Welcome to Aruba Cloud Essentials!

What to expect

ENGLISH | Presenter: Tyler McMinn

SPANISH | Presenter: Alvaro Tellez

- Thanks for choosing to learn with us, we can't wait to get started!
- To start learning Aruba's industry leading technologies you need some basic networking knowledge- and that's what you'll get here.
- If you attend both sessions, you will get a certificate of course completion!

Welcome to Aruba Networking Essentials!

What to expect

ENGLISH | Presenter: Tyler McMinn

~~PART 1: May 3, 2021 | 08-10 AM PDT~~

PART 2: May 10, 2021 | 08-10 AM PDT

SPANISH | Presenter: Alvaro Tellez

~~PART 1: May 3, 2021 | 11-1 PM PDT~~

PART 2: May 10, 2021 | 11-1 PM PDT

- ~~Part 1 Introduces Aruba Cloud technology, products and orchestration~~.
- Part 2 Expands to include Cloud device on-boarding, integration, monitoring, and troubleshooting with a focus on Aruba Edge Services Platform.

Rev #1.1

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Day 2: Cloud Continued

Aruba Cloud Essentials

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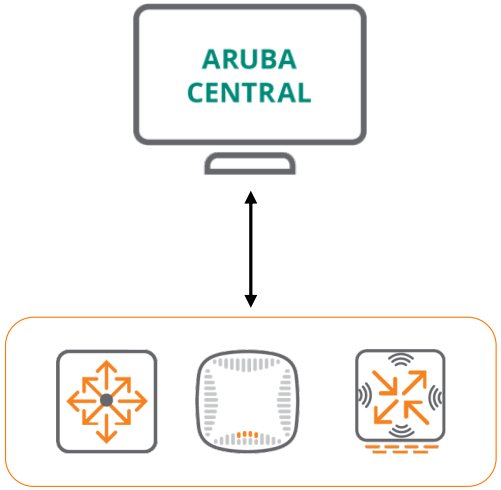
Cloud Device On-Boarding

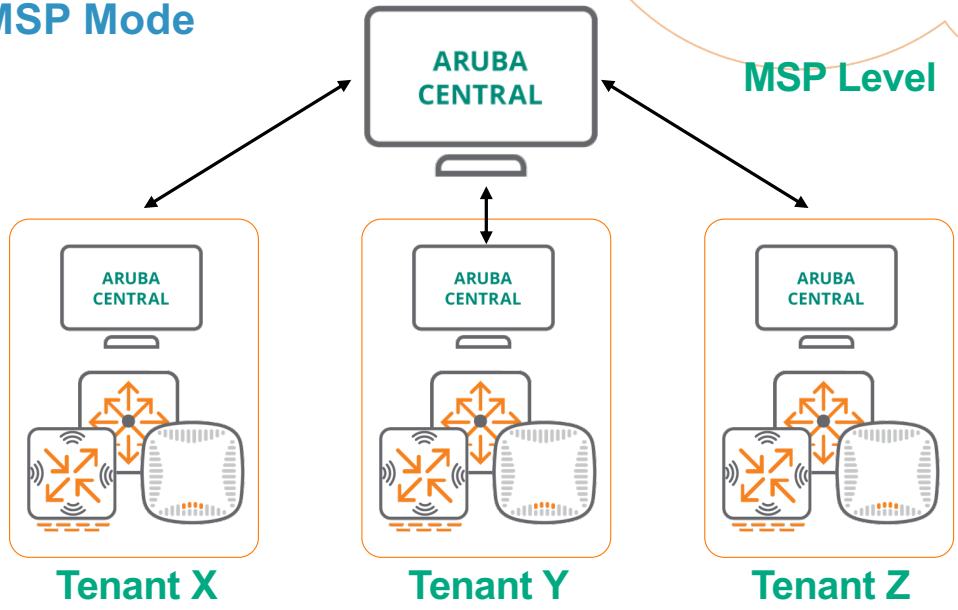
Standard Enterprise vs Managed Service Provider (MSP)

Standard Enterprise Mode



- Single Tenant environment
- Single end-customer
- Single Aruba Central account with power to:
  - Onboarding
  - Key management
  - Subscriptions

MSP Mode



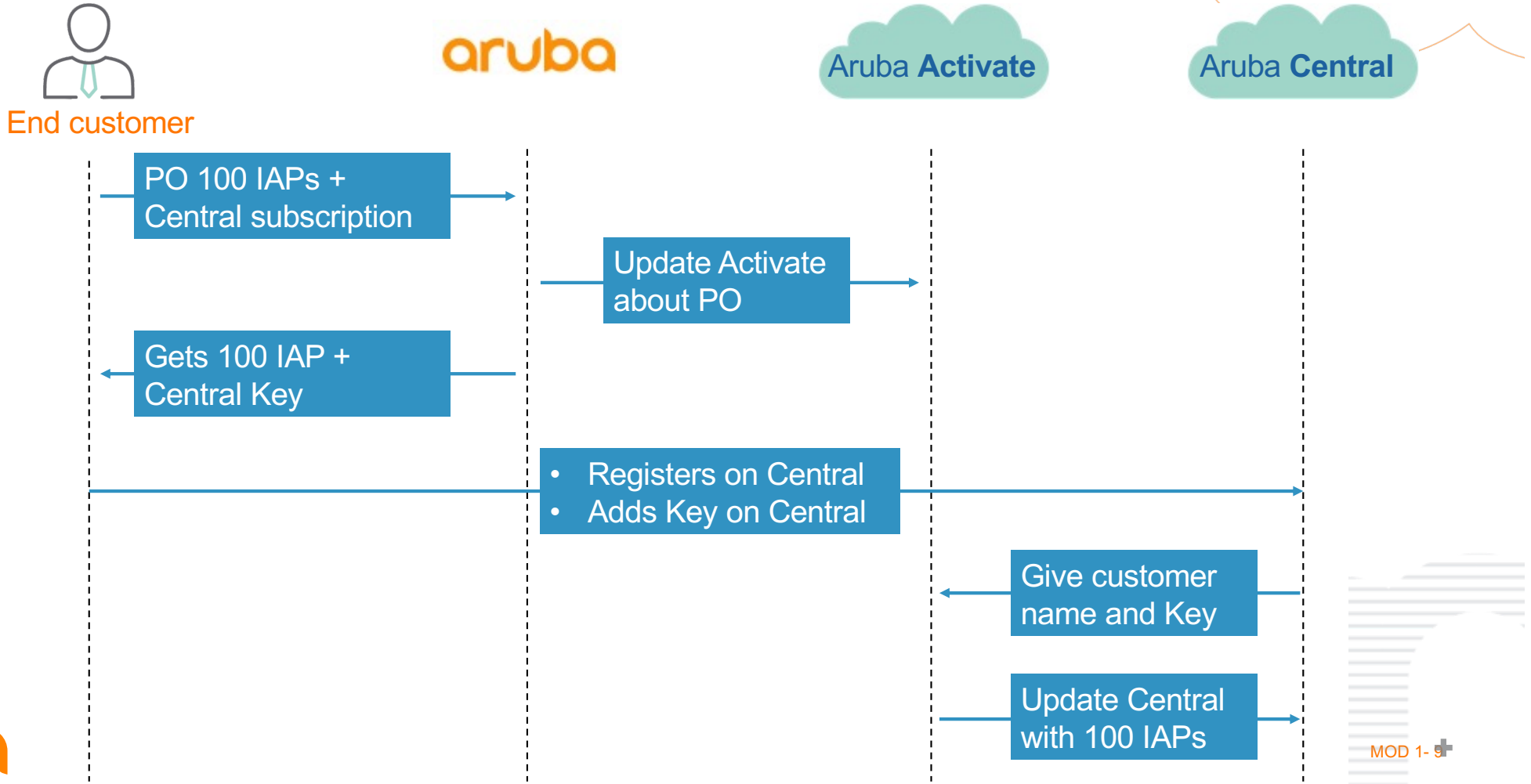
- Multi-Tenant environment
- MSP level account with power to:
  - Onboarding
  - Key management
  - Subscriptions
  - Global Management and monitoring (all tenants)

Adding Devices to Central Inventory

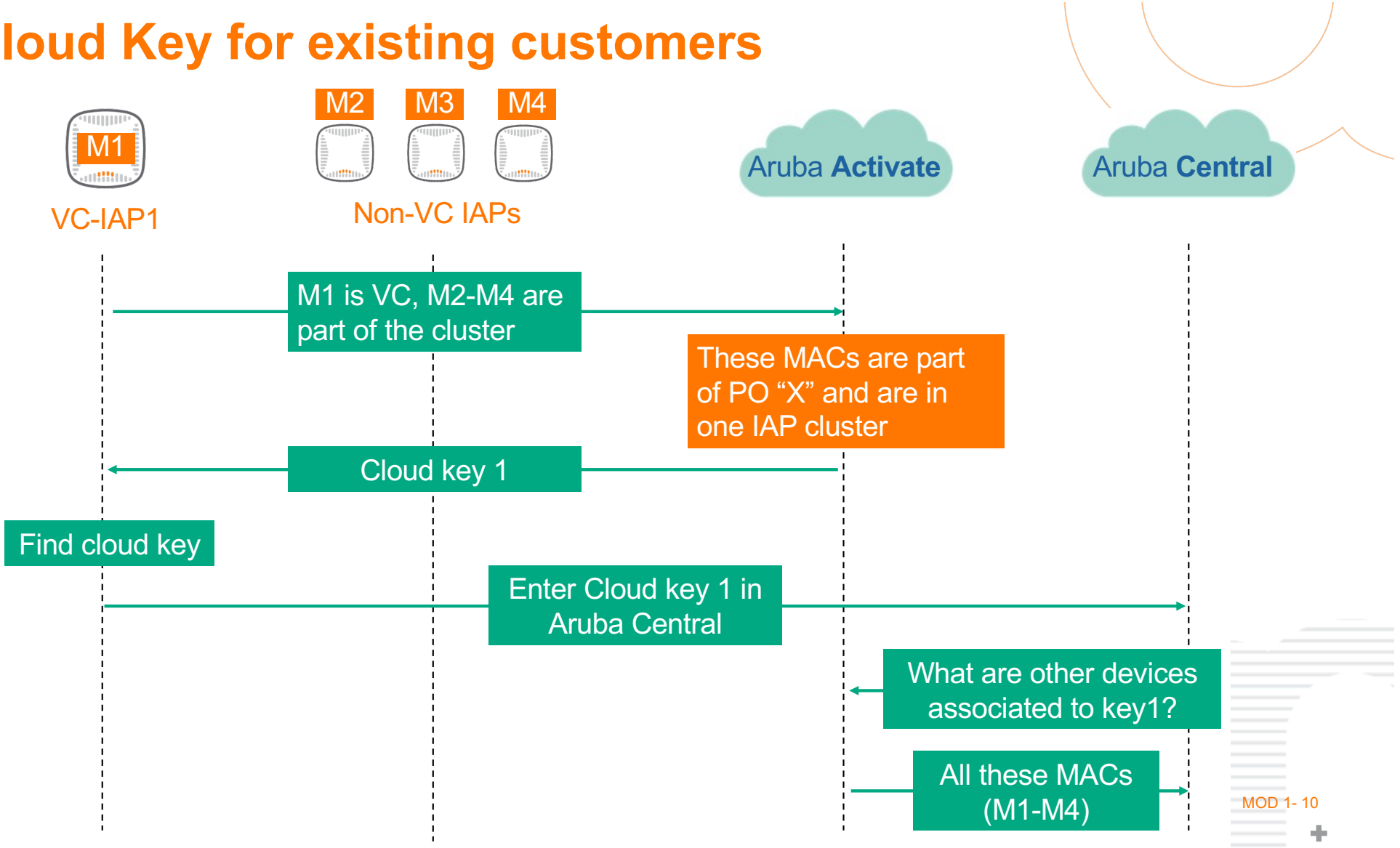
Onboarding is the process to populate the Aruba Central Device database with your devices (IAPs, Switches and Gateways)

- Zero Touch
- Use Cloud Activation Key
- Manually add MAC address and serial number
- Use Aruba Central smartphone App scanning
- Use Activate credentials

Zero Touch for a new customer

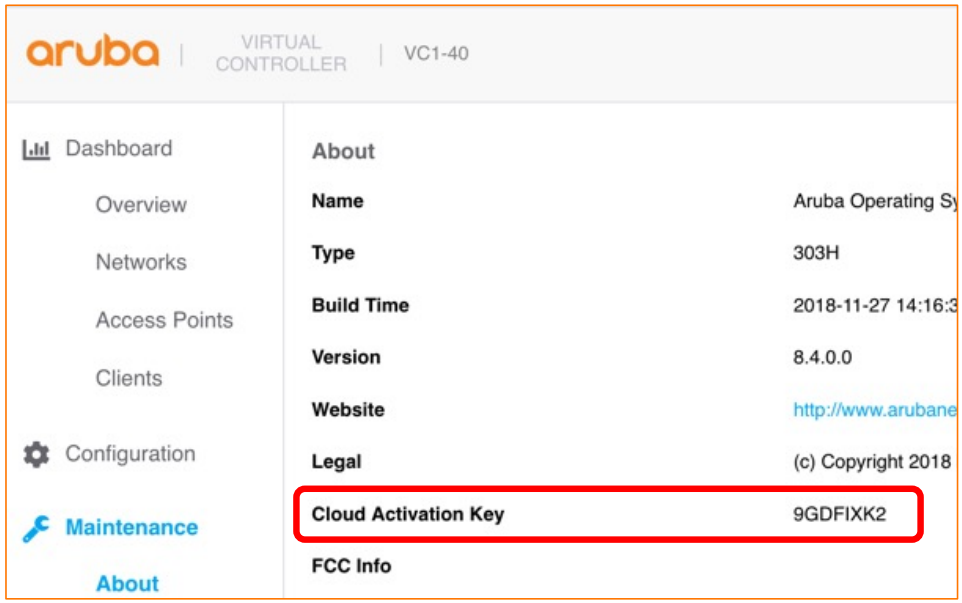


Cloud Key for existing customers



Finding Cloud Key

IAP

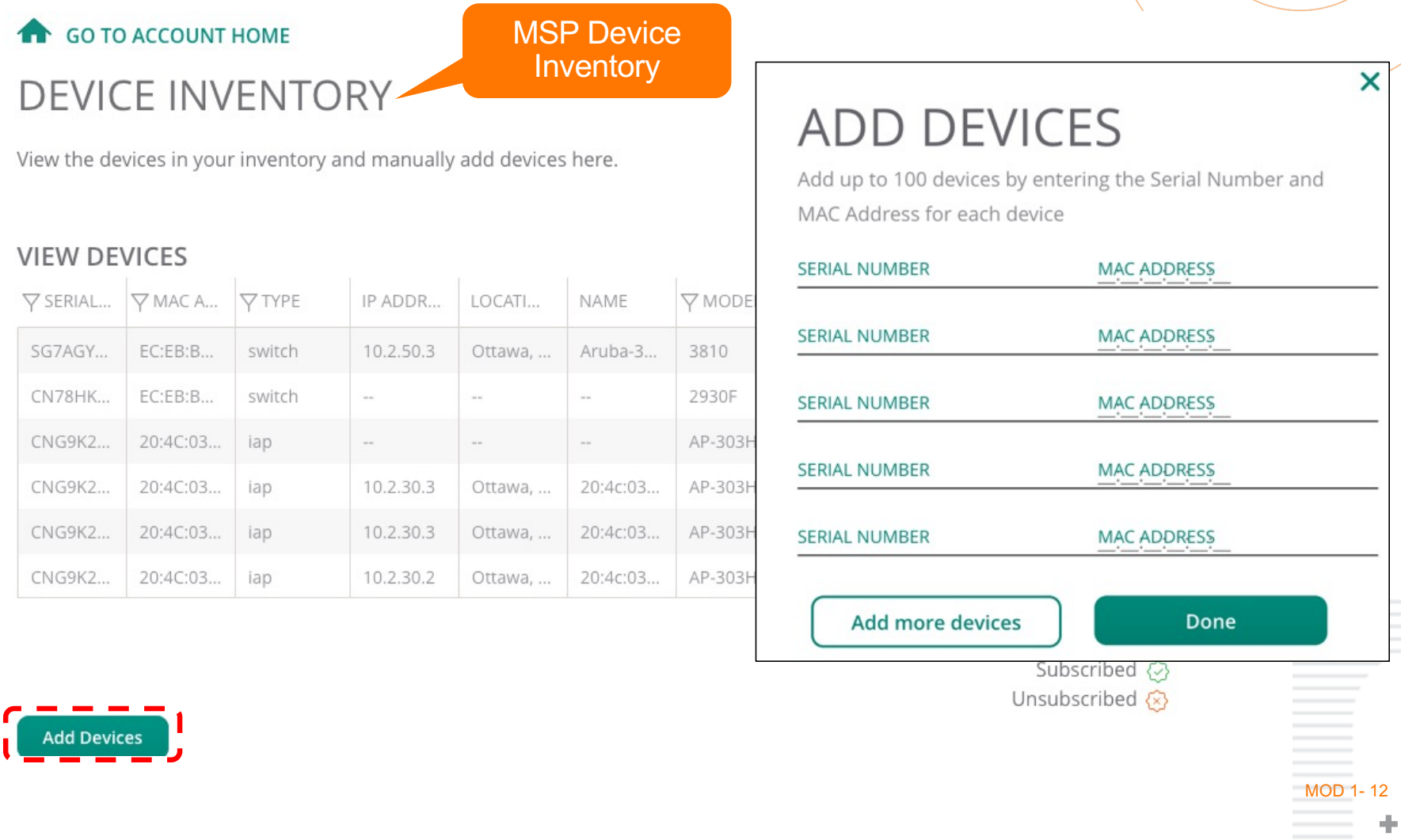



```
IAP-50-a8#  show activate

IAP MAC Address           :20:4c:03:32:aa:a8
IAP Serial Number         :CNG9K2R64T
Cloud Activation Key      :GHGMVKXI
Activate Server           :device.arubanetworks.com
Activate Status           :fail-prov-no-shipped
Provision interval        :5 minutes20:4c:03:32:aa:a8#
```

ArubaOS- Switches

```
HP-2920-24G-PoEP(config)# show activate provision

Configuration and Status - Activate Provision Service
Activate Provision Service    : Enabled
Activate Server Address       : device.arubanetworks.com
Activation Key                : Z3K5KKW2
```

Manually Added Devices



Smartphone Apps

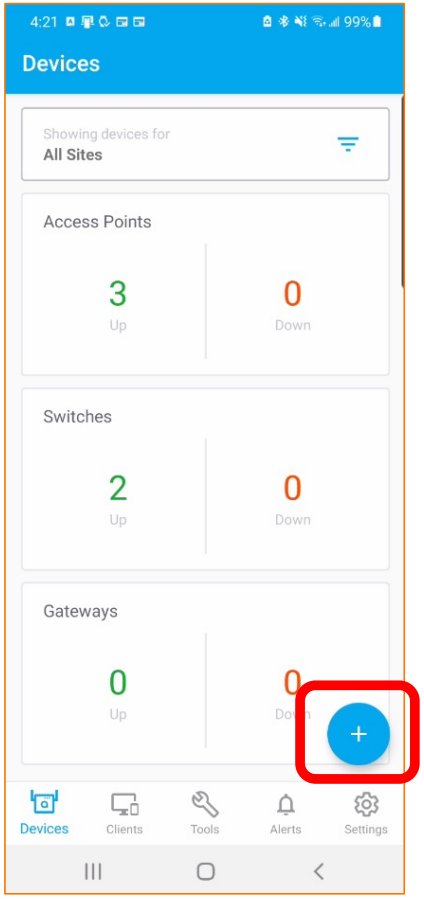
Aruba Central

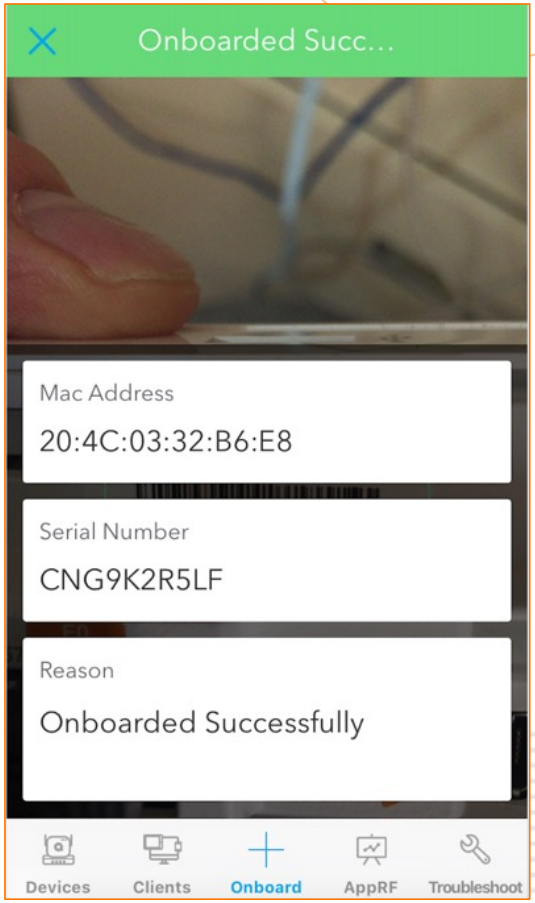
- Help to **manage** and **monitor** the network
- Used by administrators

Aruba Installer

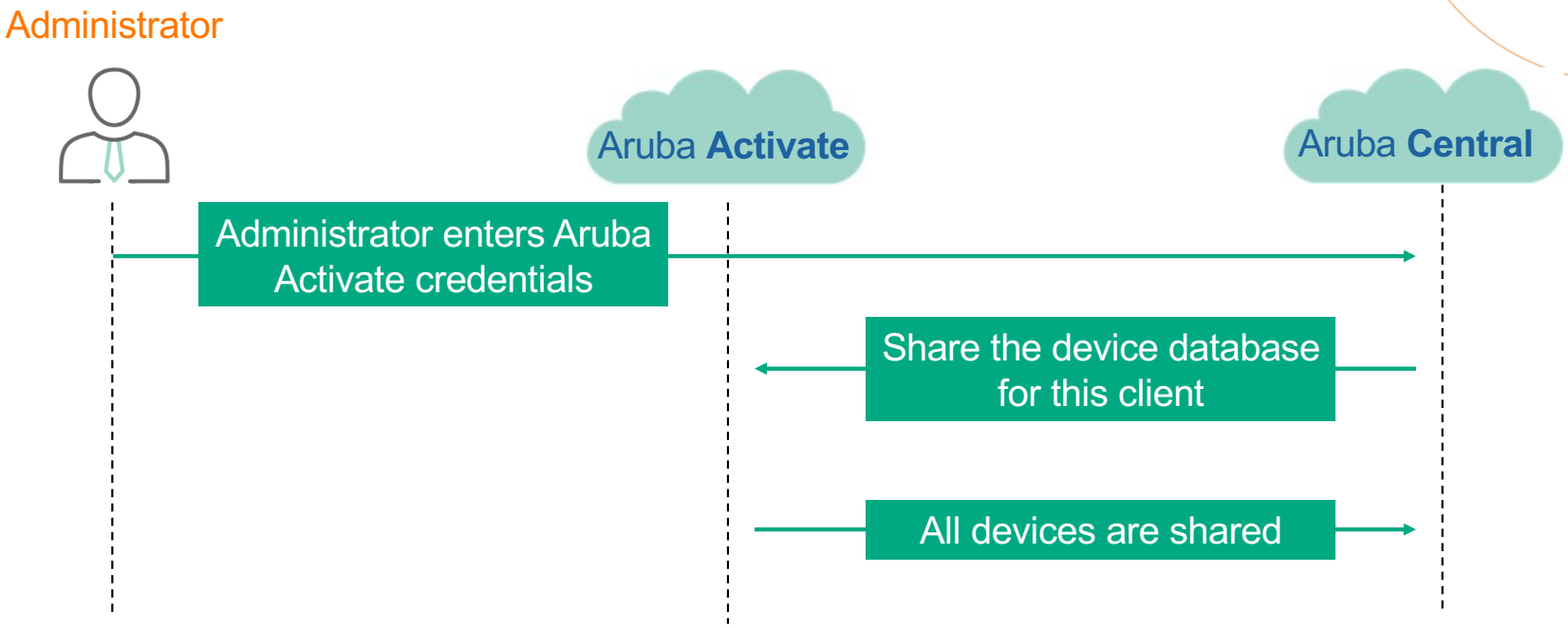
- Application that is used to **onboard** new devices
- Used by 3rd party installers
- Administrator has full control of the sites to be onboarded

Aruba Central App – Onboarding process





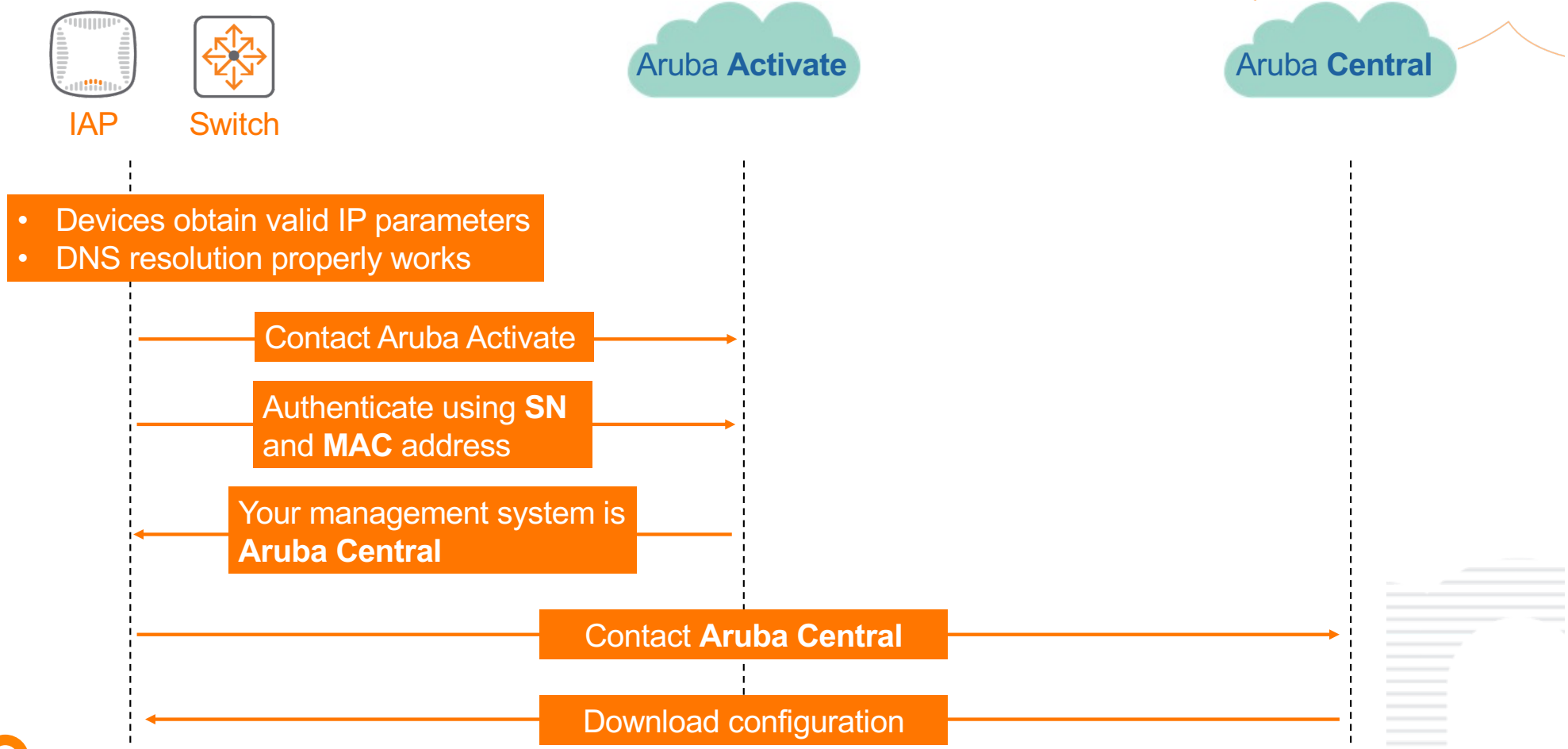
Activate Credentials



- Use it on **migration** from Aruba AirWave or Standalone AP deployment to Aruba Central
- **All** devices from Activate will be imported into Aruba Central
- This option can be used **one** time

Interaction with Aruba Activate

Interaction with Aruba Activate



Keys and Subscriptions

Aruba Central Licensing – 2.5.3

Licensing Help

Switching Licenses

- **Foundation** License
  - Support for AOS-CX and ArubaOS switches

WLAN Gateway Licenses

- **WLAN Gateway** License
  - Used in AOS10
  - Enable the features for a WLAN Gateway (previously known as Mobility Controller)

