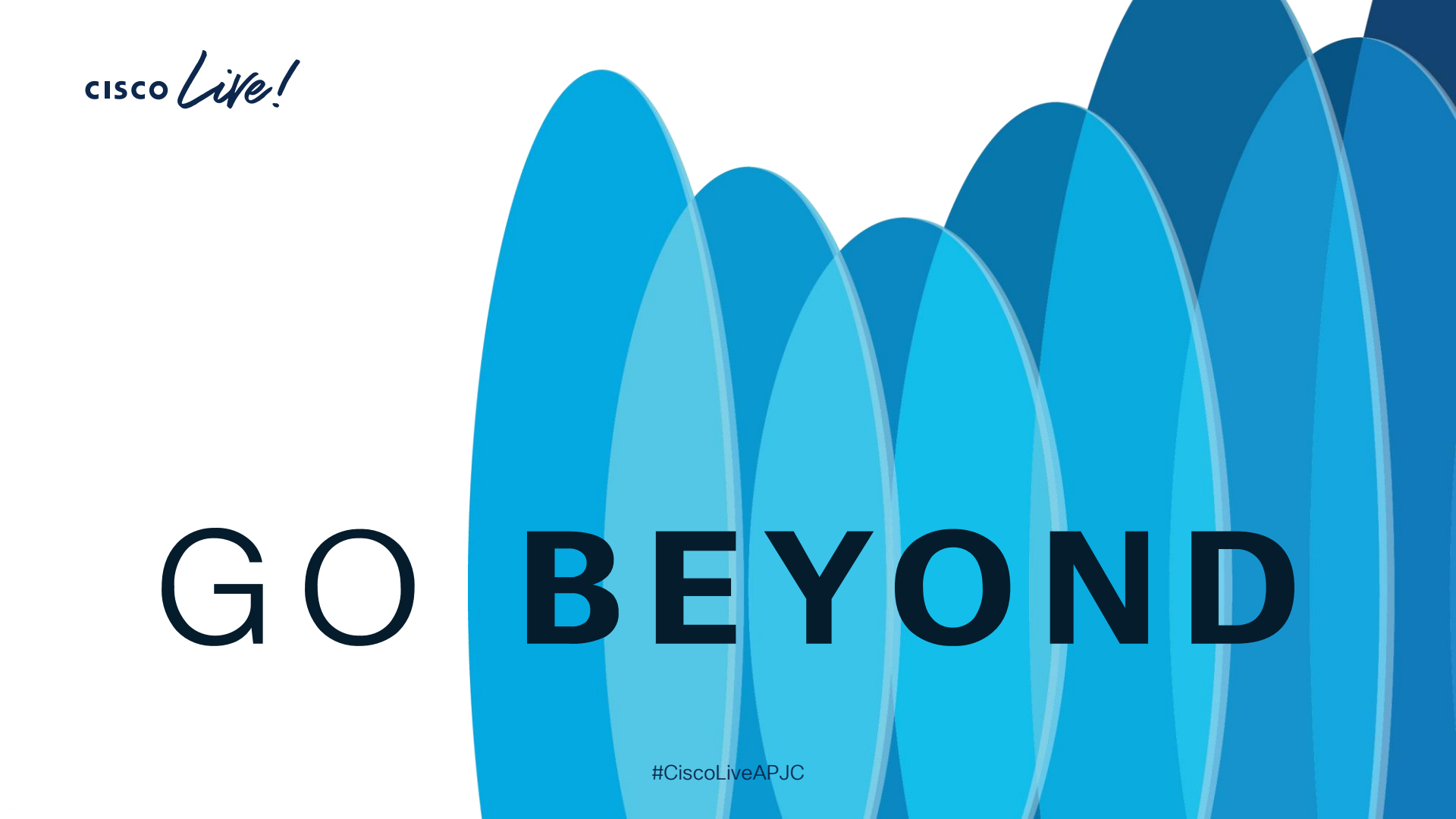
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GO BEYOND
#CiscoLiveAPJC

Automate the deployment of a wireless network with the help of Cisco Catalyst Center

Martyn Rees, Customer Success Specialist

BRKOPS-2402

Cisco Webex App

https://ciscolive.ciscoevents.com/ciscolivebot/#BRKOPS-2402

Questions?

Use Cisco Webex App to chat with the speaker after the session

How

1. Find this session in the Cisco Live Mobile App
2. Click “Join the Discussion”
3. Install the Webex App or go directly to the Webex space
4. Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until November 15, 2024.

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Cisco Catalyst Center

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Agenda

- Define Network Intent for Wireless
- Onboarding of Infrastructure
- Deployment Modes
- Software Image Management (SWIM)
- Day-N Operations

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Martyn Rees

Customer Success Specialist
Joined Cisco in 2021

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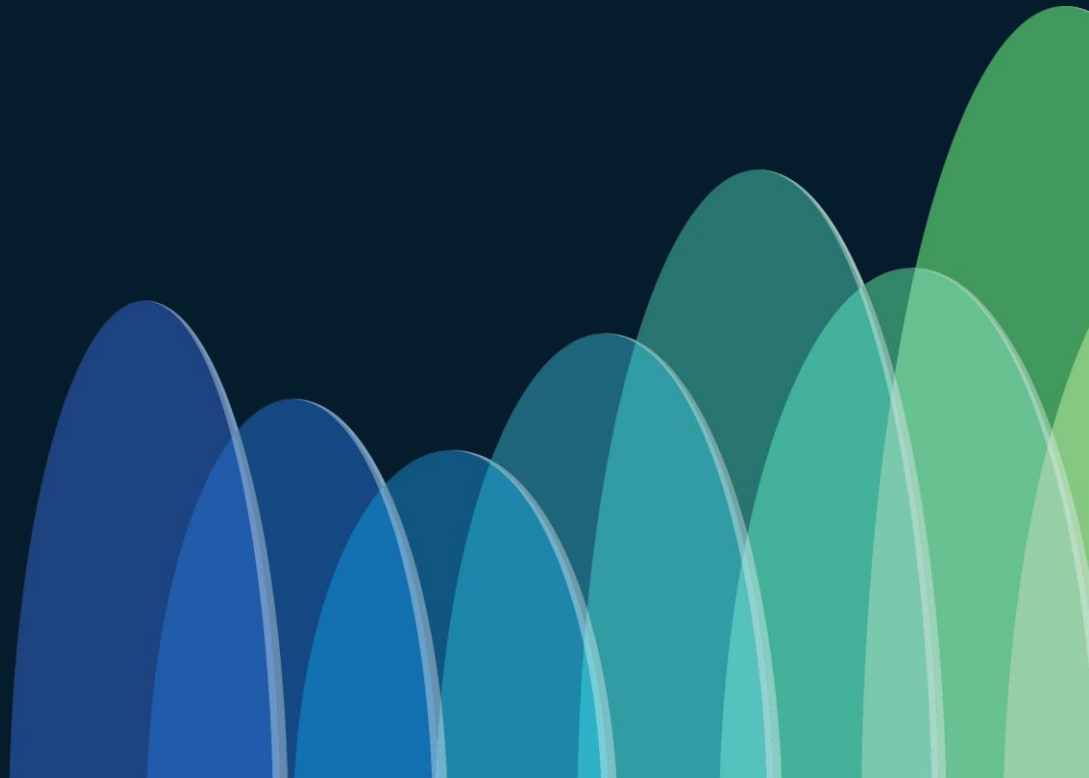
Network Intent for Wireless



