May 19, 2022

aruba
a Hewlett Packard Enterprise company

EdgeConnect Microbranch Deep Dive

John Schaap, Consulting Systems Engineer EMEA

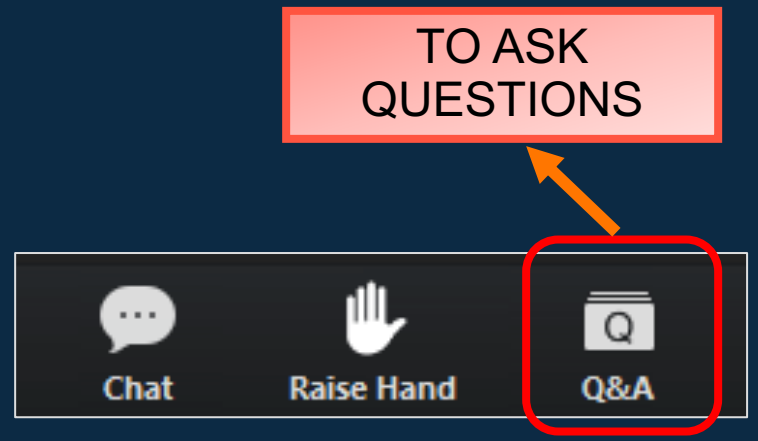
Welcome! Housekeeping.

- Listen by computer audio or dial-in

- All lines are muted during the webinar

- Ask *questions by selecting "Q&A"* and to report any webinar difficulties

- Webinar is being recorded & will be emailed to all attendees



Partner Technical Webinar Series

Aruba AOS 10 Technical Deep Dive

Session 1: Designing Next Generation Campuses with ArubaOS 10
Thu, April 21st, 2022, 11:00 AM - 12:00 AM CET

Session 2: AOS10 Services Deep Dive
Thu, May 5th, 2022, 11:00 AM - 12:00 AM CET (click here to register)

Session 3: Micro Branch Deep Dive
Thu, May 19th, 2022, 11:00 AM - 12:00 AM CET (click here to register)

Session 4: Exploring Aruba SD-Branch with AOS10
Thu, June 2nd, 2022,11:00 AM - 12:00 AM CET (click here to register)

Agenda

- Aruba ESP & EdgeConnect Microbranch
- Aruba’s Remote Work Solution Comparison
- WLAN Forwarding Modes & Traffic Load Balancing
- Automated Central Services Workflow
- Aruba Central Configuration Workflow
- Demo: WAN Visualization & SASE Integration
- Q & A
- Useful Resources

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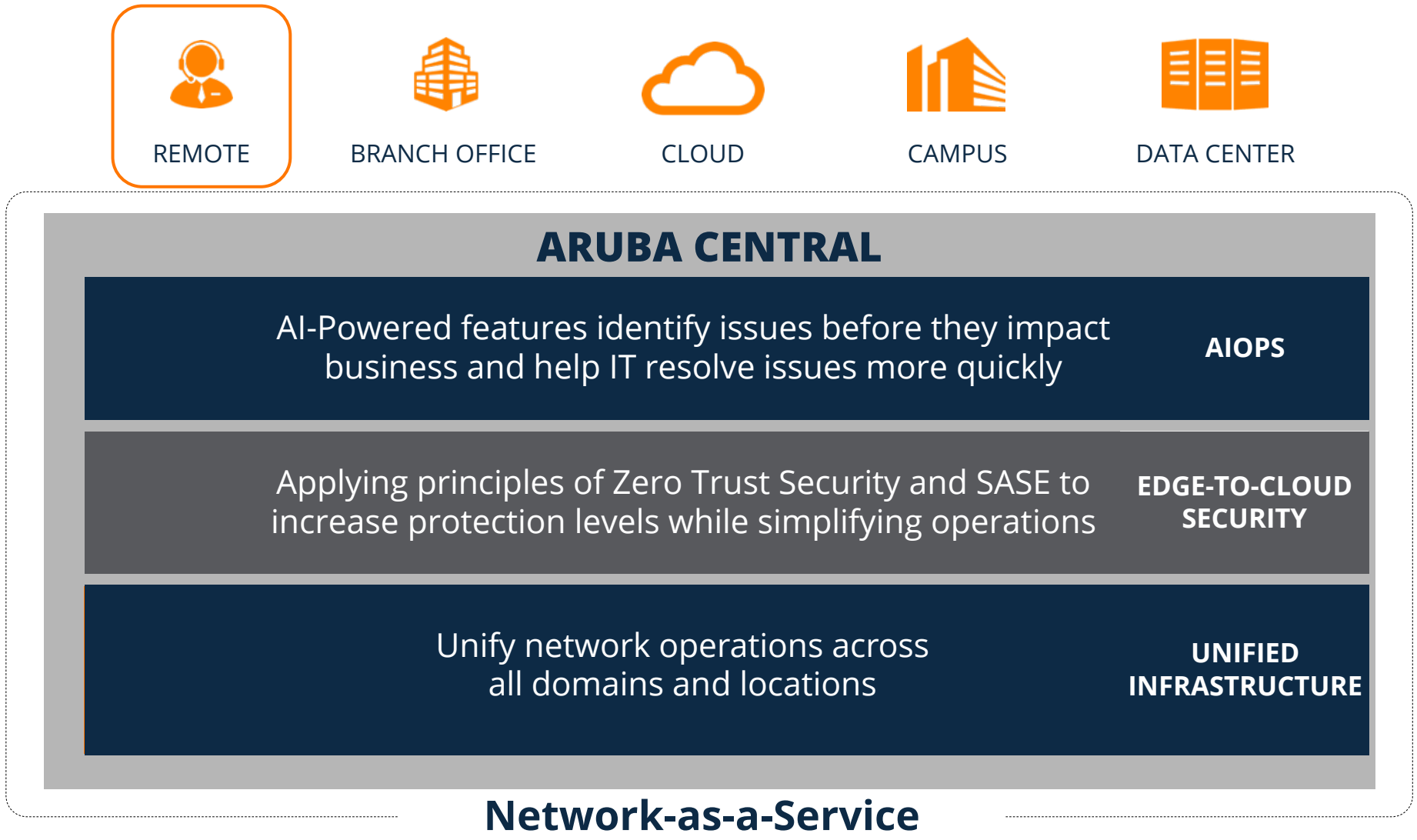
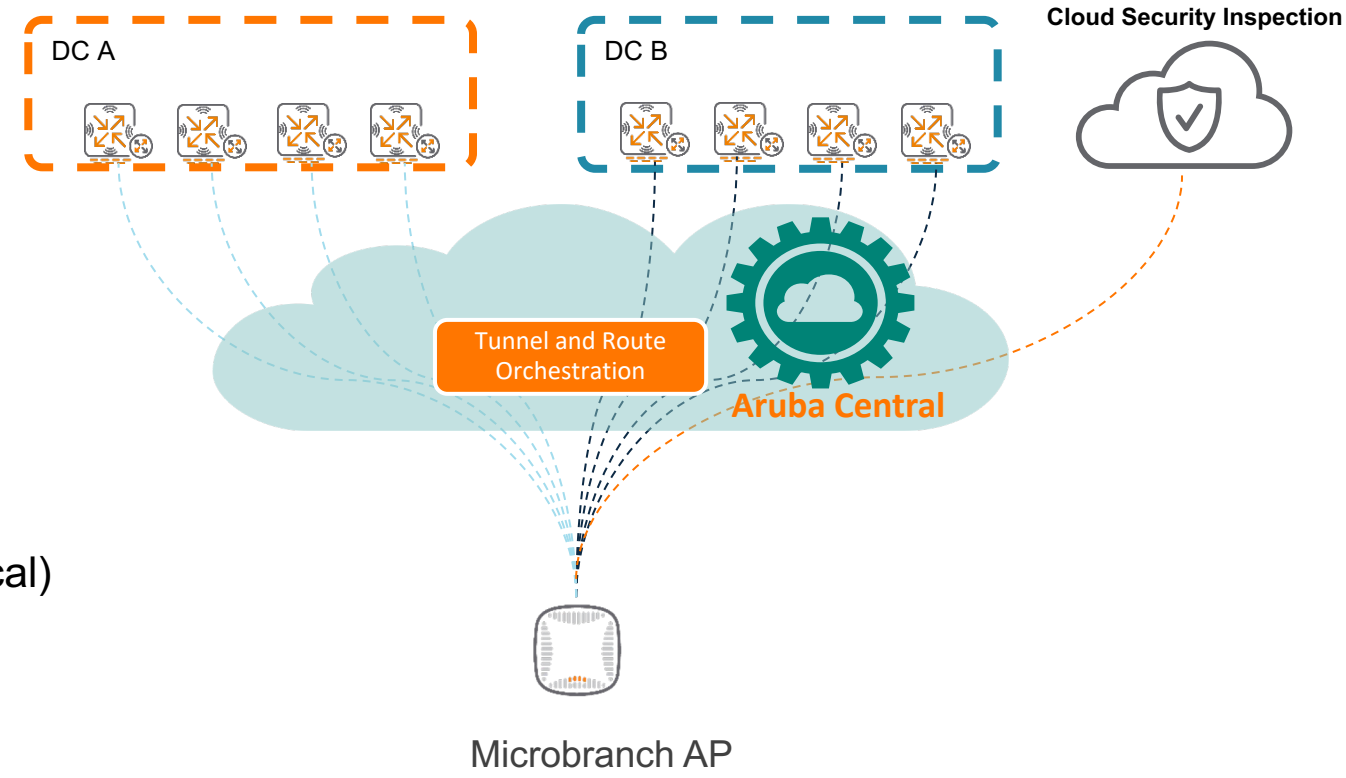
Aruba Edge Services Platform Architecture