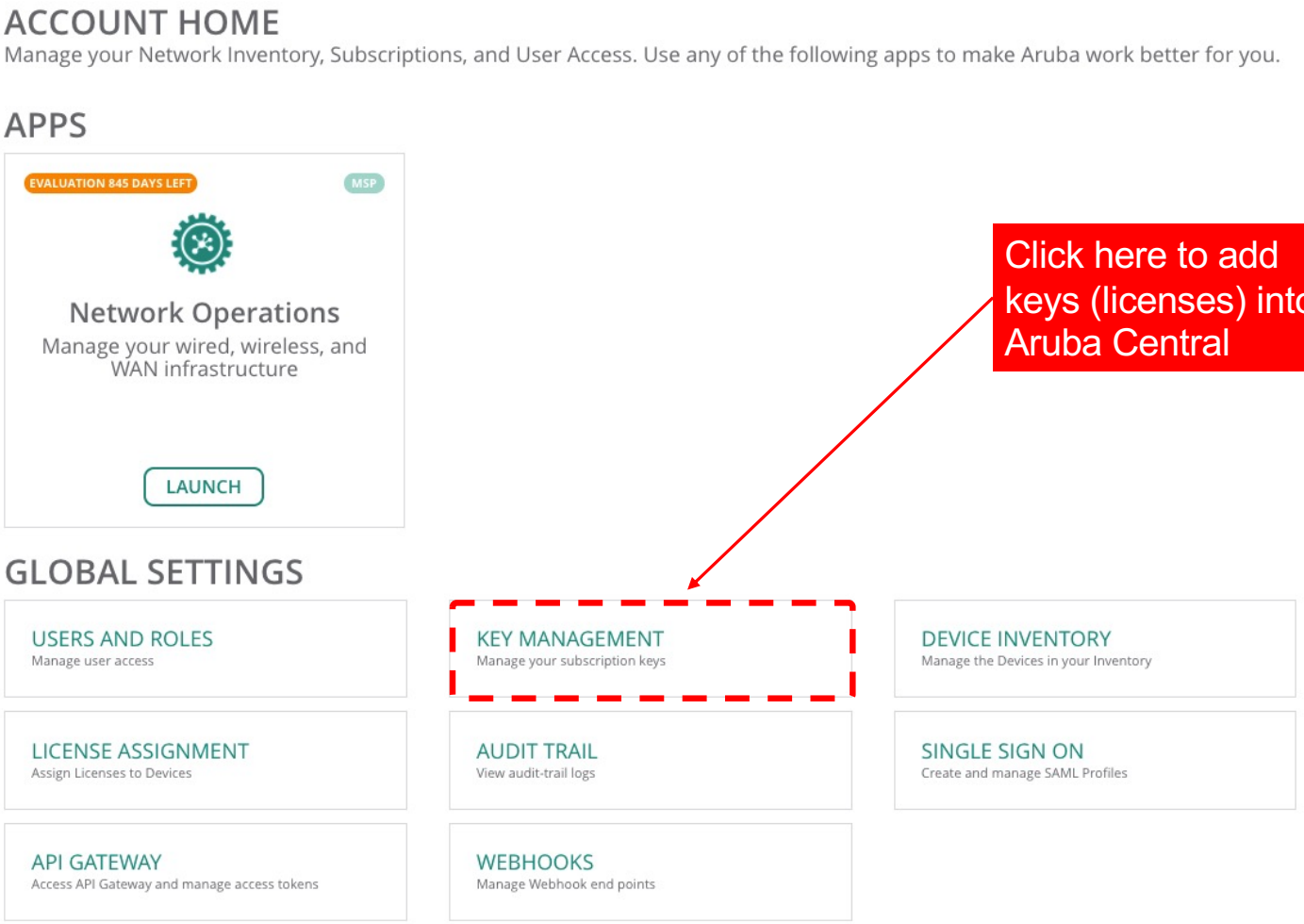
Access Point Licenses

- **Foundation** License
  - Used for Instant APs and new Access Points running AOS10
- **Advanced** License
  - Same features as Foundation plus: AI (wireless quality), UCC, Live upgrade and Streaming API

SD-Branch Licenses

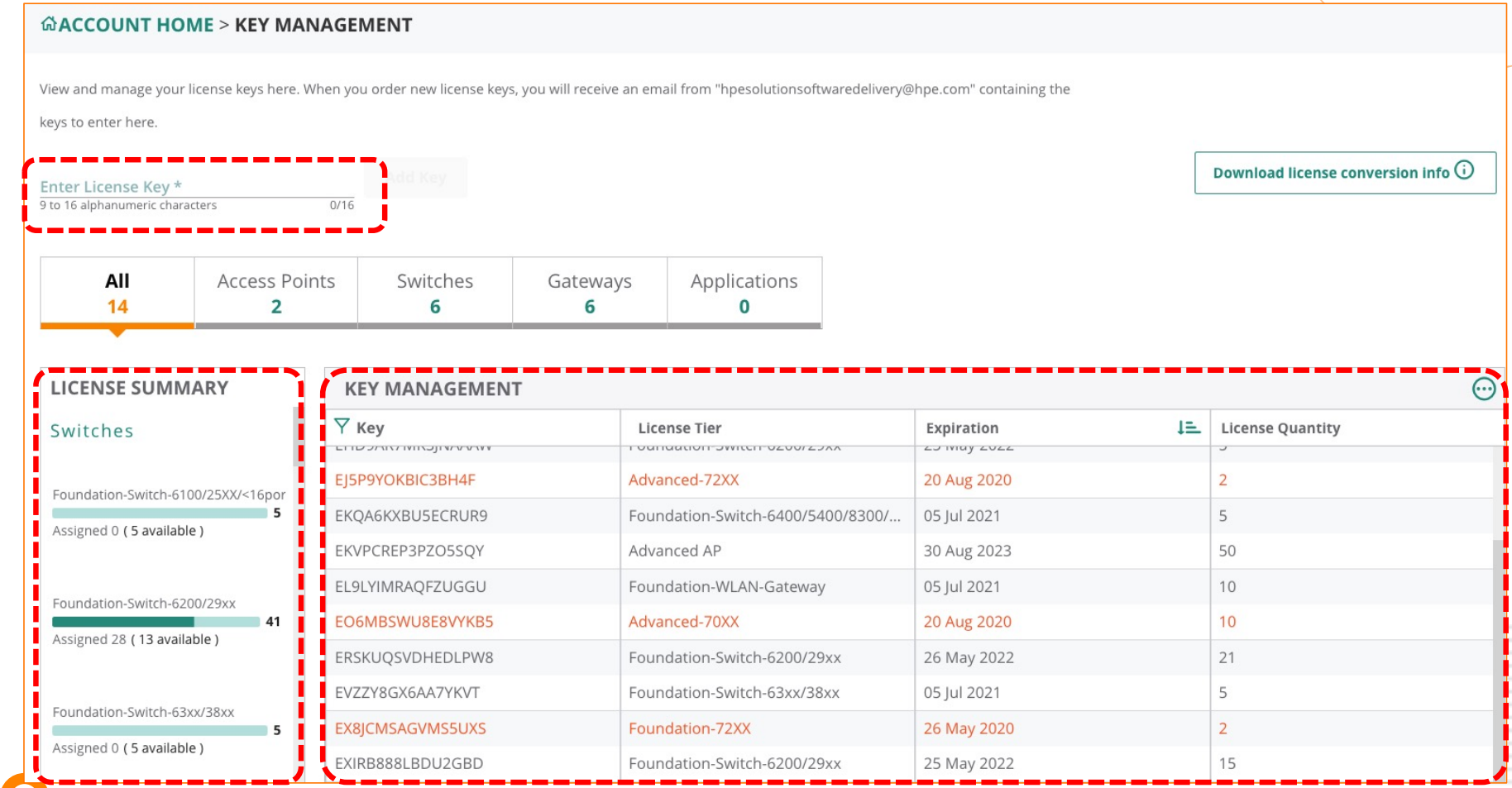
- **Foundation** License
  - VPNC and SD-Branch Gateway
- **Foundation based** License
  - Limited to 75 MAC address
  - Suitable for micro branches
- **Advanced** License
  - Streaming API
  - SaaS express
- **Foundation, Foundation based and Advanced with Security** License
  - IDS/IPS
  - Antimalware
- **Virtual Gateway** License
  - AWS, Azure deployments
  - ESXi deployments

Key Management

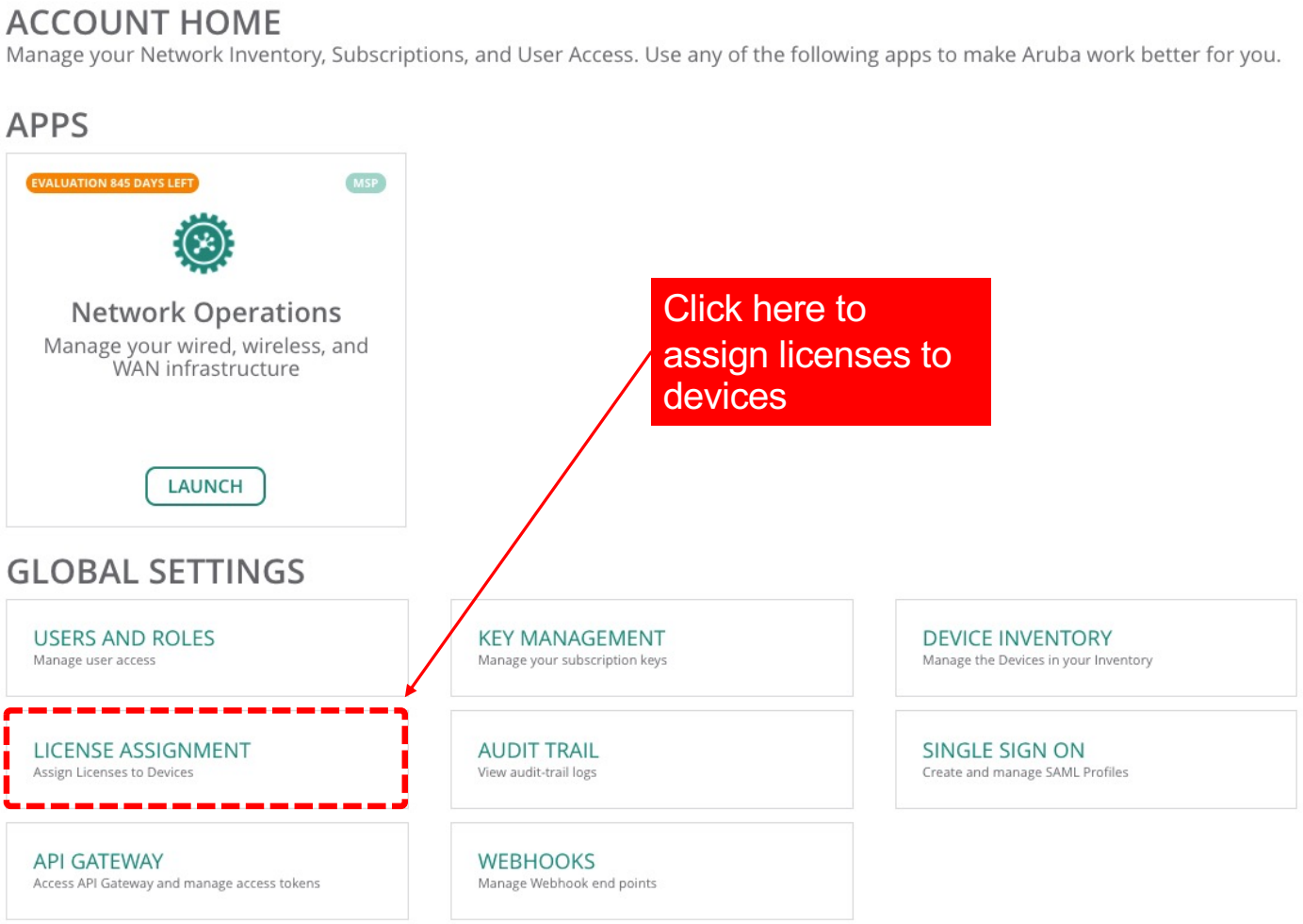


Click here to add keys (licenses) into Aruba Central

Subscription Keys (MSP or Enterprise Account)

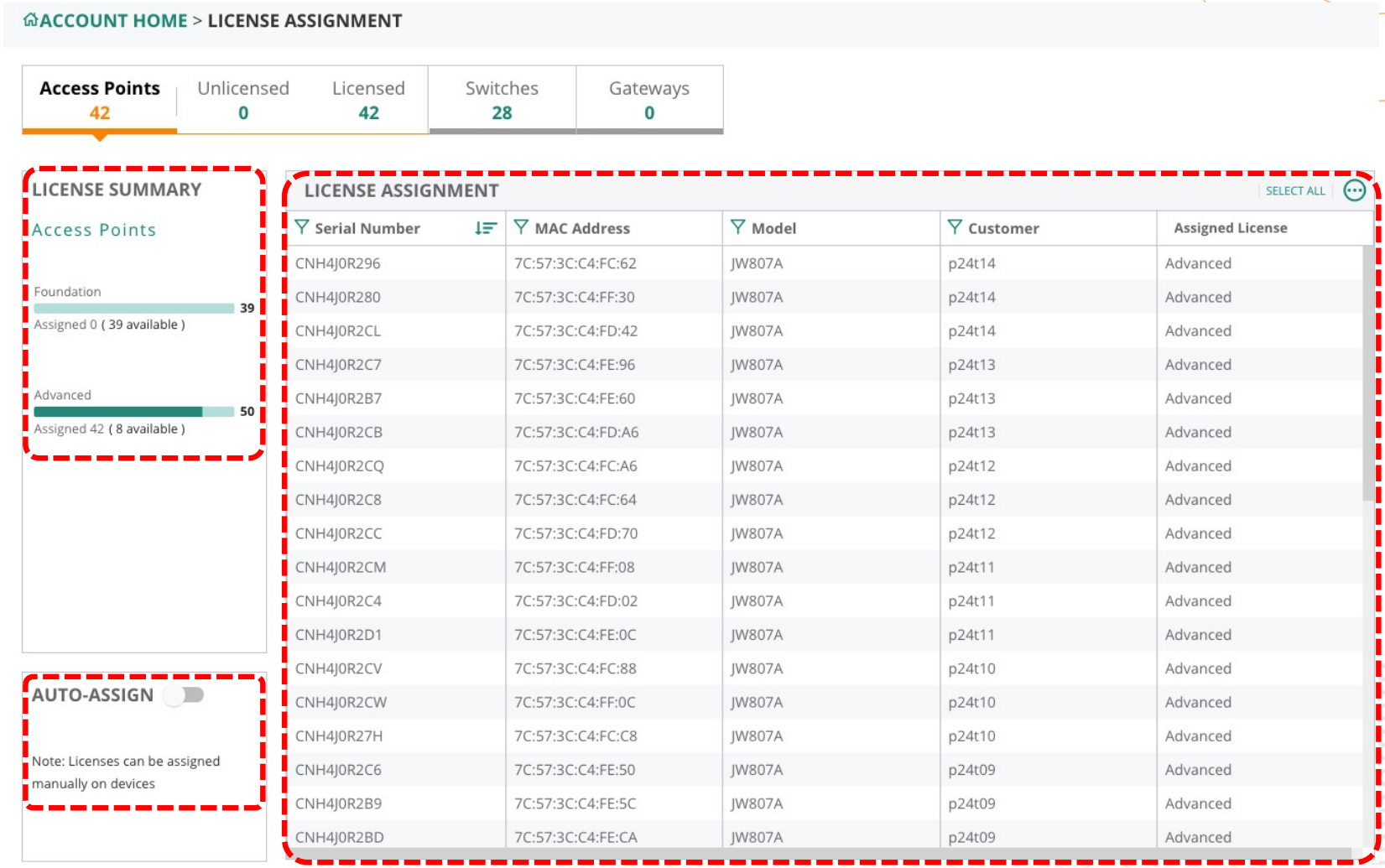


Subscription Assignment



Click here to assign licenses to devices

Subscription Assignment



Onboarding Troubleshooting

IAP Troubleshooting – Normal behavior

```
AP1-B2# show activate status

IAP MAC Address           :38:17:c3:c7:8b:fe
IAP Serial Number         :CNFPJ0R0S4
Cloud Activation Key      :KKGYOGLB
Activate Server           :device.arubanetworks.com
Activate Status           :success
Aruba Central Server      :device-prod2.central.arubanetworks.com
Last provision time       :2021-05-04 23:14:32
Provision interval        :10080 minutes

AP1-B2# show ap debug cloud-server

IAP mgmt mode                 :athena-mgmt
cloud config recved           :TRUE
autojoin mode                 :disable
state diff                    :disable
Device Cert status            :SUCCESS
Device info send              :SUCCESS
Aruba Central server                  :device-prod2.central.arubanetworks.com
Aruba Central server path             :/ws
Aruba Central proxy server            :None
Aruba Central redirect from           :device-prod2.central.arubanetworks.com
Aruba Central Protocol                :WSS
Aruba Central uptimes                 :1d:14h:0m:0s
Aruba Central status                  :Login_done
```

Activate recognized the IAP and provides redirection to Aruba Central

The IAP receives the configuration from Aruba Central

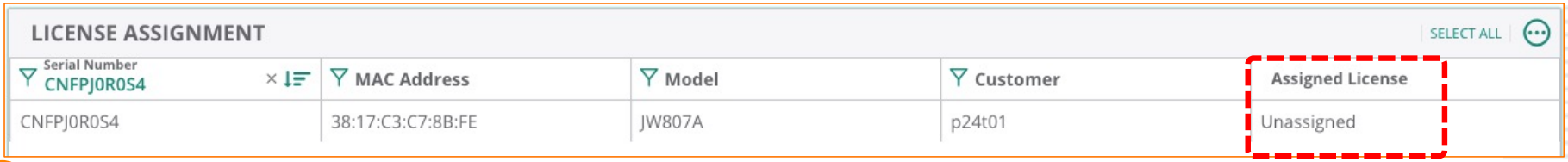
Web Secure Socket (HTTPS)

IAP Troubleshooting – No license assigned

```
AP1-B2# show activate

IAP MAC Address           :38:17:c3:c7:8b:fe
IAP Serial Number         :CNFPJ0R0S4
Cloud Activation Key      :KKGYOGLB
Activate Server           :device.arubanetworks.com
Activate Status           :fail-prov-no-rule
Last provision time       :2021-05-04 23:14:32
Provision interval        :2 minutes

AP1-B2# show ap debug cloud-server

IAP mgmt mode             :local-mgmt
cloud config recved       :TRUE
autojoin mode             :disable
state diff                :disable
Device Cert status        :SUCCESS
```

This output is shown when the administrator has not assigned a License to the IAP

Since Central rejects the connection due to a License problem, the device is managed locally



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Central Configuration Concepts

A comparison of key technology solutions and philosophies

Central Groups

Groups

- **Container for Monitoring, management and maintenance**
- Help to scale the solution (no need to individually configure devices)
  - Individual devices can be configured on device level (overrides group configuration)
- In Central you can use a single group for IAPs, Switches and Gateways
- By default, all devices are placed in **default** group

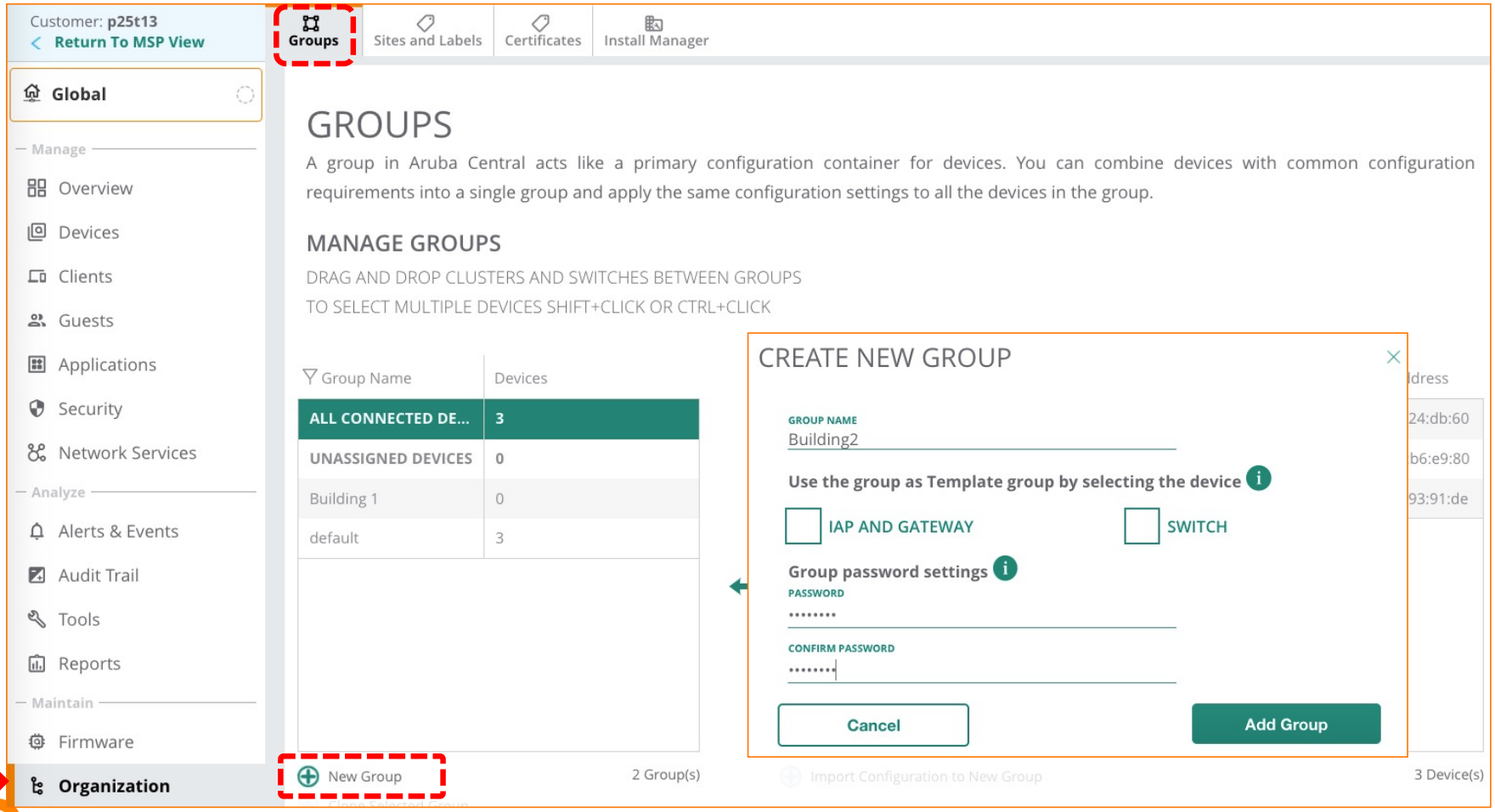
Group: default

Instant AP	Switch	Gateway
• Guest SSID	• VLAN 99 • SSH • dot1x auth	• Uplink INET1 • Uplink INET2 • PBR policy

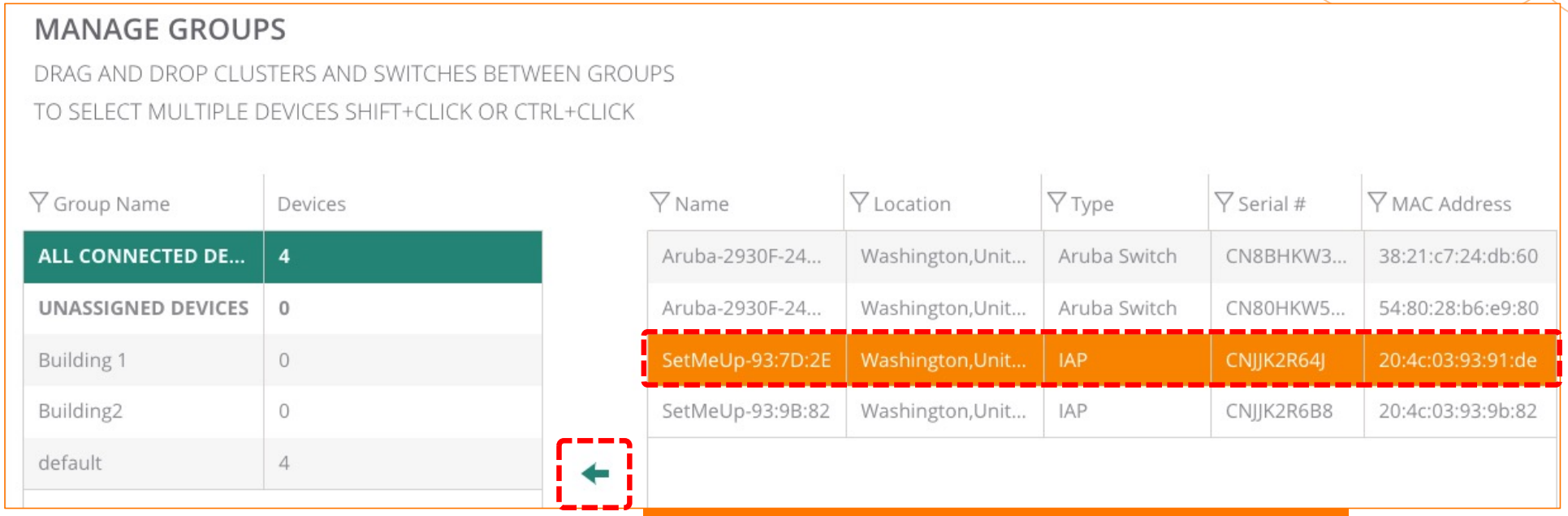
Group: Building1

Instant AP	Switch	Gateway
• Guest SSID • Employee SSID • Voice SSID	• OSPF • VLAN 10-20 • dot1x auth • MAC auth	• Uplink INET1 • Uplink INET2 • VPNC config

Group Creation



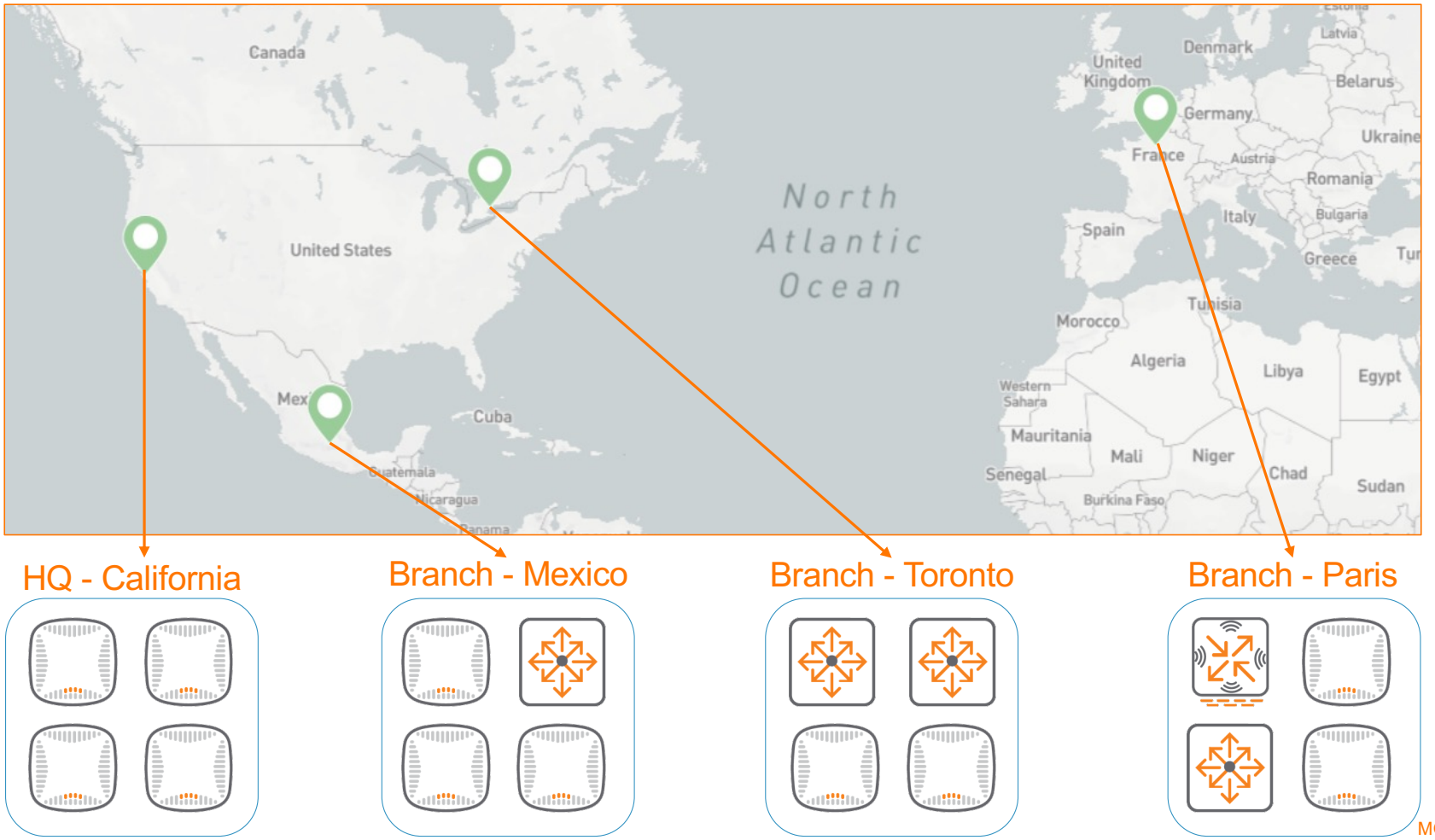
Create Sites – Device mapping



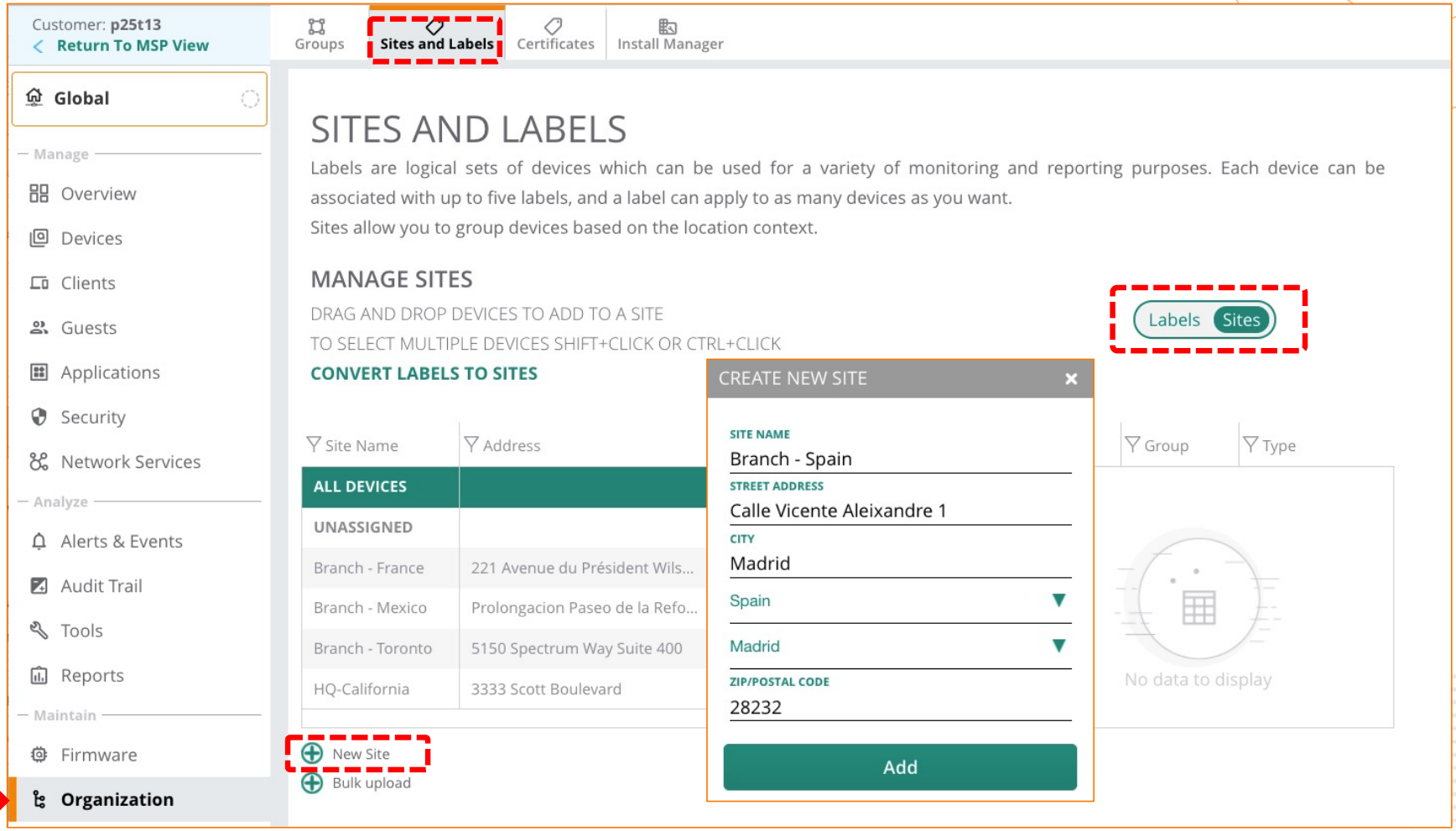
1. Select your devices
2. Drag and drop them into the Group
3. Devices clean their configuration
4. Devices then reboot
5. Devices download the group configuration

