CWNA-109 Q&As

Certified Wireless Network Administrator

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QUESTION 1

A WLAN transmitter that emits a 50 mW signal is connected to a cable with 3 dB loss. If the cable is connected to an antenna with 9dBi gain, what is the EIRP at the antenna element?

A. 26 dBm

B. 13 dBm

C. 23 dBm

D. 10 dBm

Correct Answer: C

To calculate the EIRP at the antenna element, we need to add the transmitter output power, subtract the cable loss, and add the antenna gain. All these values need to be converted to dBm first, if they are not already given in that unit. In this case, we have: Transmitter output power = 50 mW = 10 log (50) dBm = 16.99 dBm Cable loss = 3 dB Antenna gain = 9 dBi EIRP = Transmitter output power - Cable loss + Antenna gain EIRP = 16.99 - 3 + 9 EIRP = 22.99 dBm Rounding up to the nearest integer, we get 23 dBm as the EIRP at the antenna element12. References: CWNA-109 Study Guide, Chapter 2: Radio Frequency Fundamentals, page 92; CWNA-109Study Guide, Chapter 2: Radio Frequency Fundamentals, page 88.

QUESTION 2

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?

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.

Correct Answer: 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 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. References: CWNA-109 Study Guide, Chapter 5: Radio Frequency Signal and Antenna Concepts, page 139

QUESTION 3

Which unit of measurement, as formally defined, is an absolute unit that is used to quantify received signal power levels on a logarithmic scale?

A. SNI

B. VSWR

C. dBm

D. dBi

Correct Answer: C

The unit of measurement that is an absolute unit and is used to quantify received signal power levels on a logarithmic scale is dBm. dBm stands for decibel-milliwatt and represents the power level relative to 1 milliwatt (mW). dBm is an absolute unit because it has a fixed reference point and does not depend on the input power level. dBm is used to measure the received signal power levels on a logarithmic scale because it can express large variations in power levels with small numbers and make calculations easier. For example, a 10 dB increase in power level means a 10-fold increase in power, and a 20 dB increase means a 100-fold increase in power. References: [CWNP Certified Wireless Network Administrator Official Study Guide: ExamCWNA-109], page 66; [CWNA: Certified Wireless Network Administrator Official Study Guide: ExamCWNA-109], page 56.

QUESTION 4

A string of characters and digits is entered into an AP and a client STA for WPA2 security. The string is 8 characters long. What is this string called?

A. MSK

B. WEP key

C. Passphrase

D. PSK

Correct Answer: C

The string of characters and digits that is entered into an AP and a client STA for WPA2 security and is 8 characters long is called a passphrase. A passphrase is a human- readable text that is used to generate a Pre-Shared Key (PSK) for WPA2-Personal security. A passphrase can be between 8 and 63 characters long and can include any ASCII character. The PSK is a 256-bit key that is derived from the passphrase using a hashing algorithm called PBKDF2. The PSK is used to encrypt and decrypt the data frames between the AP and the client STA. A MSK is a Master Session Key that is generated by an authentication server for WPA2-Enterprise security. A WEP key is a 40-bit or 104-bit key that is used for Wired Equivalent Privacy (WEP) security, which is deprecated and insecure. A PSK is not a string of characters and digits, but a binary key. References: [CWNP Certified Wireless Network Administrator Official Study Guide: ExamCWNA-109], page 303; [CWNA: Certified Wireless Network Administrator Official Study Guide: ExamCWNA-109], page 293.

QUESTION 5

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.

Correct Answer: D

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 CertifiedWireless Network Administrator Official Study Guide: ExamCWNA-109], page 227; [CWNA: Certified Wireless Network Administrator Official Study Guide: ExamCWNA-109], page 217.