Introduction of EdgeConnect Microbranch

- Single AP Branch solution
- Supported by ArubaOS 10.3 and Central 2.5.4
- Max 5 headend **VPNC clusters** supported for high redundancy **(Layer 3 mode)**
- AP establishes IPsec tunnels with each VPNC for fast failover and load balancing
- Orchestrated tunnels and routes
- Centralized L2 and Routed L3 (DL3) and NATed L3 (local) modes supported
- Cloud Security Orchestration (SASE)
- PBR with 1st packet classification
- Next Generation IAP-VPN & RAP



NO ON-PREM GATEWAY REQUIRED

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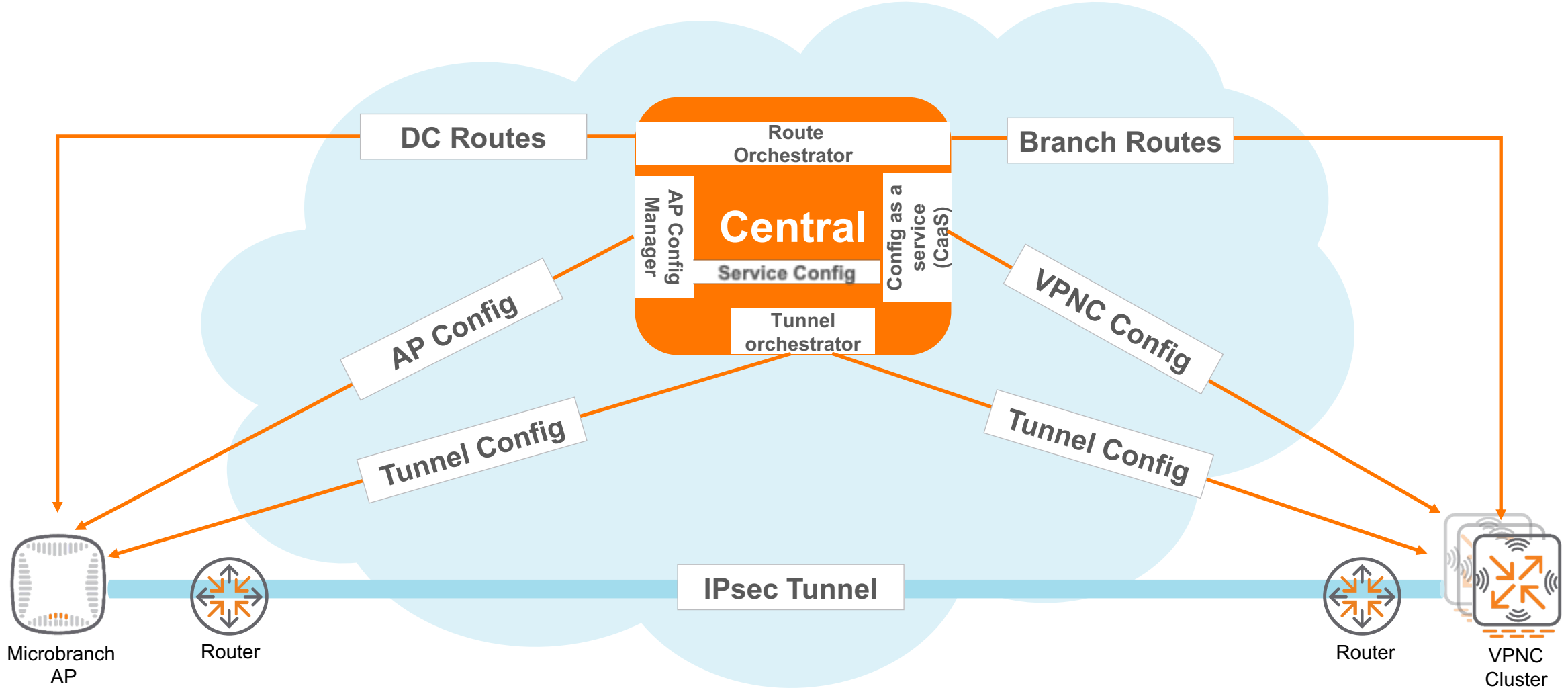
Remote Work Solutions Comparison

	RAP	IAP-VPN	EdgeConnect Microbranch
Supported OS	ArubaOS 8.x	ArubaOS 8.x	ArubaOS 10.3
Supported AP models	All	All	All
Deployment Type	Single AP	Single AP, Cluster	Single AP
Management	Mobility Conductor	IAP GUI, Aruba Central	Aruba Central
Ports to be open for AP	UDP 4500	UDP 4500	UDP 4500
Wireless client support	Yes	Yes	Yes
Wired client support	Yes	Yes	Yes
Static Routing	Yes	Yes	Yes
Dynamic Routing	No	No	Route Orchestrator
Policy Based Routing	Yes	Yes	Yes
Tunnel pre-establishment to all VPNCs	No (only to primary cluster/standalone)	Yes (w/ Fast Failover enabled)	Yes
Full-Tunnel	Yes	Yes	Yes
Split-Tunnel	Yes	Yes	Yes

Remote Work Solutions Comparison (Contd.)

	RAP	IAP-VPN	EdgeConnect Microbranch
Encryption nodes	Client to DC	AP to DC	AP to DC
Failover within DC	Yes	Yes	Yes
Failover between DC	Yes	Yes	Yes
Tunnel orchestration	No	No	Tunnel Orchestrator
Route orchestration	No	No	Route Orchestrator
Cloud Security vendor support	No	No	Yes

High Level Control Flow



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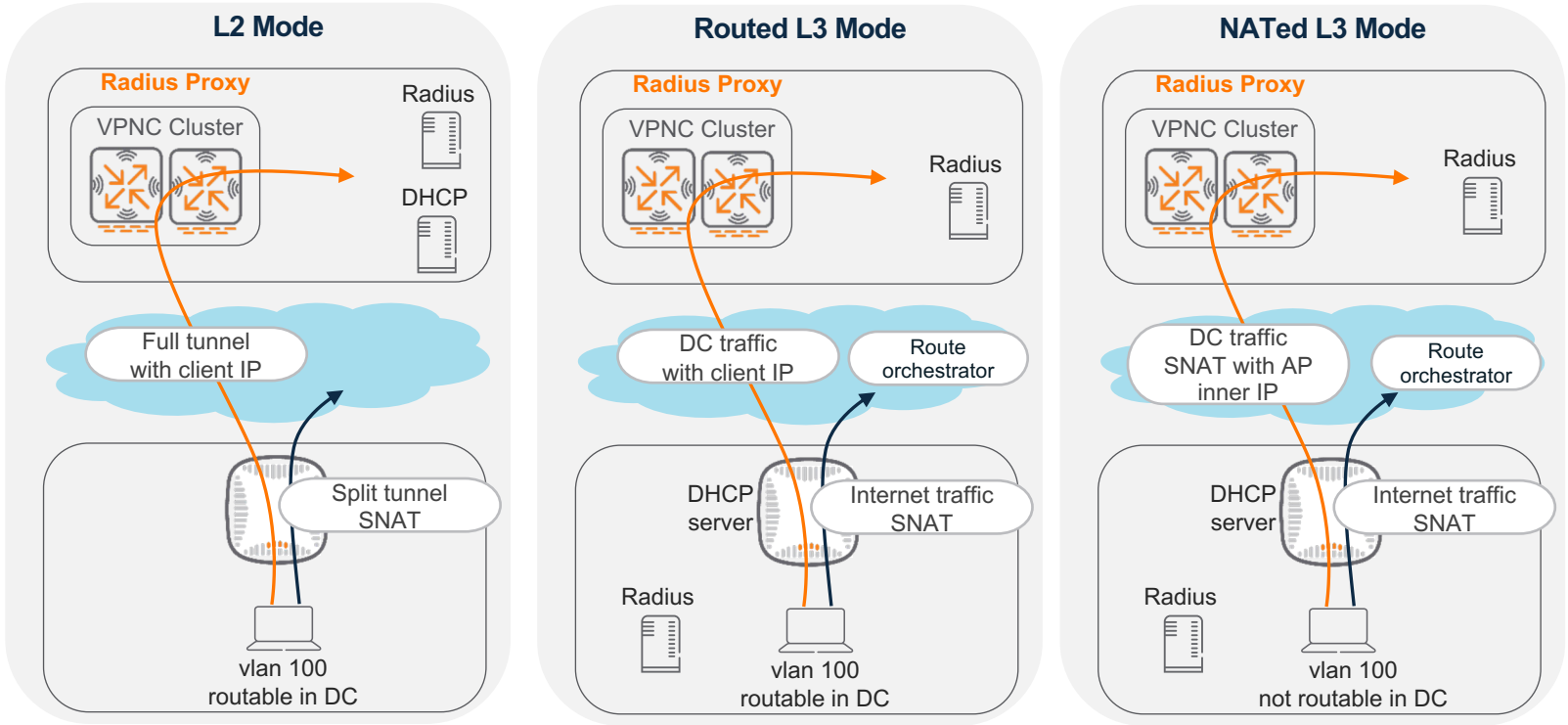
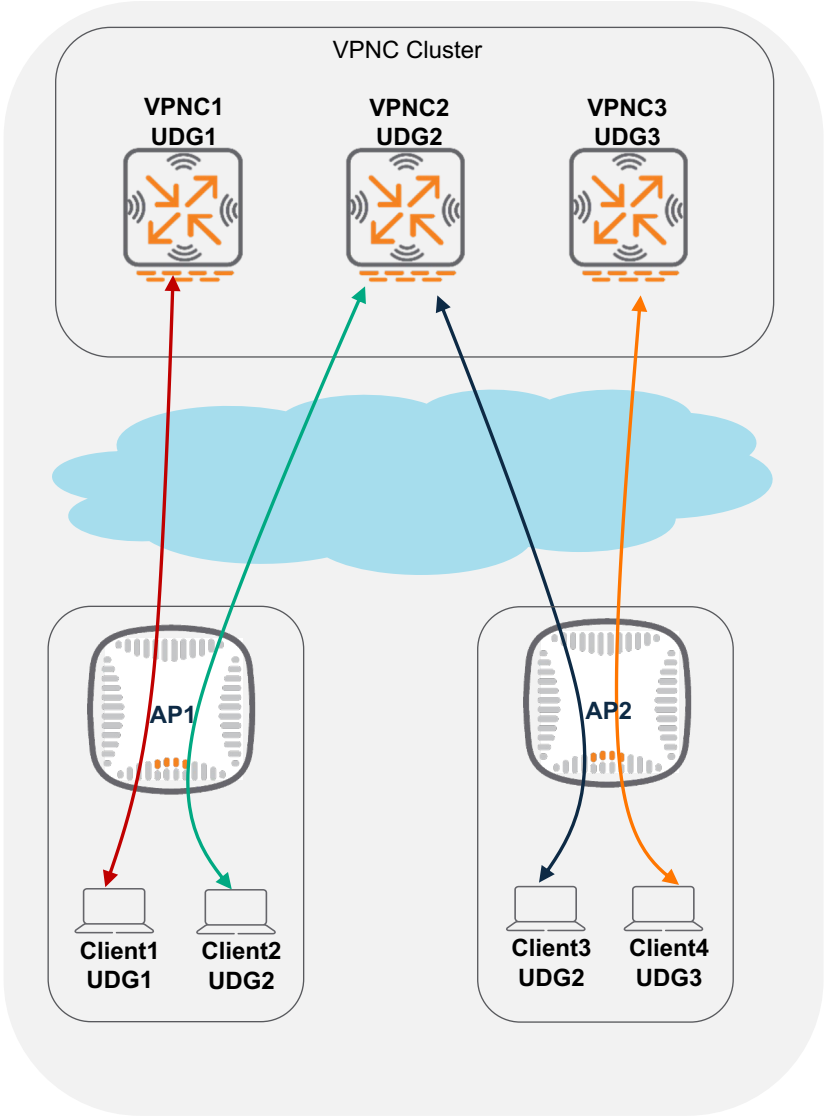
Forwarding Mode Comparison