Sites

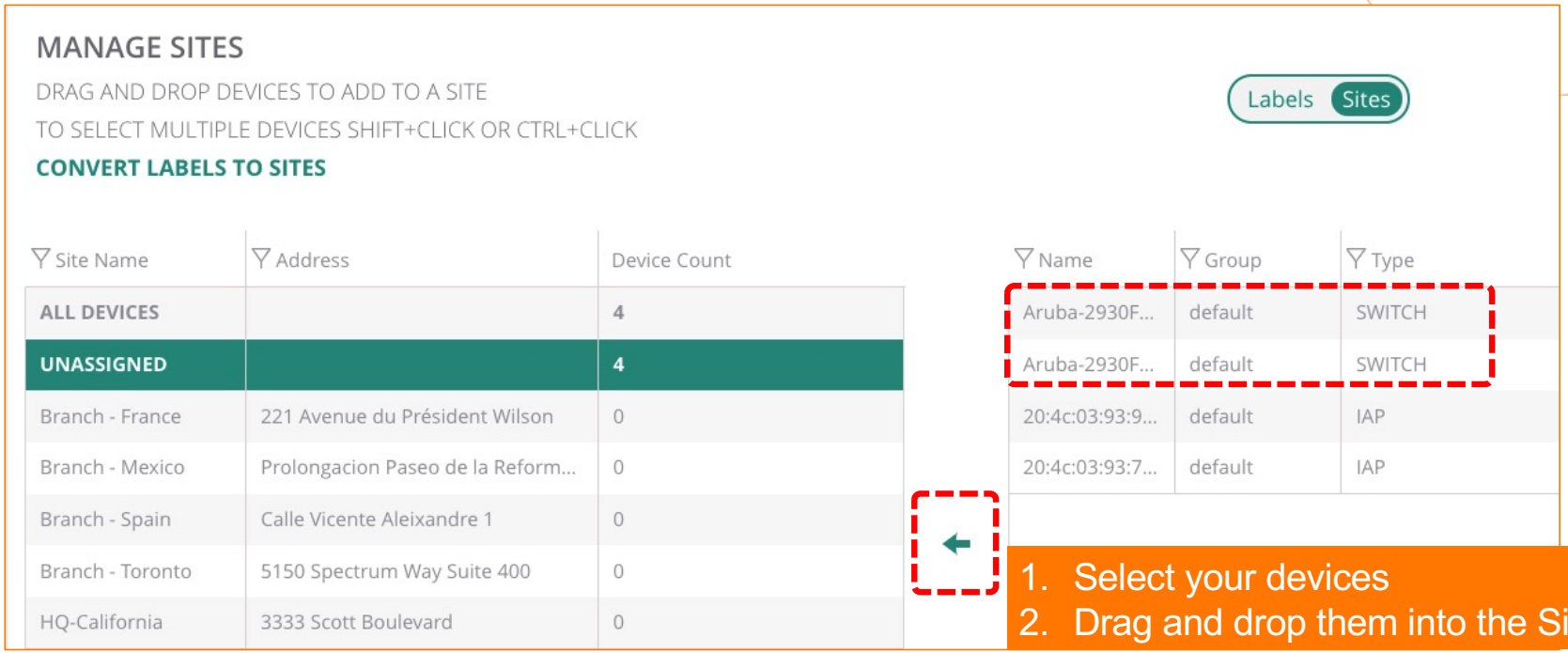
Sites


Canada
United States
North Atlantic Ocean
Cuba
Guatemala
Nicaragua
Panama
United Kingdom
Denmark
Latvia
Belarus
Germany
Ukraine
France
Austria
Romania
Italy
Bulgaria
Spain
Greece
Tunisia
Morocco
Algeria
Libya
Egypt
Western Sahara
Mauritania
Mali
Niger
Chad
Sudan
Senegal
Burkina Faso
HQ - California
Branch - Mexico
Branch - Toronto
Branch - Paris

Create Sites



Create Sites – Device mapping

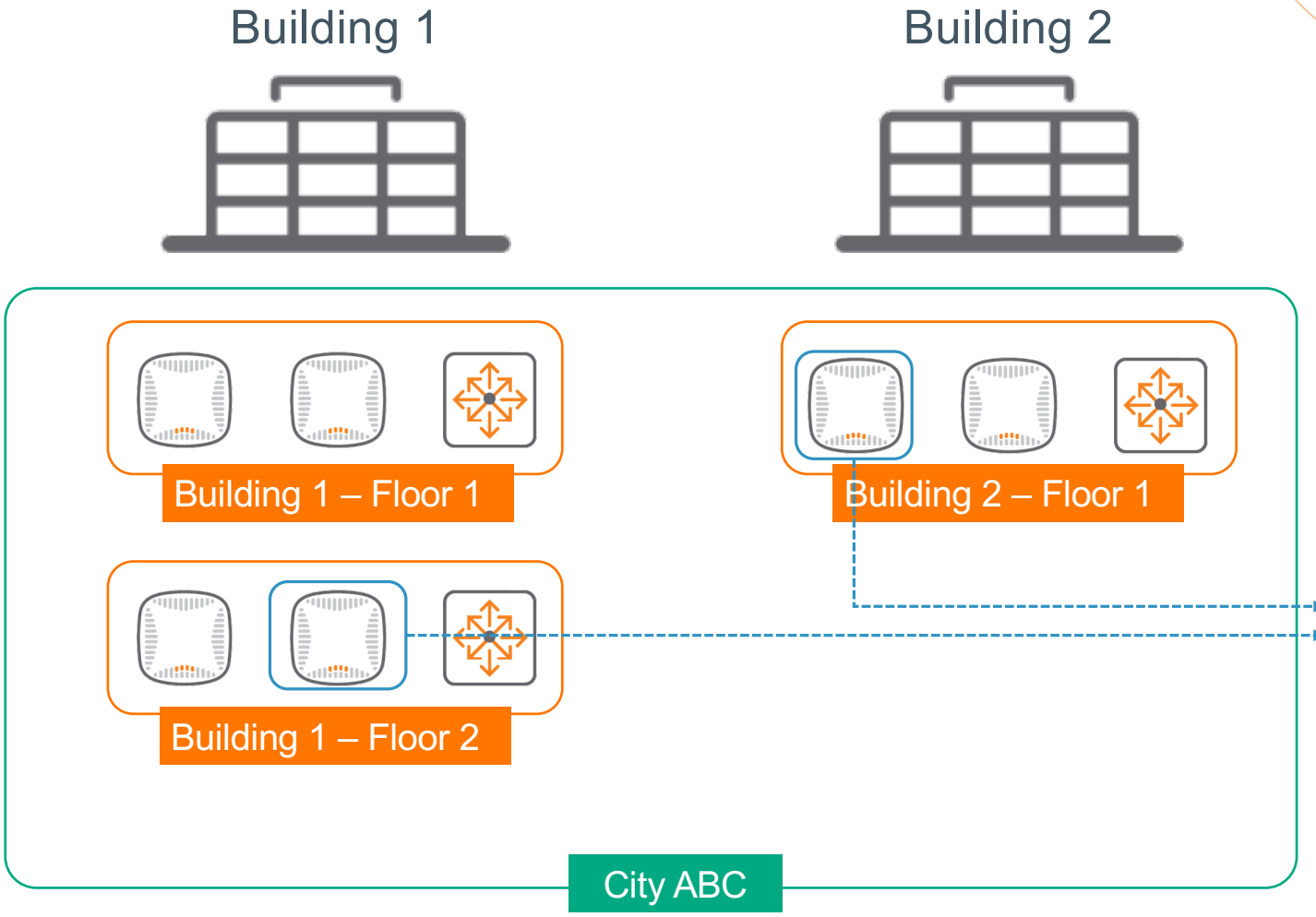


1. Select your devices
2. Drag and drop them into the Site

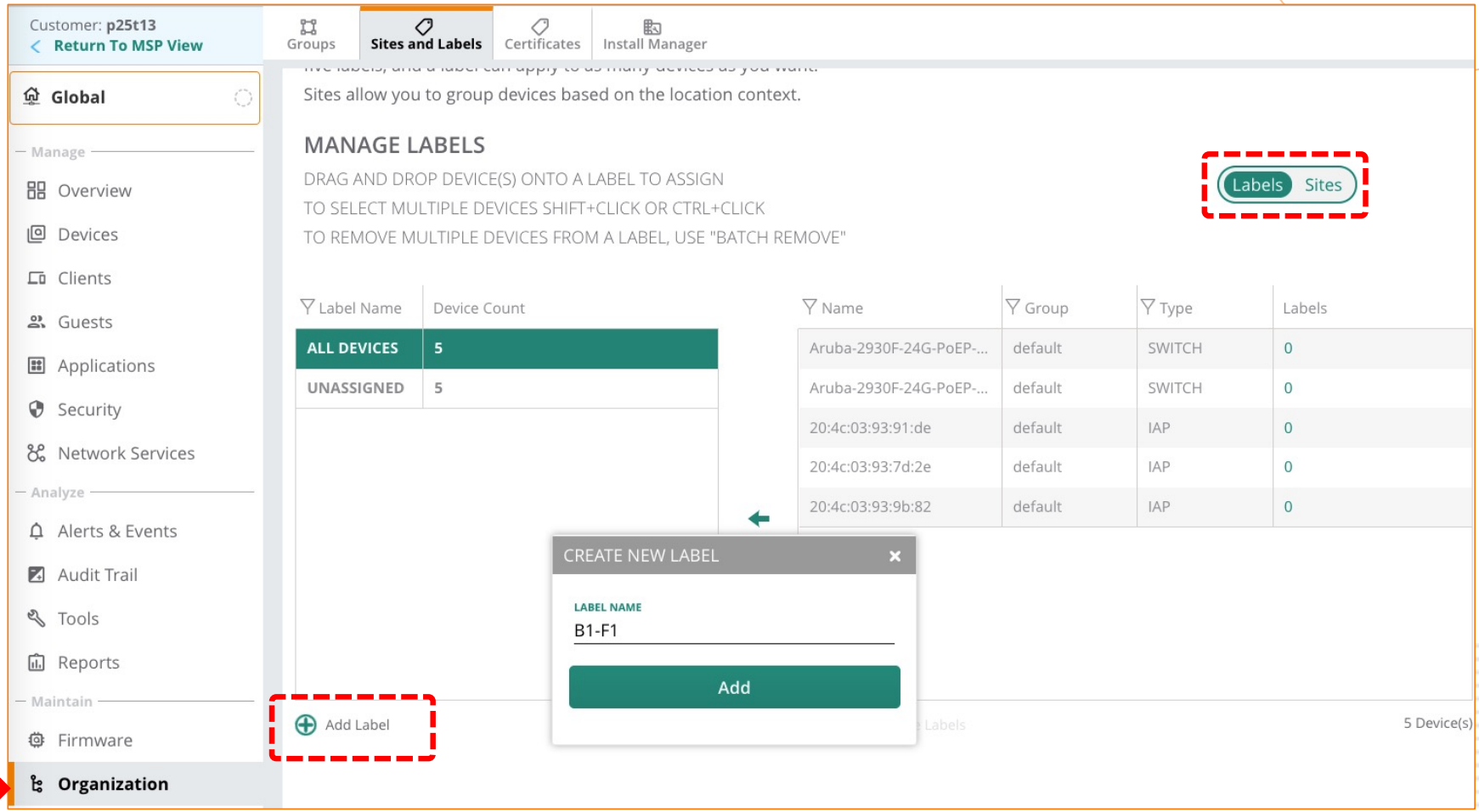
New site - ”Branch – Spain” appears now in Network Health page

Labels

Labels


Building 1
Building 2
Building 1 – Floor 1
Building 2 – Floor 1
Building 1 – Floor 2
Conference-APs
City ABC

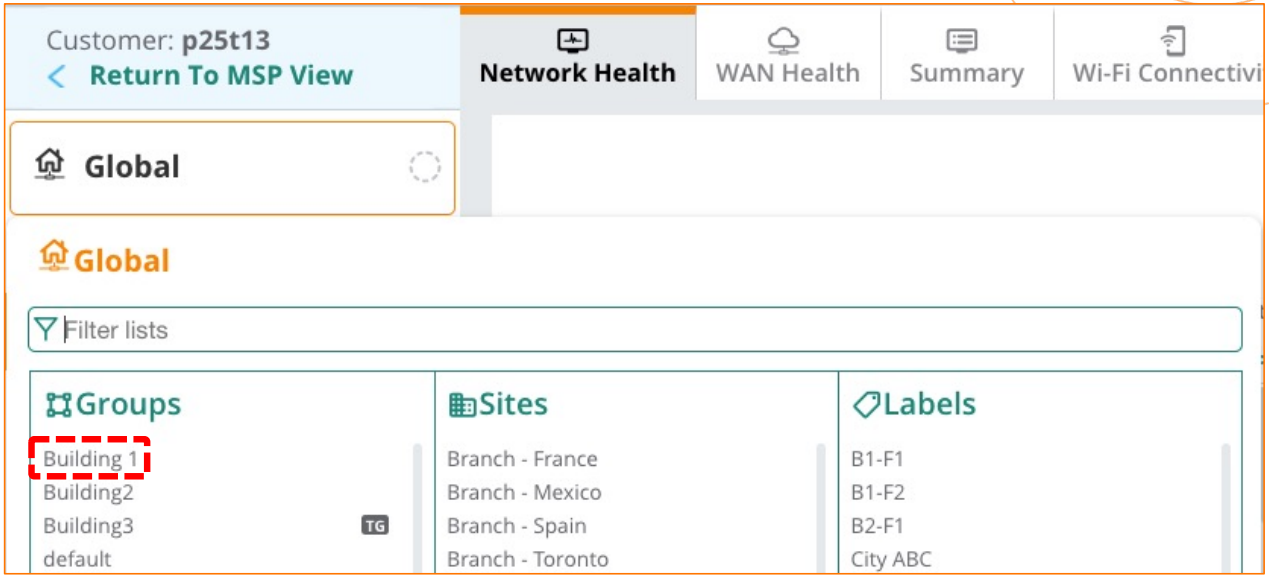
Create Labels



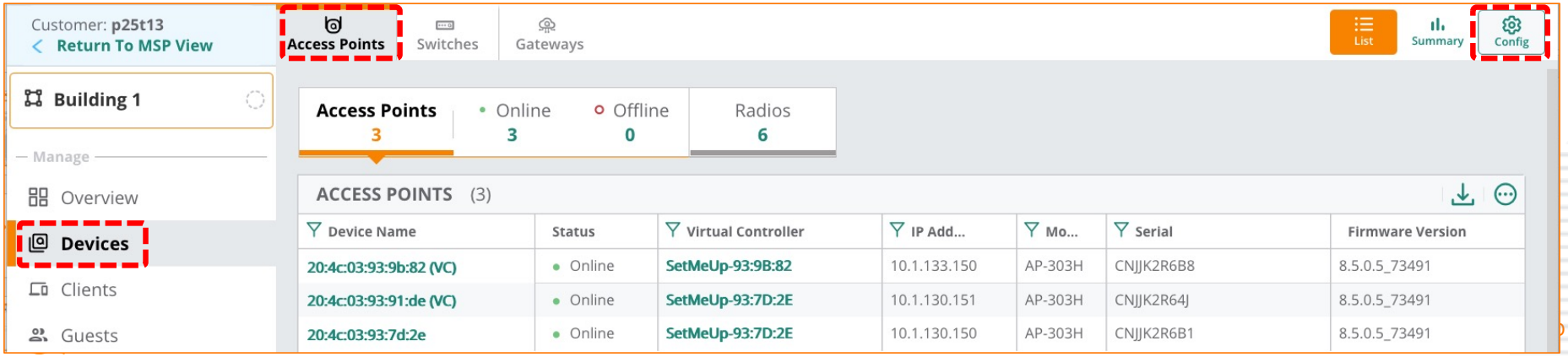
IAP Configuration

IAP Configuration

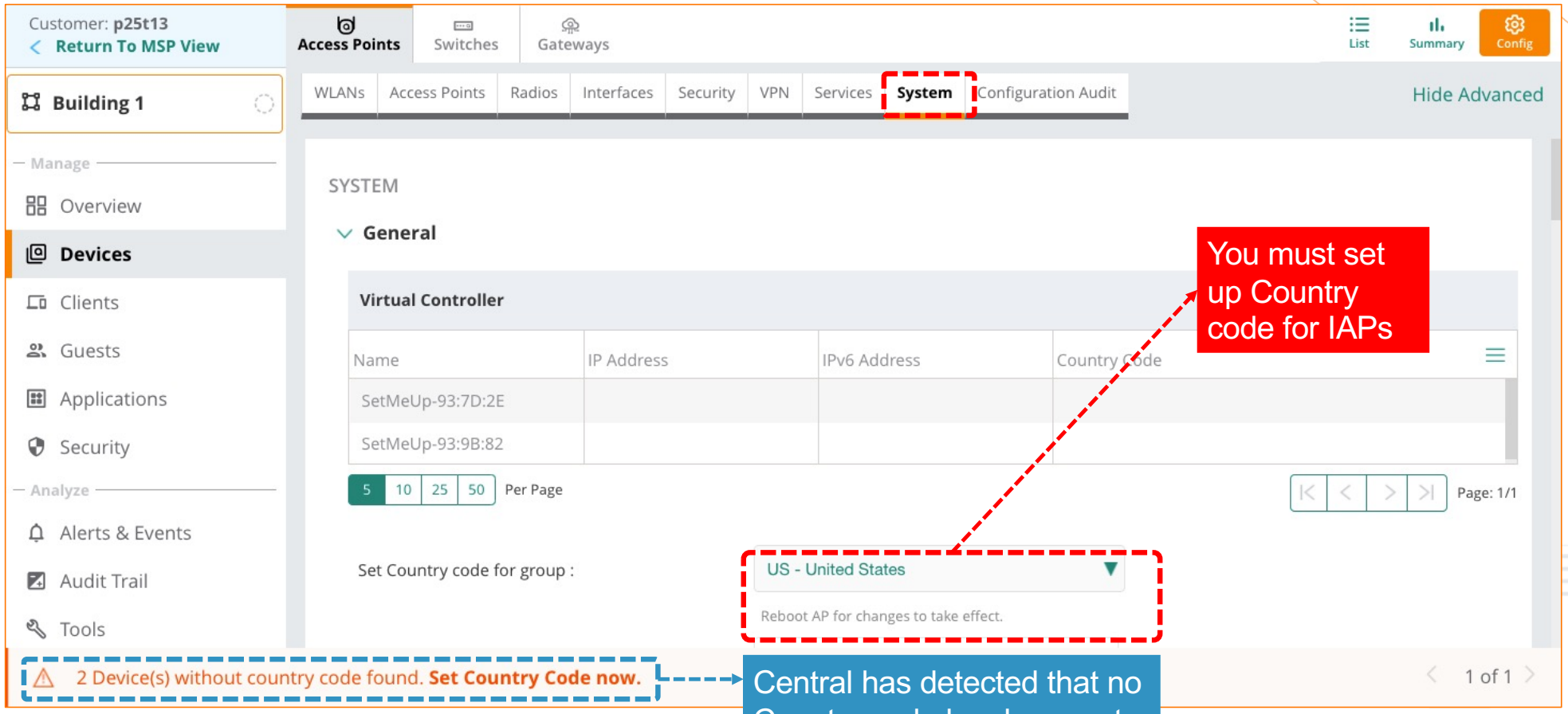
Step 1: Select your Group



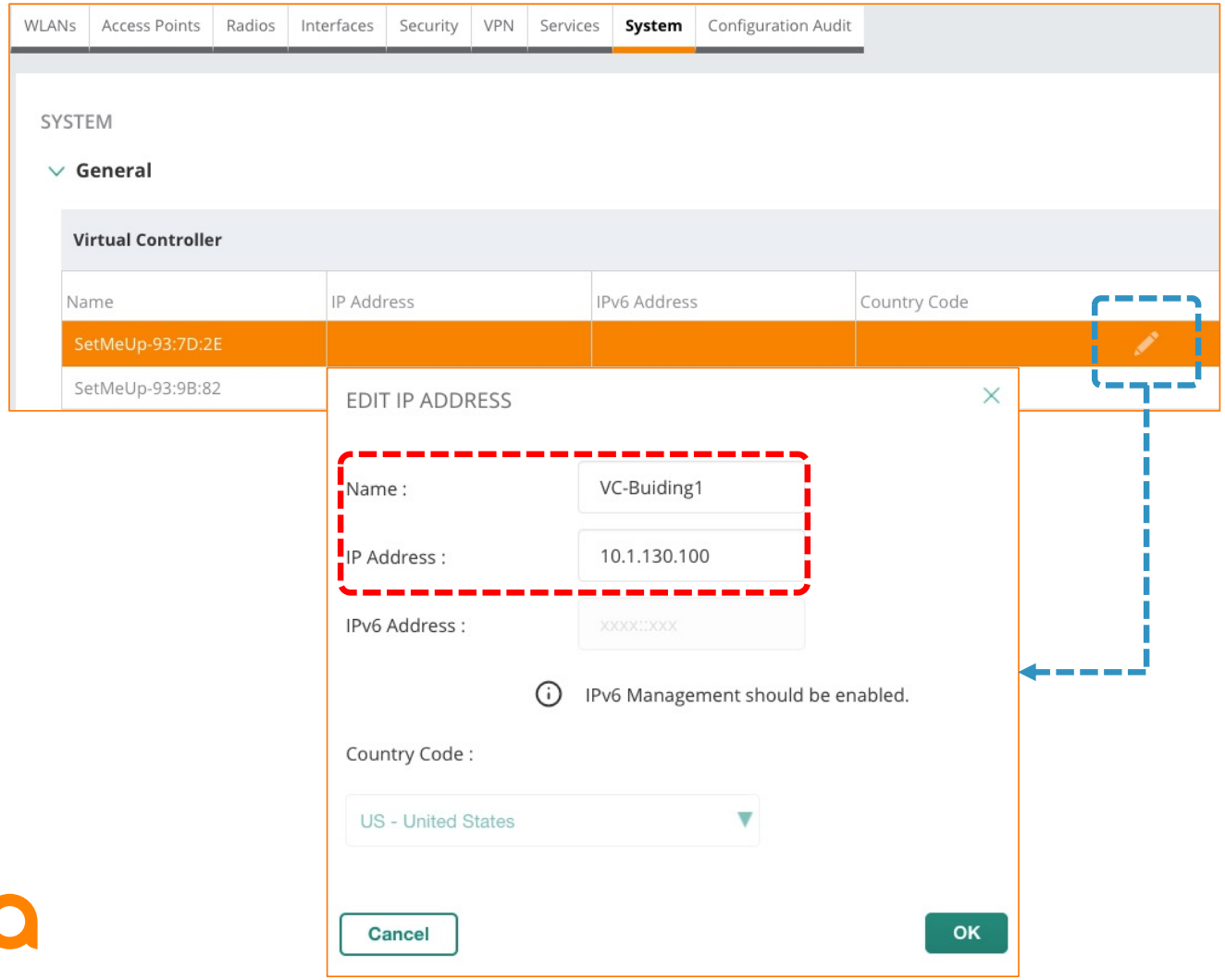
Step 2: Navigate to Devices → Access Points and click on “Config” icon



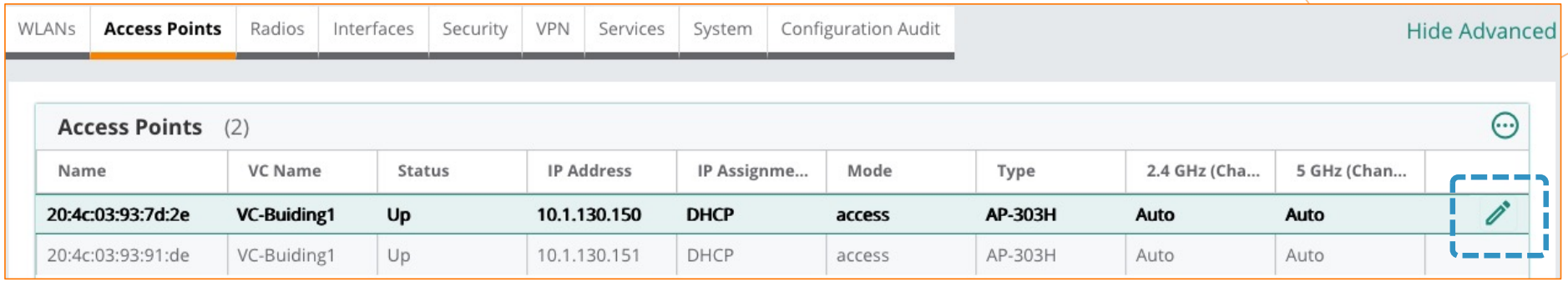
VC Cluster Configuration – Set Country Code

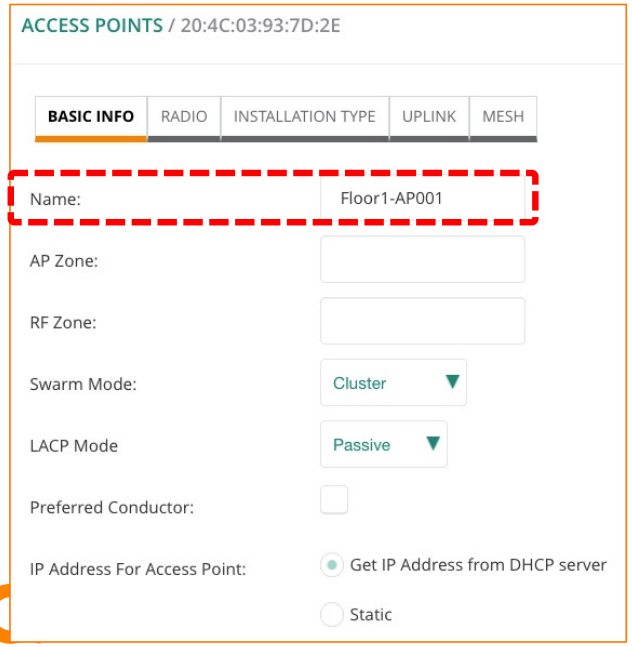


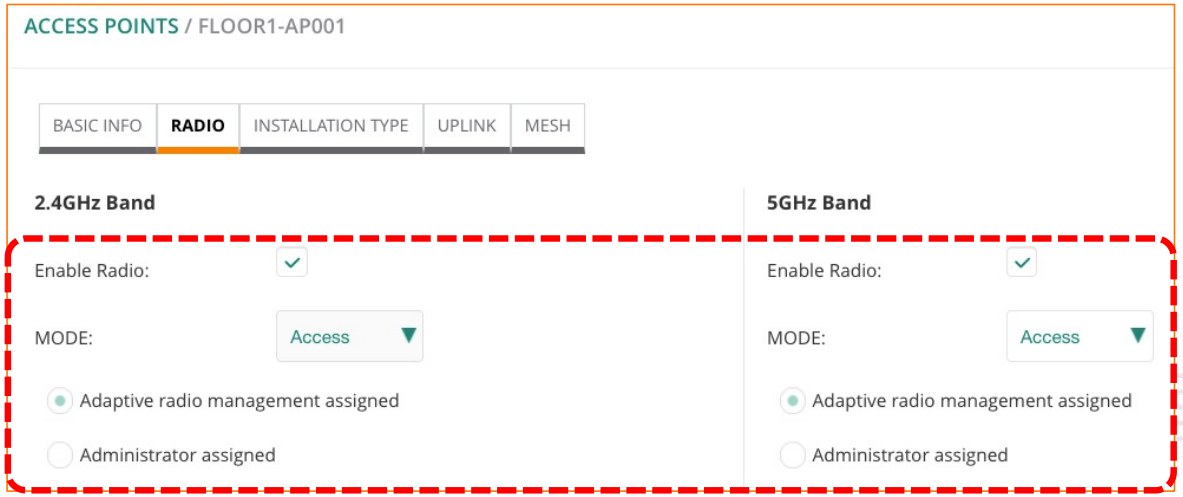
VC Cluster Configuration – Cluster name and IP



