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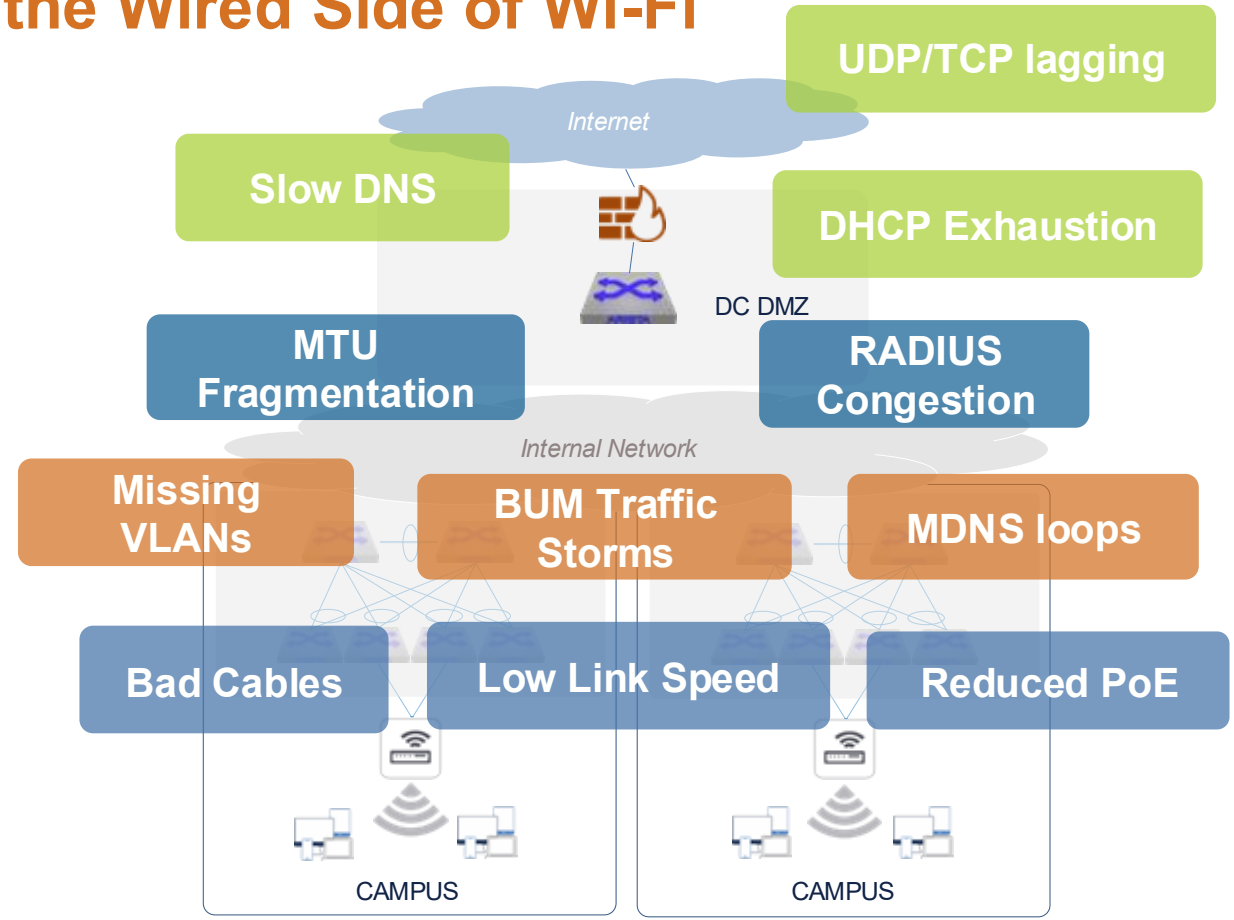


The Wired Side of Wi-Fi

Carlos Vazquez, EMEA Tech Lead
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What is the Wired Side of Wi-Fi