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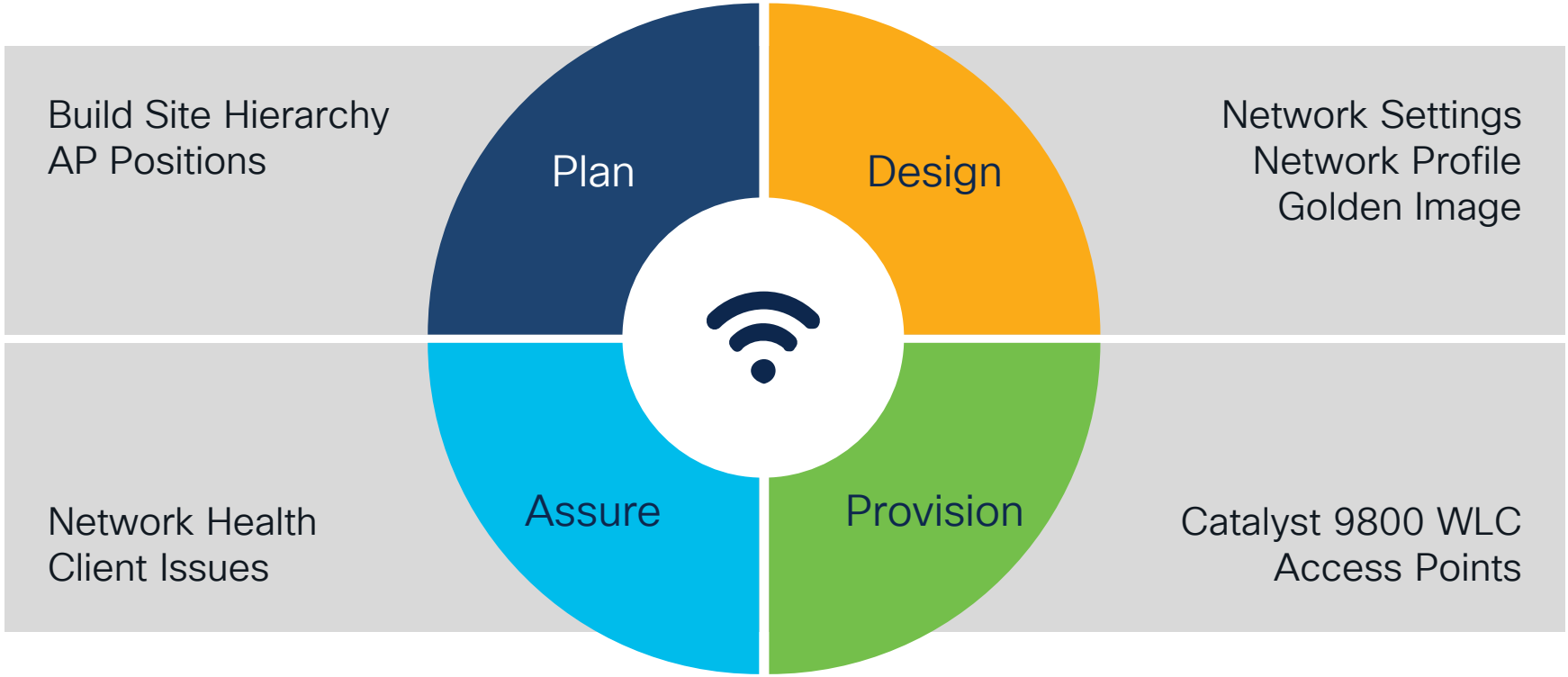
Wireless Deployment Workflow



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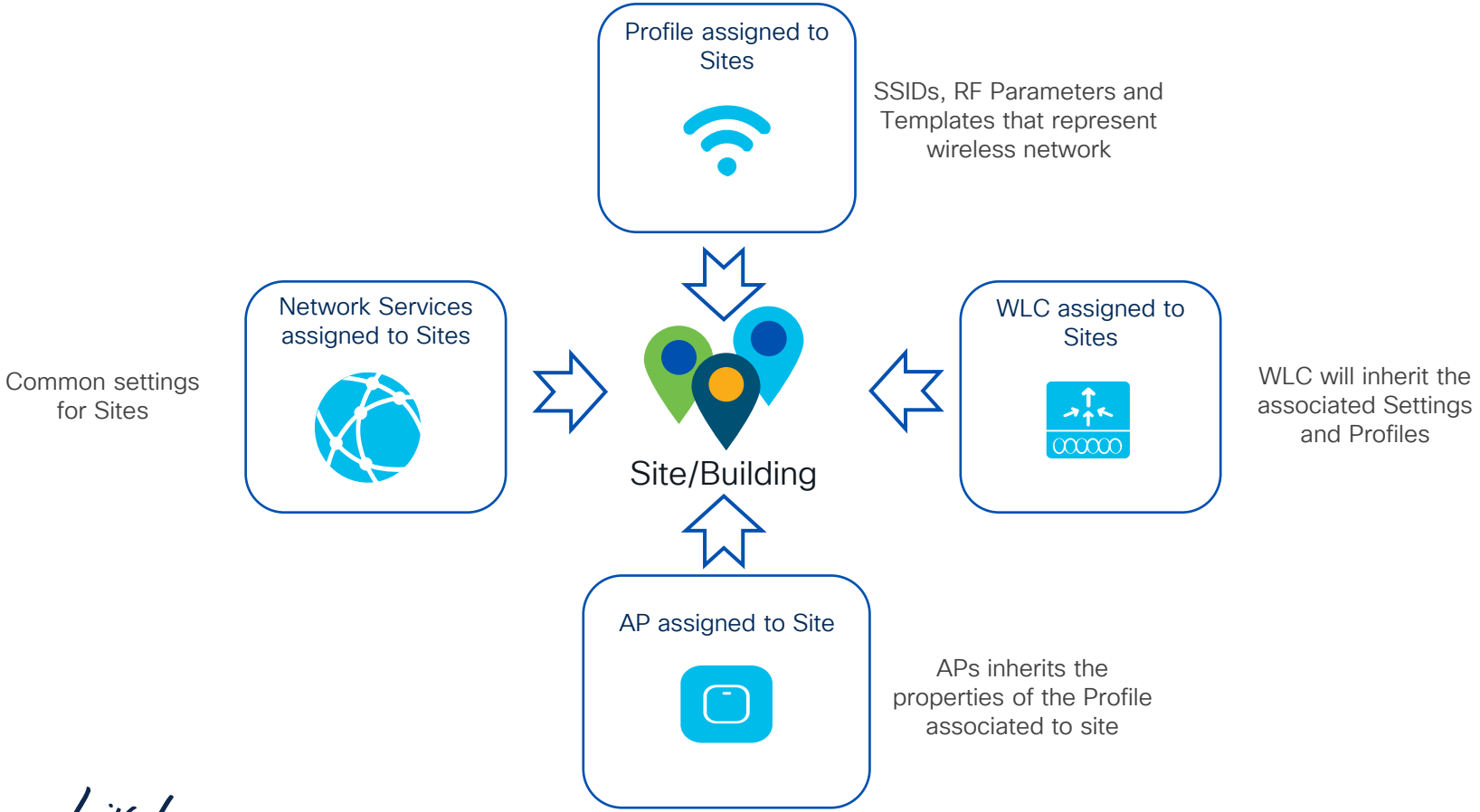
Wireless Deployment Workflow



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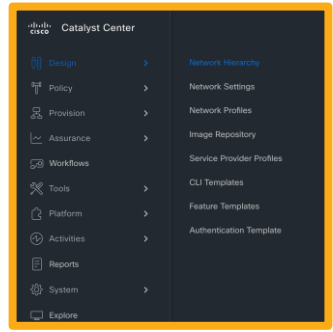
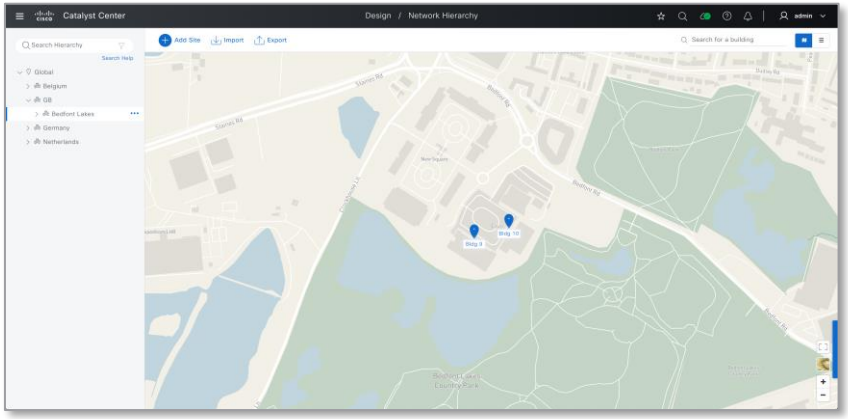
Hierarchy creation: Sites and Maps



- Area – (Area) … - Building – Floor
- Buildings need an address or Lat/Lon coordinates
  - Use the mapbox integration to auto-complete addresses
- Migration Options:
  - Manual Import
    - Sites
      - Export Network Device Groups from PI (APIC-EM Format)
      - Fix missing Lat / Lon and addresses in CSV
    - Floorplans
      - Export Wireless Maps from PI
      - Use Map Import in Catalyst Center
  - PI Migration with Catalyst Center coexistence tool in PI
  - Ekahau Import