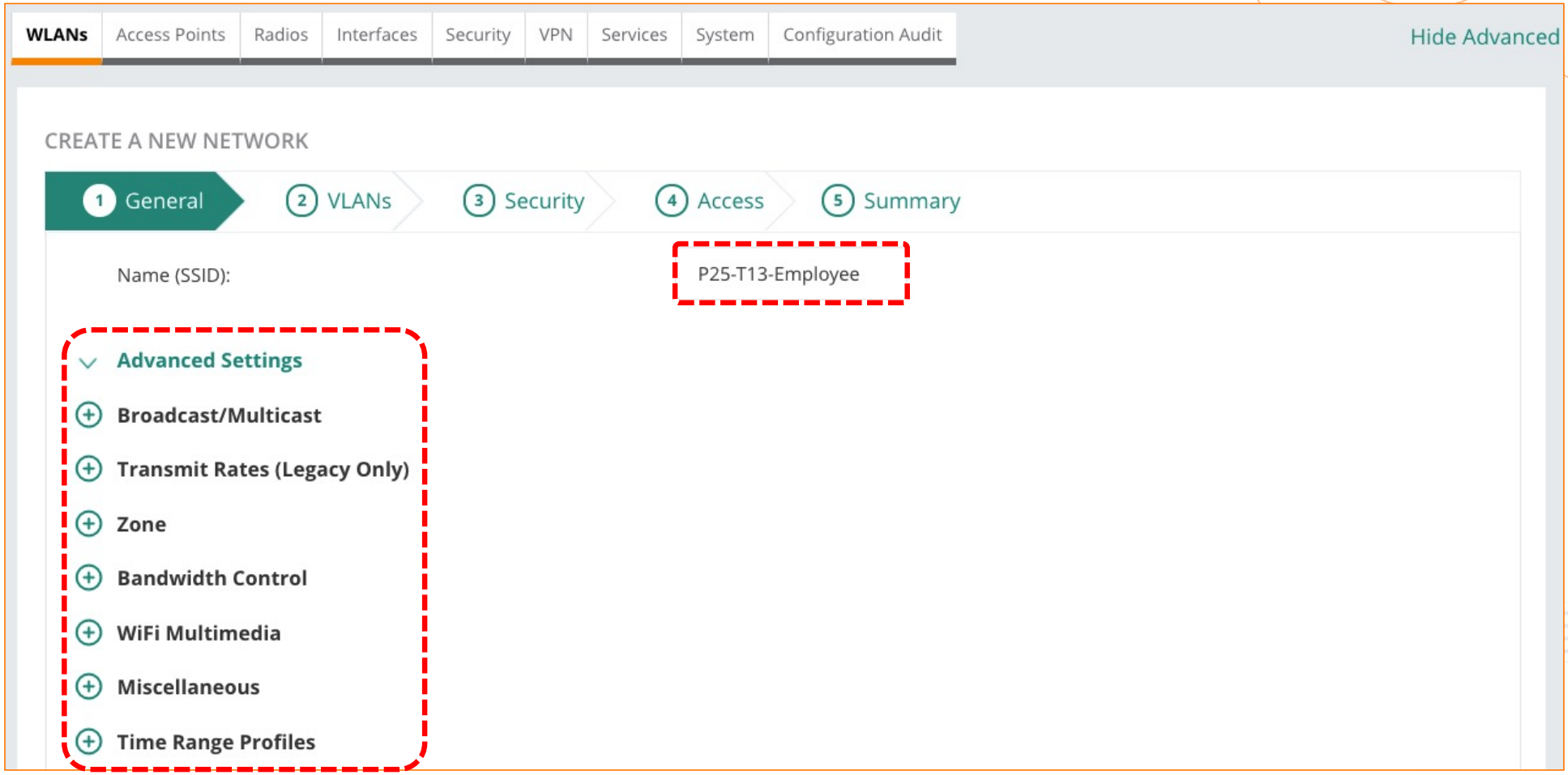
AP Configuration – Set name and Radios







WLAN Configuration – Wizard



WLAN Configuration – Wizard

General

- SSID definition
- Advanced features

VLANs

Client IP and VLAN assignment

- IAP assigned
  - Internal VLAN
  - Custom
- External DHCP
  - Native VLAN
  - Static
  - Dynamic

Security

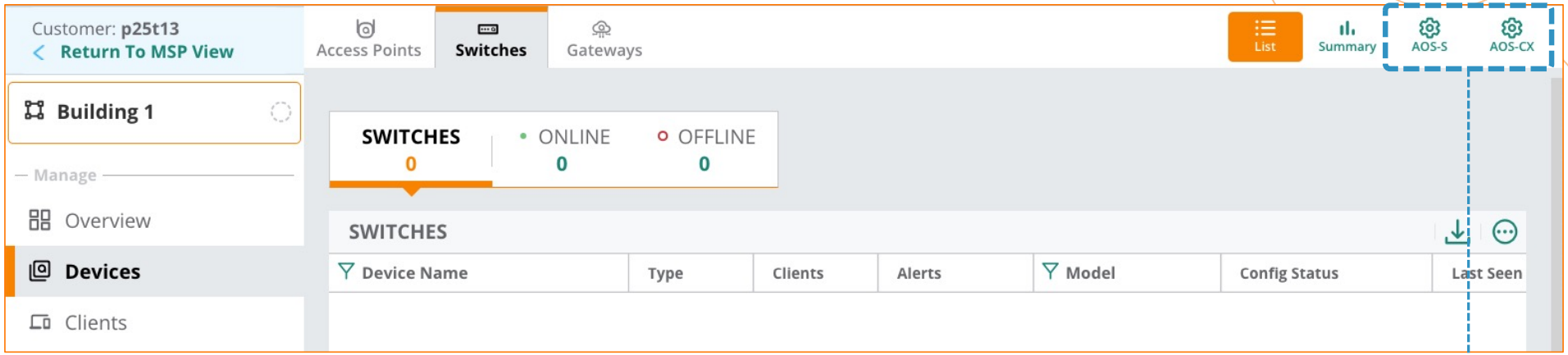
- Enterprise
- Personal
- Captive Portal
- Open

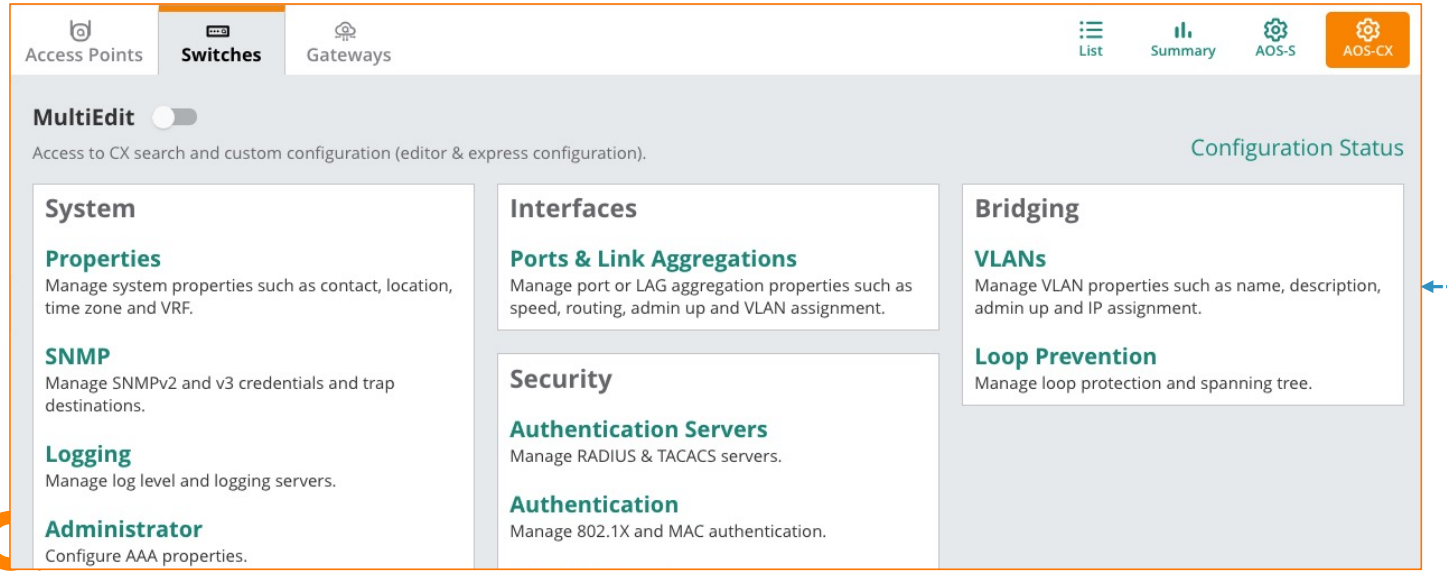
Access

- Unrestricted
- Network based
- Role based

Wired Configuration

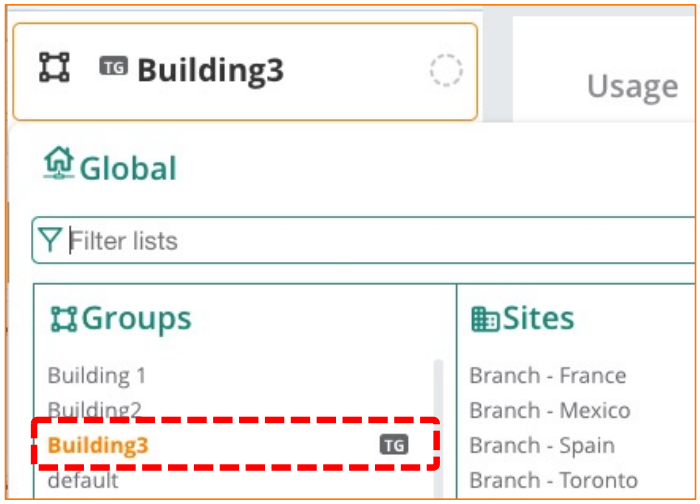
Configuring Aruba Switch – GUI



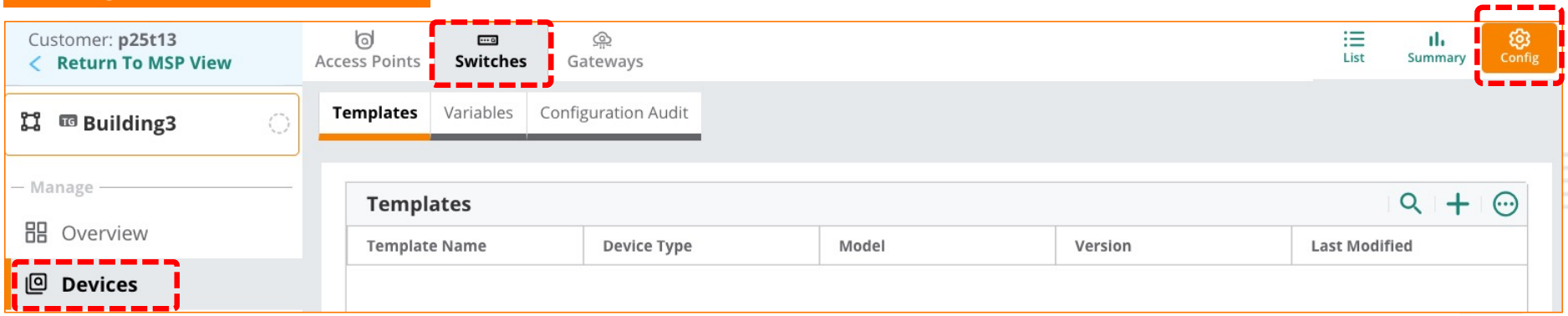


Configuring Aruba Switch – Template Group

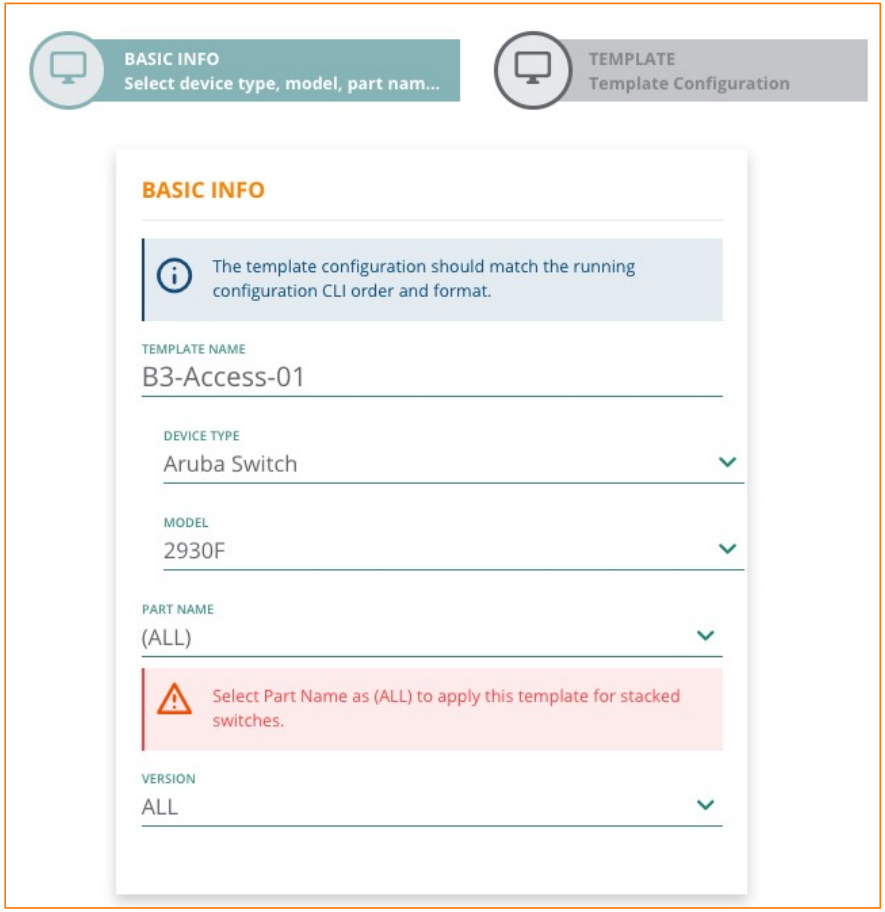
Step 1: Select your Group (Notice the "**TG**" letters)



Step 2: Navigate to Devices → Switches and click on "Config" icon

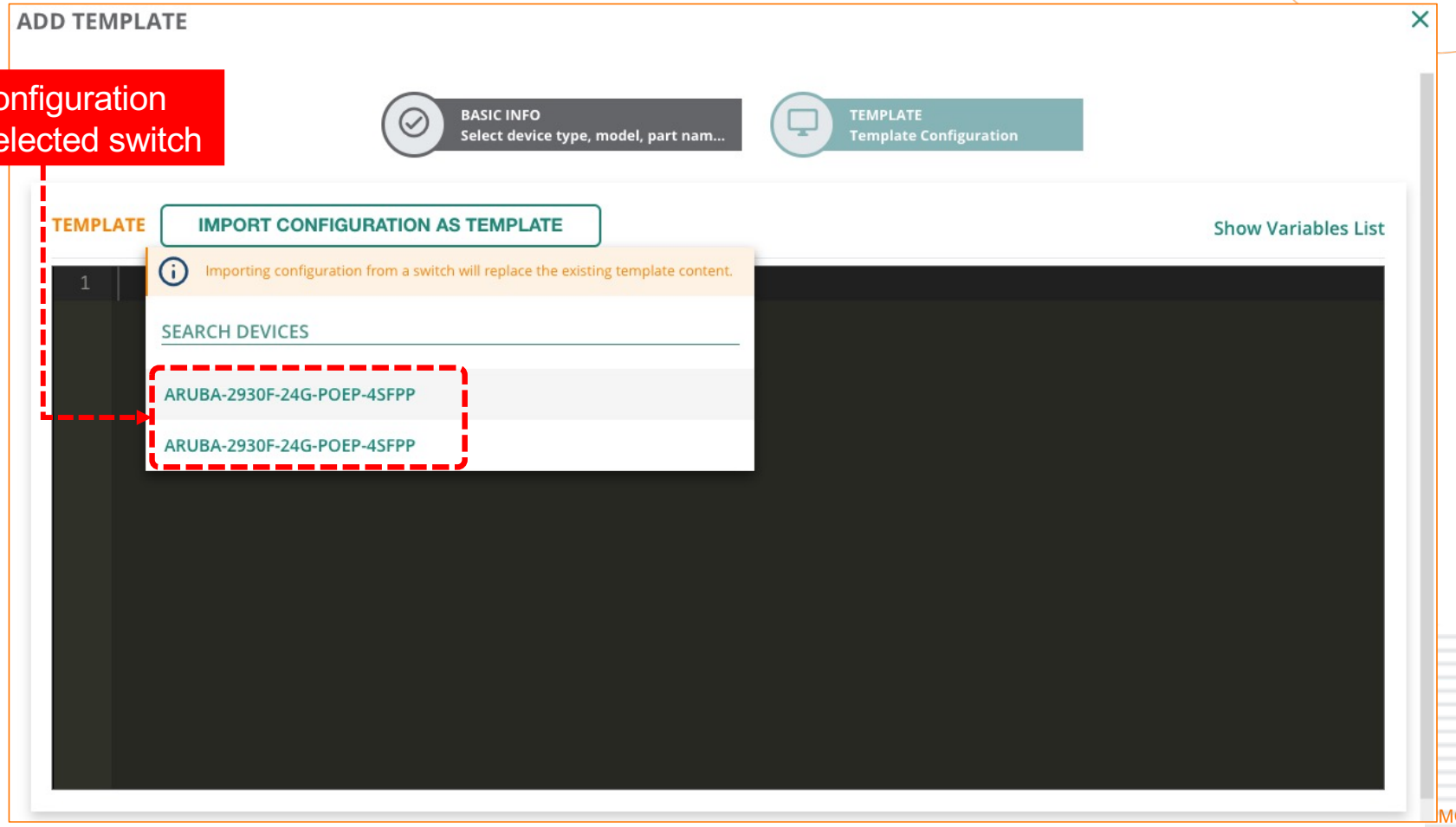


Add Template to the Group

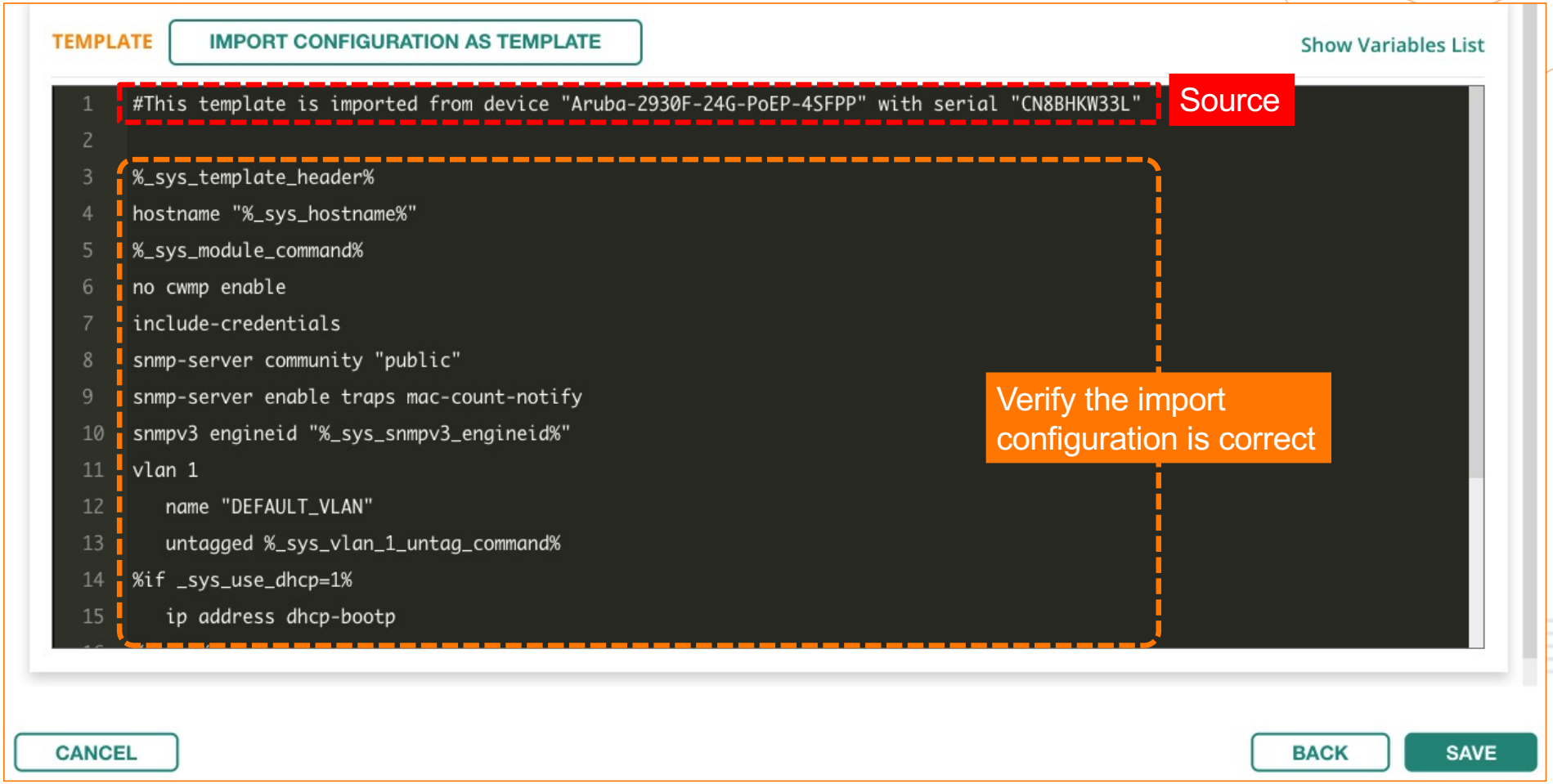


Import Template

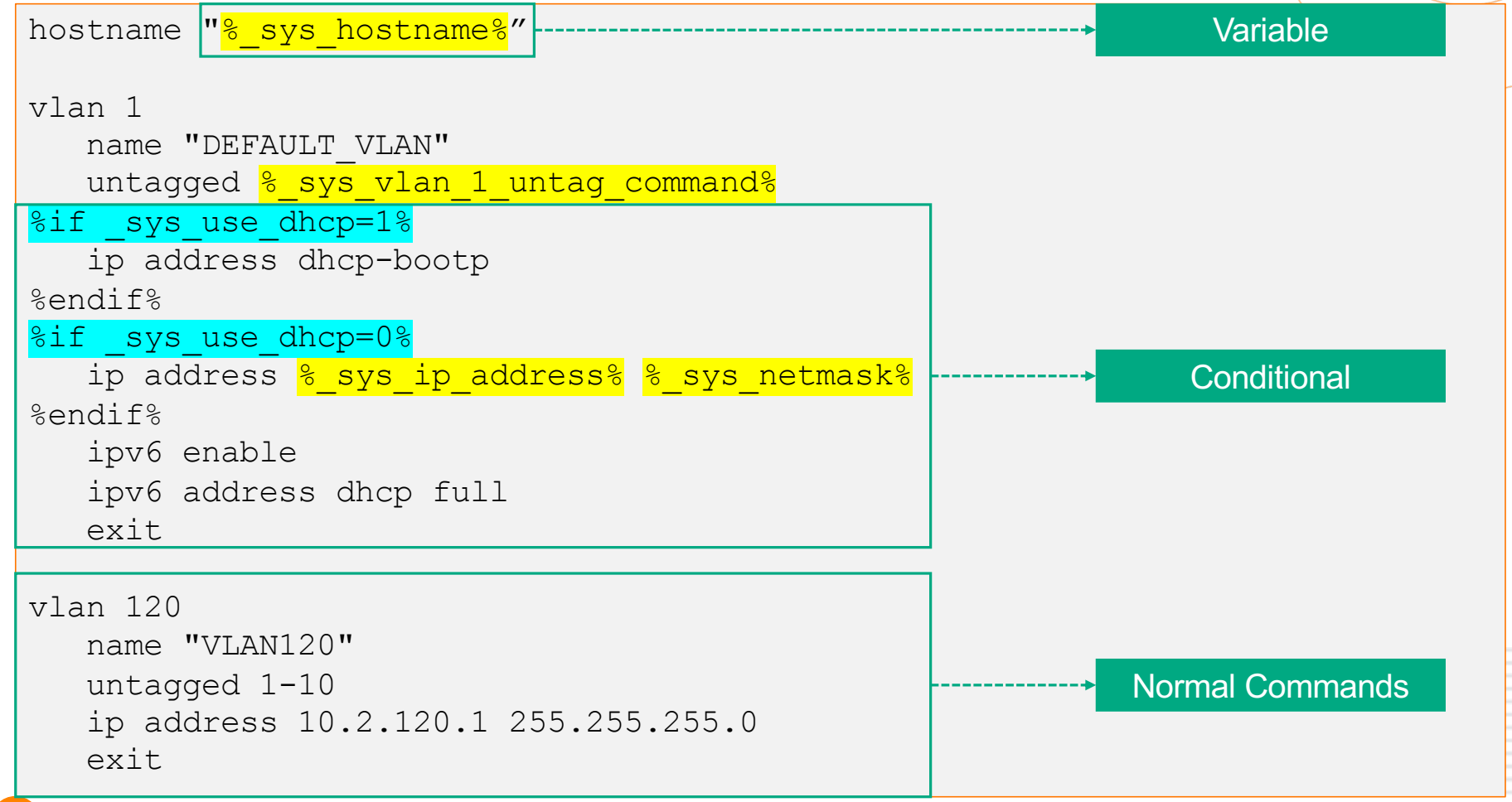
Import configuration from a selected switch



