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Question 1

Question Type: MultipleChoice

Which IEEE 802.11 physical layer (PHY) specification includes support for operation in the 2.4 GHz, 5 GHz, and 6 GHz bands?

Options:

A- VHT (802.11ac).

B- HT(802.11n)

C- HR/DSSS (802.11b)

D- HE (802.11ax)

Answer:

D

Explanation:

The IEEE 802.11ax standard, also known as High-Efficiency Wireless (HEW) or simply HE, includes support for operation across multiple frequency bands: 2.4 GHz, 5 GHz, and, with the appropriate regulatory approvals, the 6 GHz band. This makes option D the

correct answer. Here's how it compares to the other options:

HE (802.11ax): Introduced as an enhancement over previous standards, 802.11ax is designed to improve efficiency, especially in dense environments. It supports operation in the 2.4 GHz, 5 GHz, and 6 GHz bands (the latter pending regulatory approval in various regions), making it highly versatile and future-proof.

VHT (802.11ac): Very High Throughput, or 802.11ac, operates exclusively in the 5 GHz band. It introduced significant speed improvements over its predecessor (802.11n) but does not support the 2.4 GHz or 6 GHz bands.

HT (802.11n): High Throughput, or 802.11n, supports operation in both the 2.4 GHz and 5 GHz bands. However, it does not include support for the 6 GHz band.

HR/DSSS (802.11b): High-Rate Direct Sequence Spread Spectrum, or 802.11b, operates only in the 2.4 GHz band. It was one of the early Wi-Fi standards and does not support 5 GHz or 6 GHz bands.

Given these distinctions, only 802.11ax (option D) supports operation across all three mentioned bands, aligning with the requirements stated in the question.

IEEE 802.11ax-2021: High-Efficiency Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications.

Understanding the 802.11ax (Wi-Fi 6) standard and its implications for modern wireless networking.

Question 2

Question Type: **MultipleChoice**

You have implemented an 802.11ax WLAN for a customer. All APs are four stream HE APs. The customer states that it is essential that most of the clients can use the OFDMA modulation scheme. What do you tell the customer?

Options:

A- The clients that must support OFDMA must also be upgraded to 802.11ax

B- OFDMA is an optional feature of 802.11ax and most APs don't even support it

C- All 5 GHz PHYs use OFDM modulation, so you will achieve OFDMA everywhere in 5 GHz

D- If the devices support 802.11ac, they can be updated to support OFDMA through driver upgrades

Answer:

A

Explanation:

OFDMA is a new modulation scheme introduced in 802.11ax that allows multiple users to share the same channel by dividing it into smaller subchannels called resource units (RUs). This improves the efficiency and capacity of the WLAN by reducing contention and overhead. However, to use OFDMA, both the AP and the client must support 802.11ax and negotiate the parameters of the subchannel allocation.Therefore, the customer needs to upgrade the clients that require OFDMA to 802.11ax devices12.

The other options are not correct because they do not reflect the reality of OFDMA.Option B is incorrect because OFDMA is a mandatory feature of 802.11ax for both downlink and uplink transmissions, and all 802.11ax APs must support it1. Option C is incorrect

because OFDM and OFDMA are different modulation schemes, and OFDM does not allow multiple users to share the same channel.Option D is incorrect because 802.11ac devices cannot support OFDMA through driver upgrades, as they lack the hardware and firmware capabilities to do so2.

Question 3

Question Type: MultipleChoice

You are troubleshooting a problem with a new 802.11ax AP. While the AP supports four spatial streams, most clients are only achieving maximum data rates of 150 Mbps. What is the likely cause?

