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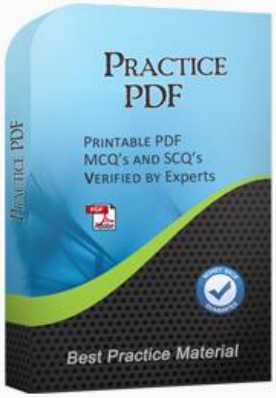

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Exam : **CWNA-109**

Title : CWNP Wireless Network Administrator (CWNA)

Vendor : CWNP

Version : DEMO

NO.1 You are implementing a multi-AP WLAN and fast secure roaming is essential. Which one of the following methods is an IEEE 802.11 standard method for fast roaming?

A. FT

B. OKC

C. Load balancing

D. Band steering

Answer: A

Explanation:

FT (Fast Transition) is an IEEE 802.11 standard method for fast roaming. FT is defined in the IEEE 802.11r amendment and is also known as Fast BSS Transition (FBT) or Fast Secure Roaming. FT is a feature that allows a client station to quickly switch from one AP to another within the same ESS (Extended Service Set) without having to re-authenticate and re-associate with each AP. This reduces the latency and packet loss that may occur during roaming, thus improving the user experience and maintaining the security of the connection. FT works by using pre-authentication and key caching mechanisms that allow the client station and the APs to exchange security information before the actual roaming occurs. This way, when the client station decides to roam to a new AP, it can use a fast reassociation request and response that contain only a few fields, instead of a full authentication and association exchange that require more time and data. References: 1, Chapter 9, page 367; 2, Section 6.3

NO.2 You are attempting to locate the cause of a performance problem in two WLAN cells in a mostly overlapping coverage area. You note that one AP is on channel 1 and the other is on channel 2. When you document your findings, what term do you use to describe the problem in this configuration?

A. CCC

B. Non-Wi-Fi interference

C. CCI

D. ACI

Answer: C

Explanation:

The term used to describe the problem in this configuration is Co-Channel Interference (CCI)1. CCI occurs when multiple access points are on the same or overlapping channels, causing interference and degradation in network performance1. In this case, one AP is on channel 1 and the other is on channel 2, which are overlapping channels, leading to CCI1.

NO.3 In an 802.11n (H T) 2.4 GHz BSS, what prevents each station from using all the airtime when other client stations are actively communicating in the same BSS?

A. 802.11 DOS prevention

B. OFDMA

C. CSMA/CD

D. CSMA/CA

Answer: D

Explanation:

What prevents each station from using all the airtime when other client stations are actively

communicating in the same BSS is CSMA/CA. CSMA/CA stands for Carrier Sense Multiple Access with Collision Avoidance and is a media access control method used by WLAN devices to share the wireless medium. CSMA/CA works by having each station sense the medium before transmitting a frame. If the medium is busy (i.e., another station is transmitting), the station defers its transmission until the medium is idle. If the medium is idle, the station waits for a random backoff period before transmitting. This way, CSMA/CA reduces the chances of collisions and ensures fair access to the medium for all stations. CSMA/CA also uses positive acknowledgements to confirm successful transmissions and retransmissions to recover from errors. CSMA /CD, DOS prevention, and OFDMA are not used by WLAN devices in a BSS. References: [CWNP Certified Wireless Network Administrator Official Study Guide: Exam CWNA-109], page 108; [CWNA: Certified Wireless Network Administrator Official Study Guide: Exam CWNA-109], page 98.

NO.4 What authentication method is referenced in the 802.11-2016 and 802.11-2020 specifications and is recommended for robust WI-AN client security?

A. SSL

B. 802.1X/EAP

C. IPSec

D. WEP

Answer: B

Explanation:

The authentication method that is referenced in the 802.11-2016 and 802.11-2020 specifications and is recommended for robust WLAN client security is 802.1X/EAP. 802.1X/EAP stands for IEEE 802.1X Port- Based Network Access Control with Extensible Authentication Protocol and is a framework that provides strong authentication and dynamic encryption key generation for WLAN clients. 802.1X/EAP involves three parties: the supplicant (the client), the authenticator (the AP or the controller), and the authentication server (usually a RADIUS server). The supplicant sends its credentials (such as username and password, certificate, or token) to the authenticator, which forwards them to the authentication server. The authentication server verifies the credentials and sends a response to the authenticator, which grants or denies access to the supplicant. The authentication server also generates a master key that is used to derive encryption keys for the data frames between the supplicant and the authenticator. 802.1X/EAP supports various EAP methods that offer different levels of security and flexibility, such as EAP-TLS, EAP-PEAP, EAP-TTLS, EAP-FAST, and EAP-SIM. SSL, IPSec, and WEP are not authentication methods, but rather encryption or security protocols that are not specific to WLANs or referenced in the 802.11 specifications. References: [CWNP Certified Wireless Network Administrator Official Study Guide: Exam CWNA-109], page 299; [CWNA: Certified Wireless Network Administrator Official Study Guide: Exam CWNA-109], page 289.