Functions and Behaviors	L2	Routed L3	NATed L3
Route orchestrator required	No	Yes	Yes
DHCP server	VPNC or External DHCP server in DC	Microbranch AP	Microbranch AP
Client subnets routable in DC	Yes	Yes	No
Client traffic to DC	Source with client IP	Source with client IP	Source-NATed with AP inner IP
Client traffic to Internet	Full tunnel to DC source with client IP or split-tunnel with source-NATed with AP uplink IP	Source-NATed with AP uplink IP	Source-NATed with AP uplink IP
VPNC cluster as radius proxy	Yes	Optional. In mixed SSID, yes	Optional. In Mixed SSID, yes
PBR rules required for user role	Yes for DC traffic as split tunnel is default	Optional	Optional
Load balancing	Evenly distributed between VPNCs	Based on VPNC cost assigned by route orchestrator	Based on VPNC cost assigned by route orchestrator

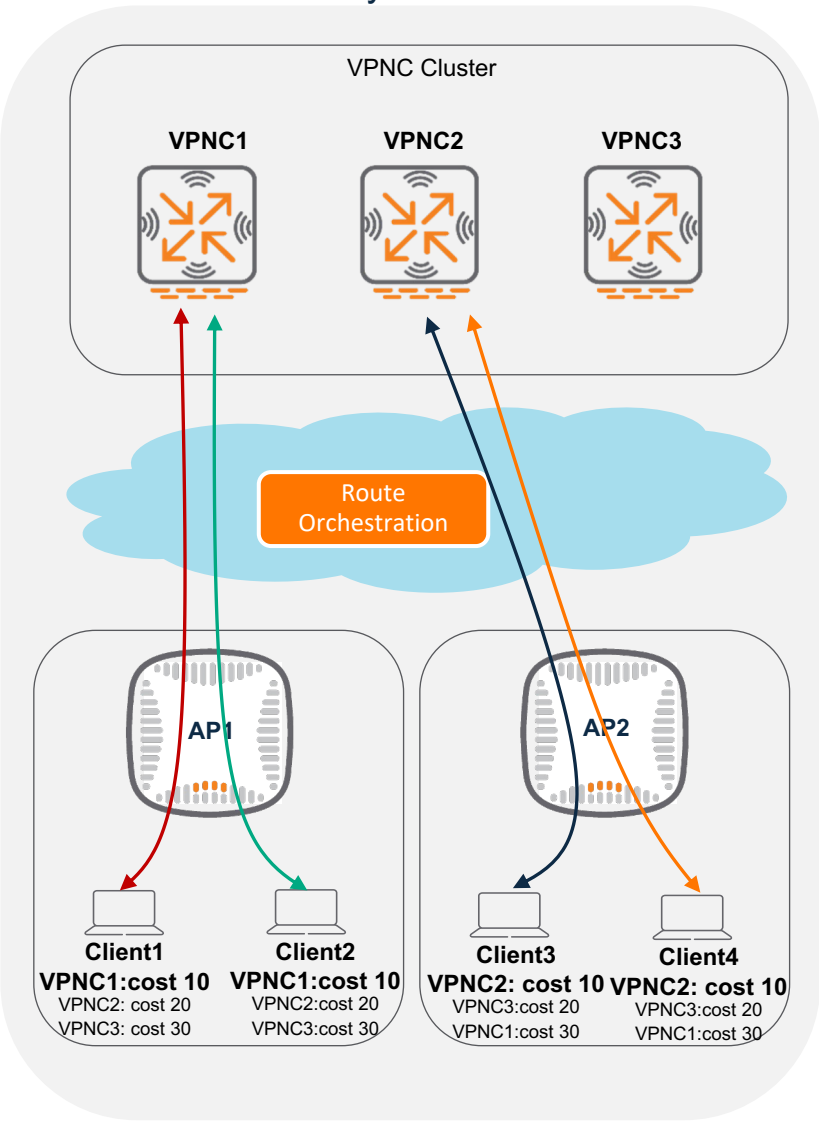


Traffic Load Balancing

L2 Mode: Client-based load balancing
All clients of one AP are distributed to different VPNCs



L3 Mode: AP-based load balancing
All clients of one AP always use same VPNC for DC traffic



* UDG – User Designated Gateway

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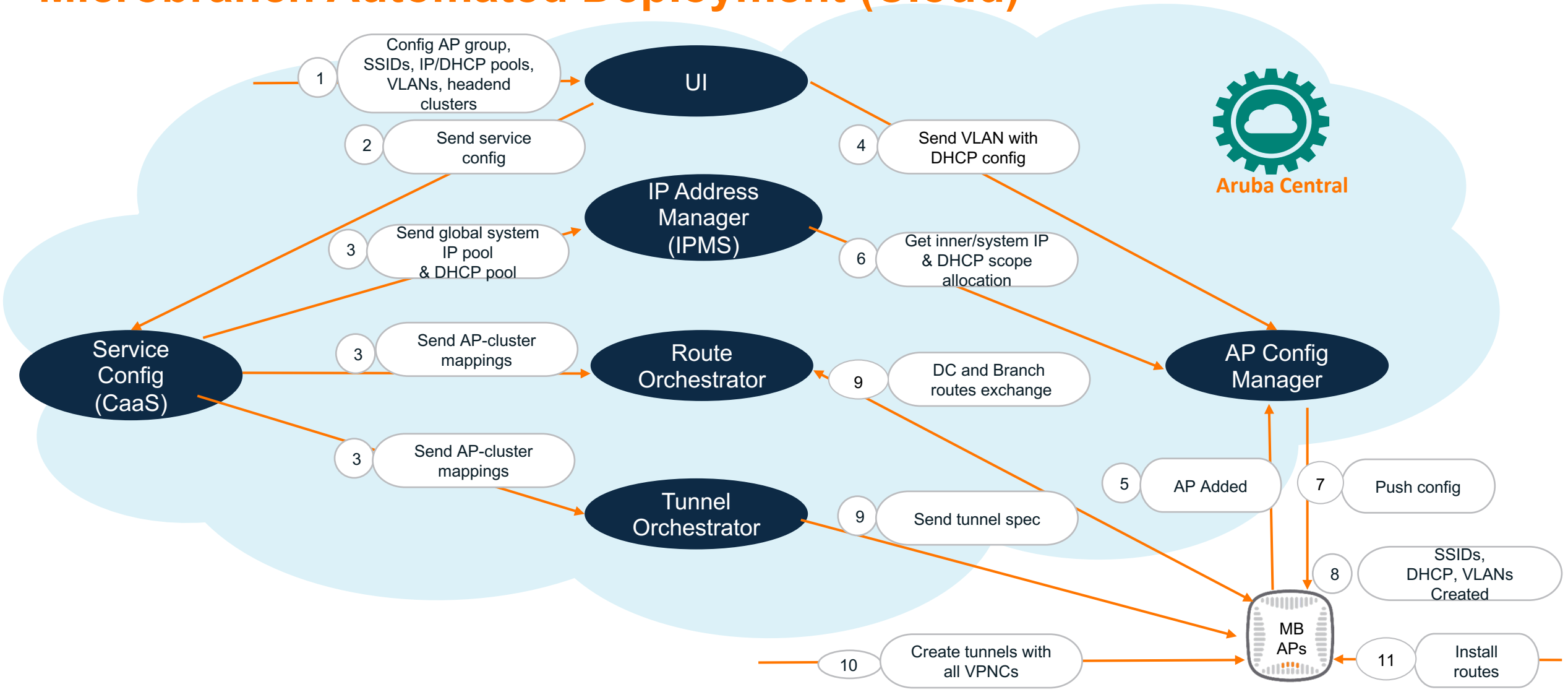
Microbranch Automated Deployment (Cloud)



