA, and transmit beamforming to increase the quality of a Wi-Fi network.
- Wi-Fi 6E is an additional certification of Wi-Fi 6 that has even faster speeds and stronger performance.

Resource for more information

For more information about Wi-Fi 6, read this article by the Wi-Fi Alliance: Wi-Fi CERTIFIED 6.

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