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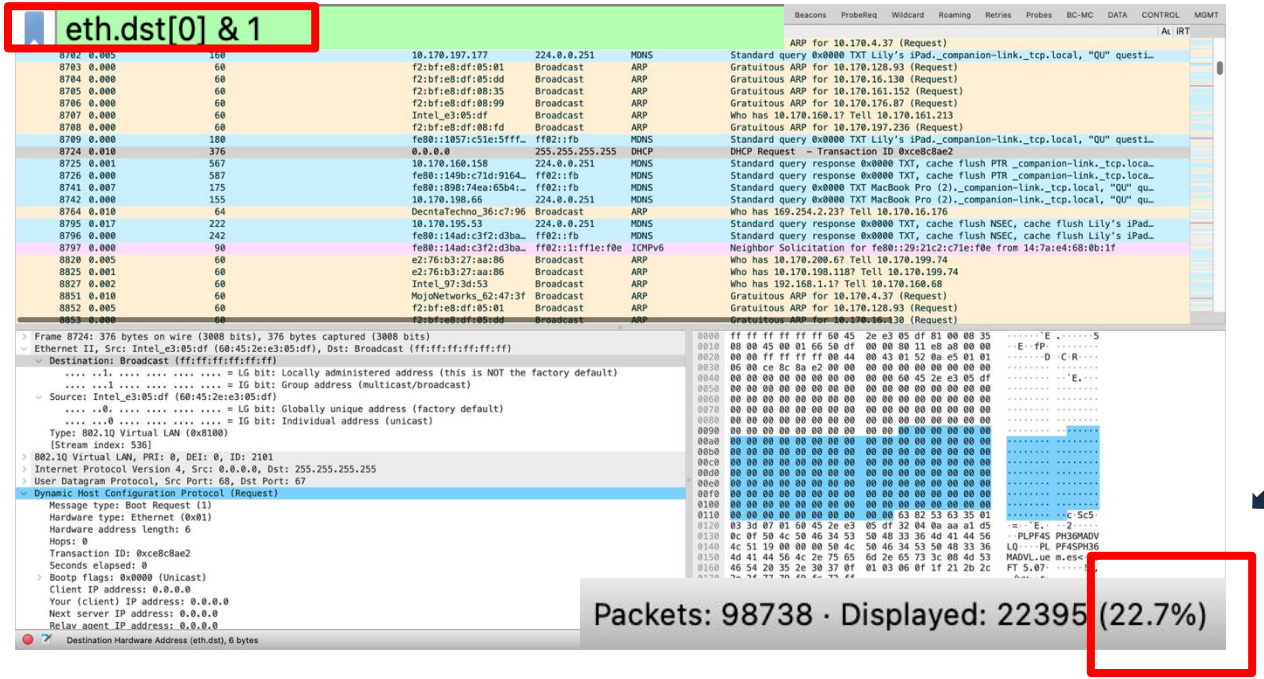
The Wired Side of Wi-Fi – My Top 10 Checklist

WHAT TO CHECK	COMMENTS/REFERENCE VALUES
TCP High Latency	Check iRTT (initial Round-Trip-Time) < 100ms
Slow DNS	DNS Latency above 250ms starts affecting user experience
RADIUS/RADSEC	Check RADIUS congestion, AAA latency < 300ms
DHCP	Check DHCP exhaustion, DHCP latency < 300ms
MTU and Fragmentation	Check ICMP messages like “Type3,Code4 - Fragmentation Needed”
BUM Traffic Storms	Check Packet drops on AP port, AP CPU spikes, Check Broadcast vs Total ratio, Endpoints sending PAUSE frames
Switch Port Configuration	Check Native VLAN for management and missing VLANs on Trunk ports
Switch Port 802.1X status	AP as 802.1 endpoint failed auth and fallback to Guest VLAN
PoE Negotiation	Check Allocated vs Requested Power value
Cable Status	AP may sync at lower link speed if cables are in bad shape < CAT6A

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BUM traffic

- BUM = **Broadcast, Unknown and Multicast** (ARPv4, NSv6, DHCP, MDNS, …)
- BUM traffic grows exponentially with the number of Wi-Fi clients