NO.5 You are using a tool that allows you to see signal strength for all Aps in the area with a visual representation.

It shows you SSIDs available and the security settings for each SSID. It allows you to filter by frequency band to see only 2.4 GHz networks or only 5 GHz networks. No additional features are available.

What kind of application is described?

A. Protocol analyzer

B. Site survey utility

C. Spectrum analyzer

D. WLAN scanner tool

Answer: D

Explanation:

The tool described is a WLAN (Wireless Local Area Network) scanner tool. WLAN scanner tools are designed to provide information about the wireless networks in a given area, including:

* Signal Strength: They show the signal strength of all access points (APs) in the vicinity, which is crucial for understanding the coverage area and potential interference.
* SSID Visualization: These tools display the SSIDs (Service Set Identifiers) of available networks, allowing users to identify different wireless networks easily.
* Security Settings Information: WLAN scanner tools often show the type of security implemented on each network, such as WPA2, WEP, etc.
* Frequency Band Filtering: They allow users to filter and view networks based on the frequency band (2.4 GHz or 5 GHz), which is useful for analyzing network distribution and planning.

While protocol analyzers, site survey utilities, and spectrum analyzers are also used in wireless networking, their functions are distinct from what is described:

* Protocol Analyzers are more sophisticated and are used to capture and analyze network traffic.
* Site Survey Utilities are used to map signal coverage and plan network layouts, often with more advanced features for detailed site surveys.
* Spectrum Analyzers provide a detailed view of the frequency spectrum and non-Wi-Fi interference but don't typically focus on SSIDs or security settings.

Thus, the correct answer is D, a WLAN scanner tool, based on the functionalities described.

References:

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

Tools and techniques for wireless network analysis and troubleshooting.

NO.6 You support a WLAN using dual-band 802.11ac three stream access points. All access points have both the
2.4 GHz and 5 GHz radios enabled and use 40 MHz channels in 5 GHz and 20 MHz channels in 2.4 GHz. A manager is concerned about the fact that each access point is connected using a 1 Gbps Ethernet link. He is concerned that the Ethernet link will not be able to handle the load from the wireless radios. What do you tell him?

A. His concern is valid and the company should upgrade all Ethernet links to 10 Gbps immediately.

B. His concern is valid and the company should immediately plan to run a second 1 Gbps Ethernet link to each AP.

C. His concern is invalid because the AP will compress all data before transmitting it onto the Ethernet link.

D. Due to 802.11 network operations and the dynamic rates used by devices on the network, the two radios will likely not exceed the 1 Gpbs Ethernet link.

Answer: D

Explanation:

What you should tell him is that due to 802.11 network operations and the dynamic rates used by devices on the network, the two radios will likely not exceed the 1 Gbps Ethernet link. This is because the actual throughput of an 802.11 network is much lower than the theoretical data rates due to

factors such as overhead, contention, interference, retransmissions, and environmental conditions. Moreover, the data rates used by devices on the network vary depending on their distance, signal quality, capabilities, and configuration.
Therefore, it is unlikely that both radios of the AP will simultaneously use the maximum data rates and saturate the 1 Gbps Ethernet link. Upgrading to a 10 Gbps Ethernet link or running a second 1 Gbps Ethernet link may be unnecessary and costly. Compressing all data before transmitting it onto the Ethernet link may introduce additional overhead and latency. References: [CWNP Certified Wireless Network Administrator Official Study Guide: Exam CWNA-109], page 227; [CWNA: Certified Wireless Network Administrator Official Study Guide: Exam CWNA-109], page 217.

NO.7 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

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

NO.8 What feature of 802.1 lax (HE) may impact design decisions related to AP placement and the spacing between same-channel BSS cells (3SAs) because it is designed to reduce overlapping BSS contention?

A. TWT

B. BSS Color

C. uplink MU-MIMO

D. 6 GHz band support

Answer: B

Explanation:
In the 802.11ax (High Efficiency, HE) amendment, one of the key features introduced is BSS (Basic Service Set) Coloring. This feature is designed to mitigate issues arising from overlapping BSSs (OBSS), which can lead to contention and interference in dense wireless environments. BSS Coloring works by:
* Assigning a "color" (a small number) to each BSS: This helps devices differentiate between frames from their own BSS and those from neighboring BSSs.