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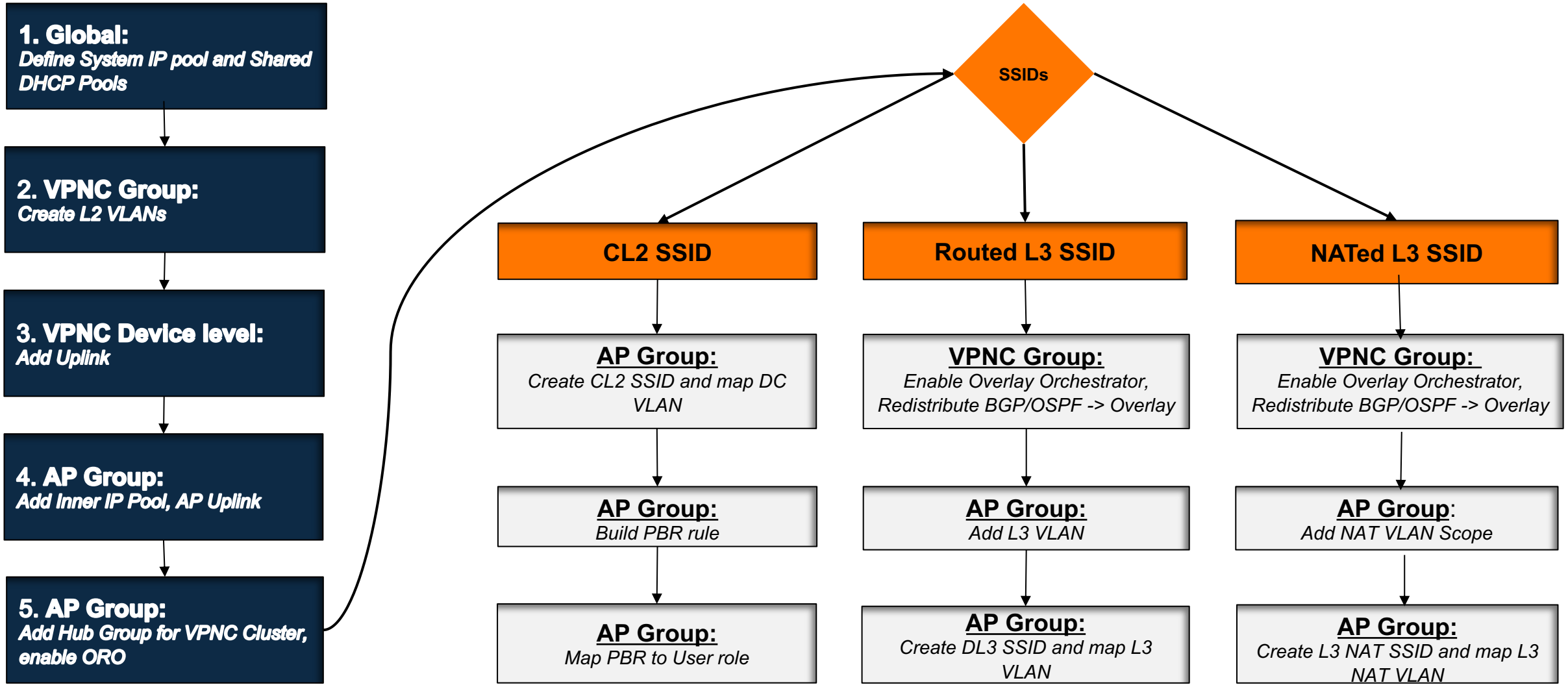
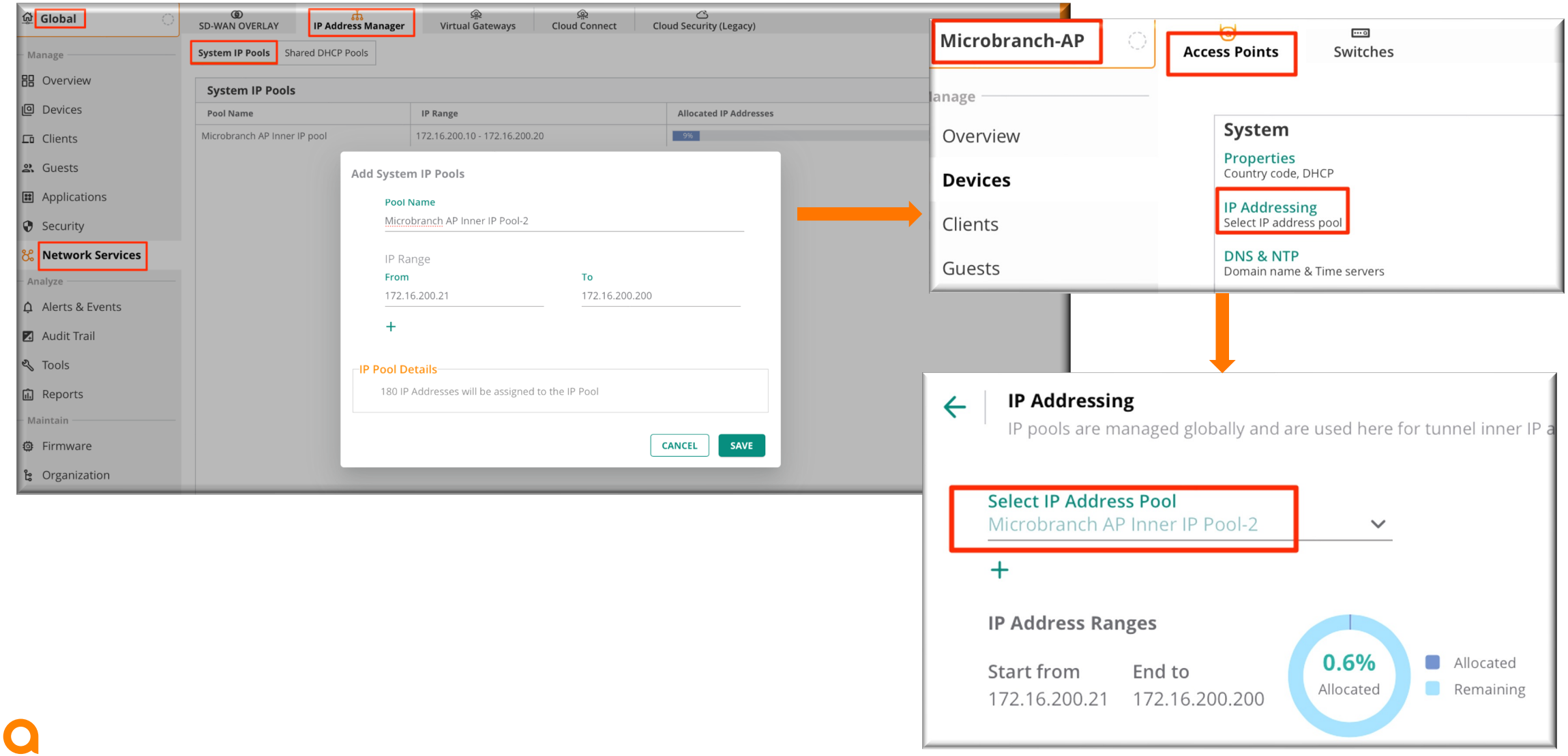
Microbranch Configuration Workflow (Aruba Central UI)



Microbranch AP Inner IP



IPMS – DHCP Pool Allocation Algorithm

Total IPs per site = Requested host count per site + 3
3 extra IPs=subnet address + broadcast address + default gateway

