Wi-Fi Module 2

1.) Brief about Split MAC architecture and how it improves the AP's performance

- Traditionally all MAC layer operations are performed by the AP itself, but in this Split MAC architecture the MAC layer operations are divided between the AP and the WLC
- The AP takes care of managing the lower MAC layer functions like ACKs, transmission, encryption, etc.
- The WLC (wireless controller) takes care of the upper MAC layer functions such as QoS management, load balancing, etc.
- This invariably increases the performance of the AP as the load on the AP is significantly reduced.

2.) Describe about CAPWAP, explain the flow between AP and Controller

- CAPWAP is the connection between WLC and Access point.
- CAPWAP contains 2 planes data plane and control plane
- Data plane is used to transfer all the information from and to the AP through the controller.
- Control plane is used to push the configurations to the AP, pass all the control and management information.

  Flow between AP and Controller:

  1. Discovery Request and Discovery Response:
     a. First Discovery request is sent by the AP as a Broadcast.
     b. The controllers after hearing the Discovery request sends Discovery response
  2. Join Request and Join response:
     a. Based on all the Discovery responses received the AP will choose a WLC and then sent a join request
     b. WLC will accept the request and send a join response with approval and initial configs.
  3. A secure DTLS (Data TLS) is established.

4. Image Data:
    a. If the AP has an older image, then the controller forwards a newer version to it.
5. Configuration Status Request and Response:
    a. Configuration request is sent from the AP and Configuration response is sent along with the required configuration parameters to the AP.
6. Keep alive:
    a. After a specified time interval, AP and WLC both transfer status info to ensure that the link is active
7. Configuration update request and response:
    a. Periodically the configuration parameters are pushed from the WLC to the AP.

3.) Where this CAPWAP fits in OSI model, what are the two tunnels in CAPWAP and its purpose

- CAPWAP fits in the 2nd, 3rd and 4th layer of the OSI layer (i.e. Data Link, Network and Transport layer)
- The tunnels in CAPWAP are
    - Data plane tunnel
    - Control plane tunnel
- Data plane tunnel
    - Data plane is used to transfer all the information from and to the AP through the controller.
- Control plane tunnel
    - Control plane is used to push the configurations to the AP, pass all the control and management information.

4.) What's the difference between Lightweight APs and Cloud-based APs?

- Lightweight APs are managed by on site physical controller
- Cloud-based APs are managed by controller in cloud.

5.) How the CAPWAP tunnel is maintained between AP and controller

- CAPWAP tunnel is maintained by regularly keep alive transmission between the controller and AP.

6.) What's the difference between Sniffer and monitor mode, use case for each mode?

- Sniffer mode makes the AP capture and send the packets to controller for analysis.
- It’s use case is when we wish to particularly capture and analyze the traffic
- Monitor mode makes the AP monitor all the traffic that passes on a specific channel or look for rogue devices in the network.
- Here the packets are kept locally. Its use case includes all enterprise networks to detect any anomalous activity.

7.) If WLC deployed in WAN, which AP mode is best for local network and how?

- In this case the best mode will be Flex Connect mode.
- In flex connect mode the AP establishes a CAPWAP tunnel with the WLC, but as the WLC is not in the local network even if the link fails the AP will enter into stand-alone mode and do the tasks
- So, in this situation Flex Connect mode is more suitable.

8.) What are challenges if deploying autonomous APs (more than 50) in large network like university

- Scalability: Difficult to scale, Configuration has to be done in each device separately.
- Roaming: No roaming support.
- Any change in configuration has to be done separately for each AP.
- No central security management.

9.) What happens to wireless clients connected to Lightweight AP in local mode if WLC goes down.

- Clients will lose connectivity.
- AP will enter again into the discovery routine.