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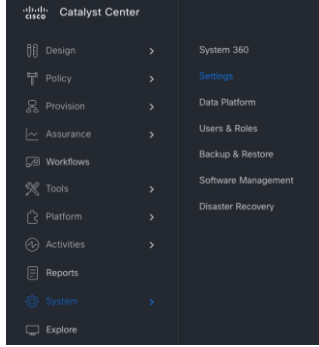
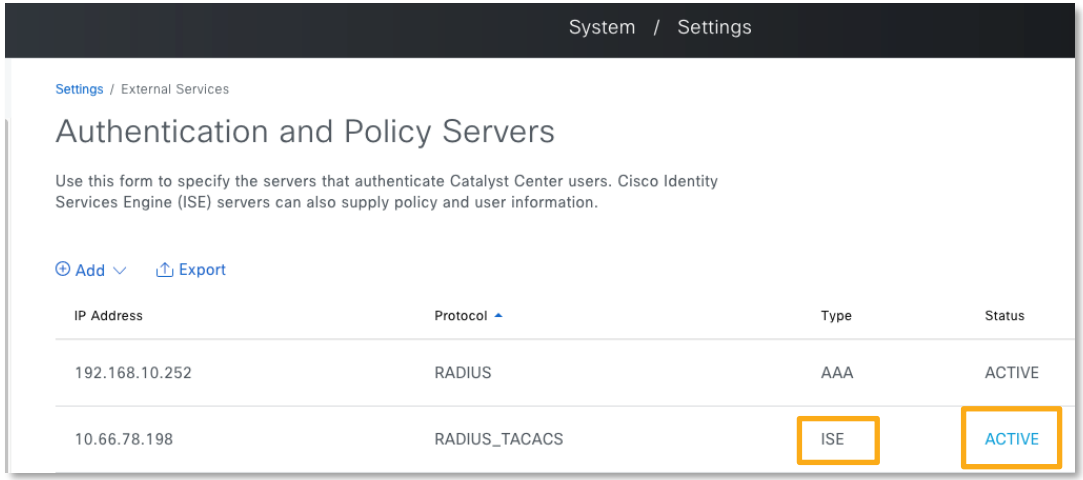
ISE Integration

- Don’t configure ISE as AAA server type!
- Automatically learn all nodes in ISE Cluster
  - All PSN nodes are automatically populated in to AAA Network & Client Endpoint drop down lists.
- Ability to configure VIP for PSN’s behind load balancers





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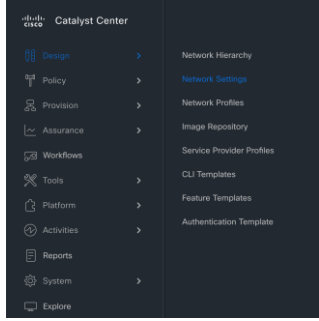
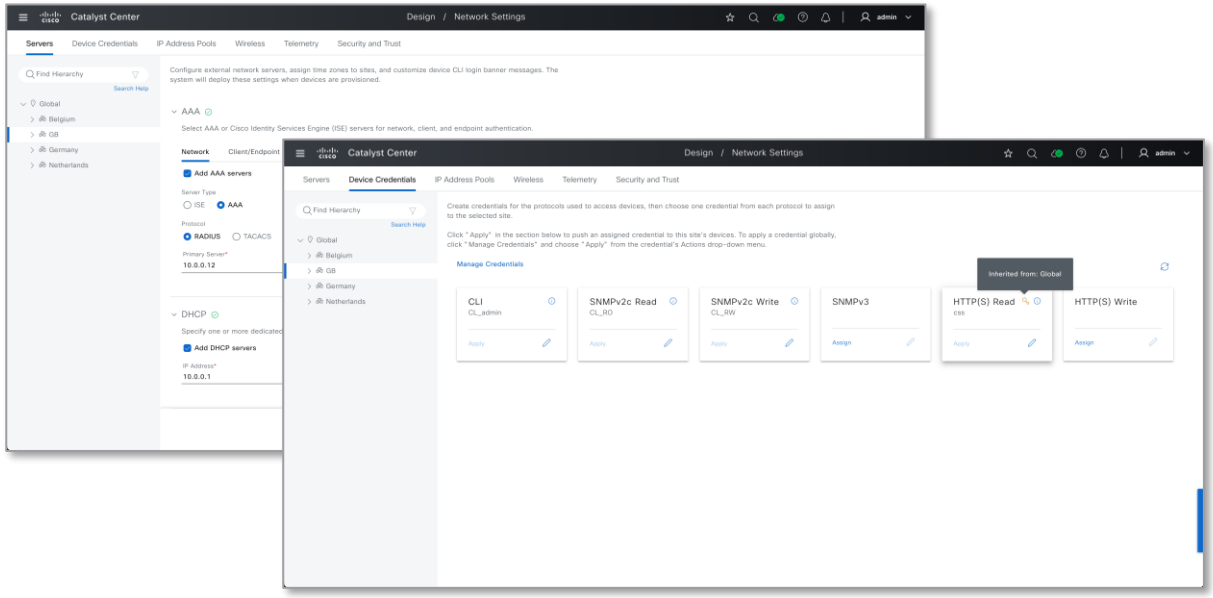
Network Settings

- Network:
  - AAA, DHCP, DNS, NTP and Time zone
- Device Credentials
  - CLI, SNMP, HTTP(S)
  - Netconf - Mandatory





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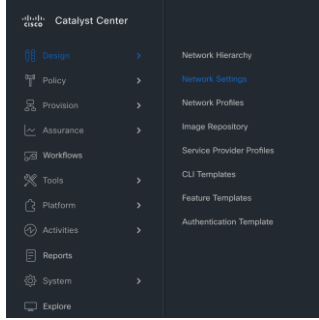
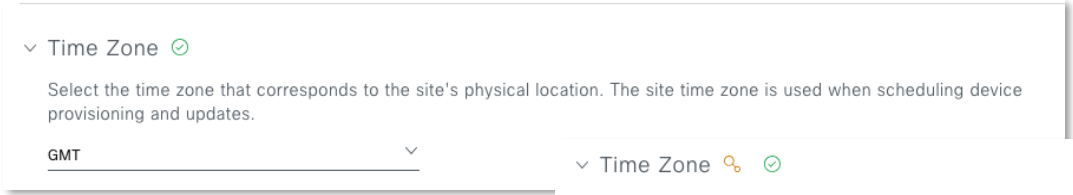
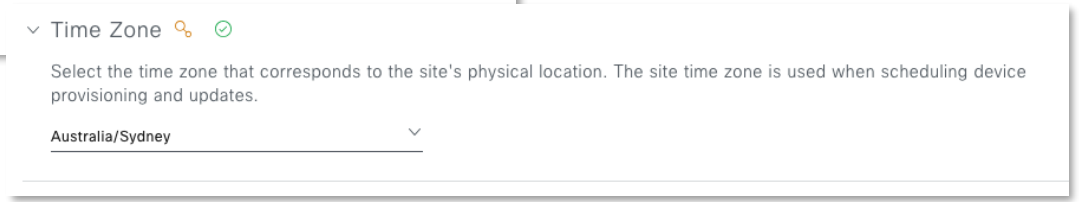
Network Settings – Time Zone

- Scheduling
  - Upgrades & provisioning based on site time
  - Maintenance windows
- AI-RRM Busy Hours