Subnet size calculation = Total IPs per site rounded to next power of 2

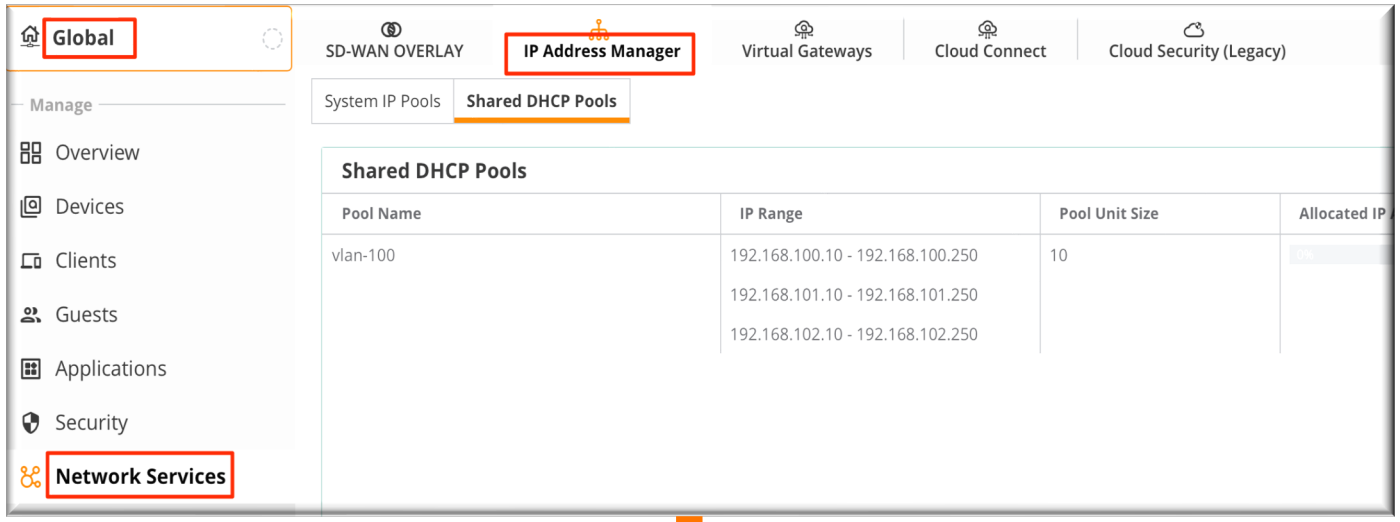
For example, pool: 172.16.10.0 – 172.16.10.255, host per site = 25
25+3=28, then rounded to next power of 2 is 32
then subnet size is 32,

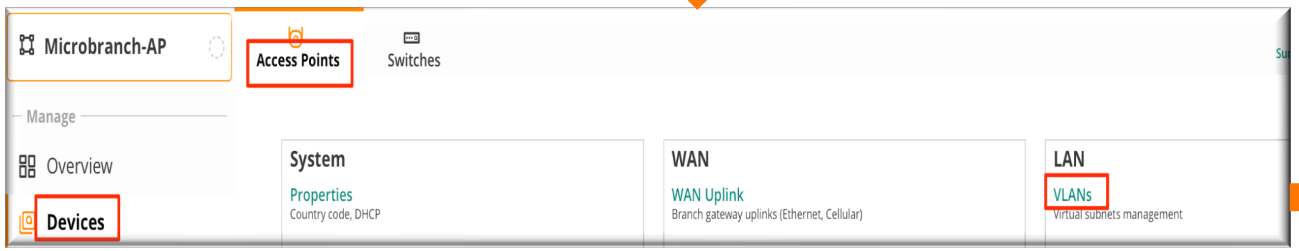
Total number of branch subnets = range size / subnet size
In this example: 256 / 32 = 8

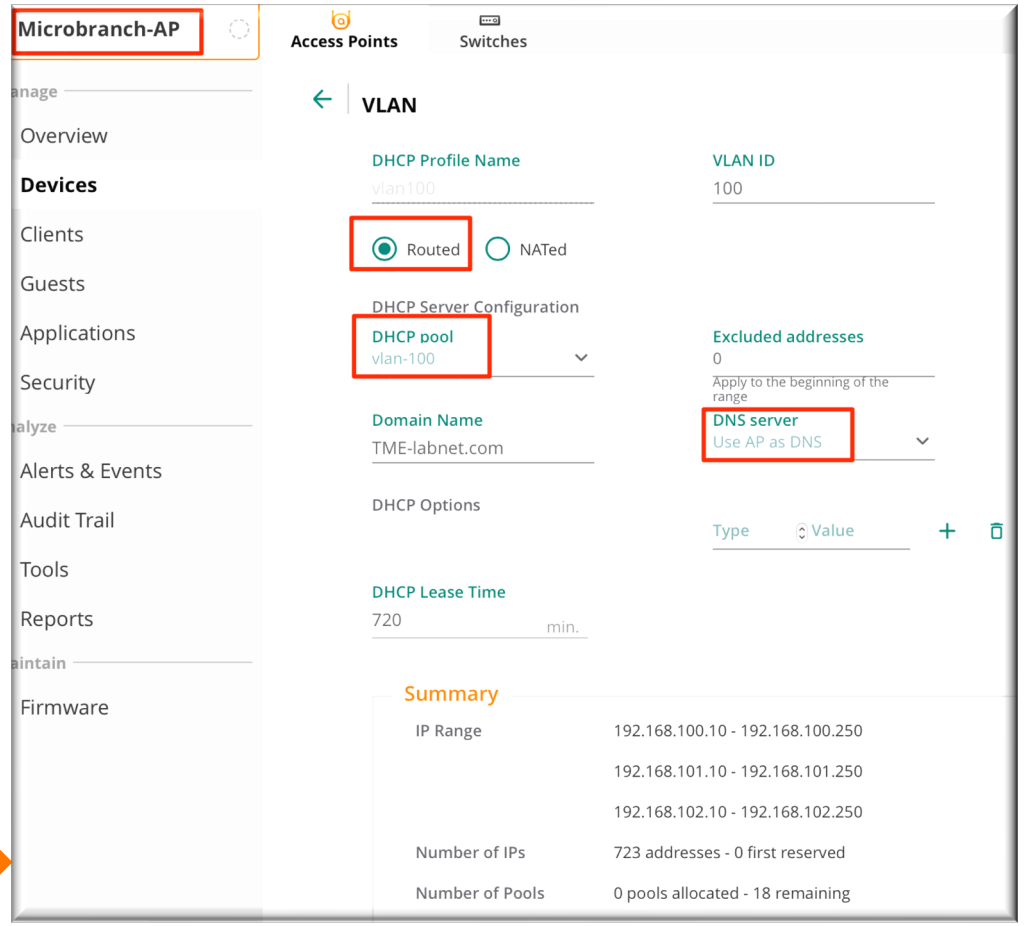
The example pool can be allocated to 8 APs:
172.16.10.0/27, 172.16.10.32/27, 172.16.10.64/27, 172.16.10.96/27
172.16.10.128/27, 172.16.10.160/27, 172.16.10.192/27, 172.16.10.224/27

DHCP Pool for Clients in L3 Mode

- Multiple IP ranges are supported for one DHCP pool
- Three types of DNS server supported: Specify server; Use AP's assigned DNS servers; Use AP as DNS

