SplitMAC Architecture

SplitMAC refers to a distributed architecture where the Media Access Control (MAC) layer functions of a wireless network are split between two entities:
the Access Point (AP) and
a centralized controller, often called a Wireless LAN Controller (WLC).

SplitMAC divides responsibilities:

- Lower MAC functions (time-sensitive tasks like frame transmission, acknowledgments, and real-time processing) are handled by the AP.
- Upper MAC functions (less time-sensitive tasks like authentication, association, and network management) are offloaded to the WLC.

This division allows for a more efficient and scalable network design, often used in enterprise-grade Wi-Fi systems.

SplitMAC Improves AP Performance

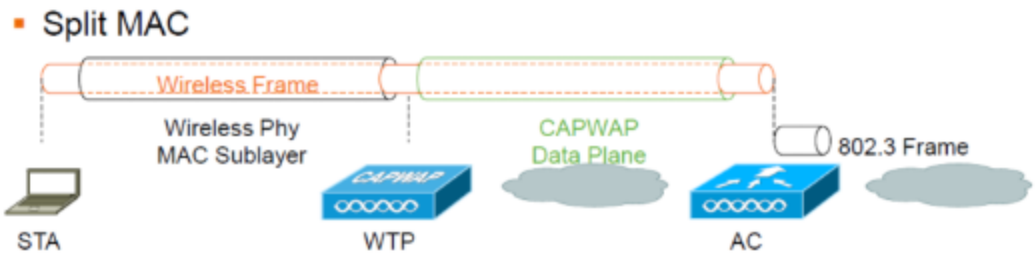
- **Reduced Processing Load on APs:** By offloading upper MAC functions to the WLC, the AP can focus on time-critical tasks like transmitting and receiving data. This reduces the computational burden on the AP, allowing it to handle more clients and traffic with lower latency.

- **Centralized Management:** The WLC can manage multiple APs, providing a centralized point for configuration, monitoring, and policy enforcement. This leads to better coordination across the network, reducing interference and improving overall performance.

- **Improved Scalability:** SplitMAC enables networks to scale more effectively. As more APs are added, the WLC can handle the increased management load, while APs focus on local traffic handling. This is particularly beneficial in dense environments like offices or stadiums.

- **Enhanced Security and Roaming:** With upper MAC functions like authentication and encryption managed centrally, SplitMAC ensures consistent security policies across all APs. It also facilitates seamless roaming for clients moving between APs, as the WLC can coordinate handoffs more efficiently.

- **Better Resource Utilization:** APs in a SplitMAC setup can dedicate their hardware resources to data forwarding rather than processing management tasks, leading to higher throughput and better performance for end users.



STA (Station): This represents the client device (e.g., a laptop, smartphone) that connects to the wireless network. It communicates using the Wireless Physical (PHY) layer and the MAC sublayer, as indicated by the "Wireless PHY MAC Sublayer" label.

WTP (Wireless Termination Point): This is the Access Point (AP) in the network. In a SplitMAC architecture, the WTP handles the lower MAC functions, which are time-sensitive tasks like frame transmission, acknowledgments, and real-time data processing. The diagram shows the WTP using the CAPWAP (Control and Provisioning of Wireless Access Points) protocol to communicate.

AC (Access Controller): This is the Wireless LAN Controller (WLC), which handles the upper MAC functions, such as authentication, association, and network management. The AC communicates with the WTP over the CAPWAP Data Plane.

CAPWAP Data Plane: CAPWAP is a protocol used to manage and control APs in a centralized architecture. In this diagram, the CAPWAP Data Plane is shown as the connection between the WTP and AC, carrying 802.3 frames (Ethernet frames) between them. This indicates that the data plane traffic is tunneled from the AP to the controller.

Working :

- The **STA** interacts with the **WTP** at the wireless PHY and MAC sublayer level, handling the real-time, lower MAC functions (e.g., sending and receiving wireless frames).

- The **WTP** then forwards relevant data or control information to the **AC** via the CAPWAP Data Plane. The AC handles upper MAC functions, such as managing client associations, authentication, and network policies.

Finally, the AC forwards the processed data as 802.3 frames to the wired network.