

Q1. Brief about SplitMAC architecture and how it improves the AP's performance

SplitMAC architecture is a networking model used in wireless LANs where the MAC functions are divided between the Access Point and the Wireless LAN Controller.

It enhances network efficiency by offloading resource-intensive MAC-layer tasks to the controller while keeping time-sensitive operations on the AP.

How it improves the AP's performance

1. Reduced AP Processing Load – APs focus only on critical, time-sensitive tasks, reducing latency.
2. Better Scalability – With centralized control, multiple APs can be managed efficiently.
3. Enhanced Security – Centralized authentication and encryption improve security measures.
4. Improved Roaming – Client transitions between APs are smoother since decisions are handled by the WLC.
5. Optimized Bandwidth Usage – The controller can implement policies like load balancing for efficient network usage.

Q2. Describe about CAPWAP, explain the flow between AP and Controller

CAPWAP - Control and Provisioning of Wireless Access Points

It is a standardized tunnelling protocol that allows communication between a Lightweight Access Point and a Wireless LAN Controller. It helps in centralizing the control of APs and improving network efficiency.

Flow between AP and Controller

AP Discovery

- The AP boots up and searches for a WLC, methods include:
 - Broadcast and multicast discovery.
 - DHCP Option 43 (provides WLC IP via DHCP).
 - DNS resolution
- The AP sends a Discovery Request to the WLC.
- The WLC responds with a Discovery Response.

AP Join and Authentication

- The AP selects a WLC and sends a CAPWAP Join Request.
- The WLC authenticates the AP and sends a CAPWAP Join Response.
- Datagram Transport Layer Security encryption is established for secure control messages.

Configuration and Image Download

- The WLC checks the AP's firmware version:

If outdated, the WLC sends a firmware update.

If updated, configuration settings are applied.

- AP receives configuration settings and reboots if necessary.

Data Transmission

- The AP starts handling client traffic.
- Wireless client data is encapsulated using CAPWAP and sent to the WLC.
- The WLC manages client mobility and security policies.