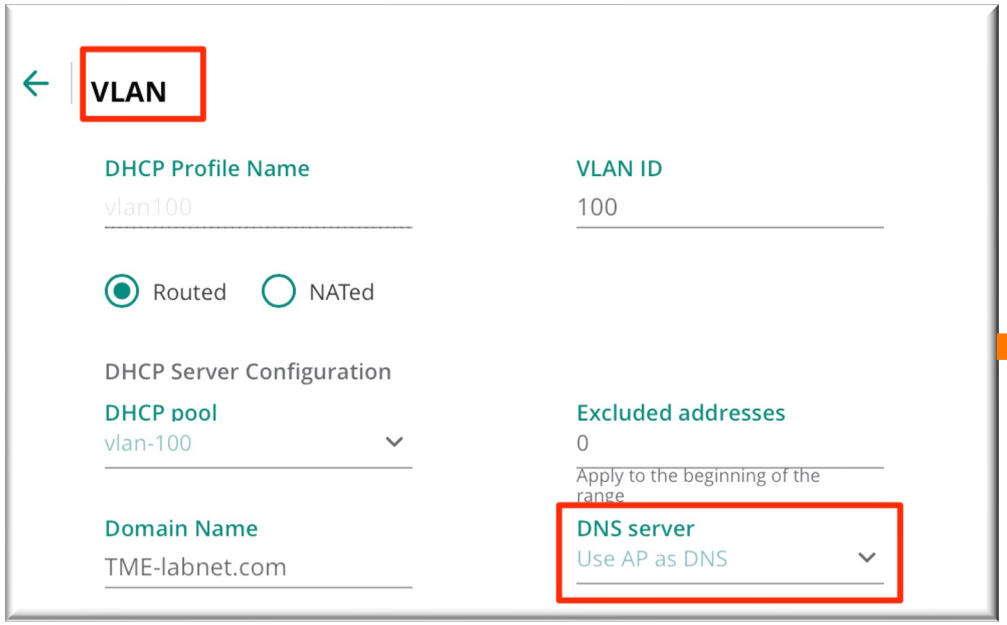


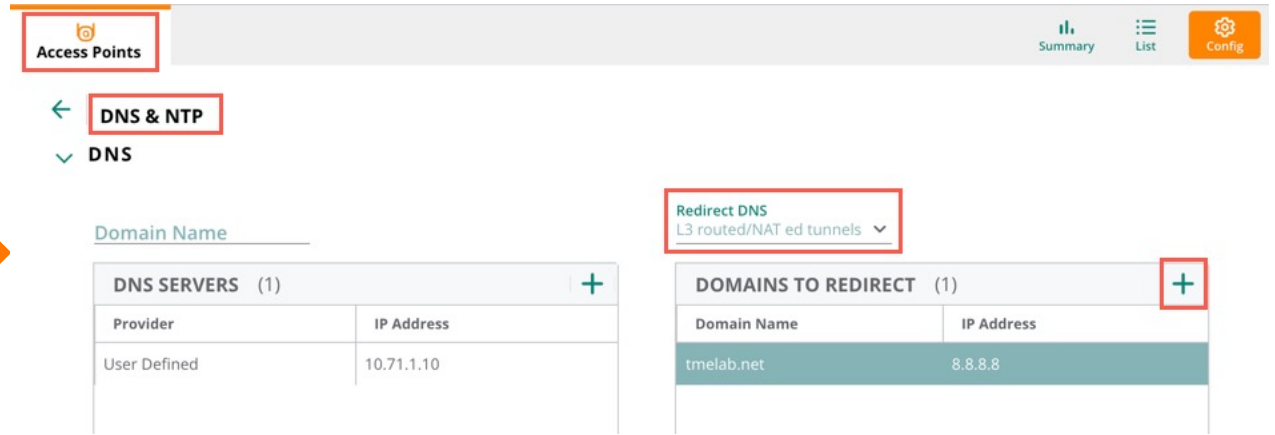




DNS Redirect

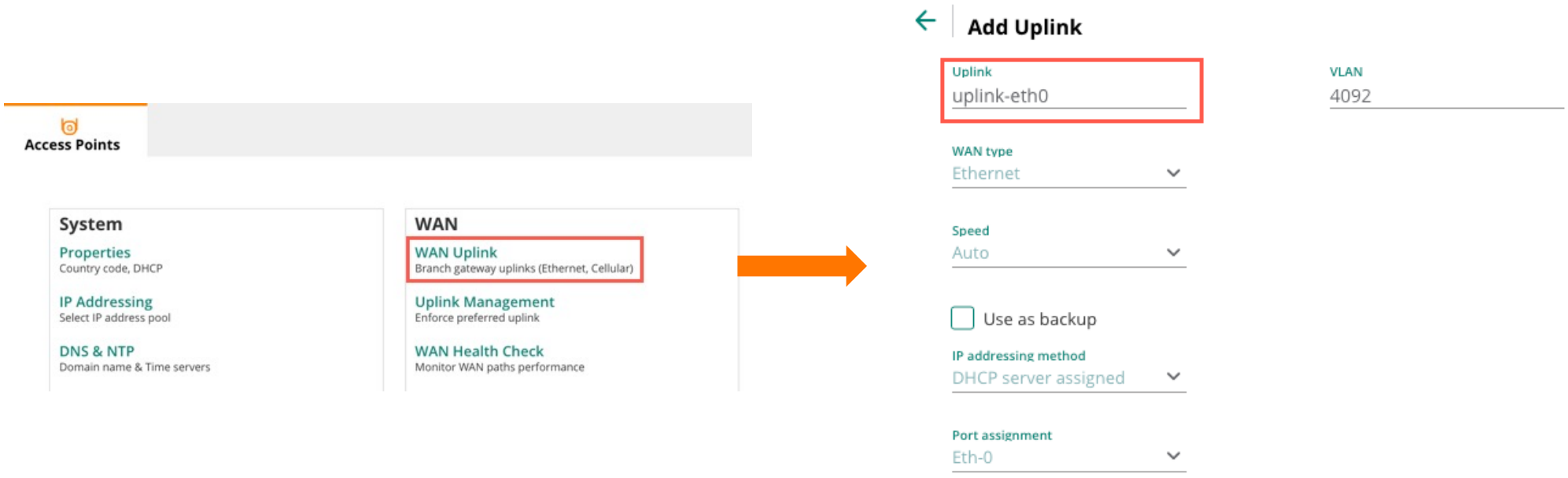
- By default, it is disabled
- AP will snoop all the DNS packets, if the FQDN domain matches any one of the domain name in redirect domain list. It will proxy the DNS request to configured redirect DNS server.
- To enable DNS redirect for L3 mode, “**Use AP as DN**S” needs to be selected under VLAN configuration





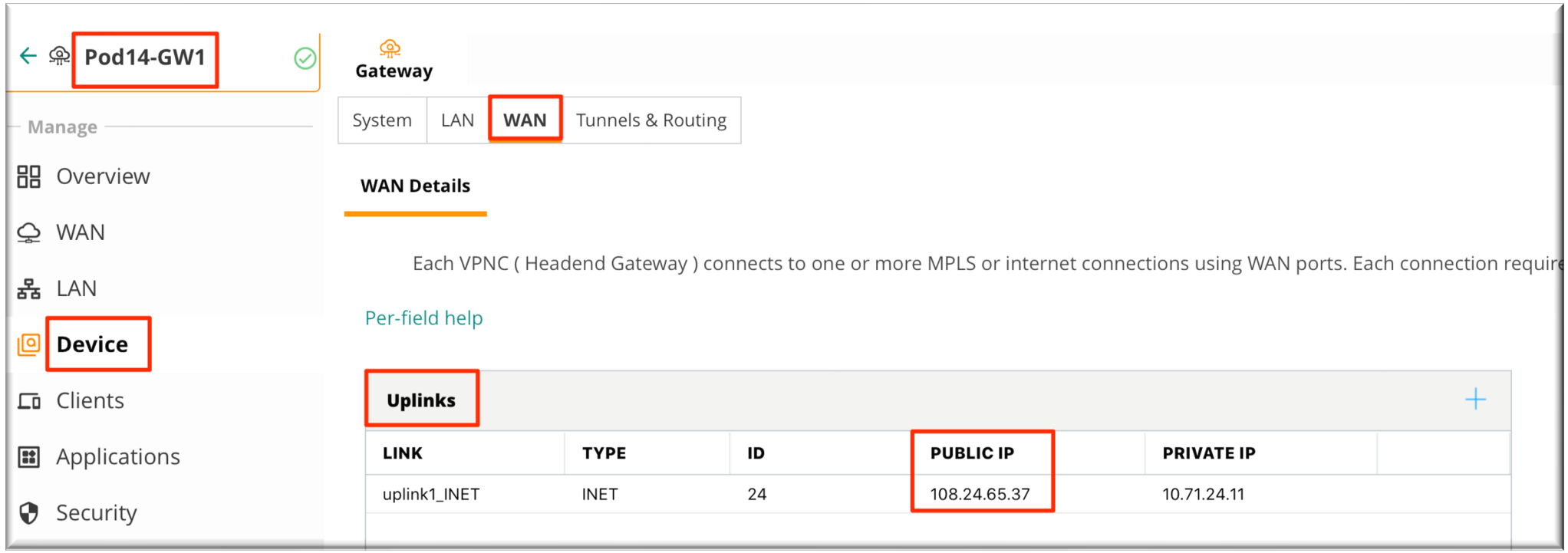
Uplink Configuration of AP

- Configured at the group level



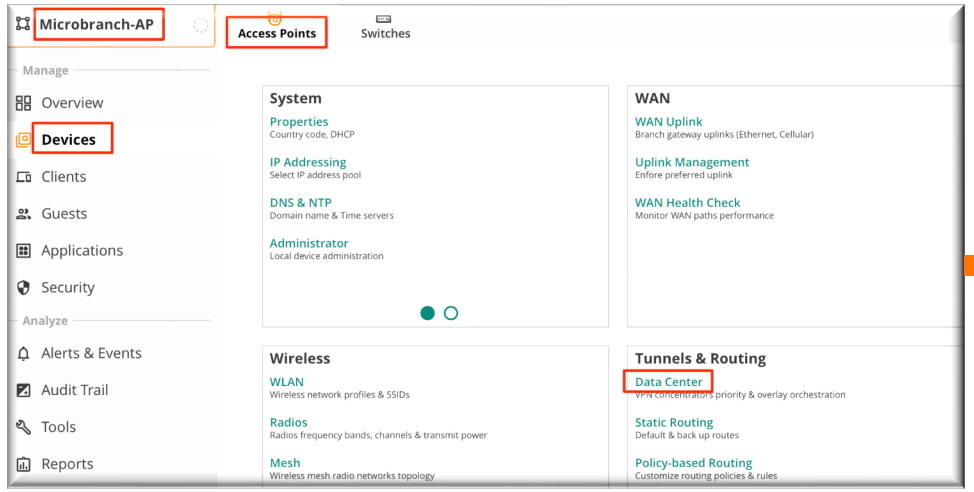
Uplink Configuration of Each VPNC

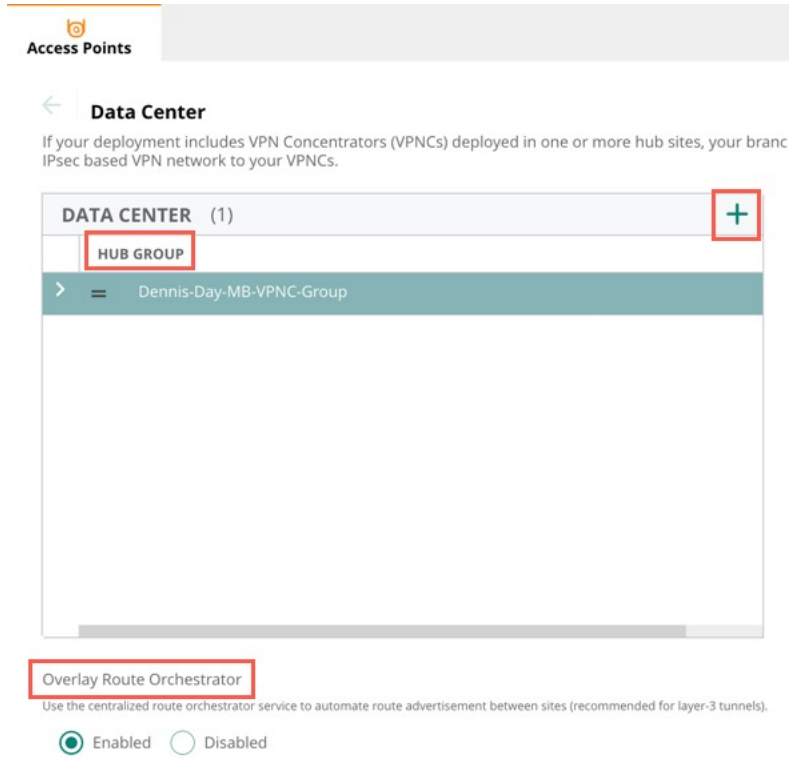
- Configured at the device level
- Public IP is required for Internet uplink