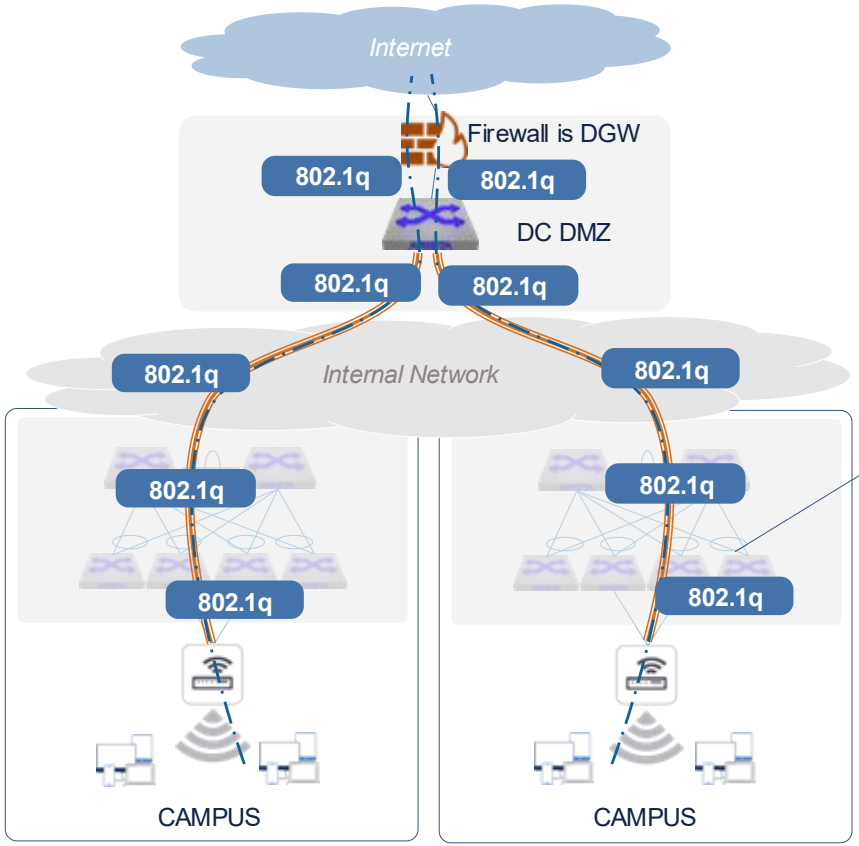
Sample pcap on an AP port with 50 clients and 5 SSIDs

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Bridge-mode SSID

Scale Up to
1,000 APs
10,000 Clients



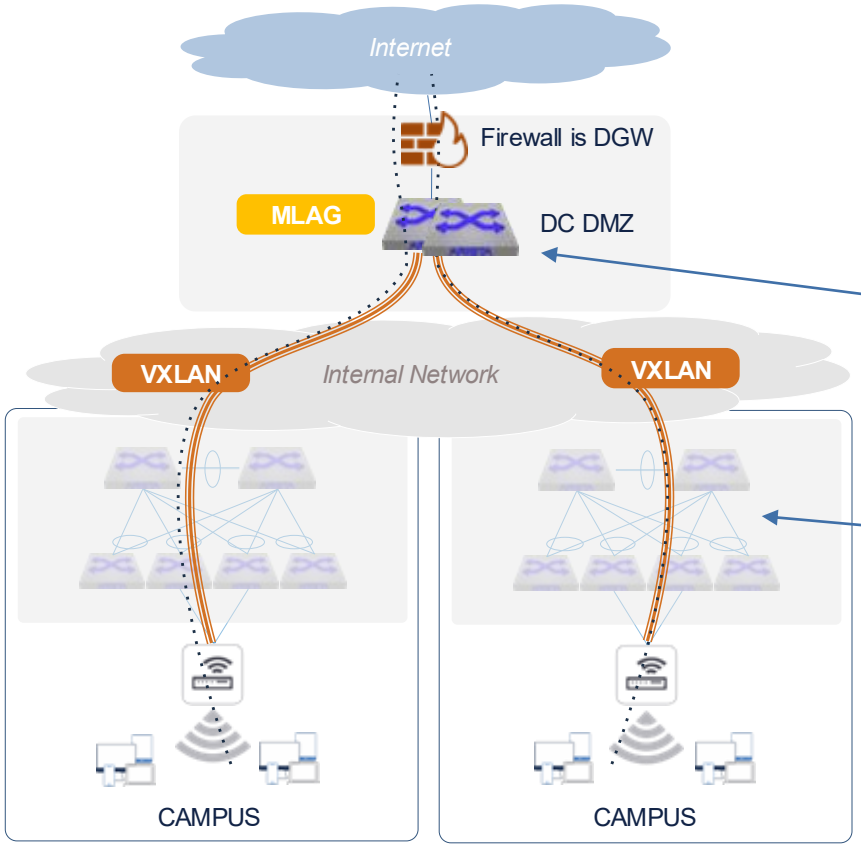
Scalability is limited by the MAC address table of the cheapest switch