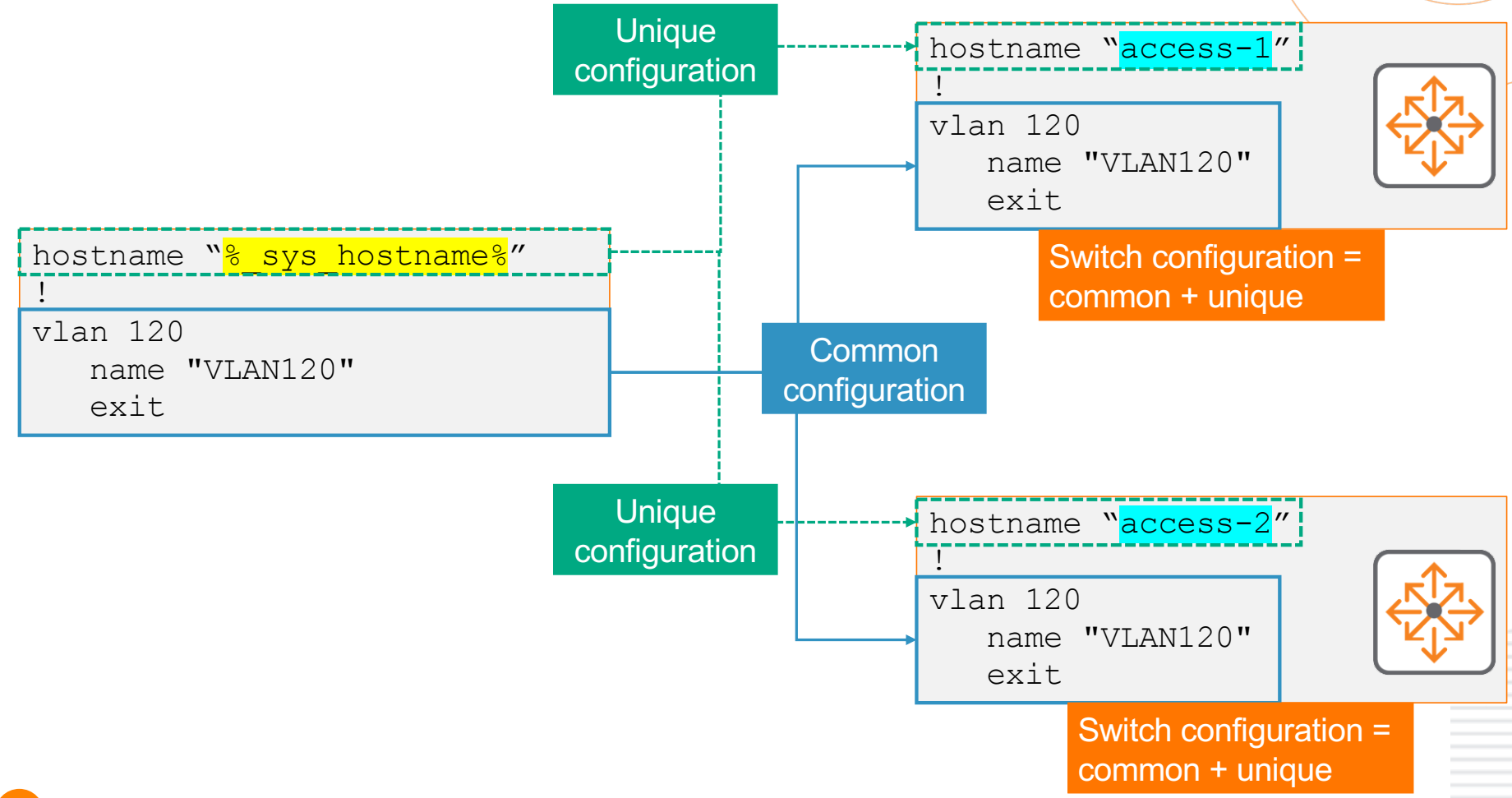
Import Template



Templates and Variables

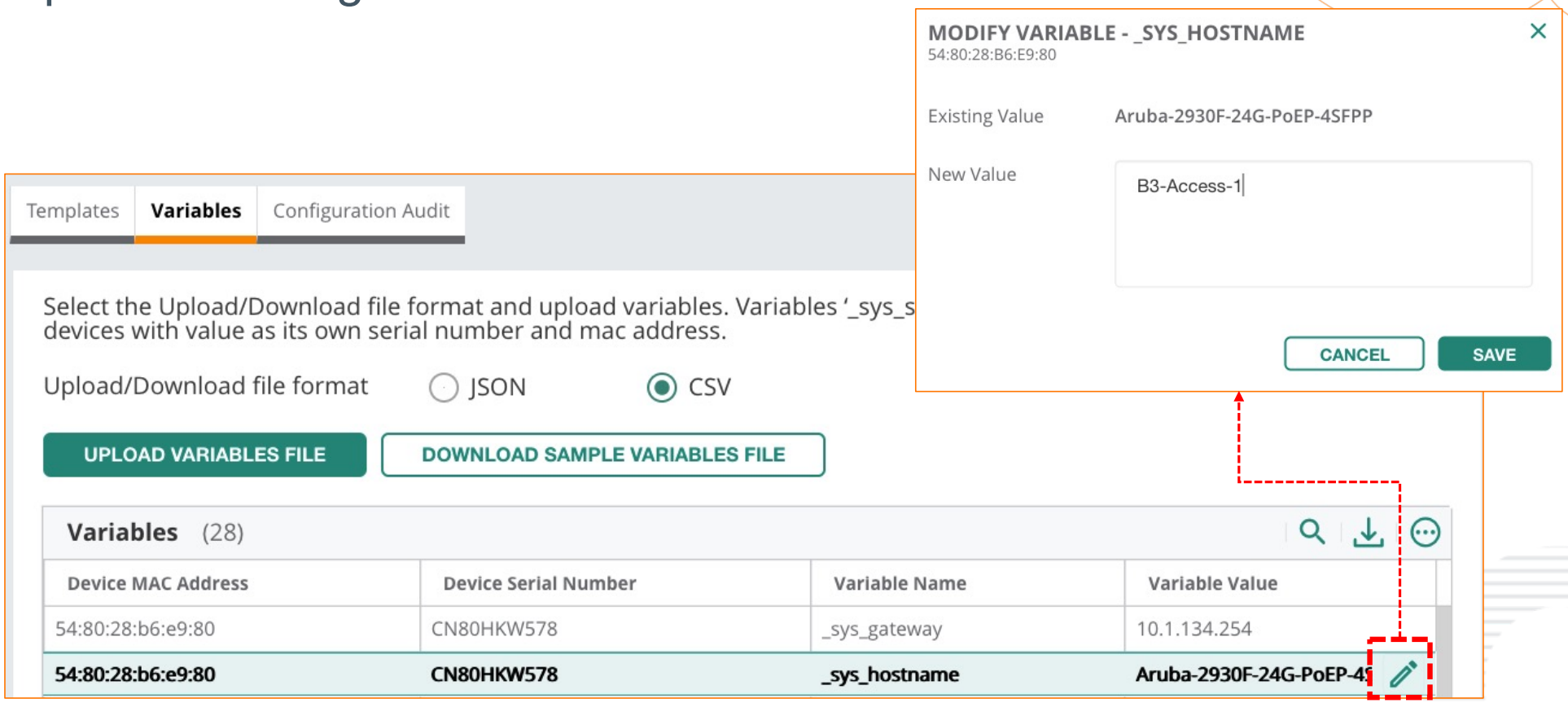


Templates and Variables



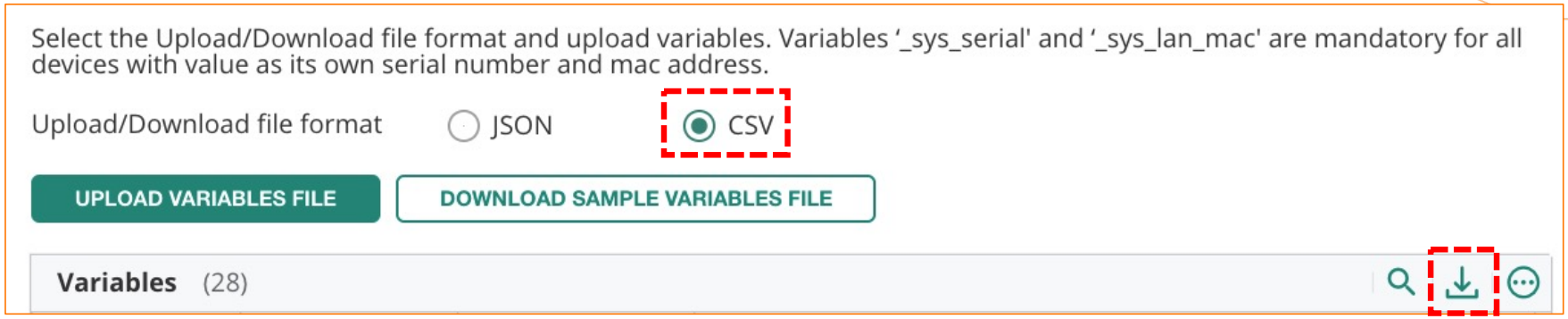
Assigning values to Variables

Option 1: Change the variable in Aruba Central



Assigning Values to Variables – CSV

Option 2: Download a CSV or JSON file



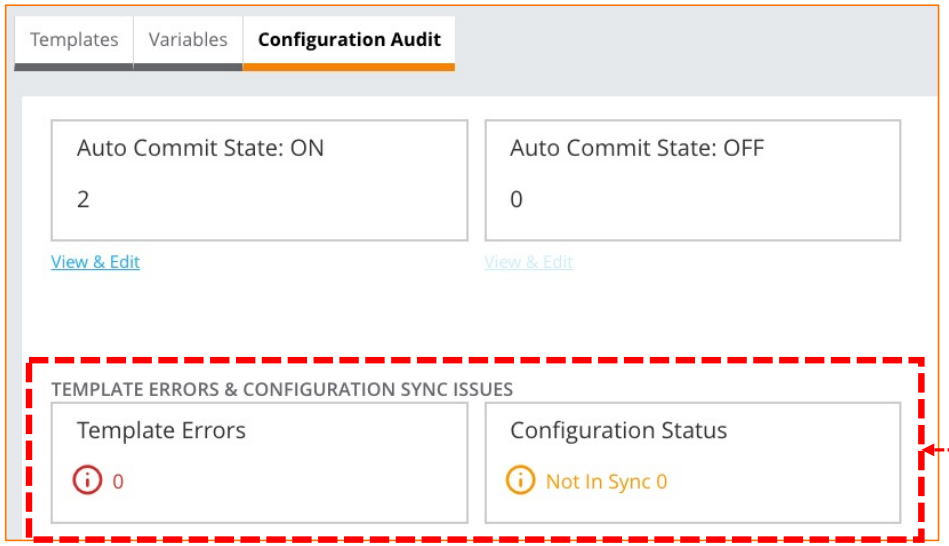
	A	B	C	D	E
1	_sys_serial	_sys_lan_mac	modified	_sys_hostname	_sys_ip_address
2	CN80HKW578	54:80:28:b6:e9:80	N		
3	CN8BHKW33L	38:21:c7:24:db:60	Y	B3-Access-2	

Do not modify

Y = inform Central about a change
N = there is no change

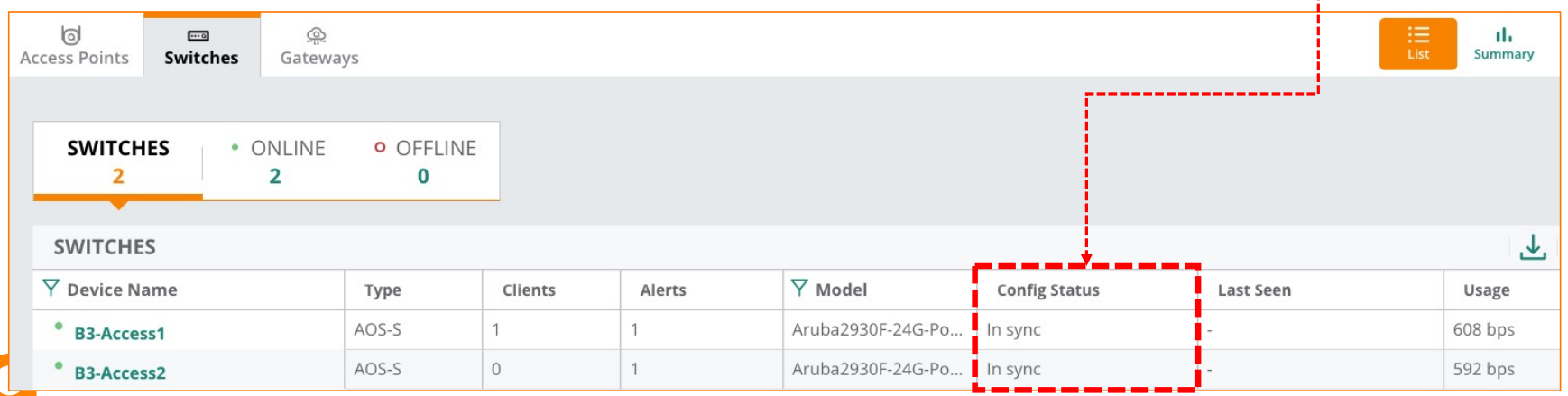
Values to variables

Configuration Audit

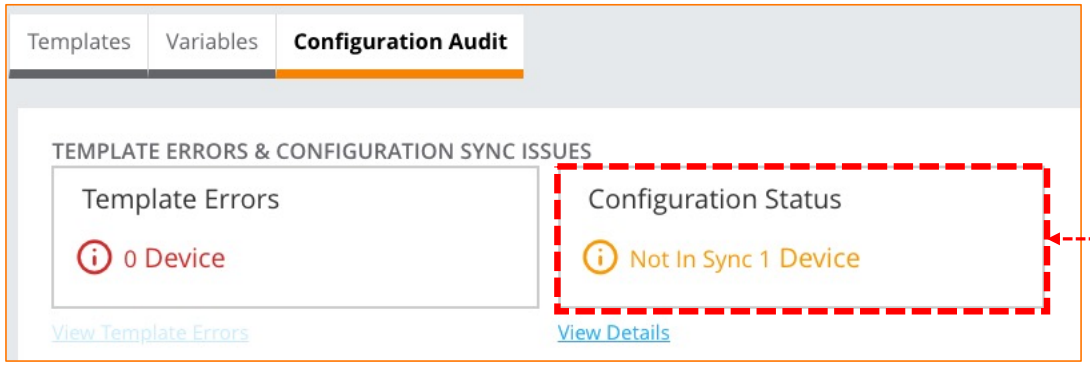


There is no Template errors, and All devices are in Sync

Config status is in sync

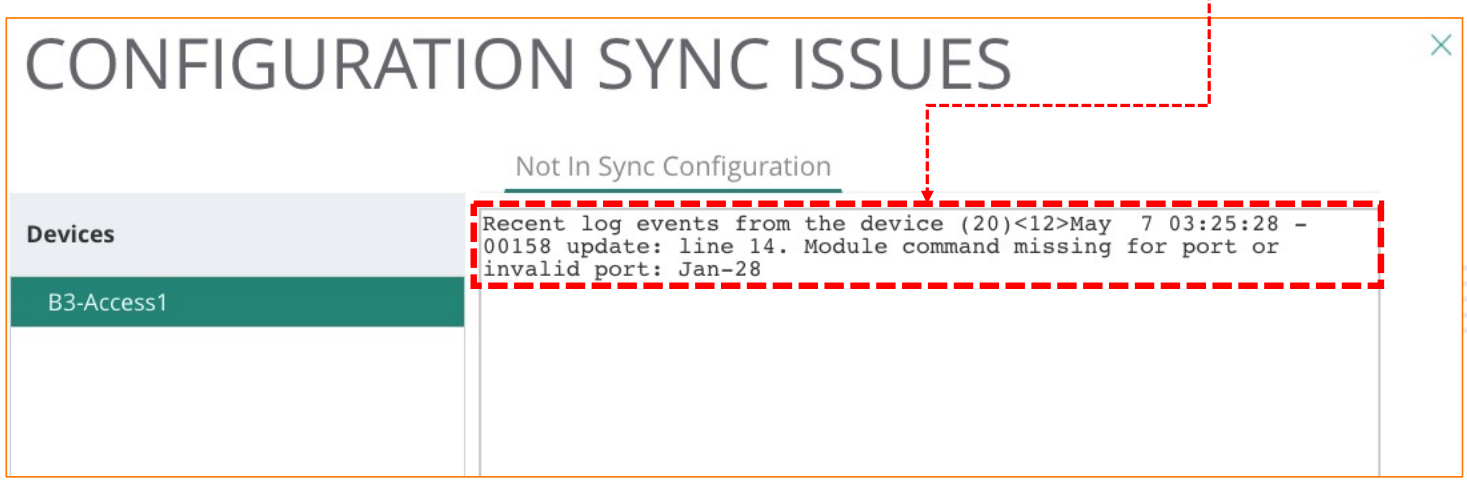


Configuration Audit Configuration Errors



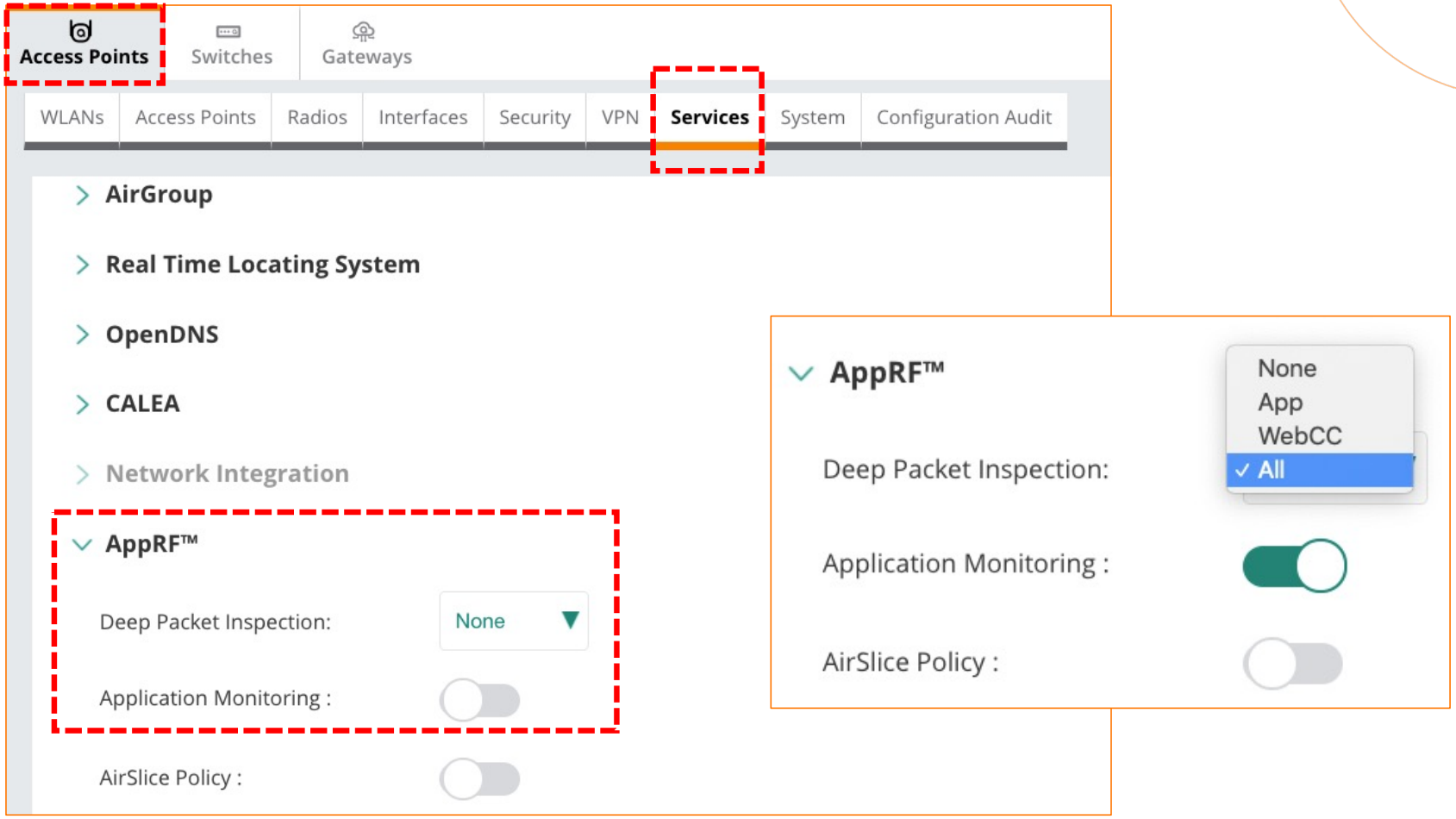
One device is not in sync

Switches expect a numeric range value (1-28) not a date (Jan-28)

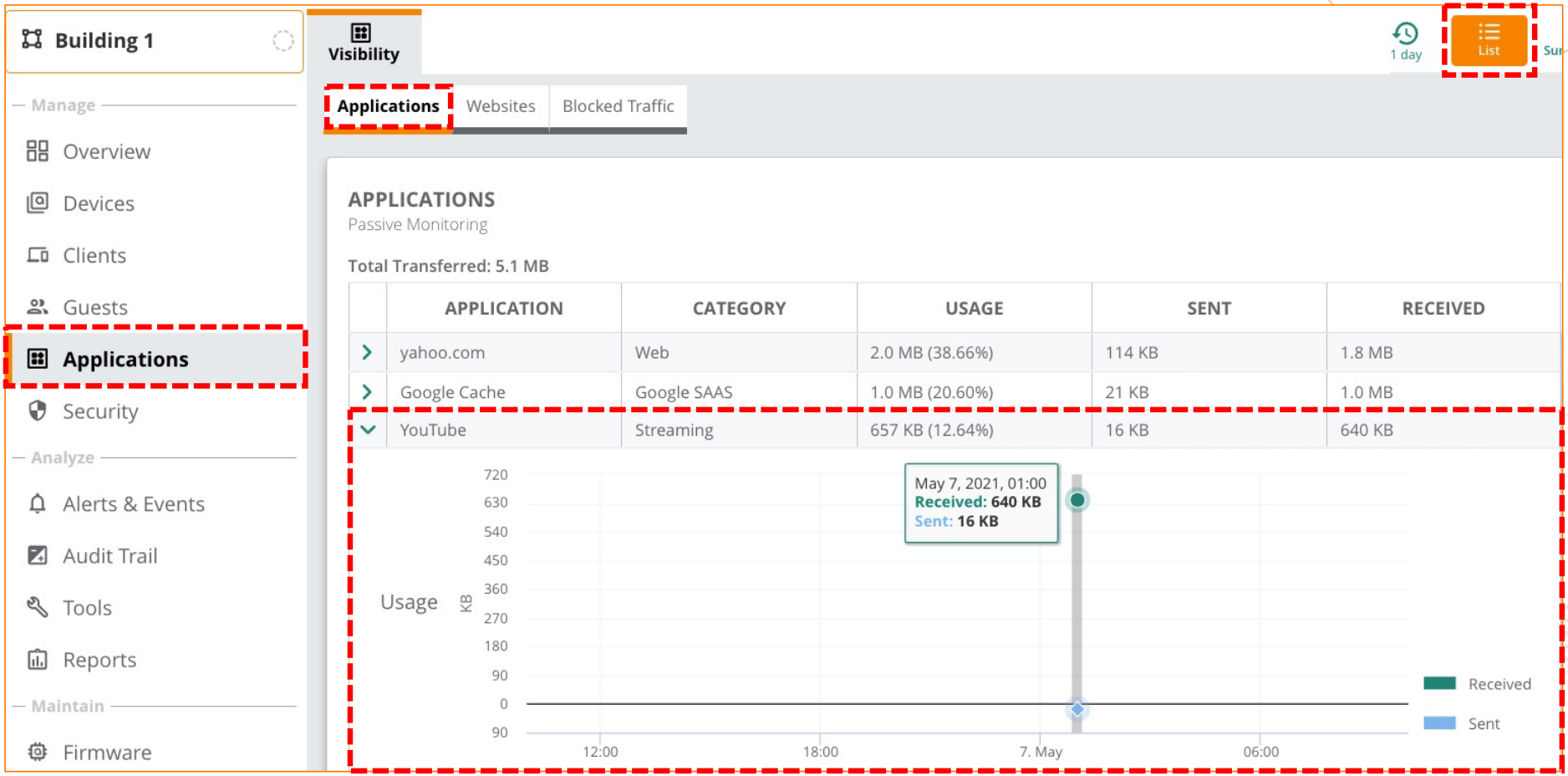


Application Visibility

IAP – Deep Packet Inspection



Applications



Websites

Applications | **Websites** | Blocked Traffic

WEBSITES

REPUTATION	USAGE
Trustworthy	96.342%
Low Risk	3.285%
Moderate Risk	0.374%

CATEGORY	USAGE
Internet Portals	2.1 MB (40.69%)
Web Hosting	1.0 MB (20.60%)
Streaming Media	657 KB (12.64%)
Computer and Internet Info	590 KB (11.36%)
Content Delivery Networks	248 KB (4.77%)
Search Engines	187 KB (3.59%)
Web Advertisements	79 KB (1.52%)
Business and Economy	19 KB (0.37%)
Society	19 KB (0.36%)
Private IP Addresses	10 KB (0.19%)
News and Media	2 KB (0.04%)
Computer and Internet Security	1 KB (0.03%)
Unclassified	199 KB (3.83%)

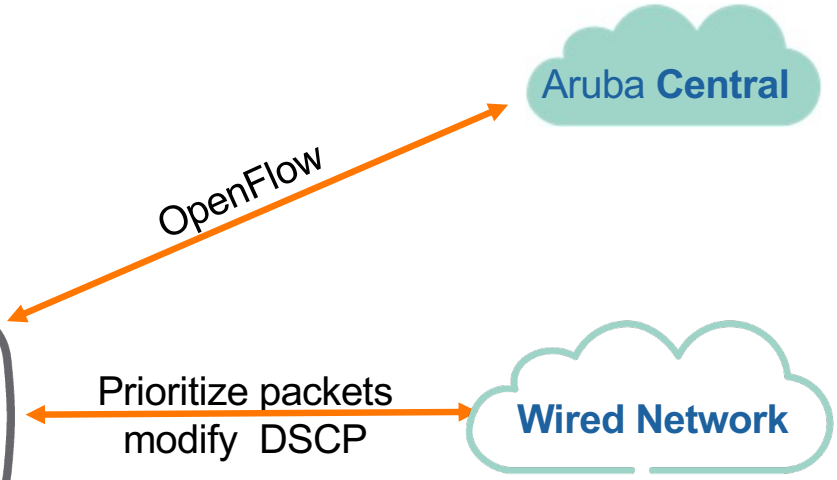
UCC

VOIP Calls

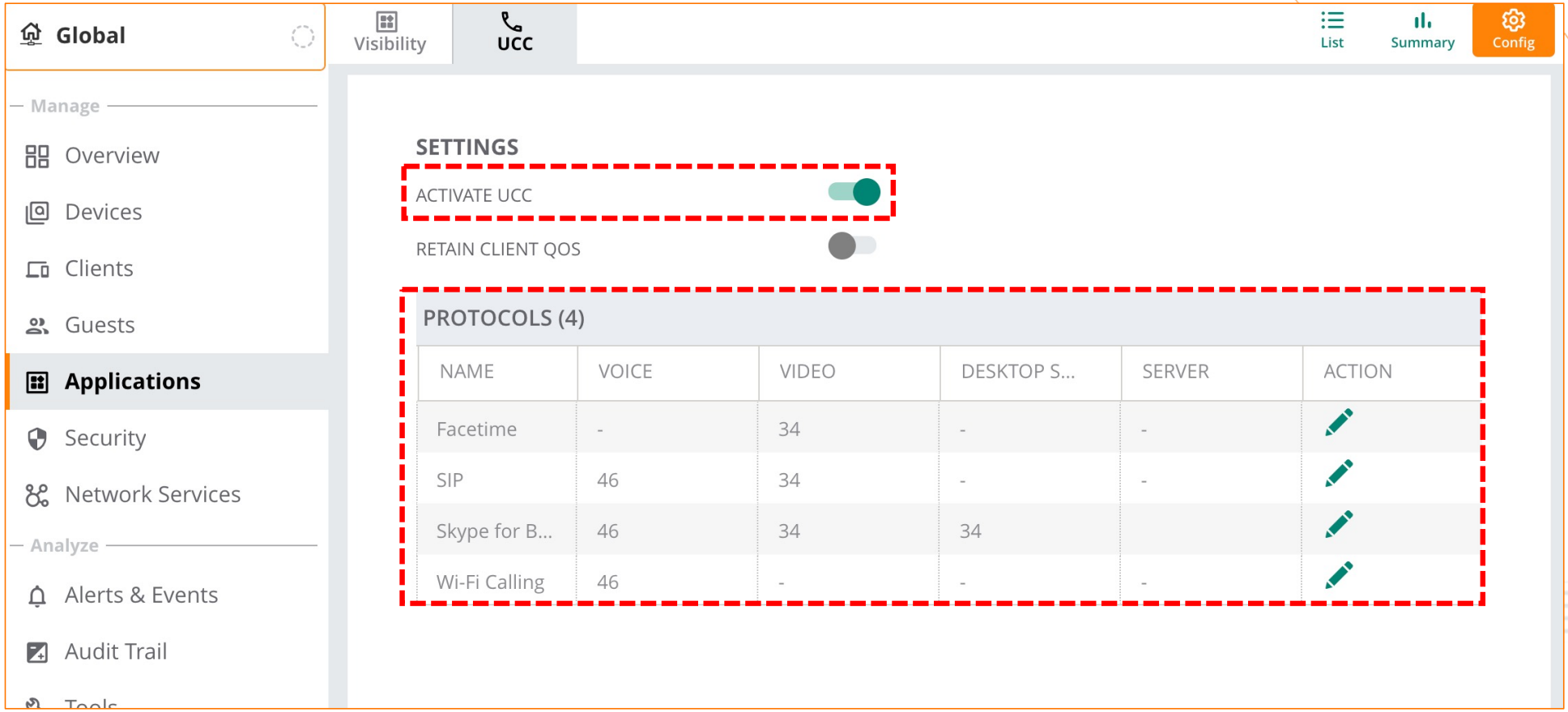
- VoIP Protocols
  - Skype for Business
  - WiFi – Calling
  - Facetime