Hub Group Configuration for L3 mode SSIDs

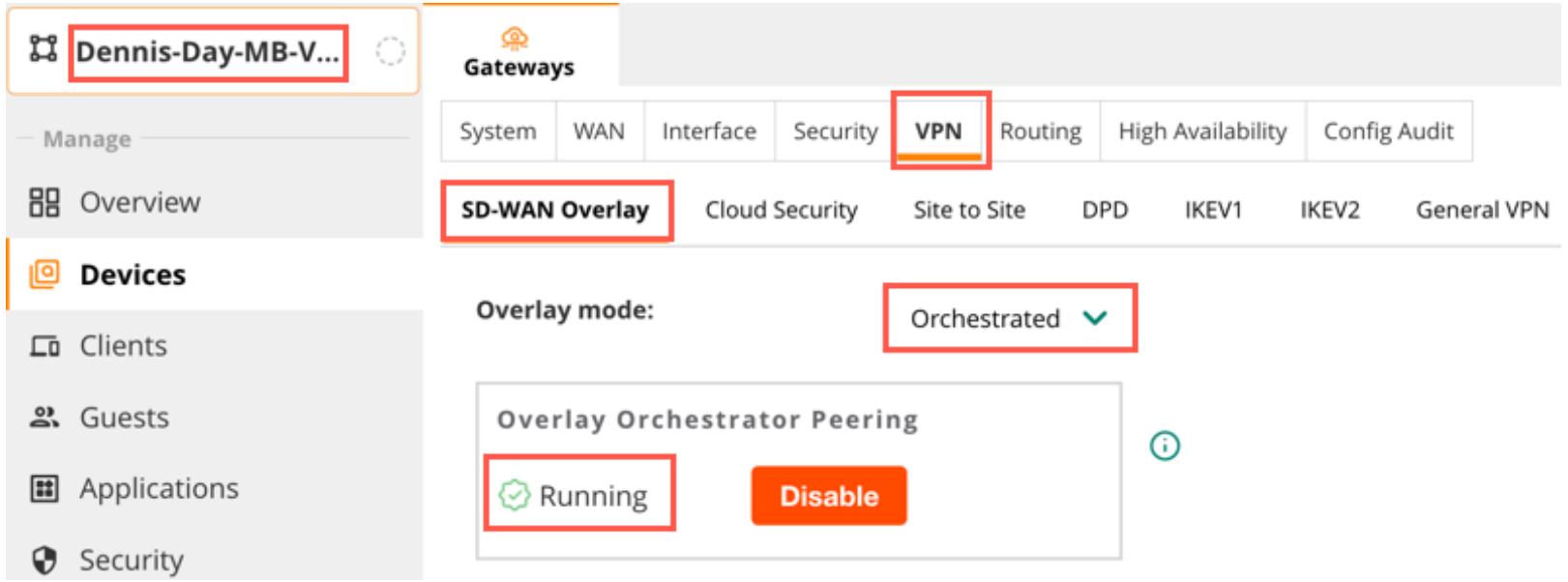
- For L3 SSID, the Hub Groups (VPNC clusters) are configured under Data Center, max. 5 Hub Groups are supported
- For L2 SSID, the VPNC clusters are configured under SSID. Primary and secondary clusters are supported
- L3 and L2 SSIDs cannot terminate on the same VPNC cluster





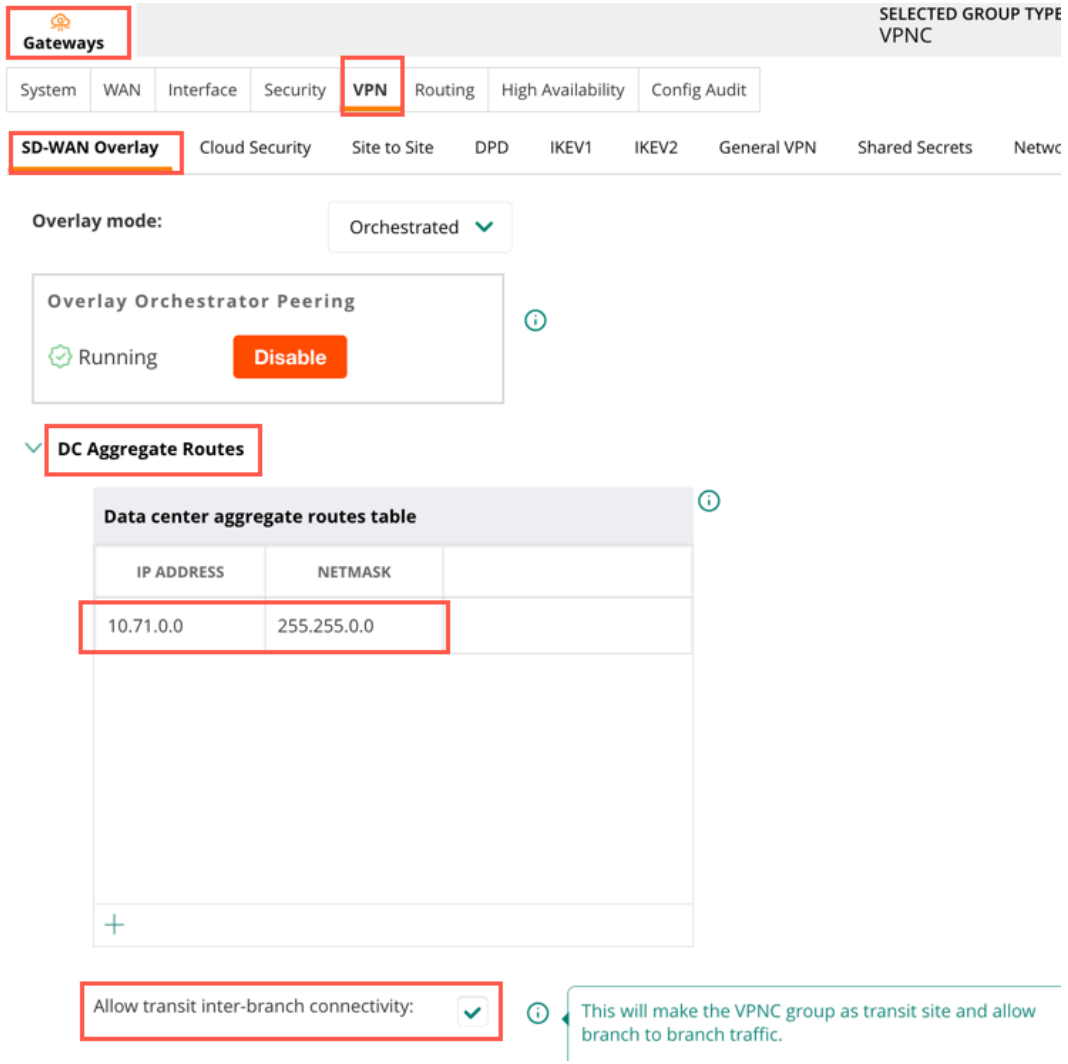
Route Orchestration for L3 mode SSIDs

- By default, Route Orchestrator assigns different costs to each DC route through different VPNCs within the clusters for next hop selection while announcing DC routes to the Microbranch APs .
- Each AP most likely gets different costs for routes through each VPNC for load balancing.