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Tunnel-mode SSID

Scale Up to
8,000 APs
200,000 Clients



Scalability is limited by the MAC address table of the Tunnel Terminators

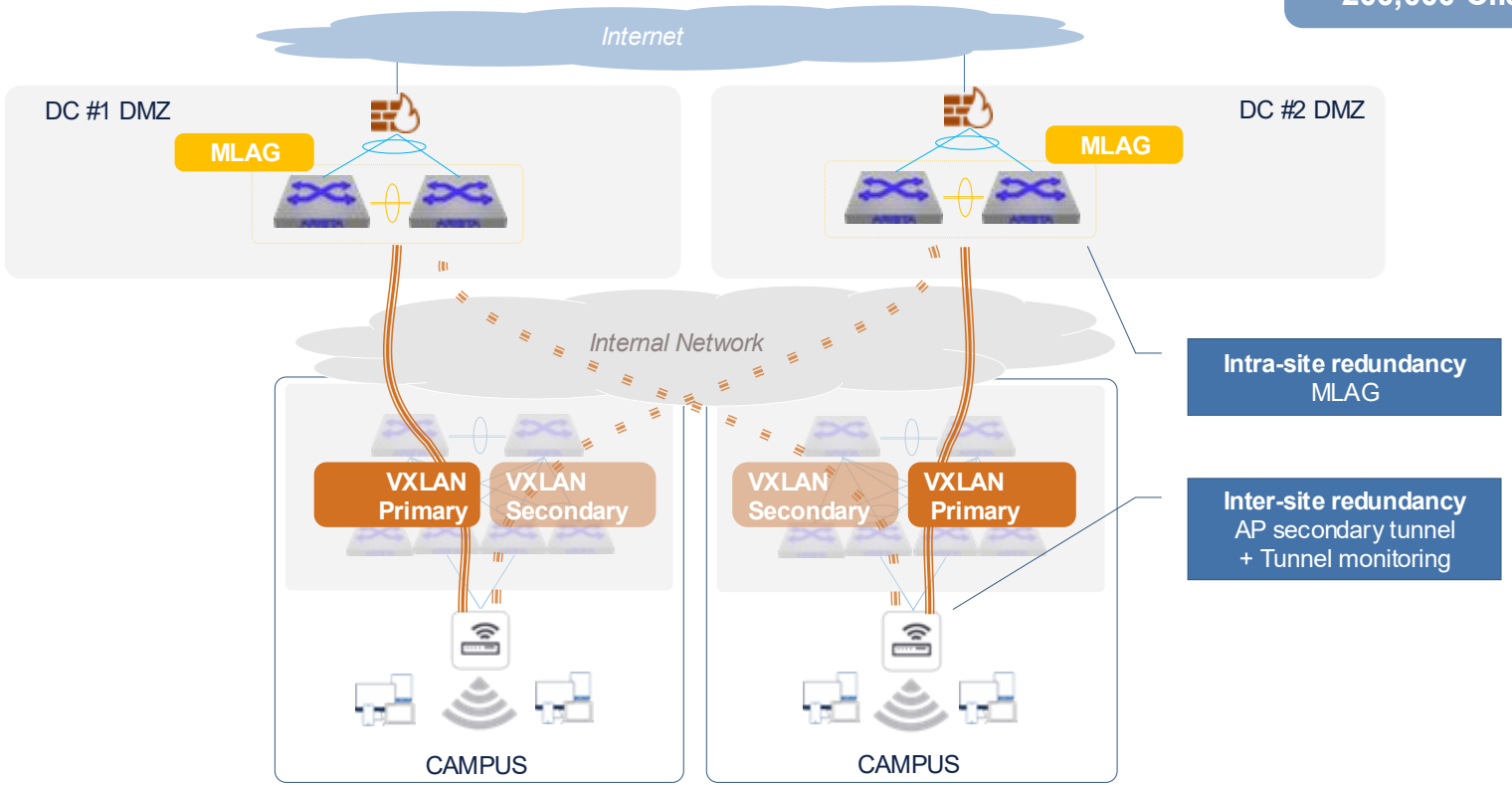
Middle switches don't need to learn WiFi Client's MAC addresess