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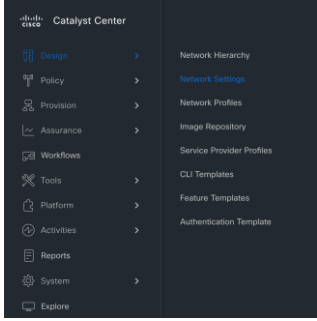
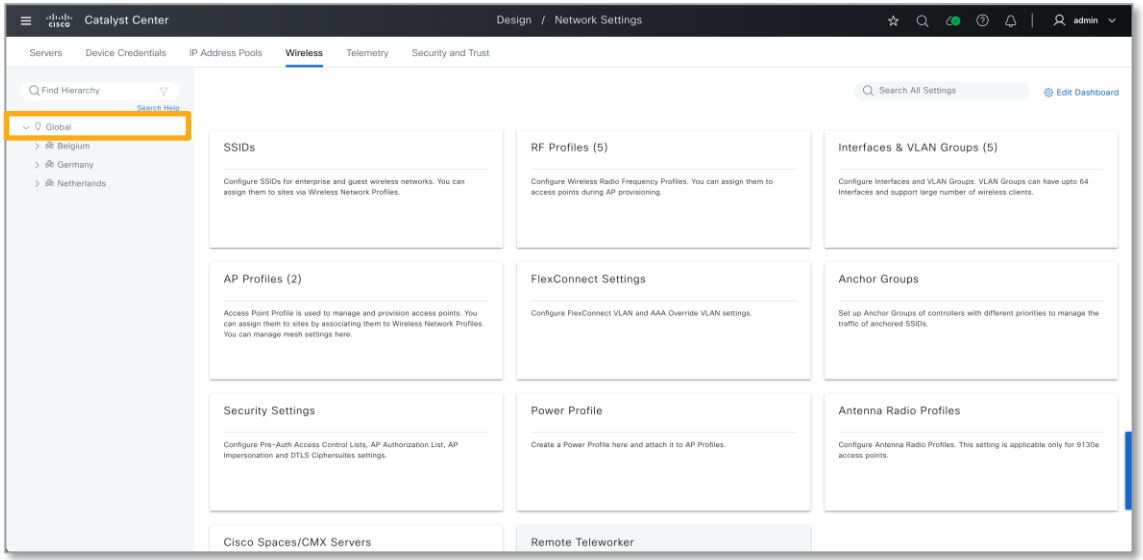
Network Settings: Wireless

- SSIDs
- RF Profiles
- Interfaces &VLAN Groups
- AP Profiles
- FlexConnect Settings
- Anchor Groups
- Security Settings
- Power Profile
- Antenna Radio Profiles
- Cisco Spaces/CMX
- Remote Teleworker





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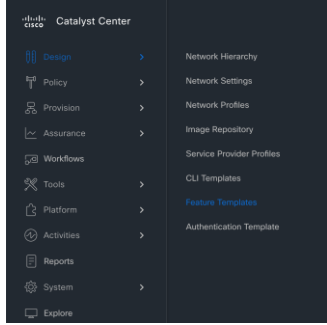
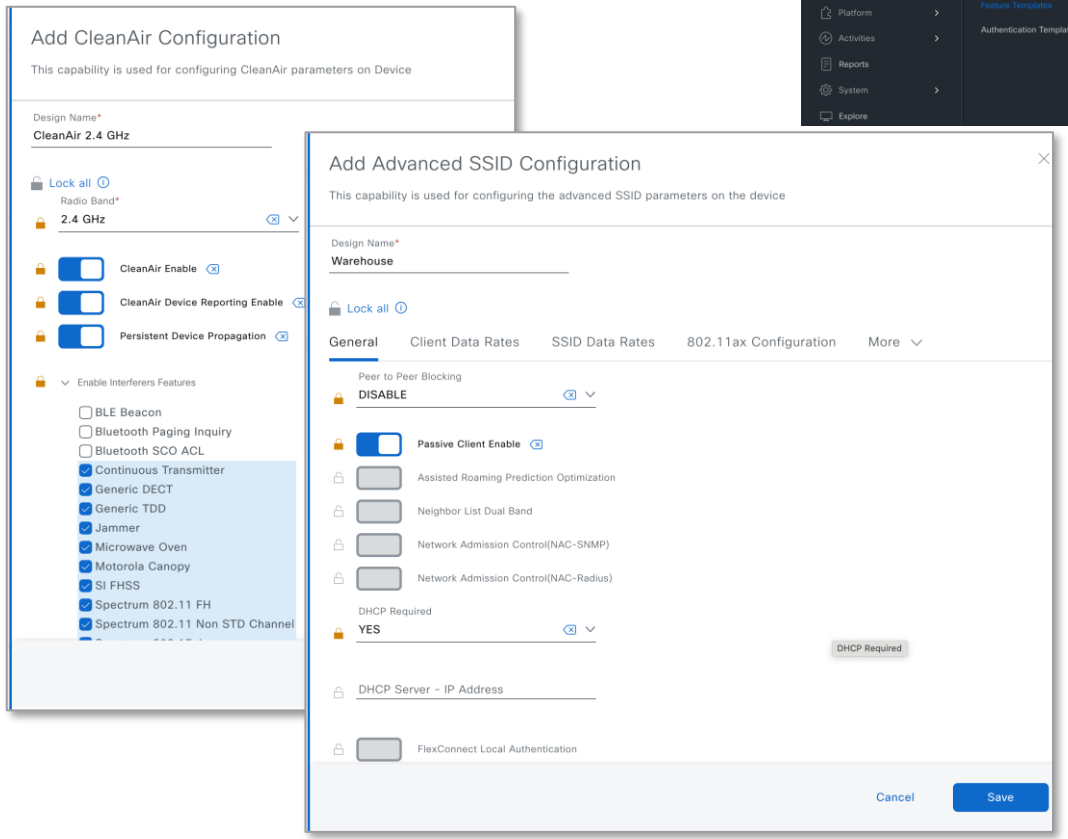
Feature Templates (aka Model Config)

- AAA Radius Attributes
- Advances SSID
- CleanAir
- 802.11ax (Wi-Fi 6)
- Event Driven RRM
- Flex
- Global IPv6
- Multicast
- RRM FRA
- RRM General
- Rogue General





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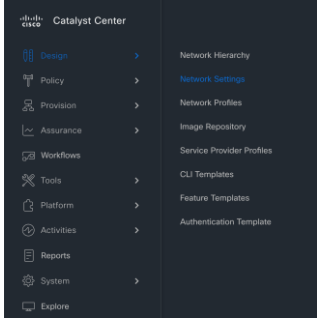
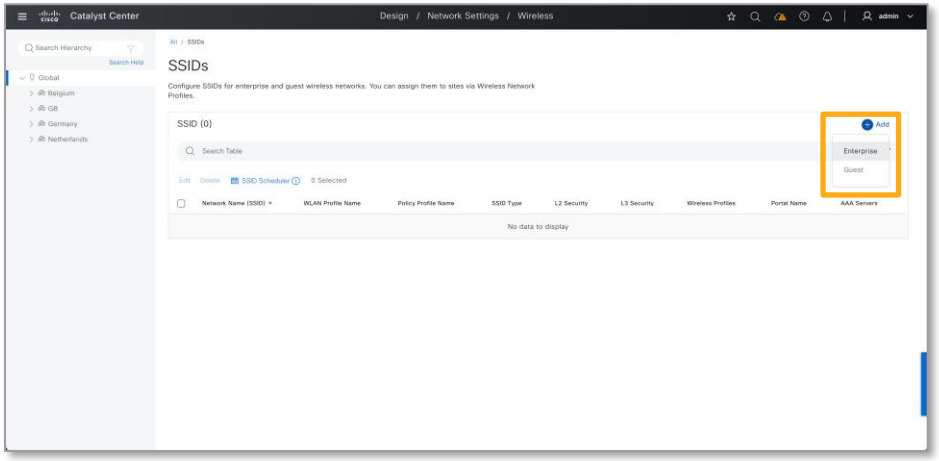
SSID creation

- Enterprise or Guest
- Settings following Best Practice



- Advanced Settings:
  - Fast Transition (802.11r)
  - 11v BSS Transition
  - MFP
  - Neighbor List (802.11k)
  - Set the Session Timeout to 86400s