Starts a S4B call

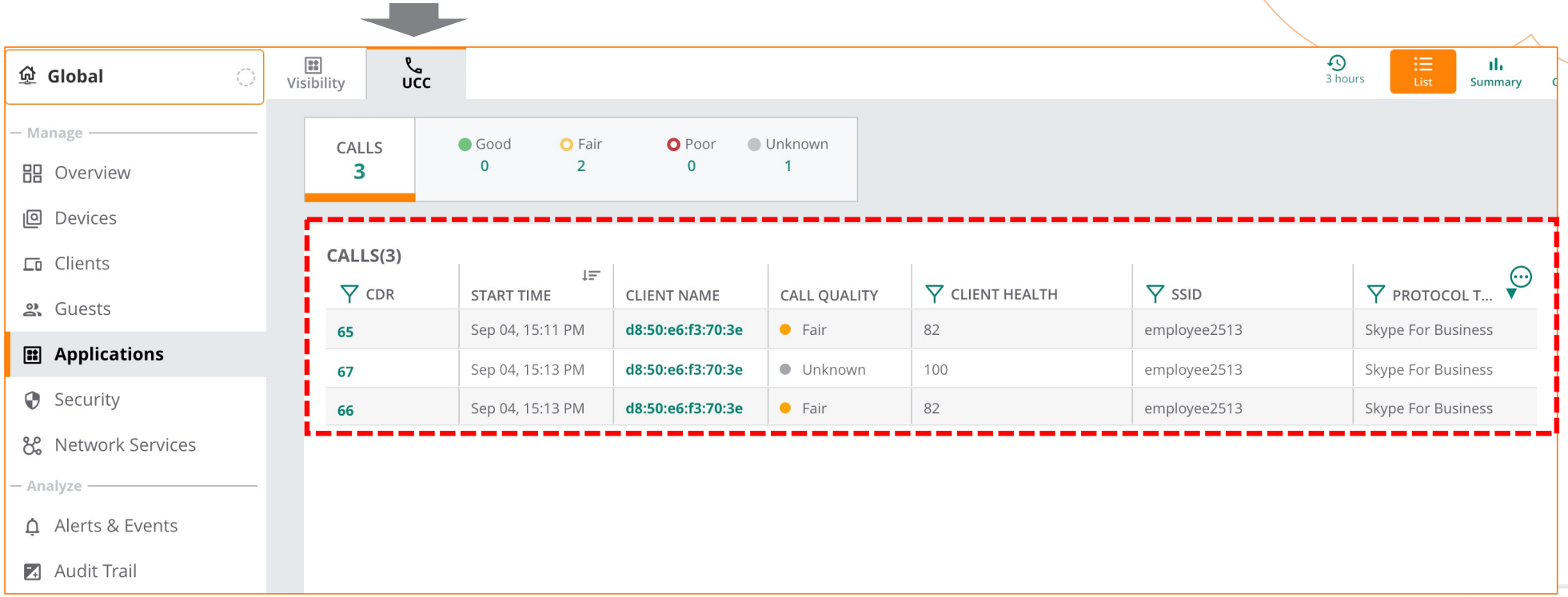
Identify a new UCC session



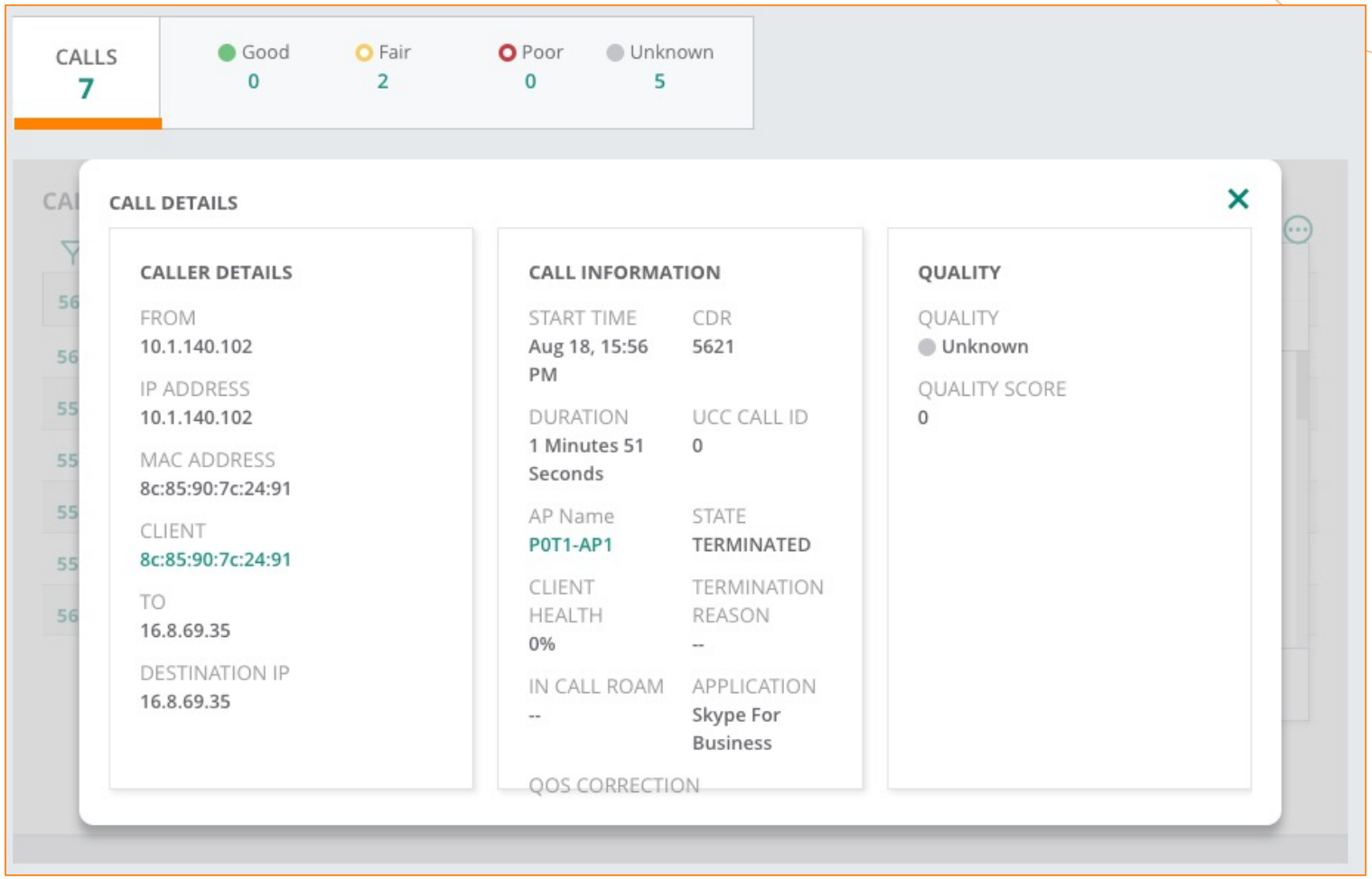
Configure Call Prioritization



UCC Call Monitoring

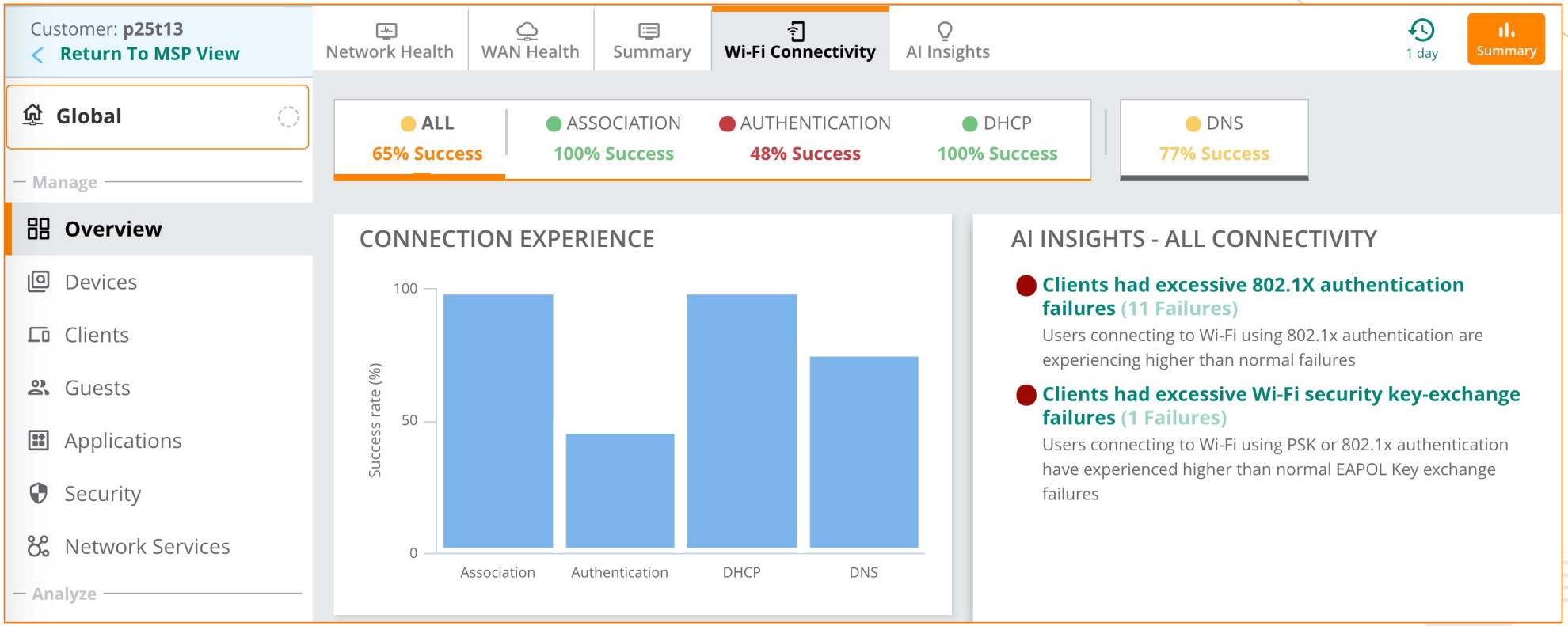


Call Details

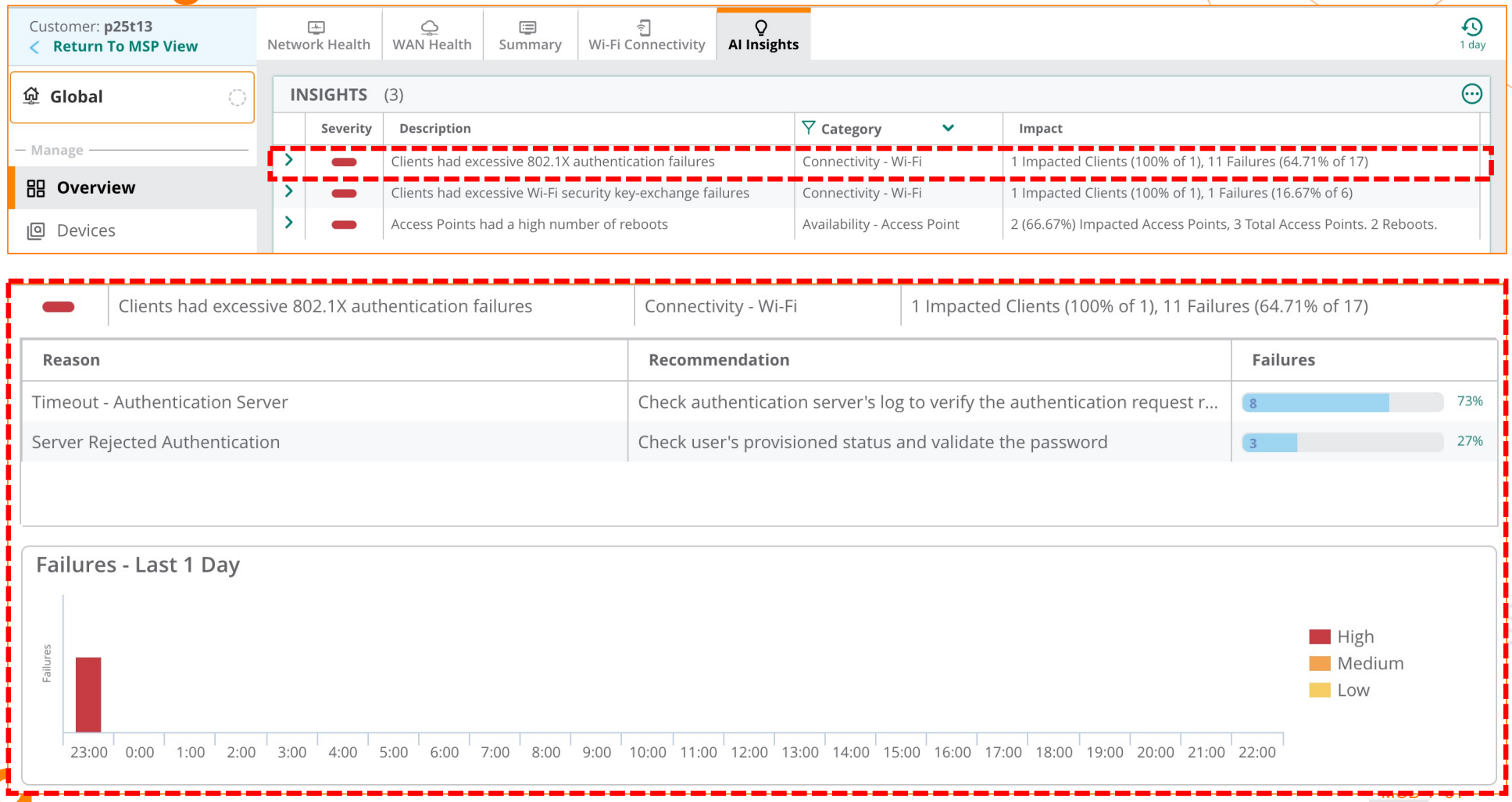


Wi-Fi Connectivity

Wi-Fi Connectivity



AI Insight


Customer: p25t13
Return To MSP View
Network Health
WAN Health
Summary
Wi-Fi Connectivity
AI Insights
1 day
Global
Manage
Overview
Devices
INSIGHTS (3)
Severity
Description
Category
Impact
Clients had excessive 802.1X authentication failures
Connectivity - Wi-Fi
1 Impacted Clients (100% of 1), 11 Failures (64.71% of 17)
Clients had excessive Wi-Fi security key-exchange failures
Connectivity - Wi-Fi
1 Impacted Clients (100% of 1), 1 Failures (16.67% of 6)
Access Points had a high number of reboots
Availability - Access Point
2 (66.67%) Impacted Access Points, 3 Total Access Points. 2 Reboots.
Clients had excessive 802.1X authentication failures
Connectivity - Wi-Fi
1 Impacted Clients (100% of 1), 11 Failures (64.71% of 17)
Reason
Recommendation
Failures
Timeout - Authentication Server
Check authentication server's log to verify the authentication request r...
8
73%
Server Rejected Authentication
Check user's provisioned status and validate the password
3
27%
Failures - Last 1 Day
Failures
High
Medium
Low
23:00
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00

Presence Analytics

Customer Traffic

How many passed by the entrance

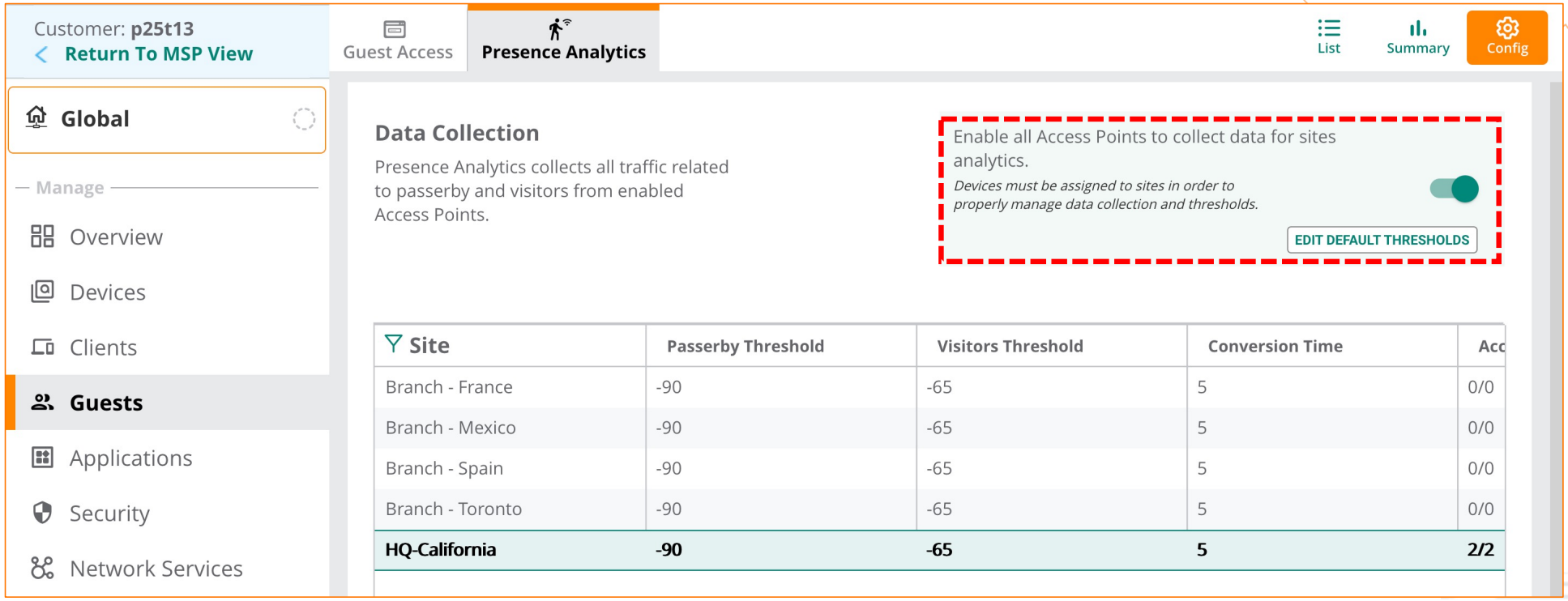
How many entered

How many stayed

How long they stayed

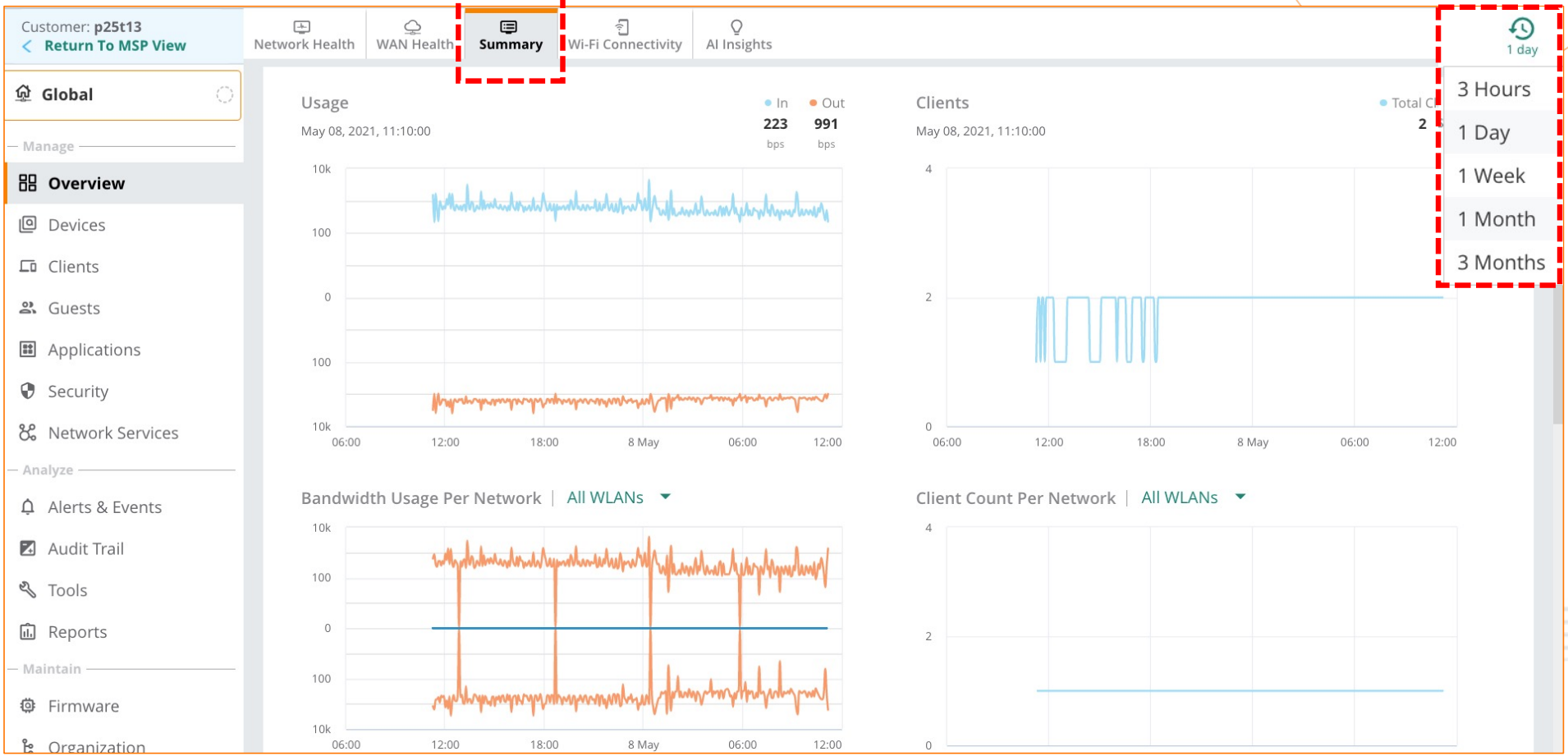
Presence Analytics requires a Service subscription per Device