Options:

A- The clients are 802.11n devices

B- The clients are only two stream 802.11ax clients

C- Contention caused by an overlapping BSS

D- Non-Wi-Fi interference in the channel

Answer:

A

Explanation:

The scenario described suggests that while the Access Point (AP) is capable of 802.11ax (Wi-Fi 6) with four spatial streams, the clients are only achieving data rates typical of 802.11n (Wi-Fi 4) devices, which indicates that the clients are likely 802.11n devices. Here's why this is the most plausible explanation:

802.11n Limitations: Devices that adhere to the 802.11n standard have lower maximum data rates compared to 802.11ax devices due to differences in technology such as modulation, spatial streams, and channel bandwidth. An 802.11n device with a single spatial stream operating on a 20 MHz channel can achieve a maximum data rate of 72.2 Mbps. Even with two spatial streams under ideal conditions, this would only double to approximately 144.4 Mbps, which is close to the 150 Mbps mentioned.

Spatial Stream Capability: The fact that the AP supports four spatial streams suggests it can achieve much higher data rates with 802.11ax clients that also support multiple spatial streams. However, if the clients are 802.11n devices, they may not be capable of using more than two spatial streams, and many earlier 802.11n devices were limited to just one.

The other options are less likely to be the primary cause based on the information provided:

B . Two Stream 802.11ax Clients: If the clients were 802.11ax with only two spatial streams, they would likely achieve higher data rates than 150 Mbps due to the efficiency improvements in 802.11ax.

C . Contention and D. Non-Wi-Fi Interference: While these could affect performance, they would not inherently limit clients to 150 Mbps, especially in the context of an 802.11ax environment where mechanisms to handle interference and contention are more advanced.

IEEE 802.11n-2009: Enhancements for Higher Throughput.

CWNA Certified Wireless Network Administrator Official Study Guide: Exam PW0-105, by David D. Coleman and David A. Westcott.

Question 4

Question Type: MultipleChoice

What can cause excessive VSWR in RF cables used to connect a radio to an antenna?

Options:

A- High gain yagi antenna

B- Radio output power above 100 mW but below 400 mw

C- High gain parabolic dish antenna

D- Impedance mismatch

Answer:

D

Explanation:

Impedance is the measure of opposition to the flow of alternating current (AC) in a circuit. Impedance mismatch occurs when the impedance of the radio does not match the impedance of the antenna or the cable. This causes some of the transmitted or received signal to be reflected back, resulting in a loss of power and efficiency. The voltage standing wave ratio (VSWR) is a metric that indicates the amount of impedance mismatch in a transmission line. A higher VSWR means a higher impedance mismatch and a lower signal quality. A VSWR of 1:1 is ideal, meaning there is no impedance mismatch and no reflected power.A VSWR of 2:1 means that for every 2 units of forward power, there is 1 unit of reflected power12.

The other options are not correct because they do not affect the VSWR in RF cables. A high gain yagi antenna or a high gain parabolic dish antenna can increase the signal strength and directionality, but they do not cause impedance mismatch in the cable.Radio output power above 100 mW but below 400 mW is within the acceptable range for most WLAN devices and does not cause excessive VSWR in the cable3.

Question 5

Question Type: **MultipleChoice**

An RF signal sometimes bends as it passes through a material rather than around an obstacle. What is the RF behavior that this statement best describes?

Options:

A- Diffraction

B- Refraction

C- Scattering

D- Reflection

Answer:

B

Explanation:

Refraction is the bending of an RF signal as it passes through a material of different density. Refraction can cause the signal to change its direction and angle of arrival. For example, when a light beam passes from air to water, it bends because of the difference in the refractive index of the two mediums.Similarly, when an RF signal passes from one medium to another, such as from air to glass, it can bend due to the change in the dielectric constant of the materials12.Reference:1: CWNA-109 Official Study Guide, page 672:Refraction

Question 6

Question Type: MultipleChoice

You administer a WLAN that offers a guest SSID of GUESTNWORK. Users connect to the GUESTNWORK SSID, but report that they cannot browse the Internet. The devices simply report no Internet connection. What common problem causes this scenario?