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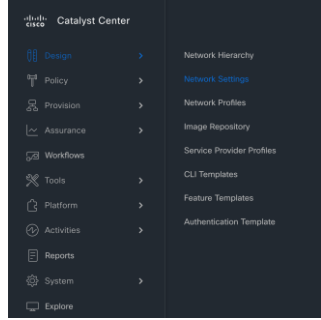
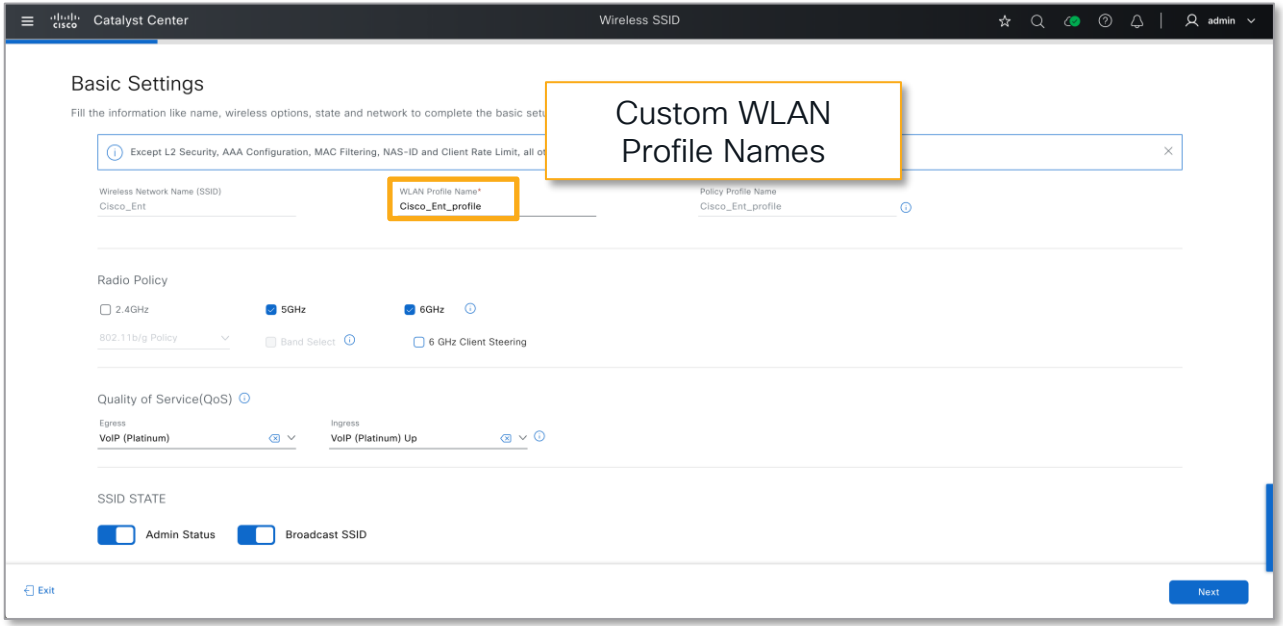
SSID creation





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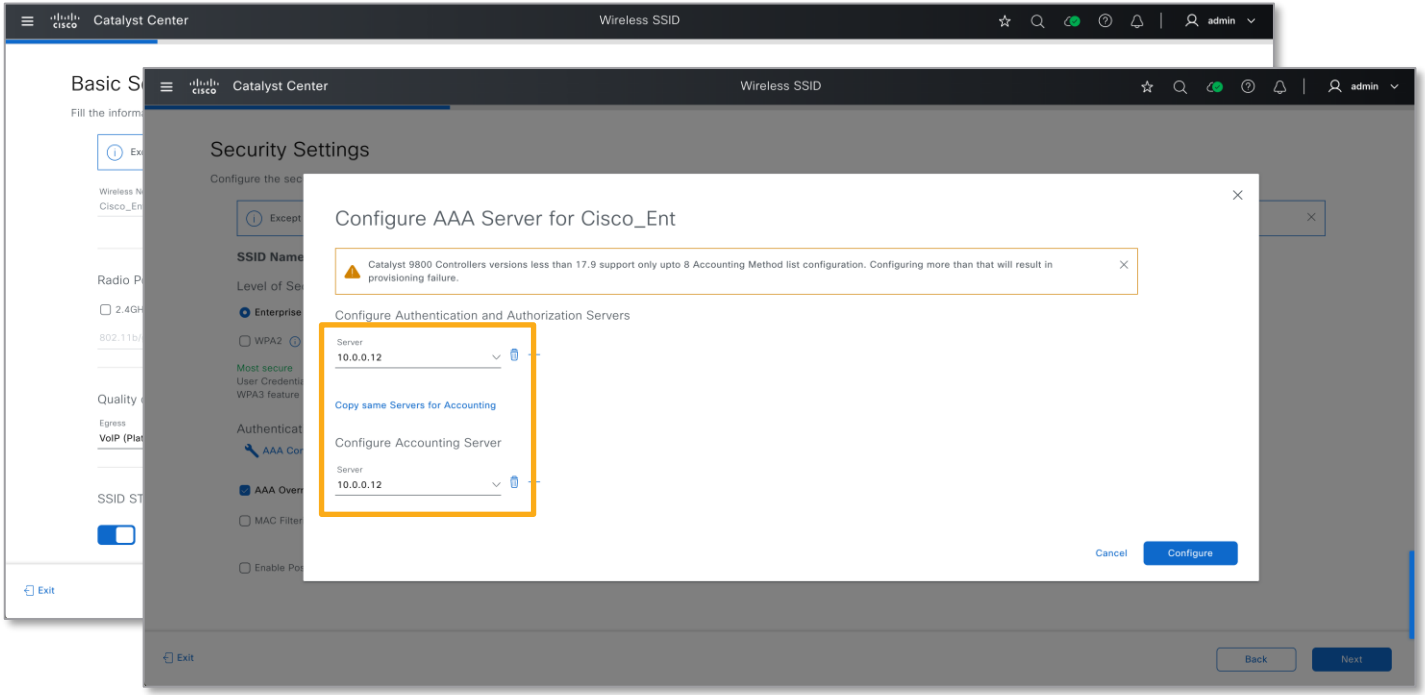
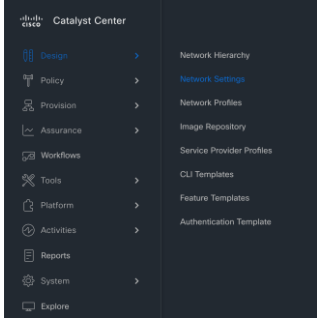
SSID creation





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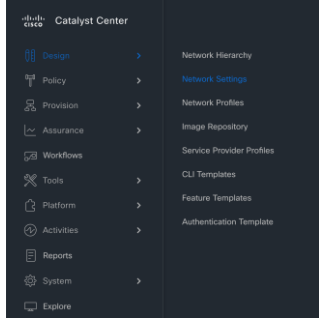
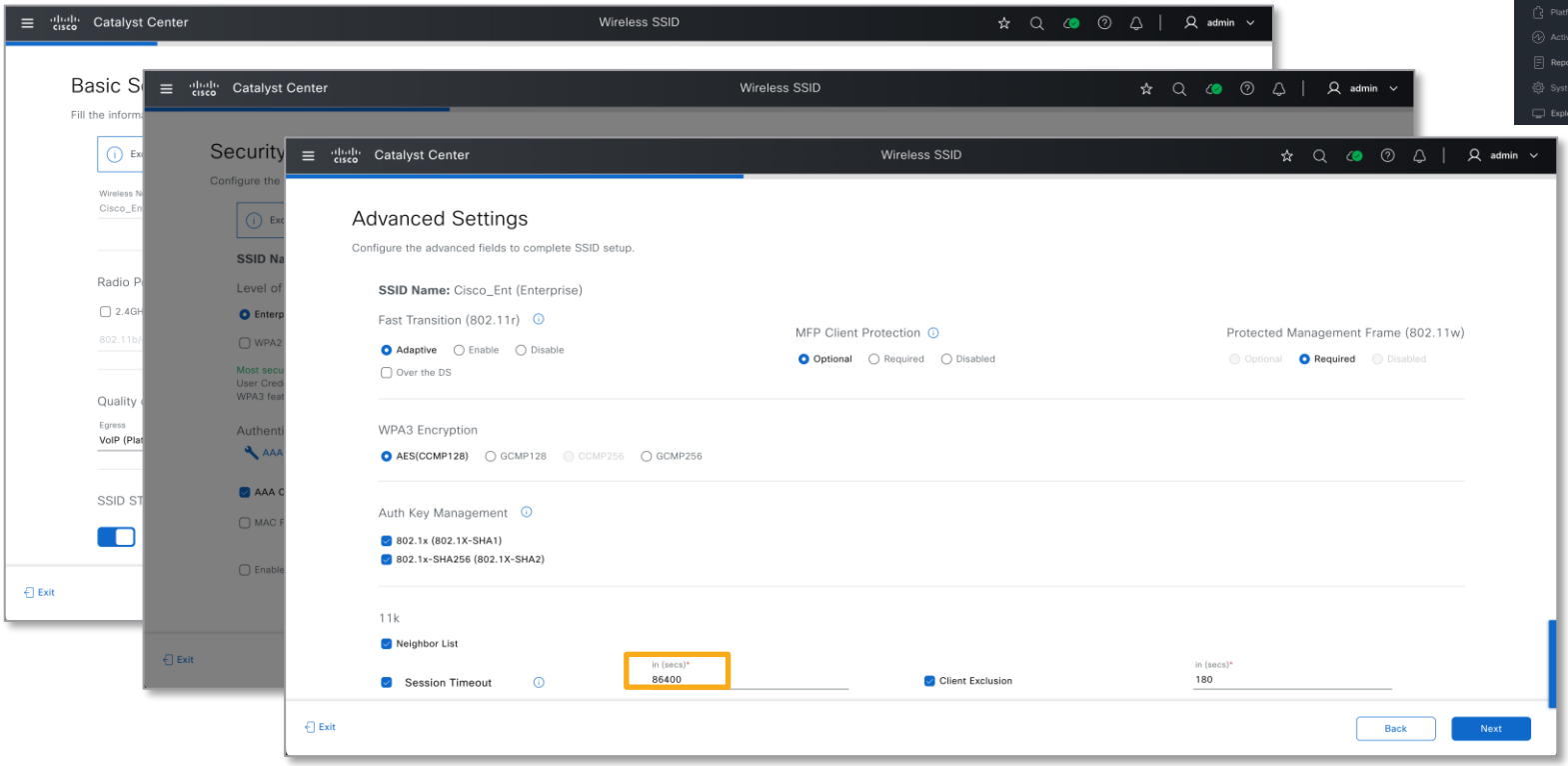
SSID creation