Data collection

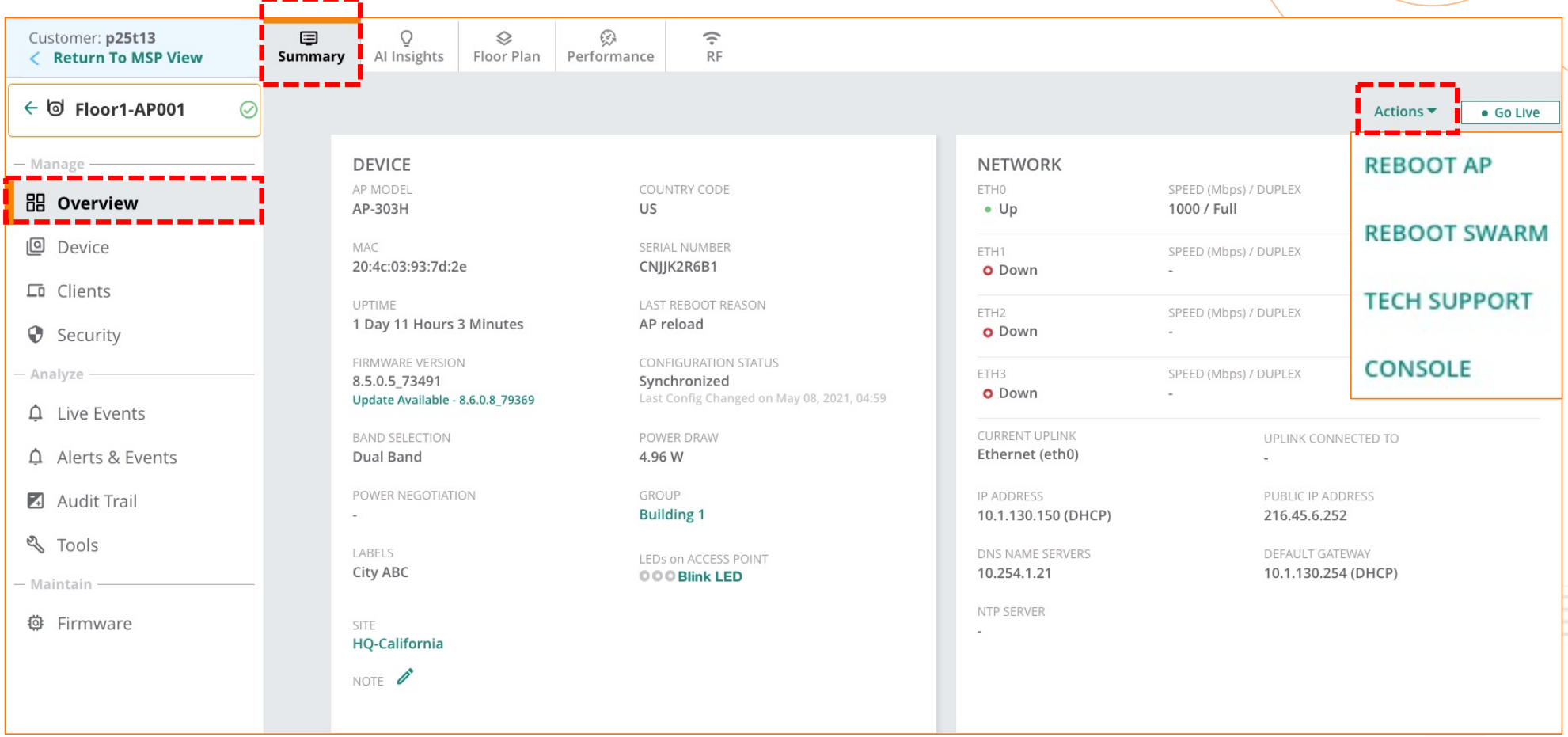


Network Overview

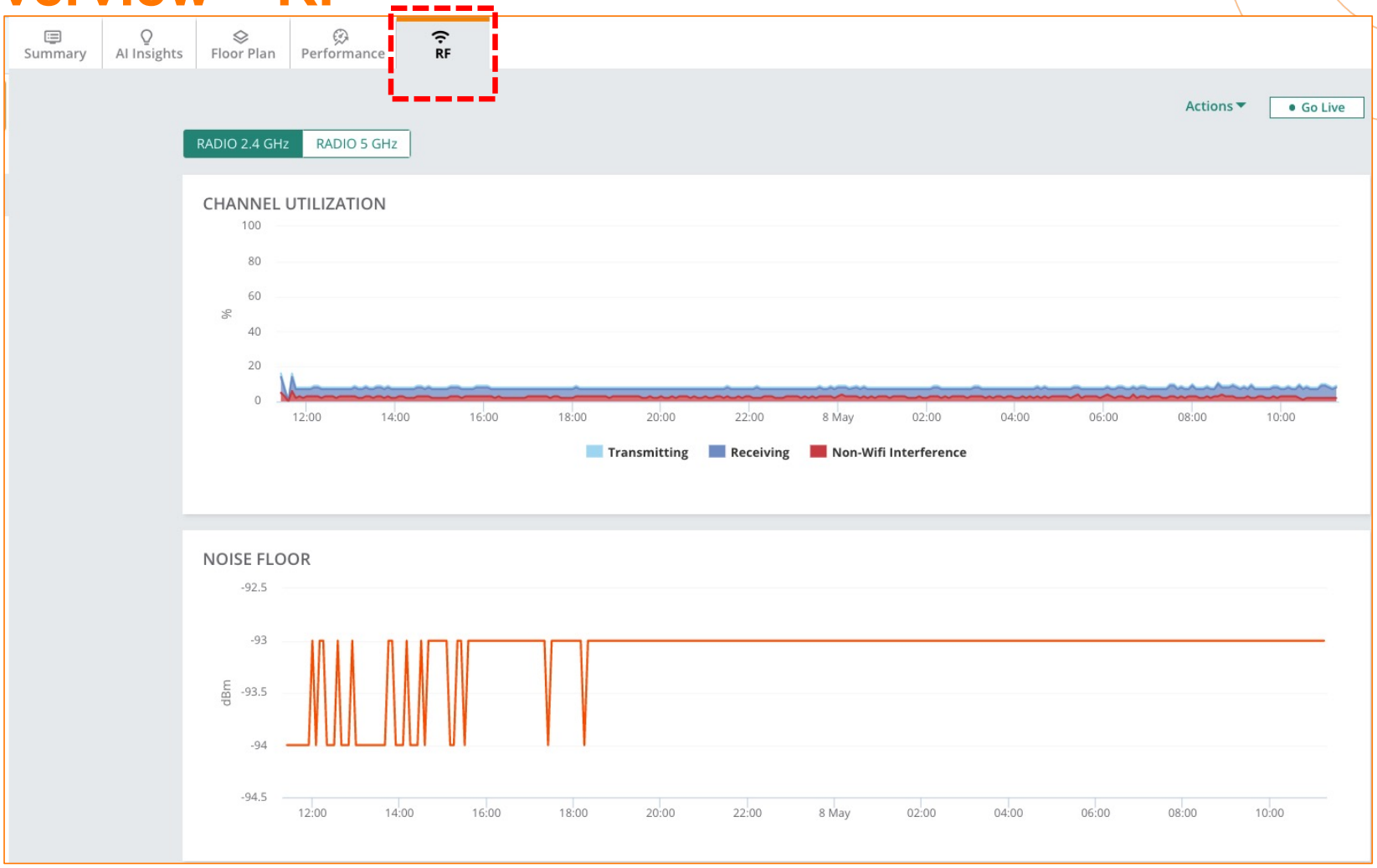
Network Overview Page



Overview – Summary

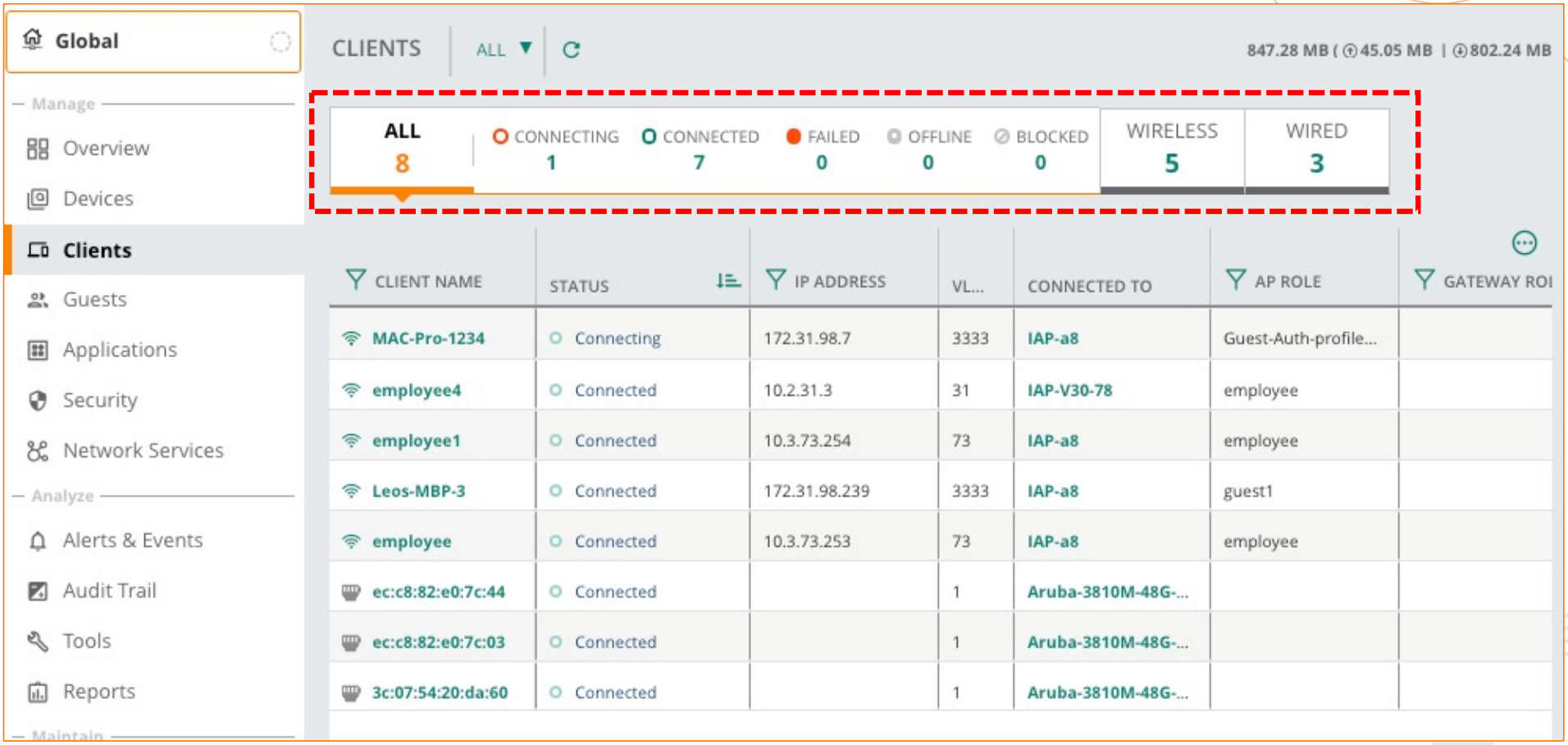


Overview – RF

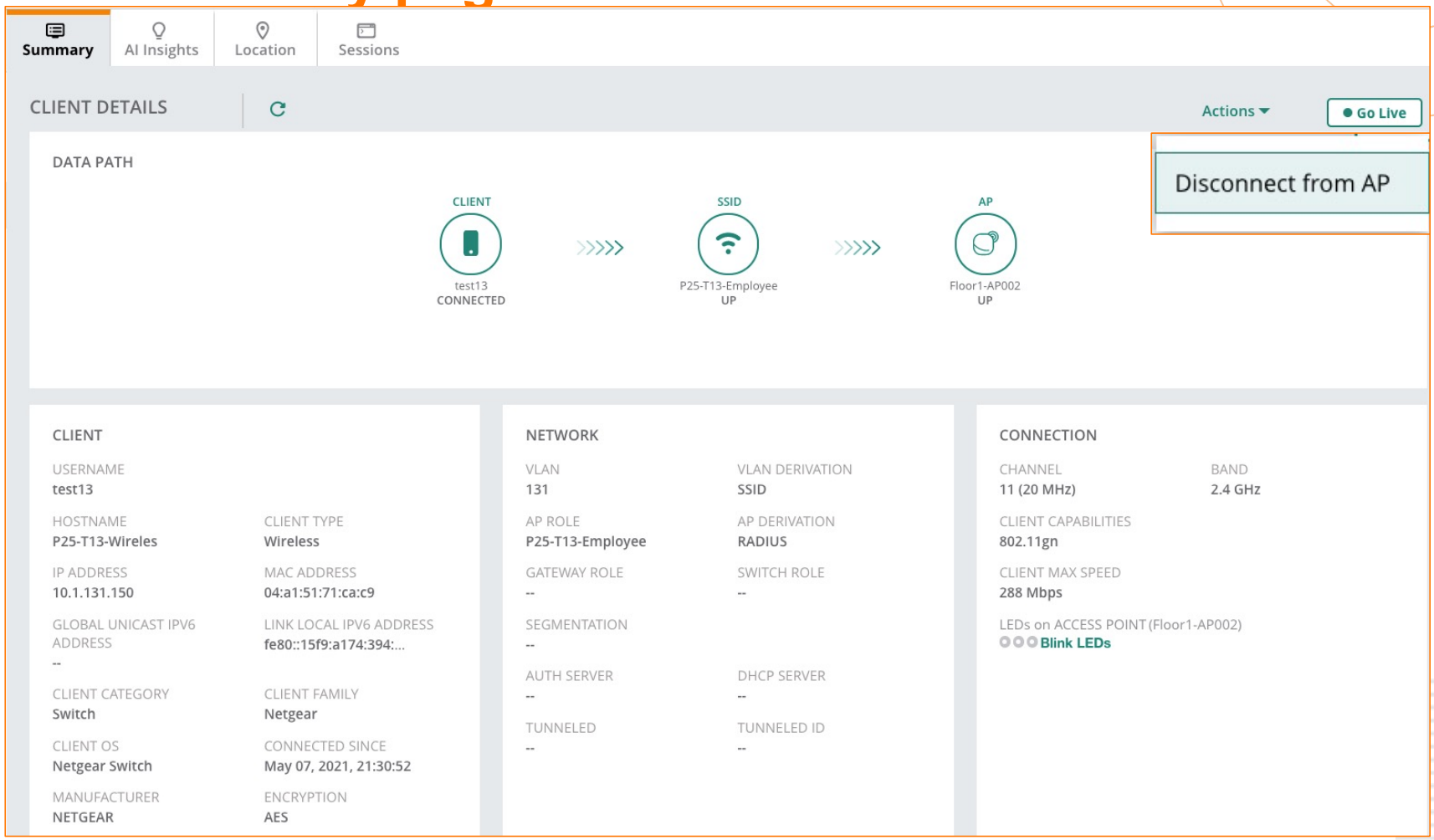

Summary
AI Insights
Floor Plan
Performance
RF
Actions
Go Live
RADIO 2.4 GHz
RADIO 5 GHz
CHANNEL UTILIZATION
100
80
60
40
20
0
%
12:00
14:00
16:00
18:00
20:00
22:00
8 May
02:00
04:00
06:00
08:00
10:00
Transmitting
Receiving
Non-Wifi Interference
NOISE FLOOR
-92.5
-93
-93.5
-94
-94.5
dBm
12:00
14:00
16:00
18:00
20:00
22:00
8 May
02:00
04:00
06:00
08:00
10:00

Client Troubleshooting

List of Clients



Client Summary page

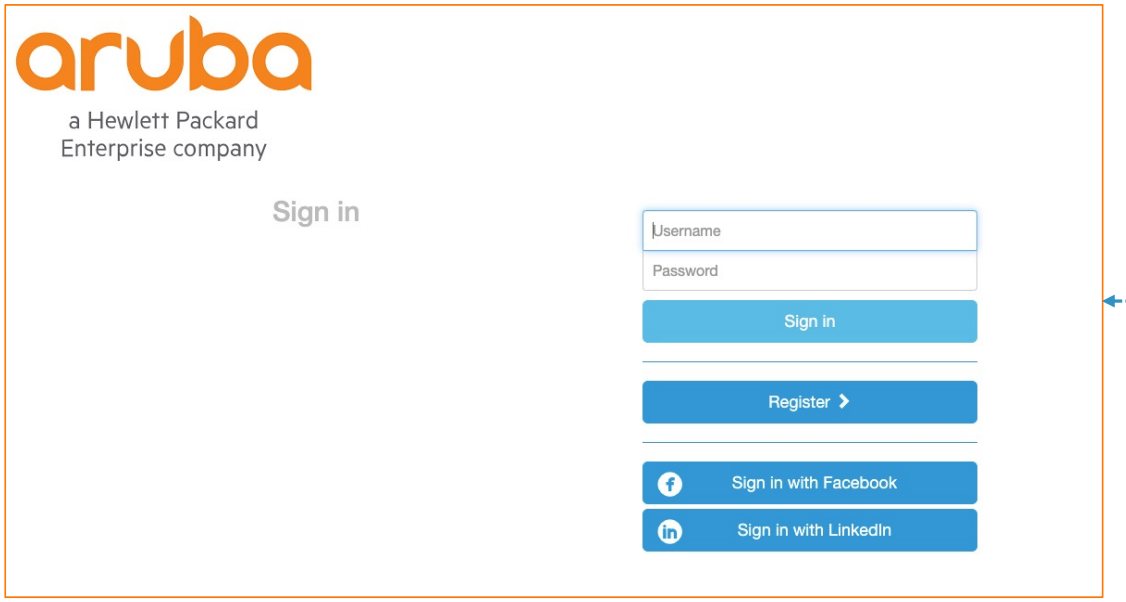


Guest Users

Captive Portal

Guest client

Guest
SSID



IAP build-in

Aruba **Central**

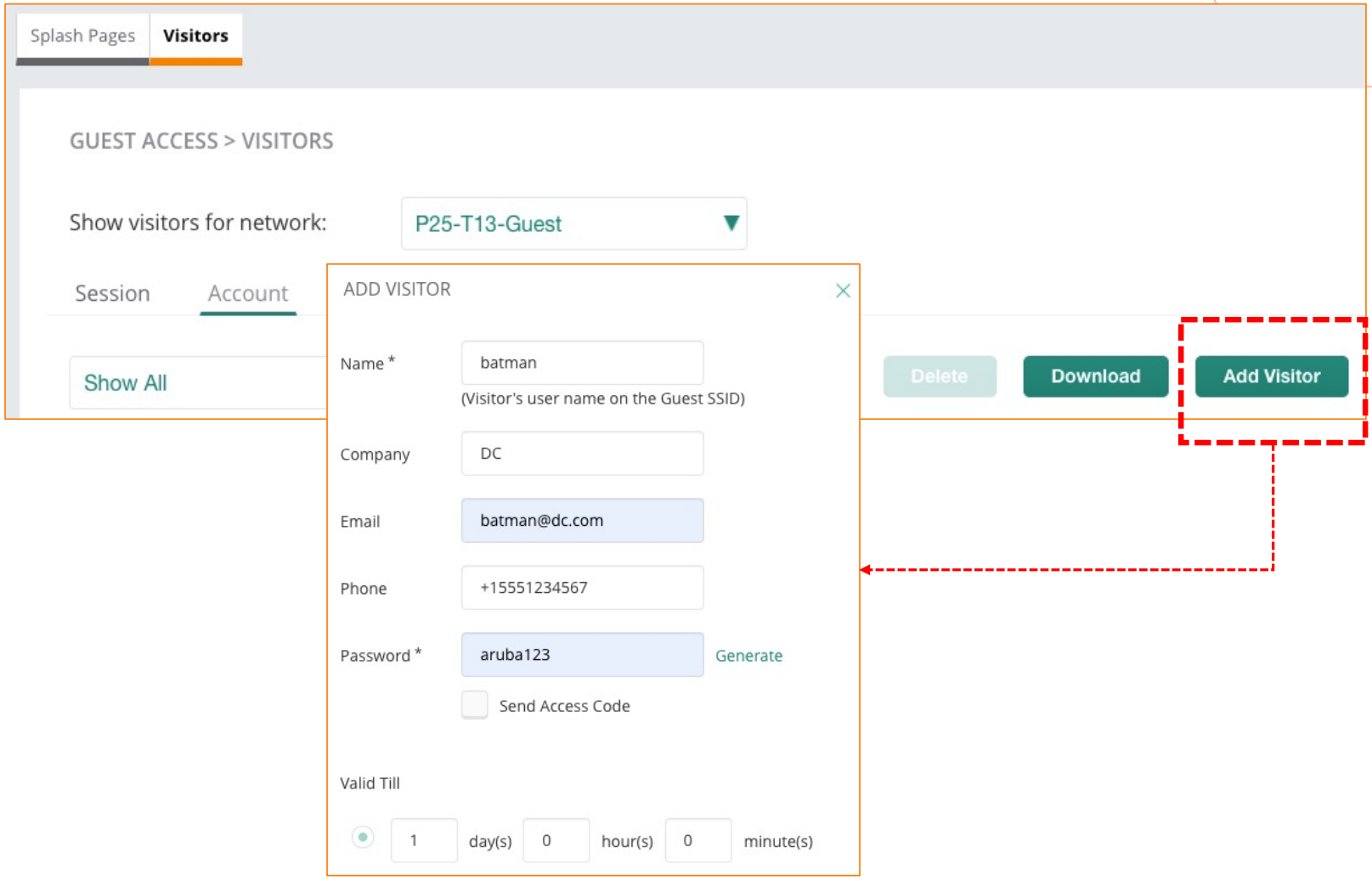
Cloud-based

CLEARPASS
ACCESS
MANAGEMENT

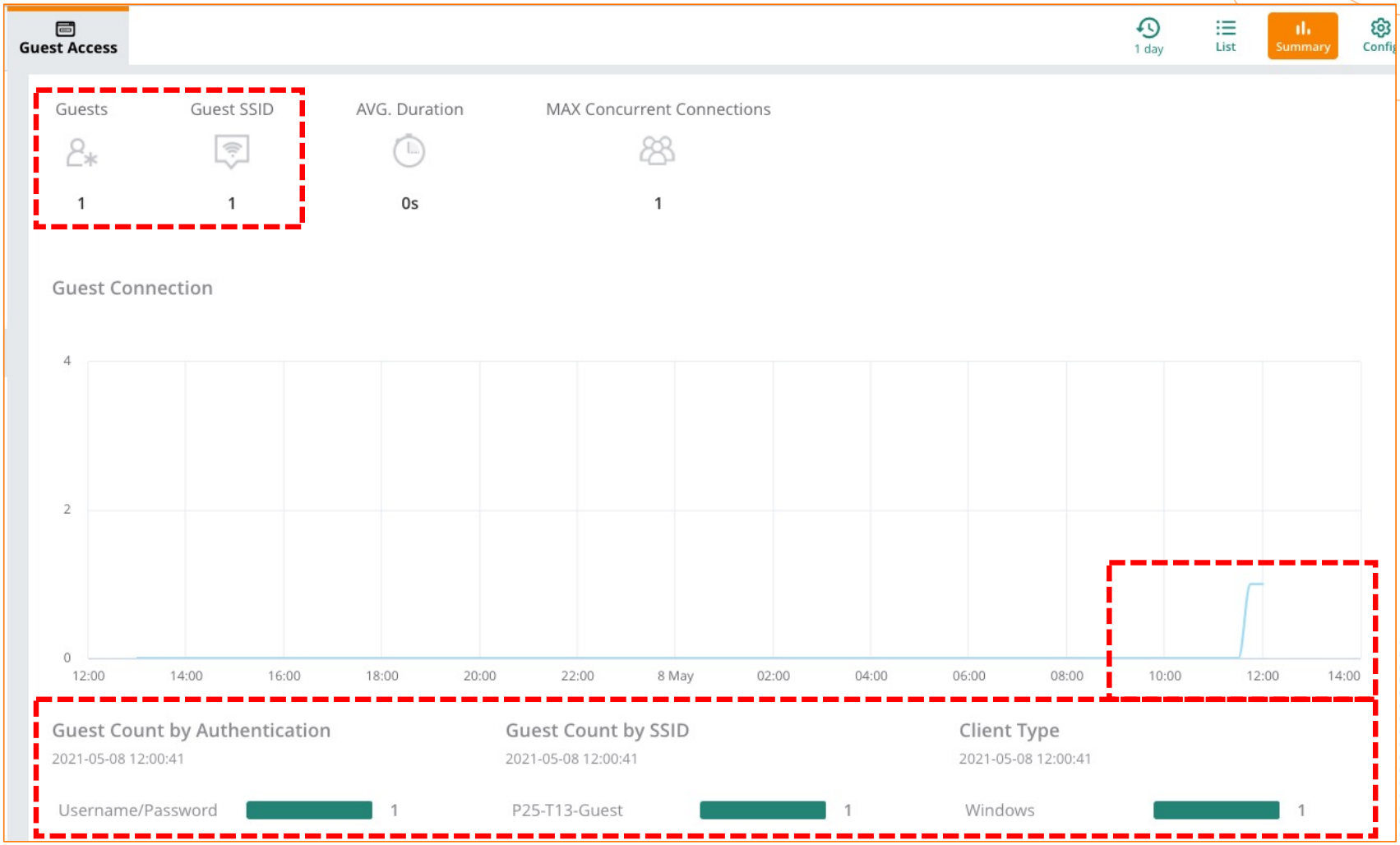
External

Captive Portal Options

Adding a Visitor (Populating database)