Options:

A- NTP issues

B- Hardware issues

C- IP routing issues

D- Captive portal issues

Answer:

D

Explanation:

A common problem that causes this scenario iscaptive portal issues. A captive portal is a web page that requires users to authenticate or accept terms and conditions before accessing the Internet through a WLAN. A captive portal is often used for guest networks to provide security and control over the network access. A captive portal works by intercepting the user's web requests and redirecting them to the portal page until the user completes the required action. However, sometimes the captive portal may not work properly due to various reasons, such as browser settings, firewall rules, DNS configuration, or network errors. This can prevent the user from browsing the Internet or seeing the portal page. To troubleshoot captive portal issues, you can try to use a different browser, clear the browser cache and cookies, disable any VPN or proxy settings, manually enter the portal URL, or contact the network administrator.

NTP issues, hardware issues, or IP routing issues are not common problems that cause this scenario.Reference:[CWNP Certified Wireless Network Administrator Official Study Guide: Exam CWNA-109], page 343; [CWNA: Certified Wireless Network Administrator Official Study Guide: Exam CWNA-109], page 333.

Question 7

Question Type: MultipleChoice

You recently purchased four laptops containing dual-band 802.11ac adapters. The laptops can connect to your 2.4 GHz network, but they cannot connect to the 5 GHz network. The laptops do not show the 5 GHz SSIds, which are different than the 2.4 GHz SSIDs. Existing devices can connect to the 5 GHz SSIDs with no difficulty. What is the likely problem?

Options:

A- Interference from non-Wi-Fi sources

B- Faulty drivers

C- DoS attack

D- Interference from other WLANs

Answer:

B

Explanation:

The likely problem that causes this scenario isfaulty drivers. Drivers are software components that enable the communication between the operating system and the hardware devices, such as the wireless adapters. Faulty drivers can cause various issues with the wireless connectivity, such as not detecting or connecting to certain networks, dropping connections, or reducing performance. Faulty drivers can be caused by corrupted files, outdated versions, incompatible settings, or hardware defects. To fix faulty drivers, you can try to update, reinstall, or roll back the drivers, or contact the manufacturer for support. Interference from non-Wi-Fi sources, DoS attack, or interference from other WLANs are not likely to cause this scenario, as they would affect all devices in the same area, not just the new laptops.Reference:[CWNP Certified Wireless Network Administrator Official Study Guide: Exam CWNA-109], page 562; [CWNA: Certified Wireless Network Administrator Official Study Guide: Exam CWNA-109], page 532.

Question 8

Question Type: MultipleChoice

You administer a small WLAN with nine access point. As a small business, you do not rum a RADIUS server and use WPA2-Personal for security. Recently, you changed the passphrase for WPA2-personal in all Aps and clients. Several users are now reporting the inability to connect to the network at time and it is constrained to one area of the building. When using scanner, you see that the AP

covering that area is online

Options:

A- The AP that covers the problem area requires a firmware update

B- The clients are improperly configured

C- The AP that covers the problem area has failed

D- The AP that covers the problem area is improperly configured

Answer:

B

Explanation:

This is because the passphrase for WPA2-Personal is case-sensitive and must match exactly on both the AP and the client. If the passphrase is entered incorrectly on the client, the client will not be able to authenticate with the AP and connect to the network. The AP that covers the problem area is not likely to require a firmware update, fail, or be improperly configured, as it is online and works with other clients that have the correct passphrase. To troubleshoot this issue, you can check the passphrase settings on the clients and make sure they match with the AP. You can also try to reconnect the clients to the network or reboot them if necessary. For more information on how to configure WPA2-Personal on your router

Question 9

Question Type: MultipleChoice

You are attempting to explain RF shadow and how it can cause lack of coverage. What common building item frequently causes RF shadow and must be accounted for in coverage plans?