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Tunnel-mode SSID – DC redundancy

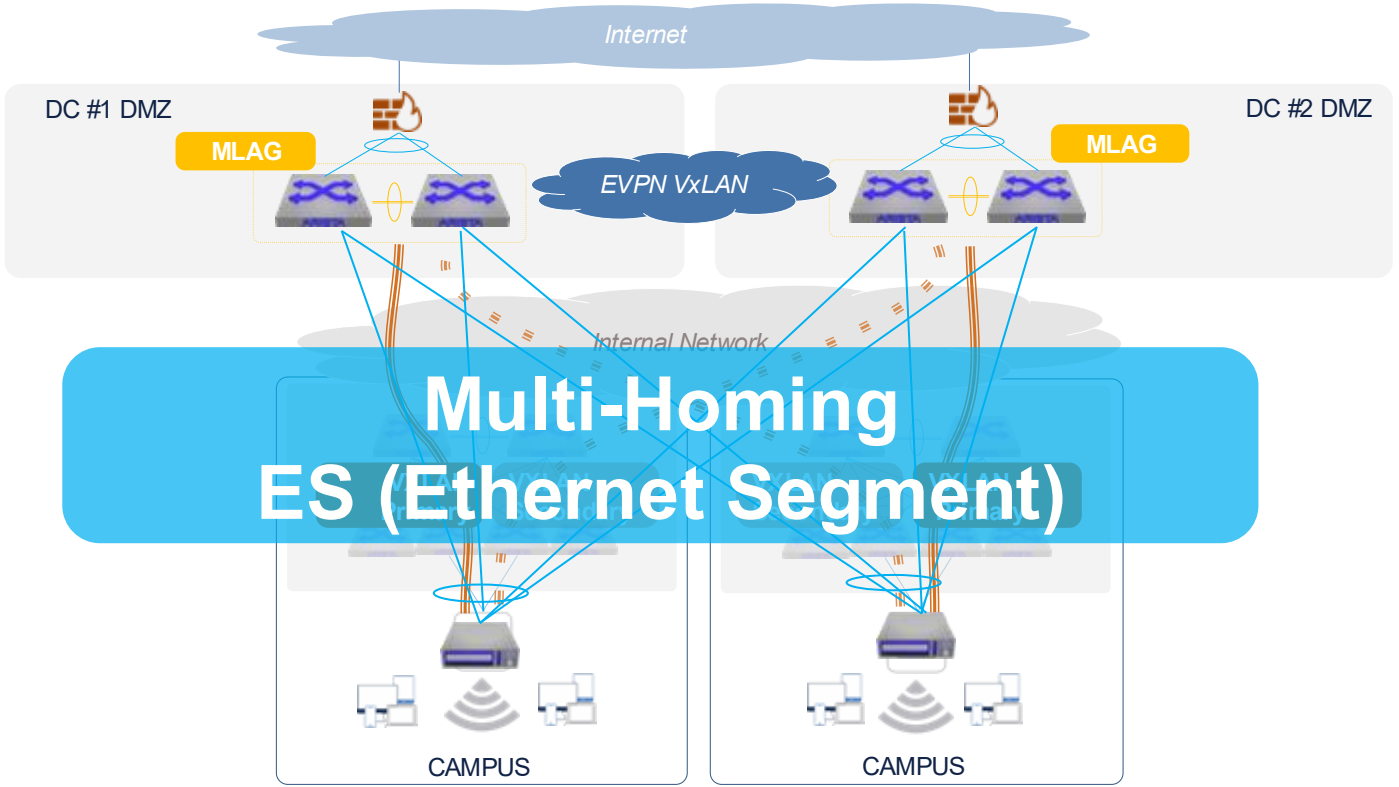
Scale Up to
8,000 APs
200,000 Clients



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Tunnel-mode SSID – DC redundancy