* Reducing Inter-BSS Interference: Devices can ignore frames from different BSSs (with a different "color") under certain conditions, reducing the impact of OBSS interference.
* Improving Spatial Reuse: By distinguishing between transmissions from different BSSs, devices can make more informed decisions about when to transmit, improving the efficiency of spatial reuse and reducing unnecessary contention.
This feature directly impacts design decisions related to AP placement and the spacing between same-channel BSS cells, as it allows for closer placement of APs on the same channel without significantly increasing interference, thus improving overall network capacity and efficiency.
The other options, while features of 802.11ax, do not directly pertain to reducing overlapping BSS contention in the same manner:
* TWT (Target Wake Time) optimizes device sleep schedules to conserve power.
* Uplink MU-MIMO enhances uplink data transmission capabilities but doesn't specifically address OBSS contention.
* 6 GHz Band Support introduces new spectrum for Wi-Fi use but is not a feature aimed at reducing OBSS contention within the 802.11ax framework.
Therefore, the correct answer is B, BSS Color.
References:
IEEE 802.11ax-2021: Enhancements for High Efficiency WLAN.
CWNA Certified Wireless Network Administrator Official Study Guide: Exam CWNA-109, by David D. Coleman and David A. Westcott.

NO.9 A client STA must choose the best AP for connectivity. As part of the evaluation, it must verify compatible data rates. What can the client STA use to verify that an AP supports the same data rates that it supports?

A. Beacon frames transmitted by the AP

B. Data frames sent between the AP and current clients STAs

C. Authentication frames transmitted by the other client STAs

D. Probe request frames transmitted by other client STAs

Answer: A

Explanation:
The client STA can use Beacon frames transmitted by the AP to verify that an AP supports the same data rates that it supports. Beacon frames are management frames that are periodically broadcasted by the APs to announce their presence, capabilities, and parameters. One of the information elements contained in the Beacon frames is the Supported Rates or Extended Supported Rates, which lists the data rates that the AP can use for communication. The client STA can compare its own data rates with those advertised by the AP to determine if they are compatible. Data frames, authentication frames, and probe request frames do not contain information about data rates.
References: [CWNP Certified Wireless Network Administrator Official Study Guide: Exam CWNA-109], page 133; [CWNA: Certified Wireless Network Administrator Official Study Guide: Exam CWNA-109], page 123.

NO.10 You are implementing a VHT-capable AP. Which one of the following channels is available in the 802.11-
2016 standard that was not available before the ratification of 802.11 ac?

A. 56

B. 161
C. 153
D. 144
Answer: D
Explanation:
Channel 144 is a new channel that was added to the 5 GHz band by the 802.11ac amendment, which defines the VHT (Very High Throughput) PHY for WLANs. Channel 144 has a center frequency of 5720 MHz and a bandwidth of 20 MHz. It can also be combined with adjacent channels to form wider channels of 40 MHz, 80 MHz, or 160 MHz. Channel 144 is available in some regions, such as North America and Europe, but not in others, such as Japan and China . References: [CWNA-109 Study Guide], Chapter 3: Antennas and Accessories, page 121; [CWNA-109 Study Guide], Chapter 3: Antennas and Accessories, page 115;
[Wikipedia], List of WLAN channels.

NO.11 What can cause excessive VSWR in RF cables used to connect a radio to an antenna?
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.: 1: CWNA-109 Official Study Guide, page 77 2: VSWR 3: CWNA-109 Official Study Guide, page 81

NO.12 A WLAN is implemented using wireless controllers. The APs must locate the controllers when powered on and connected to the network. Which one of the following methods is commonly used to locate the controllers by the APs?
A. NTP
B. DHCP
C. SNMP
D. GRE
Answer: B

Explanation:
DHCP (Dynamic Host Configuration Protocol) is a commonly used method to locate the controllers by the APs in a WLAN that is implemented using wireless controllers. DHCP is a protocol that allows a device to obtain an IP address and other network configuration parameters from a server. In a wireless controller scenario, the APs can use DHCP to request an IP address from a DHCP server, which can also provide the IP address or hostname of the wireless controller as an option in the DHCP response. This way, the APs can discover the wireless controller and establish a connection with it. Alternatively, the APs can also use other methods to locate the wireless controller, such as DNS (Domain Name System), broadcast or multicast discovery, or manual configuration. References: 1, Chapter 8, page 309; 2, Section 5.2

NO.13 What factor is likely to cause the least impact on the application layer throughput of an 802.11n client station in a 2.4 GHz HT BSS?

A. Increasing or decreasing the number of spatial streams in use by the client station and AP

B. Implementing Fast BSS Transition (FT) for roaming

C. Implementation of several other clients in the same BSS using 802.11g radios

D. RF interference from more than 10 nearby Bluetooth transmitters

Answer: B

Explanation:
Implementing Fast BSS Transition (FT) for roaming is likely to cause the least impact on the application layer throughput of an 802.11n client station in a 2.4 GHz HT BSS. FT is a feature that allows a client station to quickly switch from one AP to another within the same ESS (Extended Service Set) without having to re- authenticate and re-associate with each AP. This reduces the latency and packet loss that may occur during roaming, thus improving the user experience and maintaining the application layer throughput. FT is defined in the IEEE 802.11r amendment and is also known as Fast Roaming or Fast Secure Roaming. References: , Chapter 9, page 367; , Section 6.3