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Question 1: Explain the importance of implementing strong encryption protocols in a secure wireless infrastructure. What are the key differences between WEP, WPA, and WPA2/WPA3 encryption methods? How does the choice of encryption impact the security of a wireless network?

Answer: **Its extremely important to have encryption protocols in a wireless network because of the mode of transmission. The ability for threat actors to intercept information floating through radio transmissions is ever present. The key differences between WEP, WPA and WPA2/WPA3 are as follows:**

- **WEP – Legacy mechanism for encrypting data sent over a wireless encryption.**
  - **Released 1999. RC4. 40 Bit Session Key. Stream Cipher.**
- **WPA- Designed to fix vulnerabilities found in WEP.**
  - **Released 2003. TKIP with RC4. 128 Bit Session Key. Stream Cipher. PSK**
- **WPA2- Uses Passphrases to generate the key used to encrypt communications.**
  - **Released 2004. CCMP and AES. 128 Bit Sessions Key. Block Cipher. PSK**
- **WPA3- Still uses Passphrase but changes method to agree on secret, called PAKE.**
  - **Released 2018. AES. Up to 192-bit Session Key. Block Cipher. SHA.**

The choice of these encryption methods is important based on legacy systems. Due to the vulnerabilities identified in legacy standards you want to utilize the most up to date technologies.

Question 2: Describe the purpose and benefits of implementing load balancers in a network infrastructure. How do load balancers distribute network traffic among multiple servers to enhance performance and availability? Provide an example scenario where load balancing is essential for a secure and efficient network operation.

Answer: **The purpose of a load balancer is to act as a director of network traffic, as well as fulfilling network requests in a timely manner. The benefits of implementing load balancers in a network infrastructure the load balancers distribute client requests across available server nodes in a farm or pool. This is used to provide services that can scale from light to heavy loads, and to provide mitigation against DDoS attacks. An example would be if you are a business that deals with E-commerce. The competition wants to take your website server offline, so they send a DDos attack so that you can't make money. The load balancers will help mitigate that attack by redirecting all the traffic coming in and out.**