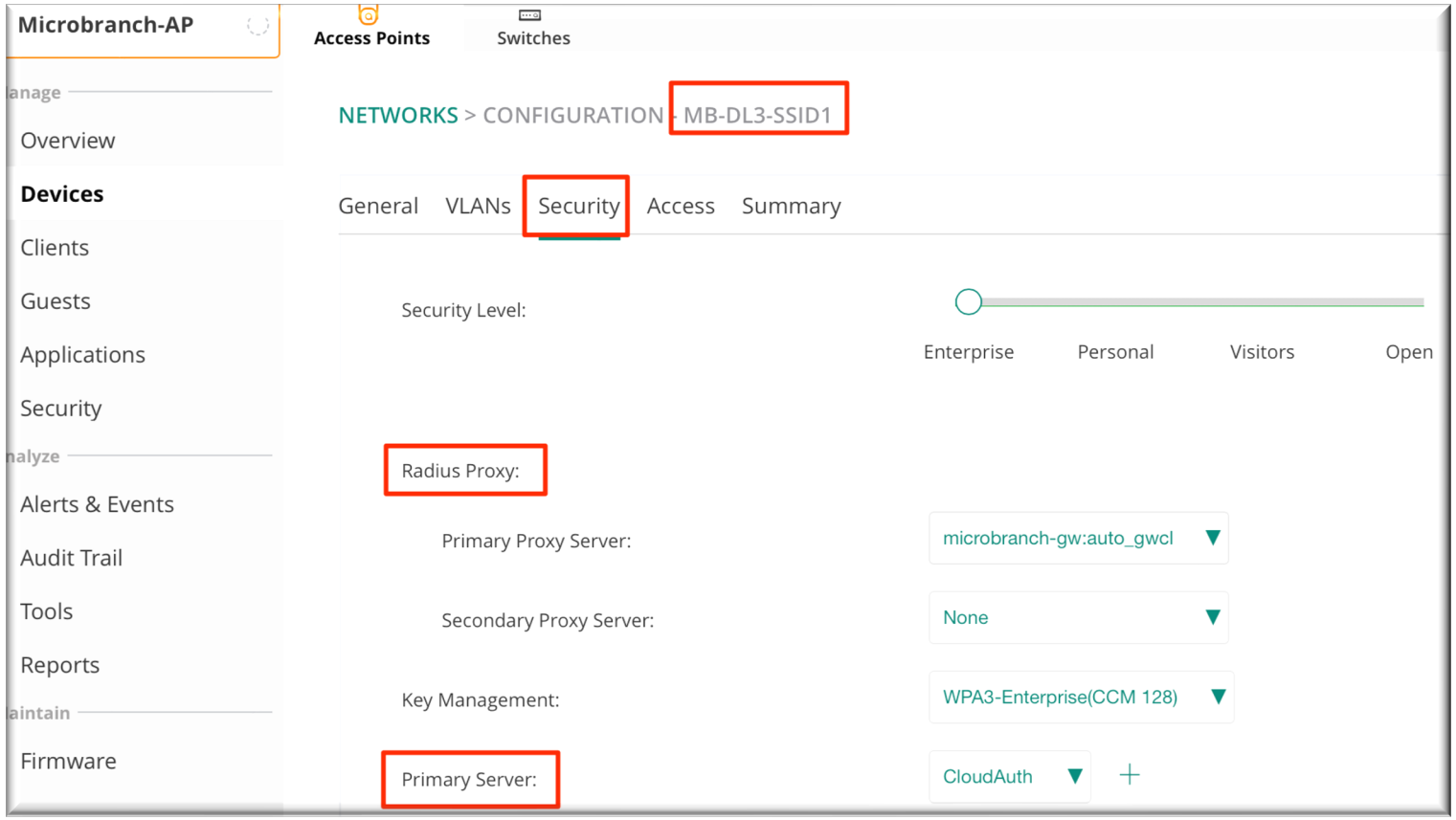
DC Aggregate Routes

- Aggregation of DC routes is highly recommended
- Every AP can have maximum 512 routes
- When “allow transit inter-branch connectivity” is enabled for specific VPNC group, the routes learnt from one branch will be advertised to other branches.



Radius Configuration in SSID workflow

- VPNC as radius proxy is **OPTIONAL** for L3 mode SSID
- VPNC is always the radius proxy for L2 and mixed (L2 + L3) mode SSID



DEMO

Key Takeaways

NO ADDITIONAL HARDWARE REQUIRED	All services delivered via AP
	On-campus experience without an appliance
	Scalability from cloud-based management
CONSISTENT SECURITY, HOME TO CAMPUS	Identity-based access control
	SASE-based cloud services
SUITED FOR ENTERPRISE	Zero-Touch Provisioning, automated onboarding
	More insights (WAN, AI)
	Unified/centralized visibility
	Ability to manage at scale

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EdgeConnect Microbranch Resources

Arubapedia:

- Partners: https://afp.arubanetworks.com/afp/index.php/AOS_10

Validated Solution Guides:

- https://www.arubanetworks.com/techdocs/VSG/

Questions

Partner Resources

Portals

Airheads Community
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Arubapedia for Partners
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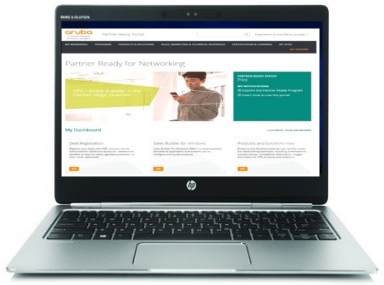
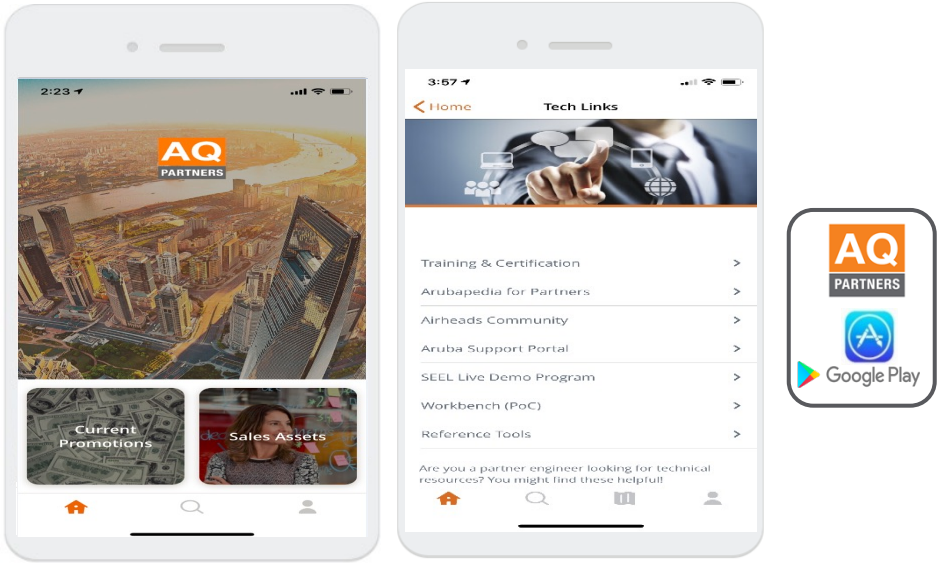


Partner Ready for Networking portal
(Click Here)

Mobile App



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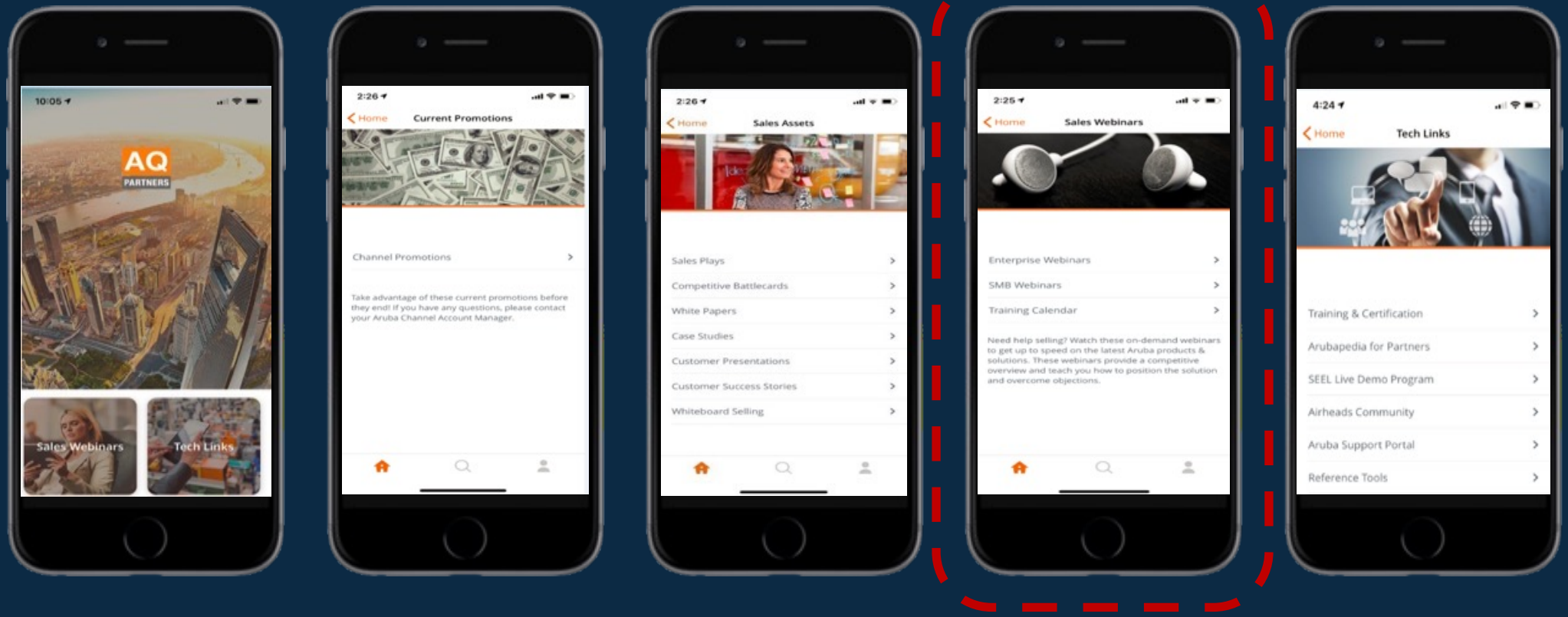

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