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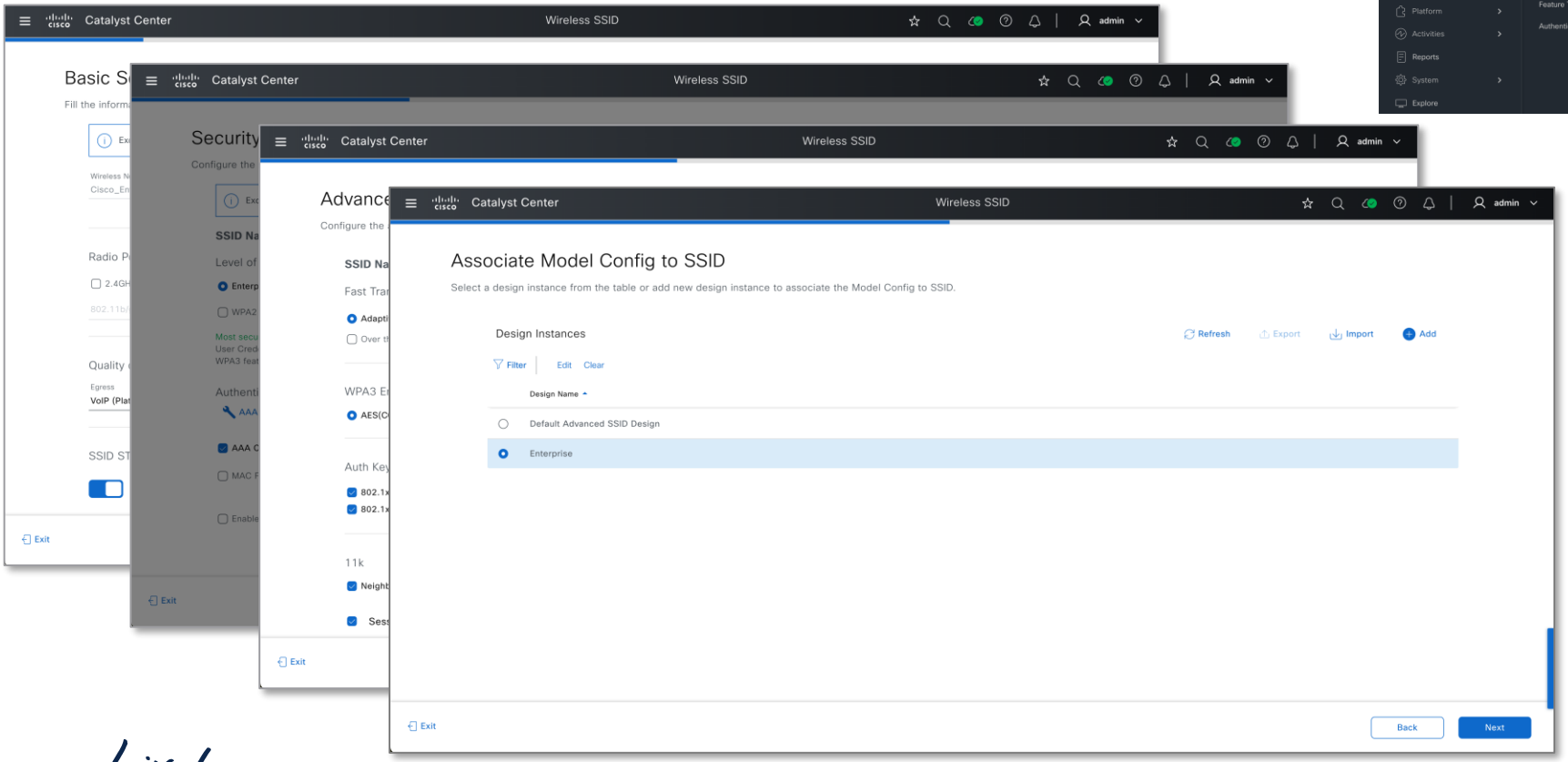
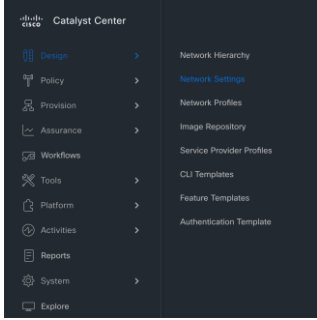
SSID creation





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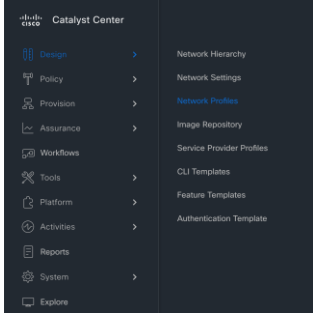
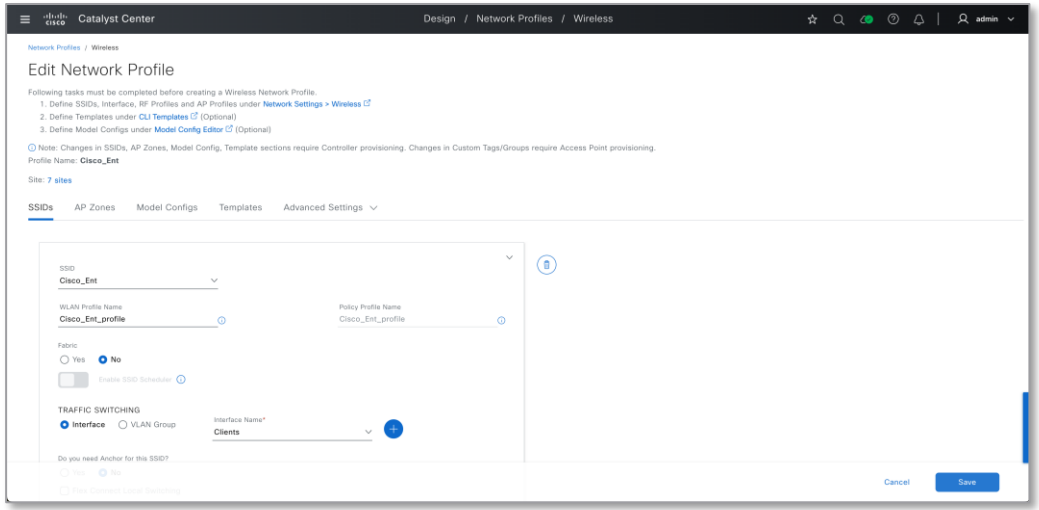
Wireless Network Profile

- Combine SSID with Site Specific Settings
- AP Zones
- Model Configs
  - Feature Templates
- CLI Templates
- Advances Settings
  - Provision Group
  - Custom Site and Policy Tags
  - Additional Interfaces





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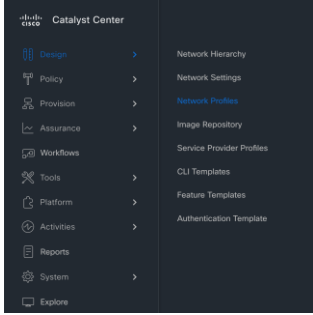