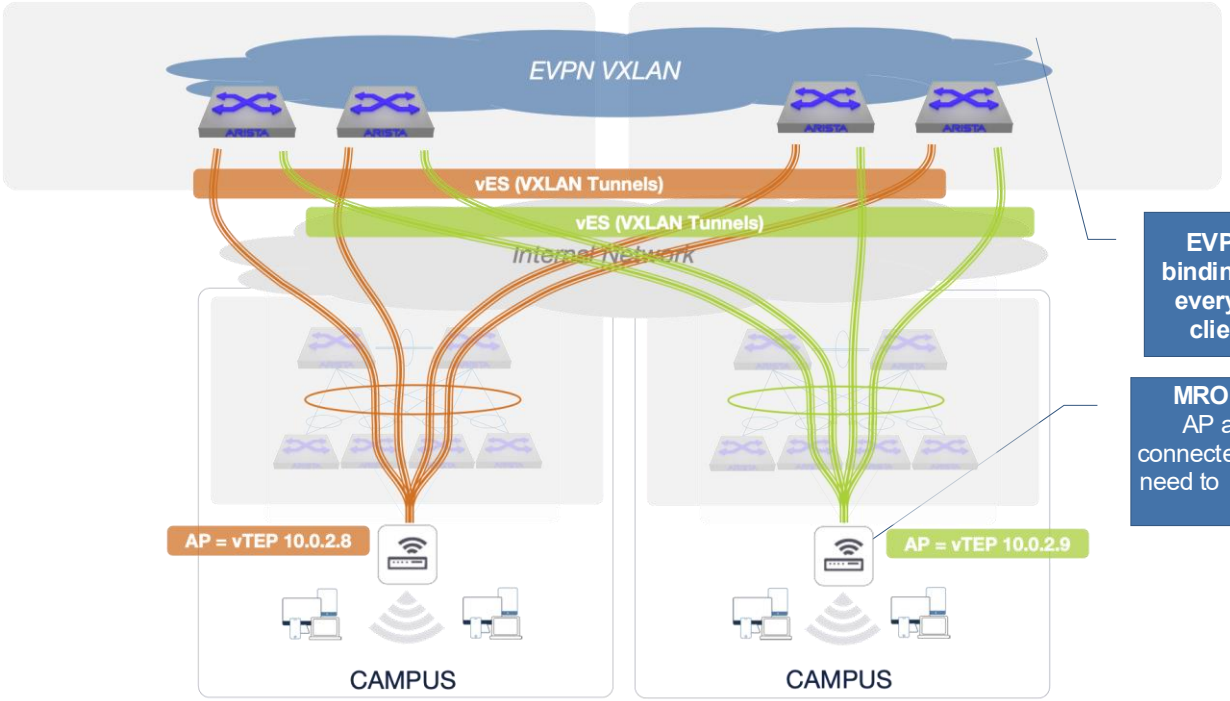


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Mega Scale Campus Mobility
with Virtual ES with Path Aliasing (VESPA)

Scale Up to 30,000 APs 500,000 Clients



EVPN updates MAC/IP bindings among Gateways everytime there's a new client or a client roam

MRO (MAC Rewrite Offload)
AP acts as a L2 proxy for all connected clients, so Gateways only need to learn the AP MACs, not the Clients MACs