Options:

A- Wooden doors

B- Carpeted floors

C- Elevators

D- Cubicle partitions

Answer:

C

Explanation:

Elevators are a common building item that frequently causes RF shadow and must be accounted for in coverage plans. RF shadow is a term that describes an area where wireless signals are blocked or significantly weakened by an obstacle or an object that absorbs or

reflects RF energy. RF shadow can cause lack of coverage or poor performance in a WLAN because wireless devices in those areas may not be able to communicate with access points or other devices. RF shadow can be mitigated by adjusting access point placement, antenna orientation, transmit power level, or channel selection to avoid or overcome the obstacle or object that causes it. Elevators are a common building item that frequently causes RF shadow because they are made of metal and they move up and down within a shaft. Metal is a material that has high attenuation and reflection values, which means it can block or bounce off wireless signals very effectively. A moving elevator can create dynamic RF shadow that changes depending on its position and direction. Therefore, elevators must be accounted for in coverage plans to ensure adequate WLAN coverage and performance throughout the facility. The other options are not common building items that frequently cause RF shadow or must be accounted for in coverage plans. Wooden doors are not likely to cause RF shadow because they are made of wood, which is a material that has low attenuation and reflection values, which means it can pass through or slightly weaken wireless signals. Carpeted floors are not likely to cause RF shadow because they are made of fabric, which is a material that has low attenuation and reflection values, which means it can pass through or slightly weaken wireless signals. Cubicle partitions are not likely to cause RF shadow because they are made of thin plastic or cardboard, which are materials that have low attenuation and reflection values, which means they can pass through or slightly weaken wireless signals.Reference:CWNA-109 Study Guide, Chapter 13: Wireless LAN Site Surveys - Types & Processes , page 433

Question 10

Question Type: **MultipleChoice**

You are reporting on the RF environment in your facility. The manager asks you to describe the noise floor noted in the report. Which of the following is the best explanation?

Options:

A- The noise caused by elevators, microwave ovens, and video transmitters.

B- The extra energy radiated by access points and client devices beyond that intended for the signal.

C- The energy radiated by flooring materials that causes interference in the 2.4 GHz and 5 GHz bands.

D- The RF energy that exists in the environment from intentional and unintentional RF radiators that forms the baseline above which the intentional signal of your WLAN must exist.

Answer:

D

Explanation:

The RF energy that exists in the environment from intentional and unintentional RF radiators that forms the baseline above which the intentional signal of your WLAN must exist is the best explanation of the noise floor noted in the report. The noise floor is a term that describes the level of background noise or interference in a wireless channel or band. The noise floor is measured in dBm (decibel-milliwatts) and it represents the minimum signal strength that can be detected or received by a wireless device. The noise floor is influenced by various factors, such as the sensitivity of the receiver, the antenna gain, the cable loss, and the ambient RF environment. The ambient RF environment consists of intentional and unintentional RF radiators that emit RF energy in the wireless spectrum. Intentional RF radiators are devices that are designed to transmit RF signals for communication purposes, such as Wi-Fi access points, Bluetooth devices, microwave ovens, or cordless phones. Unintentional RF radiators are devices that are not designed to transmit RF signals but generate electromagnetic radiation as a by-product of their operation, such as USB 3 devices, PC power supplies, or fluorescent lights. The noise floor affects WLAN performance and quality because it determines the minimum signal-to-noise ratio (SNR)

that is required for a successful wireless transmission. SNR is the difference between the signal strength of the desired signal and the noise floor of the channel. SNR is also measured in dB and it indicates how much the signal stands out from the noise. A higher SNR means a better signal quality and a lower bit error rate. A lower SNR means a worse signal quality and a higher bit error rate. Therefore, to achieve a reliable WLAN connection, the intentional signal of your WLAN must exist above the noise floor by a certain margin that depends on the data rate and modulation scheme used. The other options are not accurate or complete explanations of the noise floor noted in the report. The noise caused by elevators, microwave ovens, and video transmitters is not the noise floor but rather examples of interference sources that contribute to the noise floor. The extra energy radiated by access points and client devices beyond that intended for the signal is not the noise floor but rather an example of spurious emissions that cause interference to other devices or channels. The energy radiated by flooring materials that causes interference in the 2.4 GHz and 5 GHz bands is not the noise floor but rather an example of attenuation or reflection that reduces or changes the direction of the signal.Reference:CWNA-109 Study Guide, Chapter 5: Radio Frequency Signal and Antenna Concepts, page 139