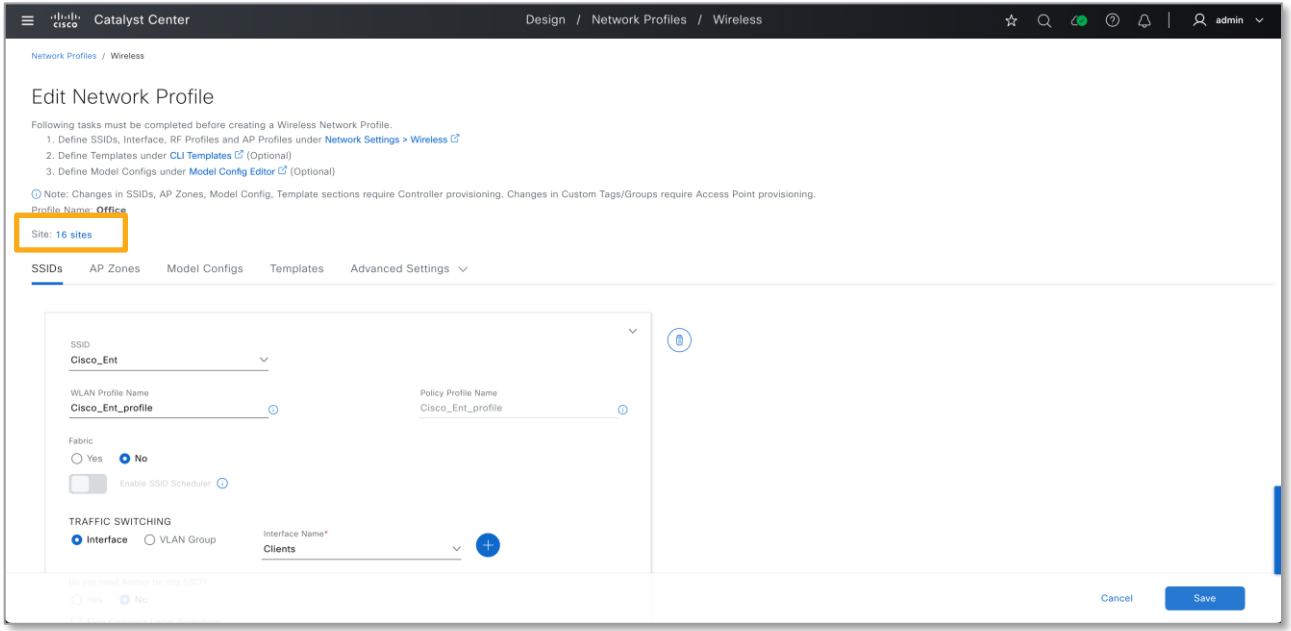

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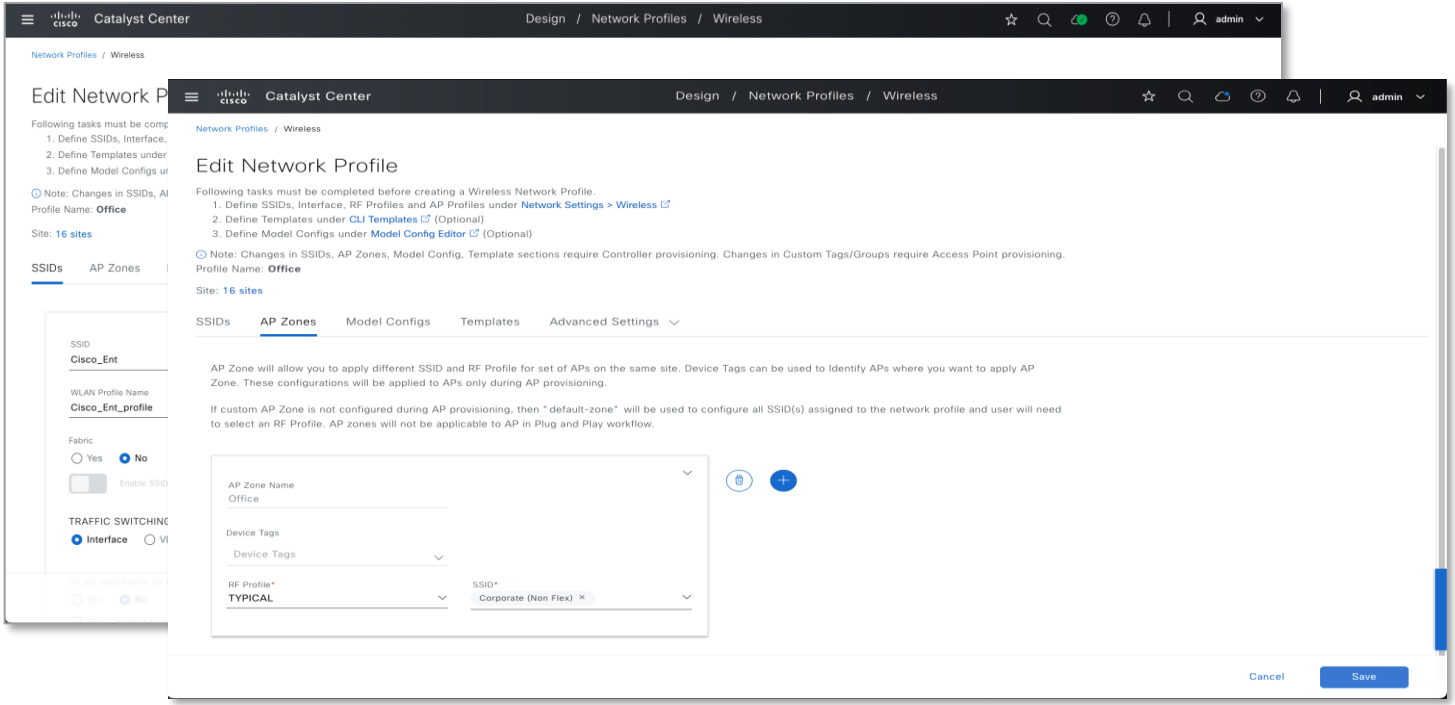

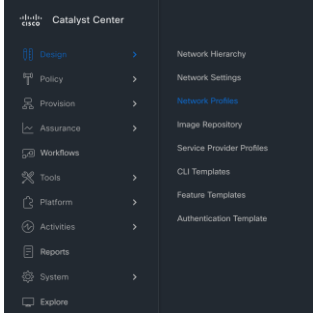

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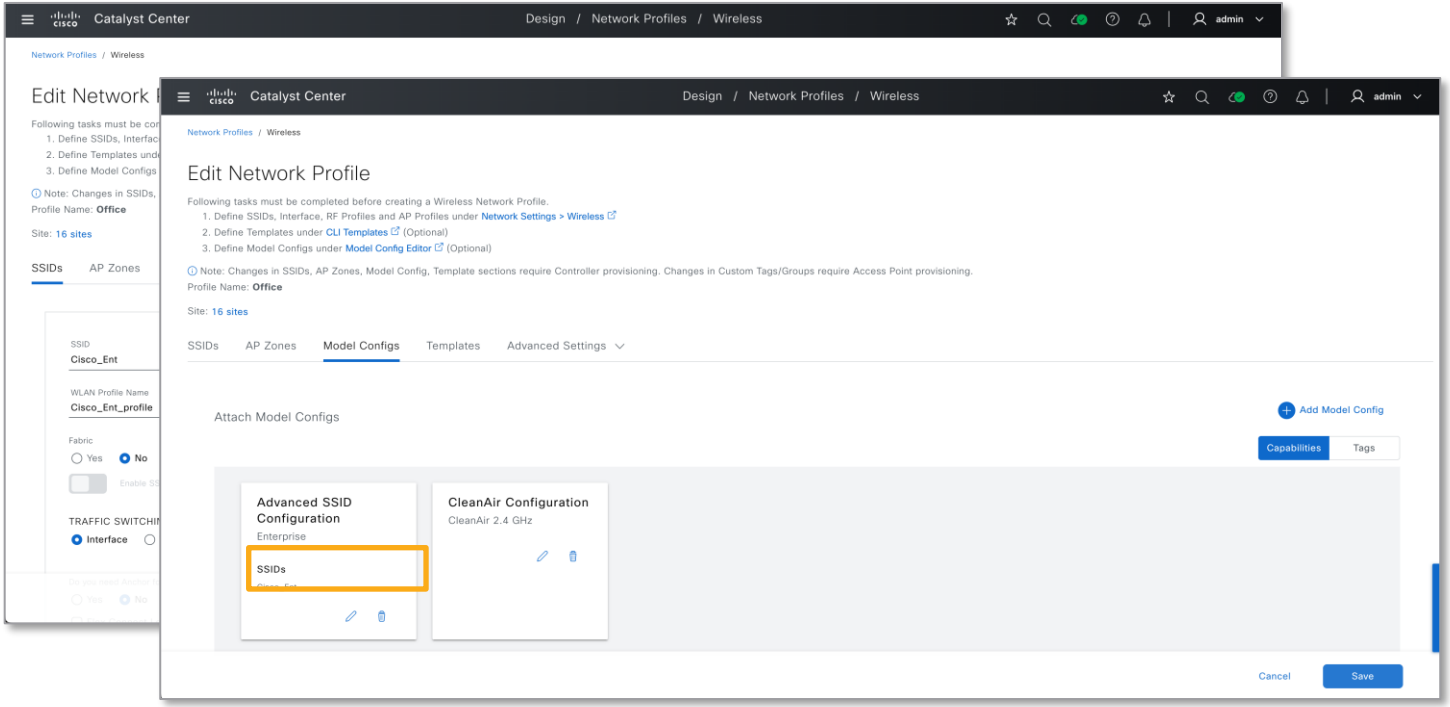