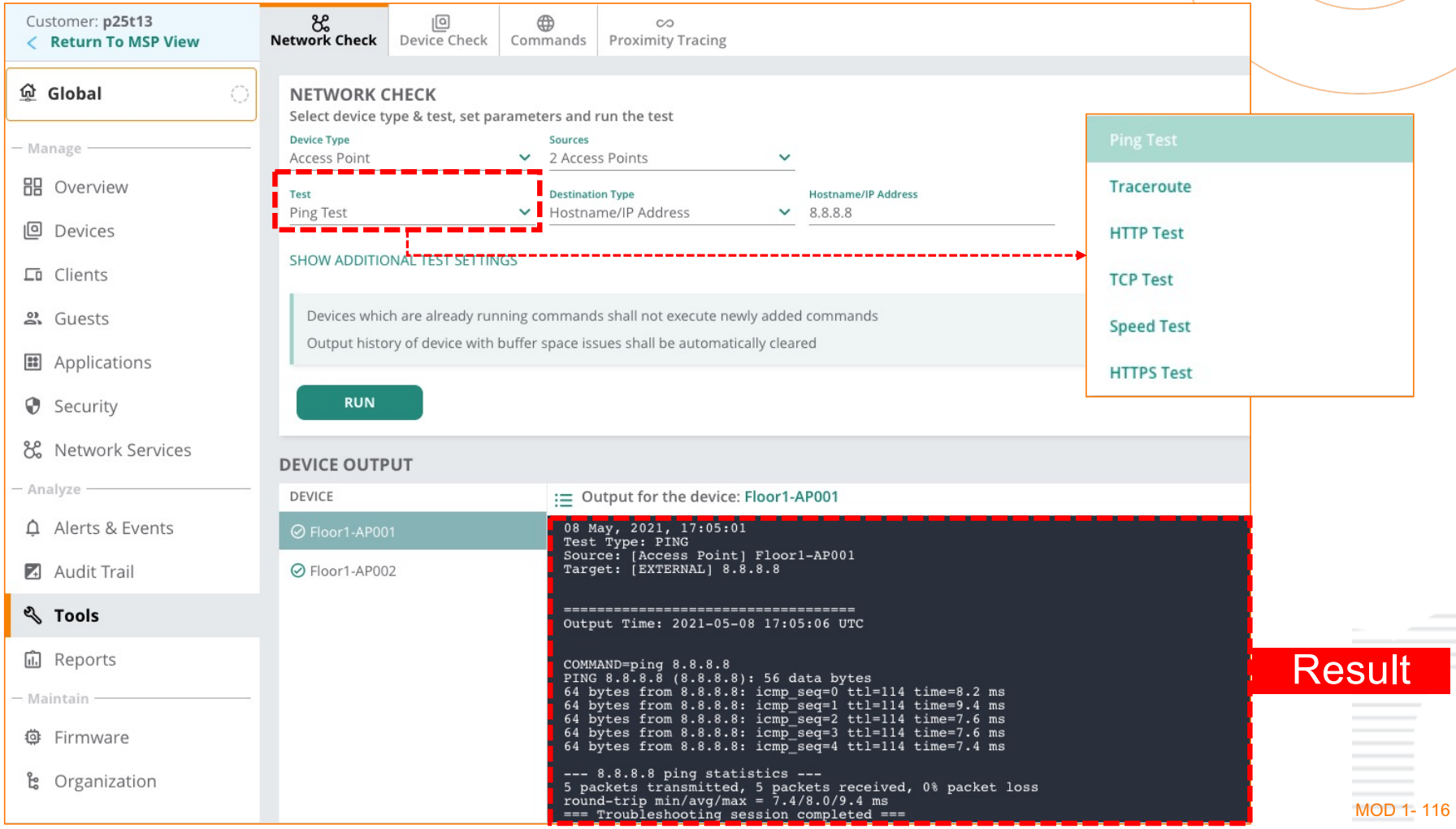


Guest Connections



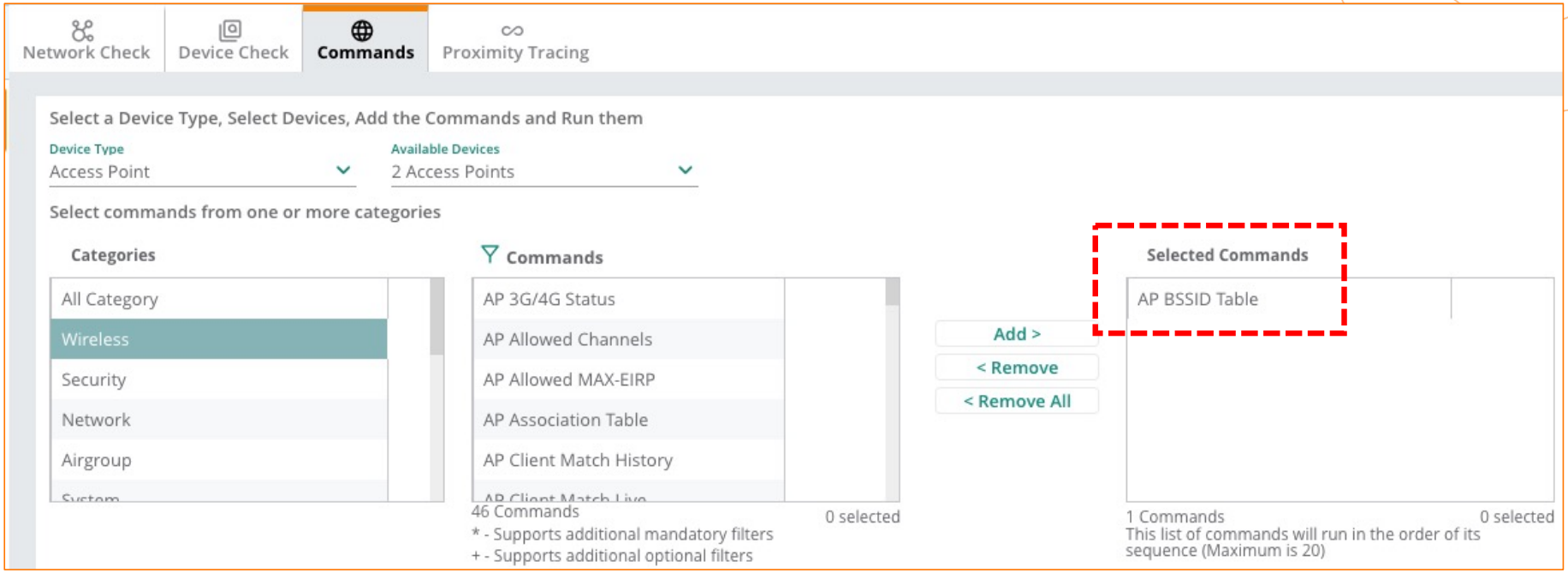
Tools

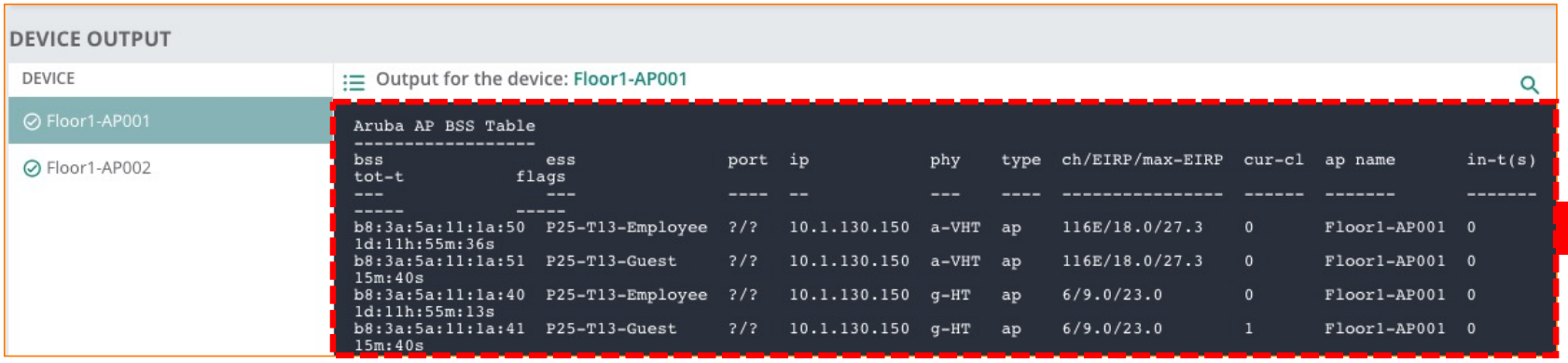
Tools – Network Check



Result

Tools - Commands

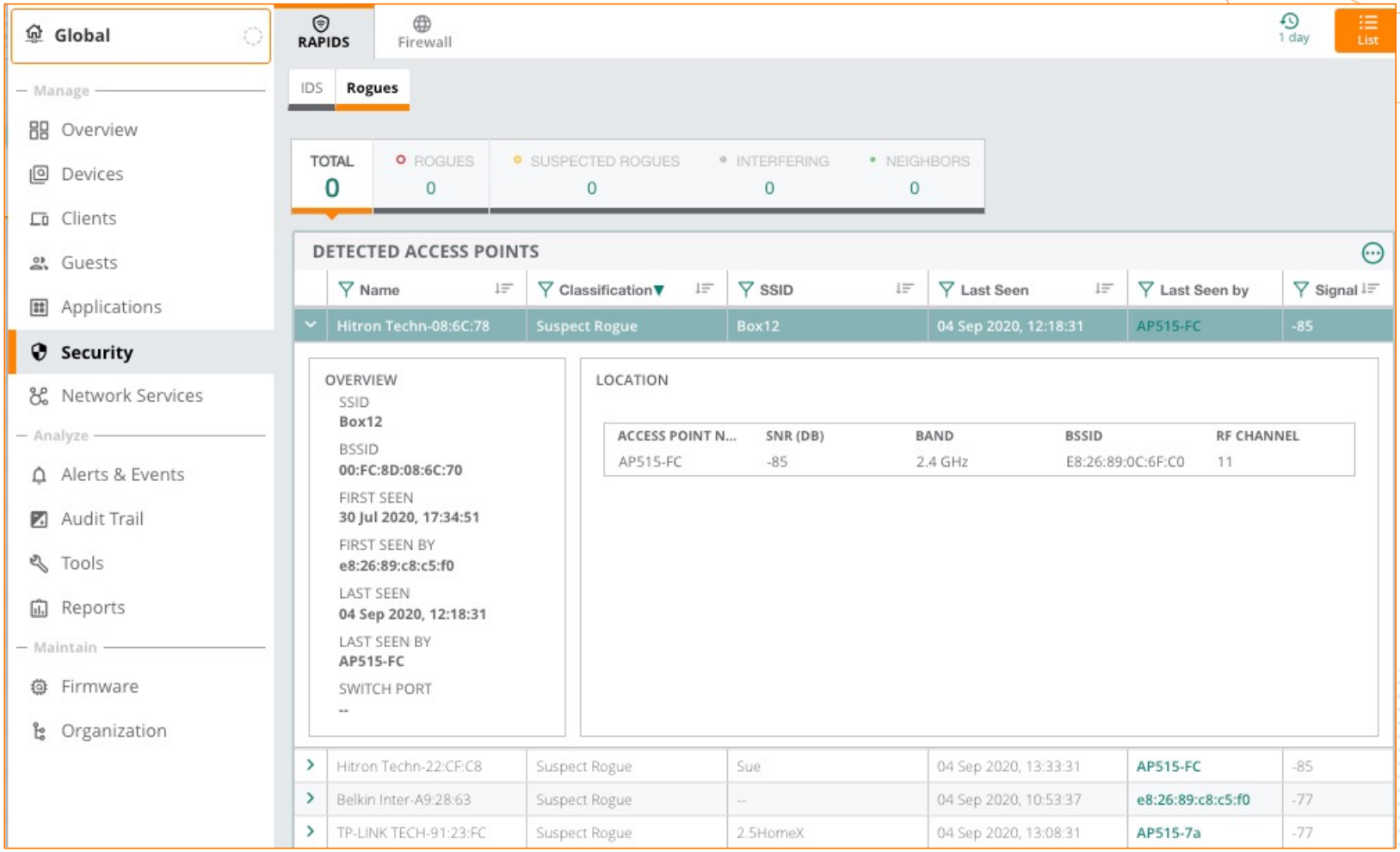




Output

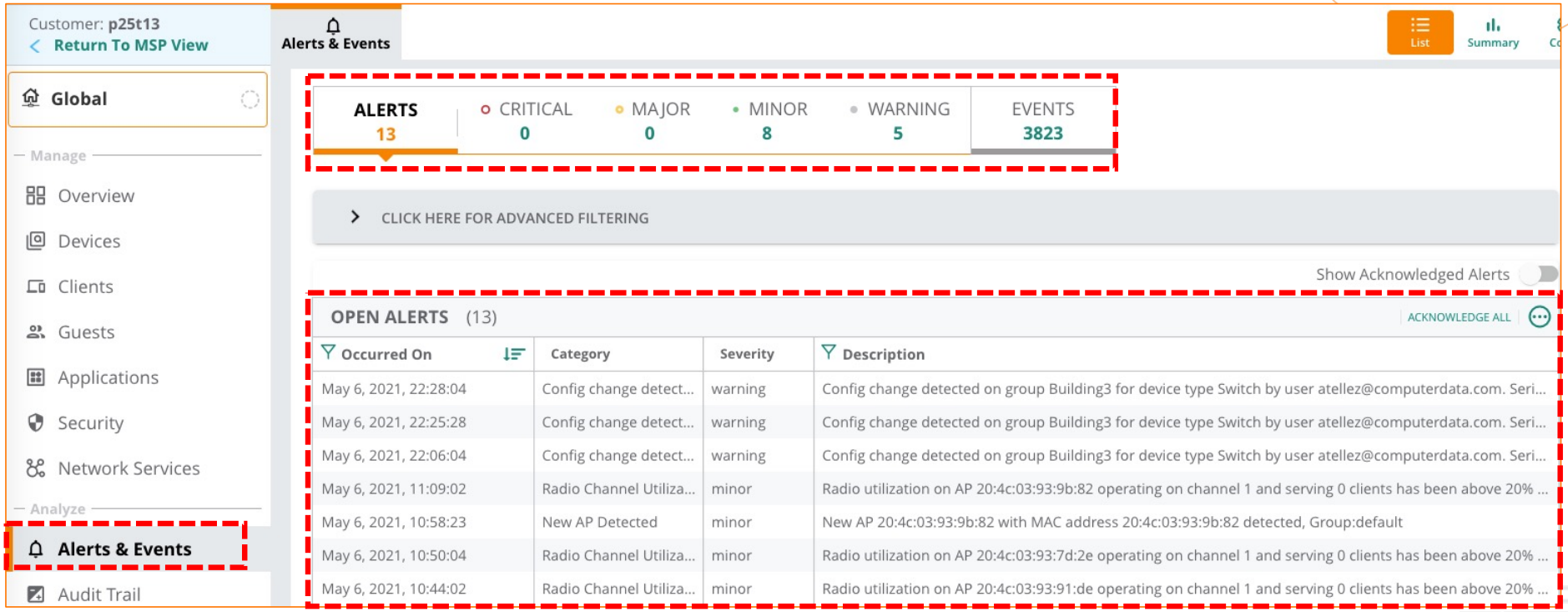
Security

RAPIDS

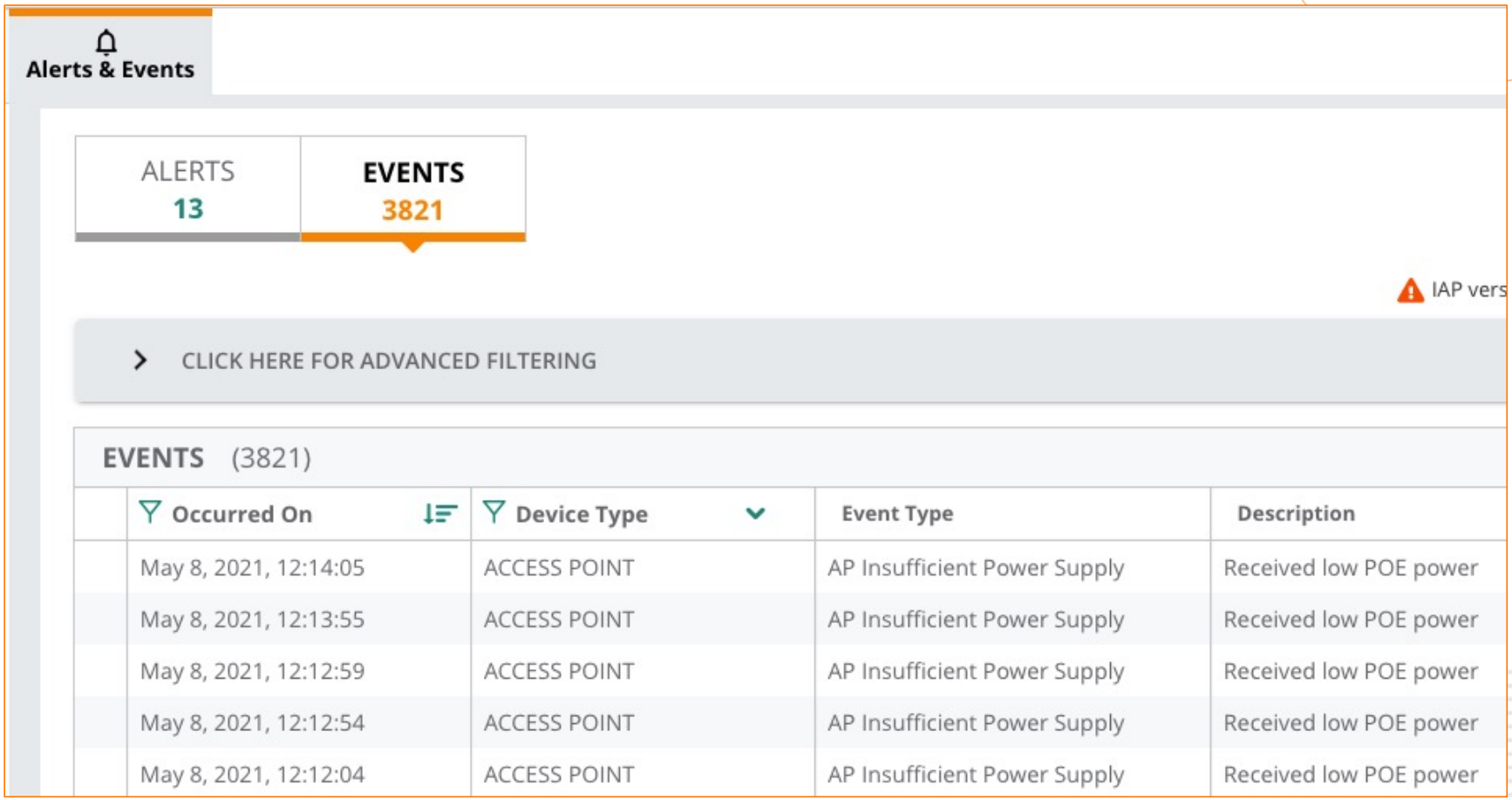

Global
Manage
Overview
Devices
Clients
Guests
Applications
Security
Network Services
Analyze
Alerts & Events
Audit Trail
Tools
Reports
Maintain
Firmware
Organization
RAPIDS
Firewall
1 day
List
IDS
Rogues
TOTAL 0
ROGUES 0
SUSPECTED ROGUES 0
INTERFERING 0
NEIGHBORS 0
DETECTED ACCESS POINTS
Name
Classification
SSID
Last Seen
Last Seen by
Signal
Hitron Techn-08:6C:78
Suspect Rogue
Box12
04 Sep 2020, 12:18:31
AP515-FC
-85
OVERVIEW
SSID
Box12
BSSID
00:FC:8D:08:6C:70
FIRST SEEN
30 Jul 2020, 17:34:51
FIRST SEEN BY
e8:26:89:c8:c5:f0
LAST SEEN
04 Sep 2020, 12:18:31
LAST SEEN BY
AP515-FC
SWITCH PORT
--
LOCATION
ACCESS POINT N...
SNR (DB)
BAND
BSSID
RF CHANNEL
AP515-FC
-85
2.4 GHz
E8:26:89:0C:6F:C0
11
Hitron Techn-22:CF:C8
Suspect Rogue
Sue
04 Sep 2020, 13:33:31
AP515-FC
-85
Belkin Inter-A9:28:63
Suspect Rogue
--
04 Sep 2020, 10:53:37
e8:26:89:c8:c5:f0
-77
TP-LINK TECH-91:23:FC
Suspect Rogue
2.5HomeX
04 Sep 2020, 13:08:31
AP515-7a
-77

Alerts

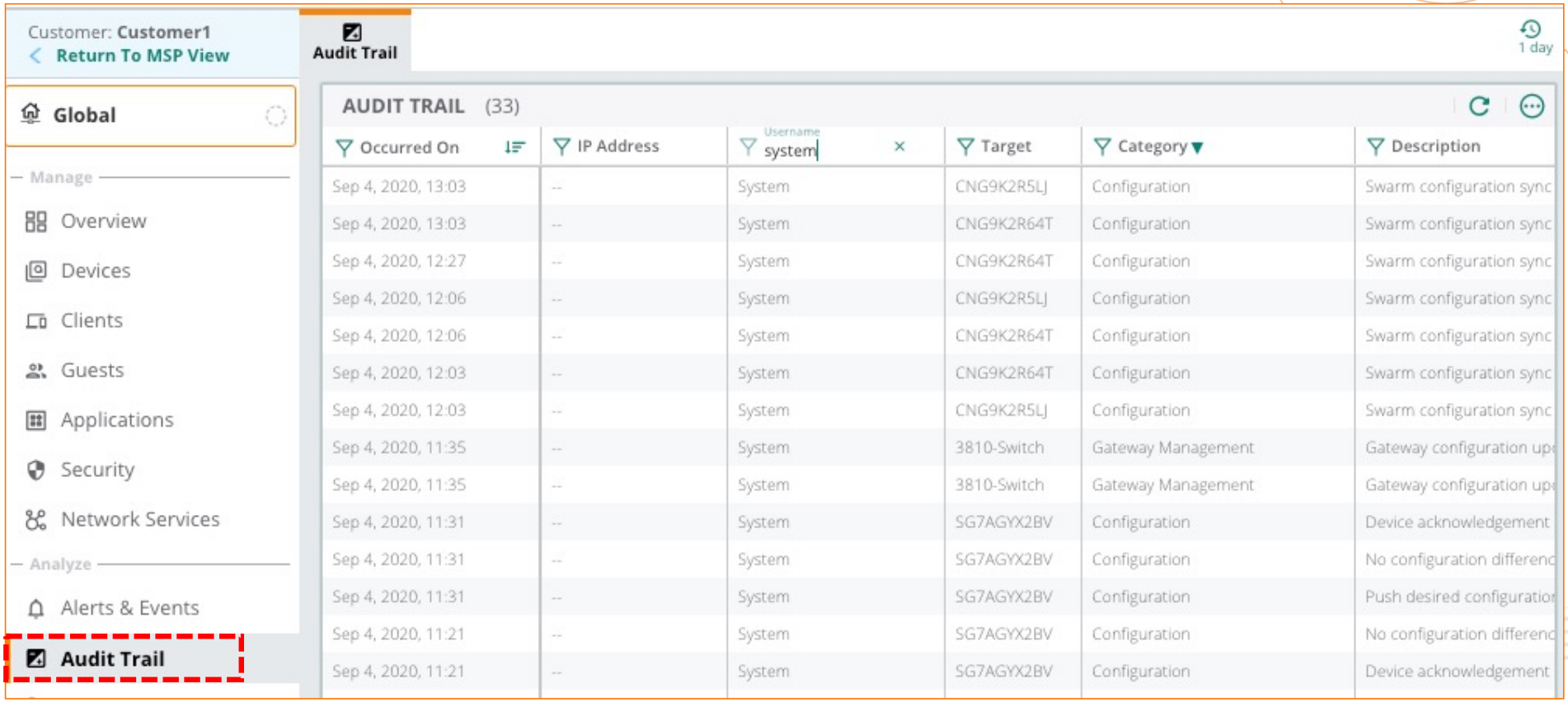
Alerts


Customer: p25t13
Return To MSP View
Alerts & Events
List
Summary
Global
Manage
Overview
Devices
Clients
Guests
Applications
Security
Network Services
Analyze
Alerts & Events
Audit Trail
ALERTS 13
CRITICAL 0
MAJOR 0
MINOR 8
WARNING 5
EVENTS 3823
CLICK HERE FOR ADVANCED FILTERING
Show Acknowledged Alerts
OPEN ALERTS (13)
ACKNOWLEDGE ALL
Occurred On
Category
Severity
Description
May 6, 2021, 22:28:04 Config change detect... warning Config change detected on group Building3 for device type Switch by user atellez@computerdata.com. Seri...
May 6, 2021, 22:25:28 Config change detect... warning Config change detected on group Building3 for device type Switch by user atellez@computerdata.com. Seri...
May 6, 2021, 22:06:04 Config change detect... warning Config change detected on group Building3 for device type Switch by user atellez@computerdata.com. Seri...
May 6, 2021, 11:09:02 Radio Channel Utiliza... minor Radio utilization on AP 20:4c:03:93:9b:82 operating on channel 1 and serving 0 clients has been above 20% ...
May 6, 2021, 10:58:23 New AP Detected minor New AP 20:4c:03:93:9b:82 with MAC address 20:4c:03:93:9b:82 detected, Group:default
May 6, 2021, 10:50:04 Radio Channel Utiliza... minor Radio utilization on AP 20:4c:03:93:7d:2e operating on channel 1 and serving 0 clients has been above 20% ...
May 6, 2021, 10:44:02 Radio Channel Utiliza... minor Radio utilization on AP 20:4c:03:93:91:de operating on channel 1 and serving 0 clients has been above 20% ...

View Events


Alerts & Events
ALERTS
13
EVENTS
3821
IAP vers
CLICK HERE FOR ADVANCED FILTERING
EVENTS (3821)
Occurred On
Device Type
Event Type
Description
May 8, 2021, 12:14:05
ACCESS POINT
AP Insufficient Power Supply
Received low POE power
May 8, 2021, 12:13:55
ACCESS POINT
AP Insufficient Power Supply
Received low POE power
May 8, 2021, 12:12:59
ACCESS POINT
AP Insufficient Power Supply
Received low POE power
May 8, 2021, 12:12:54
ACCESS POINT
AP Insufficient Power Supply
Received low POE power
May 8, 2021, 12:12:04
ACCESS POINT
AP Insufficient Power Supply
Received low POE power

Audit Trail

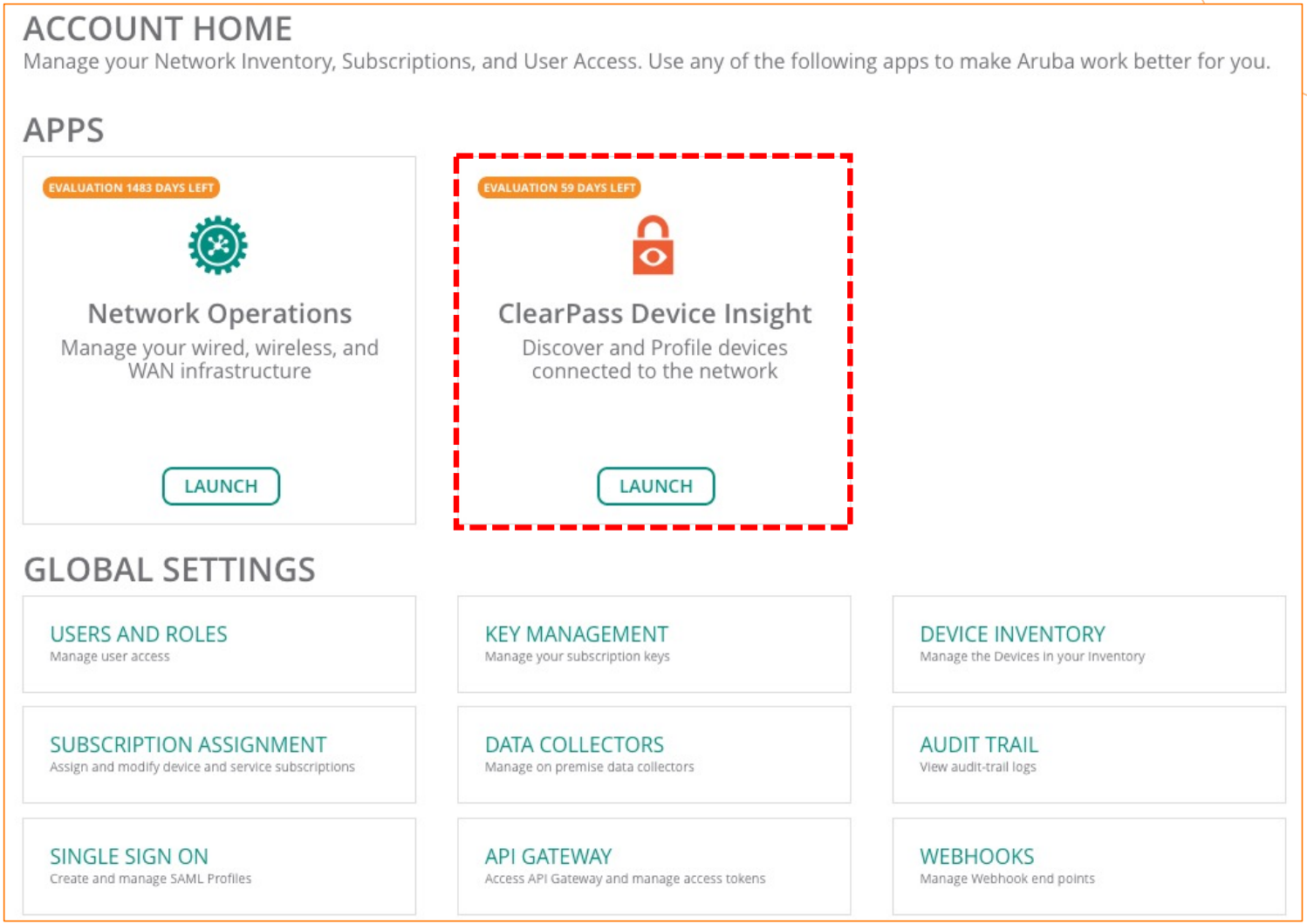

Customer: Customer1
Return To MSP View
Global
Manage
Overview
Devices
Clients
Guests
Applications
Security
Network Services
Analyze
Alerts & Events
Audit Trail
Audit Trail
1 day
AUDIT TRAIL (33)
Occurred On
IP Address
Username
system
Target
Category
Description
Sep 4, 2020, 13:03 -- System CNG9K2R5LJ Configuration Swarm configuration sync
Sep 4, 2020, 13:03 -- System CNG9K2R64T Configuration Swarm configuration sync
Sep 4, 2020, 12:27 -- System CNG9K2R64T Configuration Swarm configuration sync
Sep 4, 2020, 12:06 -- System CNG9K2R5LJ Configuration Swarm configuration sync
Sep 4, 2020, 12:06 -- System CNG9K2R64T Configuration Swarm configuration sync
Sep 4, 2020, 12:03 -- System CNG9K2R64T Configuration Swarm configuration sync
Sep 4, 2020, 12:03 -- System CNG9K2R5LJ Configuration Swarm configuration sync
Sep 4, 2020, 11:35 -- System 3810-Switch Gateway Management Gateway configuration up
Sep 4, 2020, 11:35 -- System 3810-Switch Gateway Management Gateway configuration up
Sep 4, 2020, 11:31 -- System SG7AGYX2BV Configuration Device acknowledgement
Sep 4, 2020, 11:31 -- System SG7AGYX2BV Configuration No configuration differenc
Sep 4, 2020, 11:31 -- System SG7AGYX2BV Configuration Push desired configuratio
Sep 4, 2020, 11:21 -- System SG7AGYX2BV Configuration No configuration differenc
Sep 4, 2020, 11:21 -- System SG7AGYX2BV Configuration Device acknowledgement

aruba
a Hewlett Packard Enterprise company

Cloud Applications

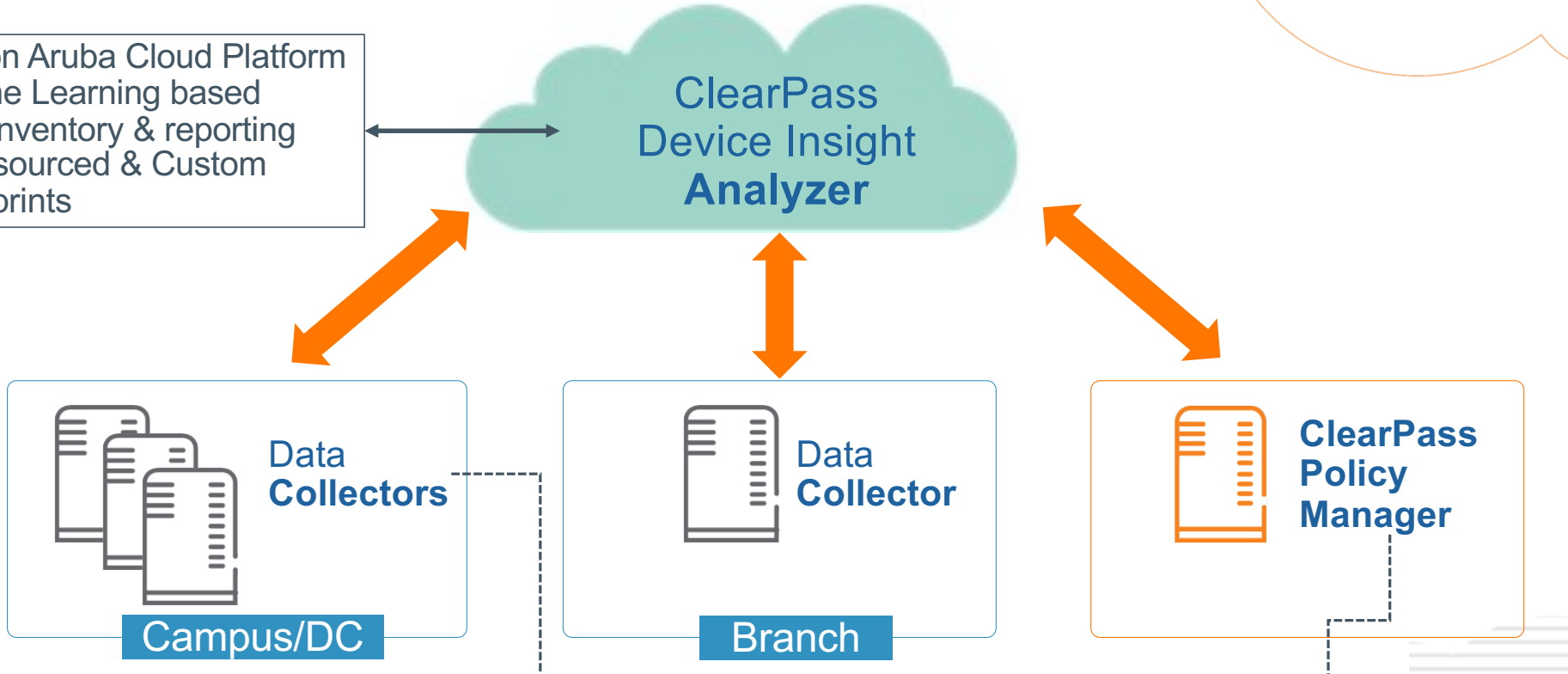
ClearPass Device Insight and Aruba User Experience Insight

Central APPS



Device Insight

- Runs on Aruba Cloud Platform
- Machine Learning based
- Asset inventory & reporting
- Crowdsourced & Custom Fingerprints



- HW/ Virtual Appliance
- DPI support
- Passive collection & Active Scanning
- Sends metadata to Device Insight Analyzer

- Enhanced profiling data
- Bidirectional communication
- Central reporting infrastructure

Device Insight

Aruba User Experience Insight

Generate synthetic traffic

UXI G-Series Sensor

UXI F-Series Sensor

SSID

Access Point
(Any vendor)

Aruba Cloud

Administrator

I know what is the user experience

Aruba User Experience Insight

User-perspective **insights** for detecting and troubleshooting problems in ways no other solution can provide, without site-visits or truck-rolls

UNIQUE

- **Synthetic** client testing
- Provide an outside-in perspective of the network
- **Vendor-agnostic**
- Wi-Fi **SSID** and/or **Wired** port

POWERFUL

- Offers **real-time** performance status
- Enables proactive problem resolution
- Tests the full path from the edge to data/app/service
- Analytics facilitates troubleshooting
- Triage feature
- Packet capture history

SIMPLE

- Straightforward value prop
- Intuitive user interface
- **Zero-touch installation**
- Minimal ongoing admin

Aruba User Experience Insight

UXI F-Series Sensor

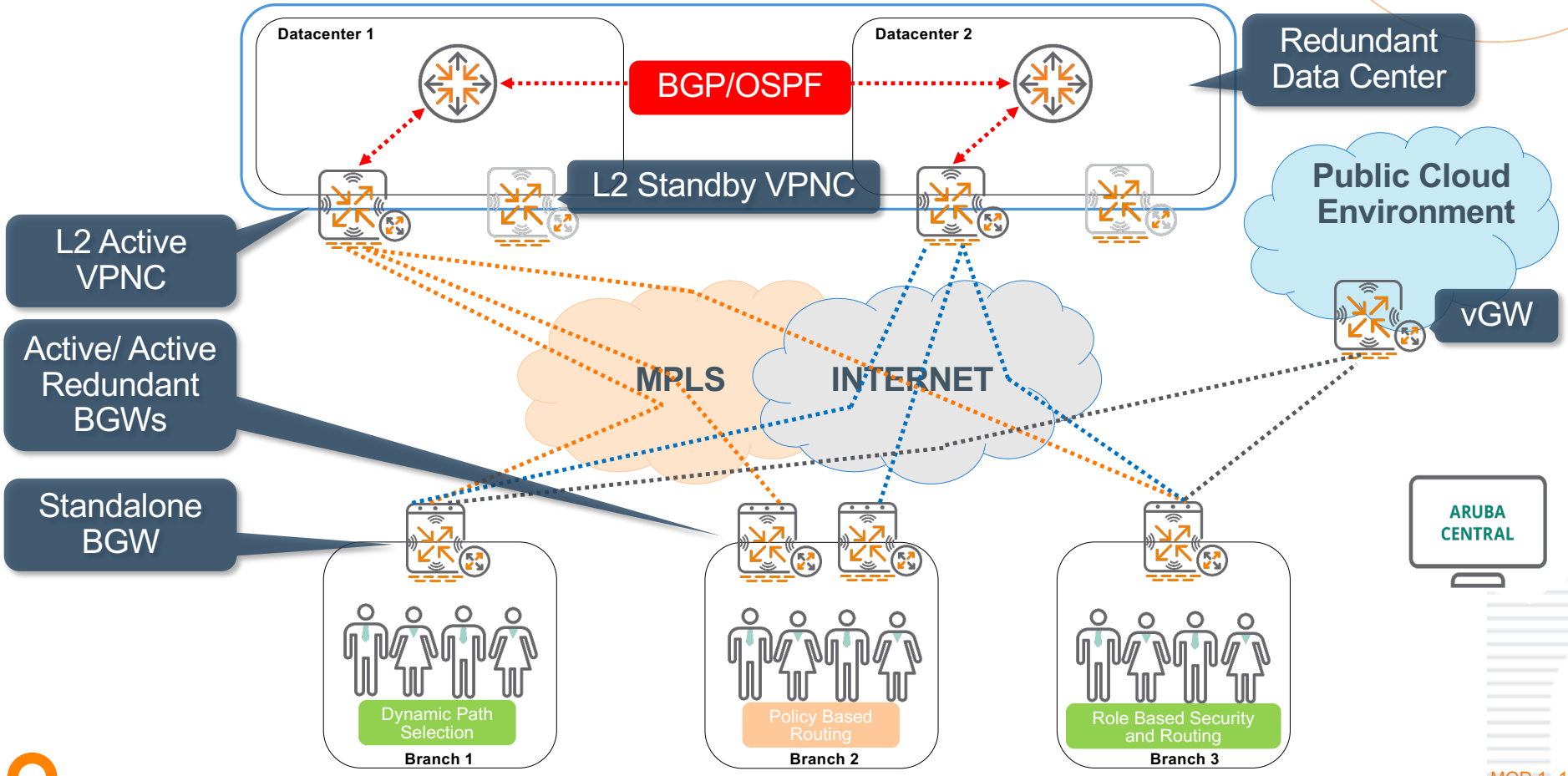
Wi-Fi Connection	Internal Servers	External Servers
SSID visibility AP association RF environment	Authentication Captive Portal DNS, DHCP,… Speed/ Reliability	Throughput Latency Jitter Packet Loss

Aruba User Experience Insight

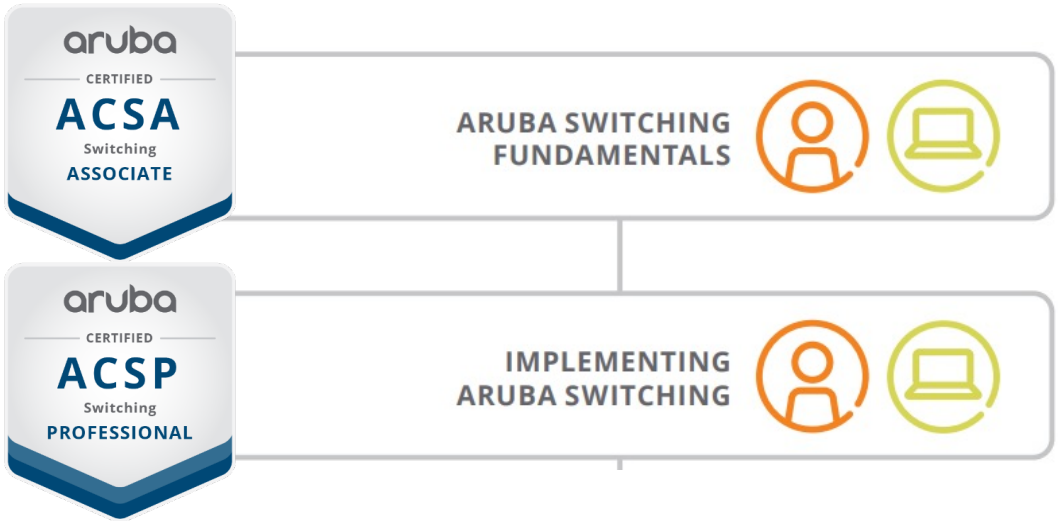
Performance is OK

There’s an issue

SD-Branch


Datacenter 1
Datacenter 2
BGP/OSPF
Redundant Data Center
L2 Standby VPNC
L2 Active VPNC
Public Cloud Environment
vGW
Active/ Active Redundant BGWs
MPLS
INTERNET
Standalone BGW
ARUBA CENTRAL
Dynamic Path Selection
Branch 1
Policy Based Routing
Branch 2
Role Based Security and Routing
Branch 3

Thank you for attending Part 1 of Aruba Cloud Essentials!

arubanetworks.com/certification

- If you want to take the next steps to get a deeper understanding of Aruba switching technologies, check out the Aruba Switching Fundamentals course or review the ACSA study guide on HPE Press. (Currently on Aruba OS Switch, Aruba OSCX Study guide)
- Hungry for more? Aruba Mobility Essentials is coming soon
- In the meantime, Airheads Learning Community is available for free bite-sizes videos