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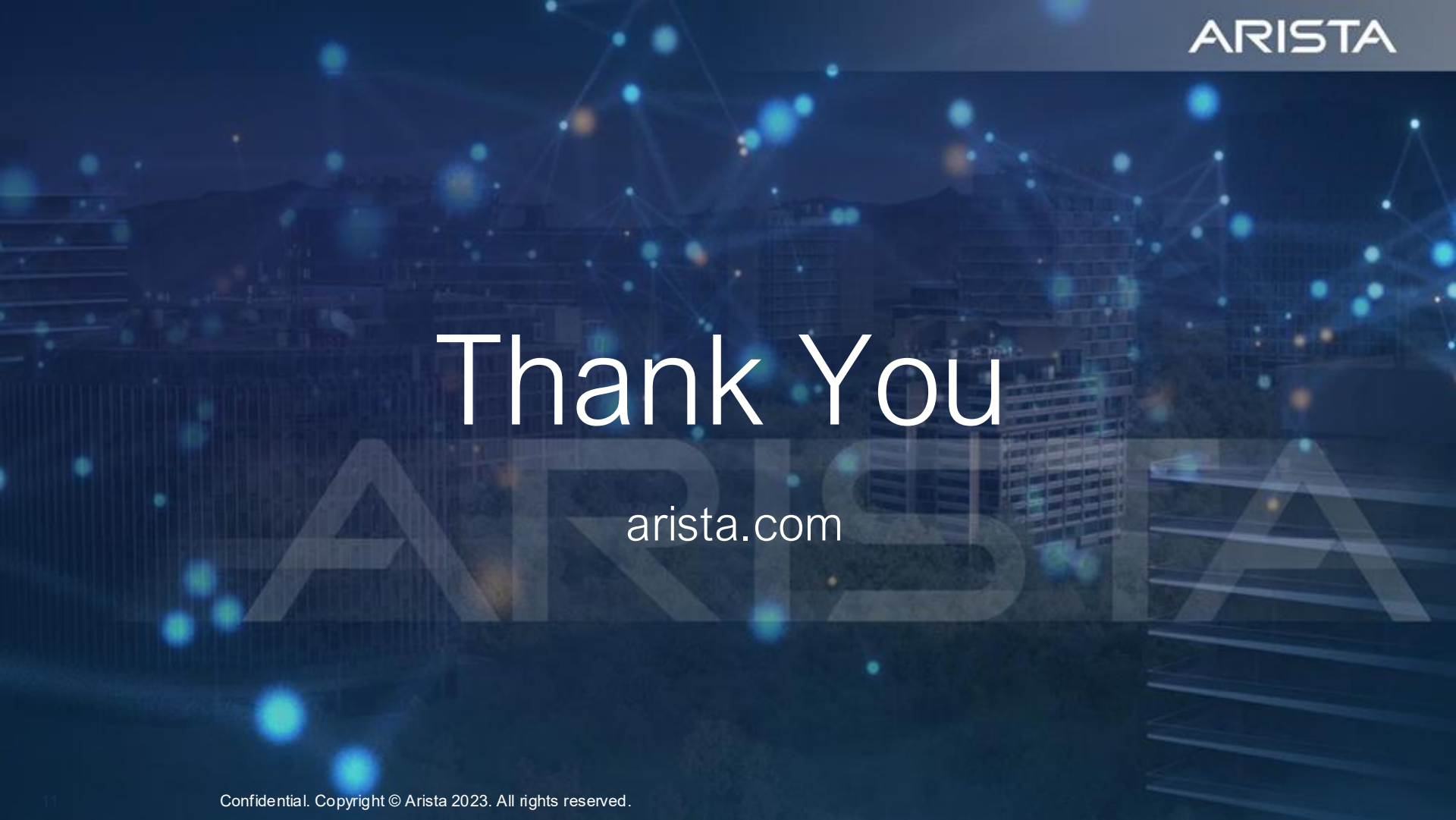
Summary

- The Wired side matters for Wi-Fi, build your own Wired-side checklist

- Best practices to achieve large scale wireless fabric:
  - Control Plane: Run it on the APs
  - Data Plane: Use standard Tunneling protocols, like VxLAN

- Best practices to build a scalable and reliable fabric:
  - Move from Flood-and-Learn to EVPN/VxLAN

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