### Q9) ****What Happens When a Wireless Client is Connected to a Lightweight AP (in Local Mode) and the WLC Goes Down?****

When a **Lightweight Access Point (LAP)** operates in **Local Mode** (the default mode for most deployments) and the **Wireless LAN Controller (WLC)** fails, the impact on connected clients depends on the **failure scenario** and **network design**. Here’s what happens:

**1. Immediate Impact (WLC Failure)**

* **Existing Connected Clients:**
* **Continue to work temporarily** (data forwarding may still function).
* **No new clients can authenticate** (WLC handles security like 802.1X, DHCP, etc.).
* **Roaming fails** (handoffs between APs won’t work).
* **AP Behavior:**
* The AP **loses management connectivity** to the WLC.
* **CAPWAP tunnel drops**, and the AP may reboot or go into **"standalone" mode** (if supported).

**2. Short-Term vs. Long-Term Failure**

**Short-Term WLC Outage (<5 min)**

* Clients **stay connected** (existing sessions persist).
* APs **attempt to reconnect** to the WLC (CAPWAP retries).
* **No noticeable disruption** for active users.

**Prolonged WLC Outage (>5 min)**

* **APs may reboot** (if no WLC heartbeat response).
* **Clients lose connectivity** (if APs reset or lose configs).
* **No new logins** (WLC required for authentication).

**3. Key Limitations in Local Mode**

* **No Local Authentication Cache:**
* If using **802.1X (WPA2/3-Enterprise)**, new clients **cannot connect** (WLC is needed for RADIUS).
* **PSK (WPA2-Personal)** clients may still work (if AP retains config).
* **No Local DHCP:**
* If the WLC provides DHCP, **new clients won’t get IPs**.
* **No Roaming:**
* Clients **stick to the last AP** (no handoffs to neighboring APs).

**4. Mitigation Strategies**

To minimize downtime, consider:

**1. High Availability (HA) WLC Pair**

* Deploy **two WLCs in redundancy mode** (one takes over if the other fails).

**2. FlexConnect Mode (for Branch Sites)**

* APs **cache credentials** and **switch traffic locally** if the WLC is unreachable.
* Supports **local authentication fallback** (PSK or 802.1X caching).

**3. Cloud-Managed APs (e.g., Meraki, Aruba Central)**

* No single point of failure (controller is cloud-based).

**4. AP Fallback to "Standalone" Mode (Vendor-Specific)**

* Some APs (e.g., Cisco) can **revert to autonomous mode** with saved configs.

**Local Mode vs. FlexConnect During WLC Failure**

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| Behavior | Local Mode | FlexConnect Mode |
| Existing Clients | Stay connected (short-term) | Stay connected (long-term) |
| New Clients | Cannot connect | Can connect (cached auth) |
| Traffic Flow | Stops if tunnel drops | Locally switched |
| Best For | Campus/core networks | Remote/branch sites |