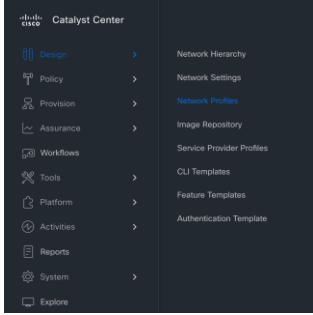

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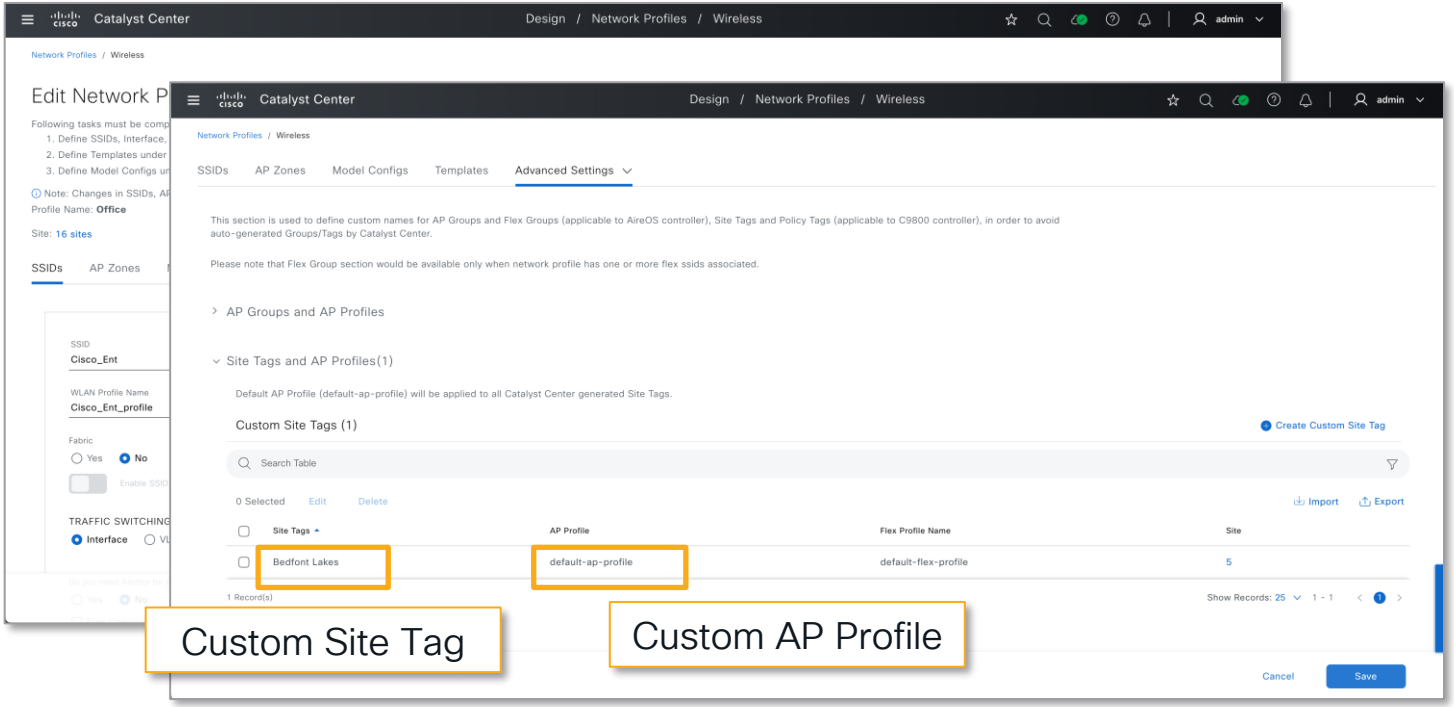
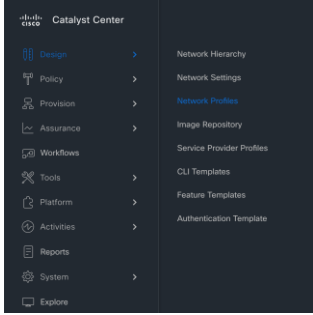
Wireless Network Profile





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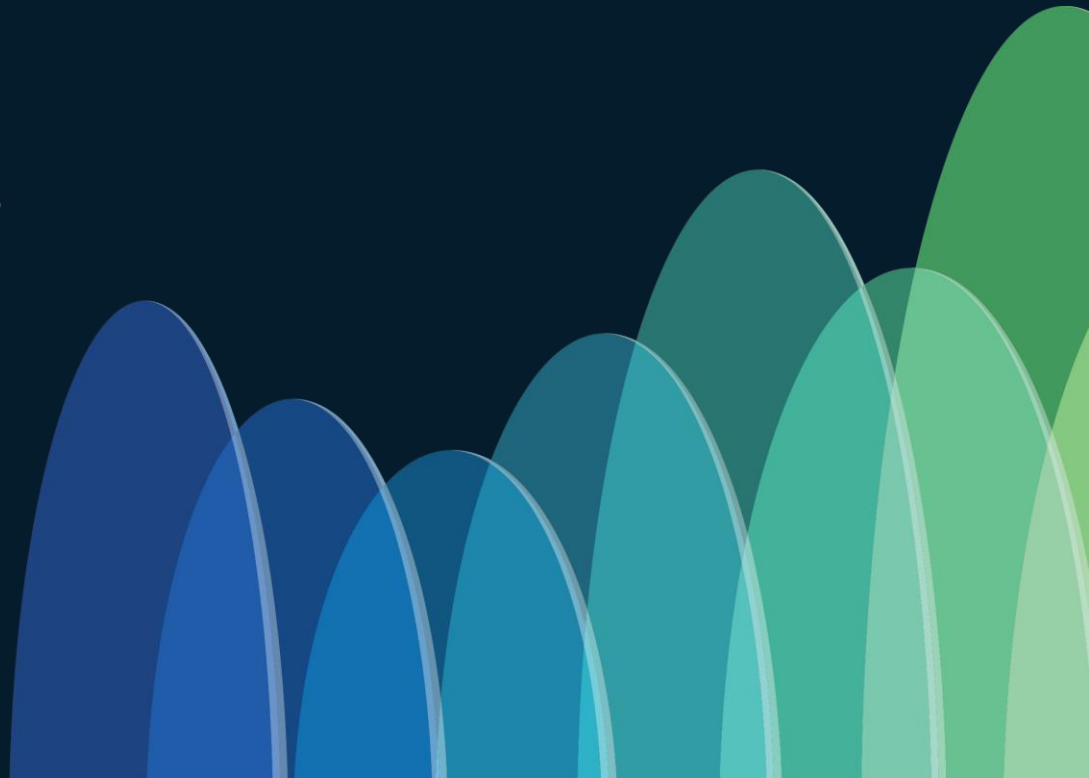
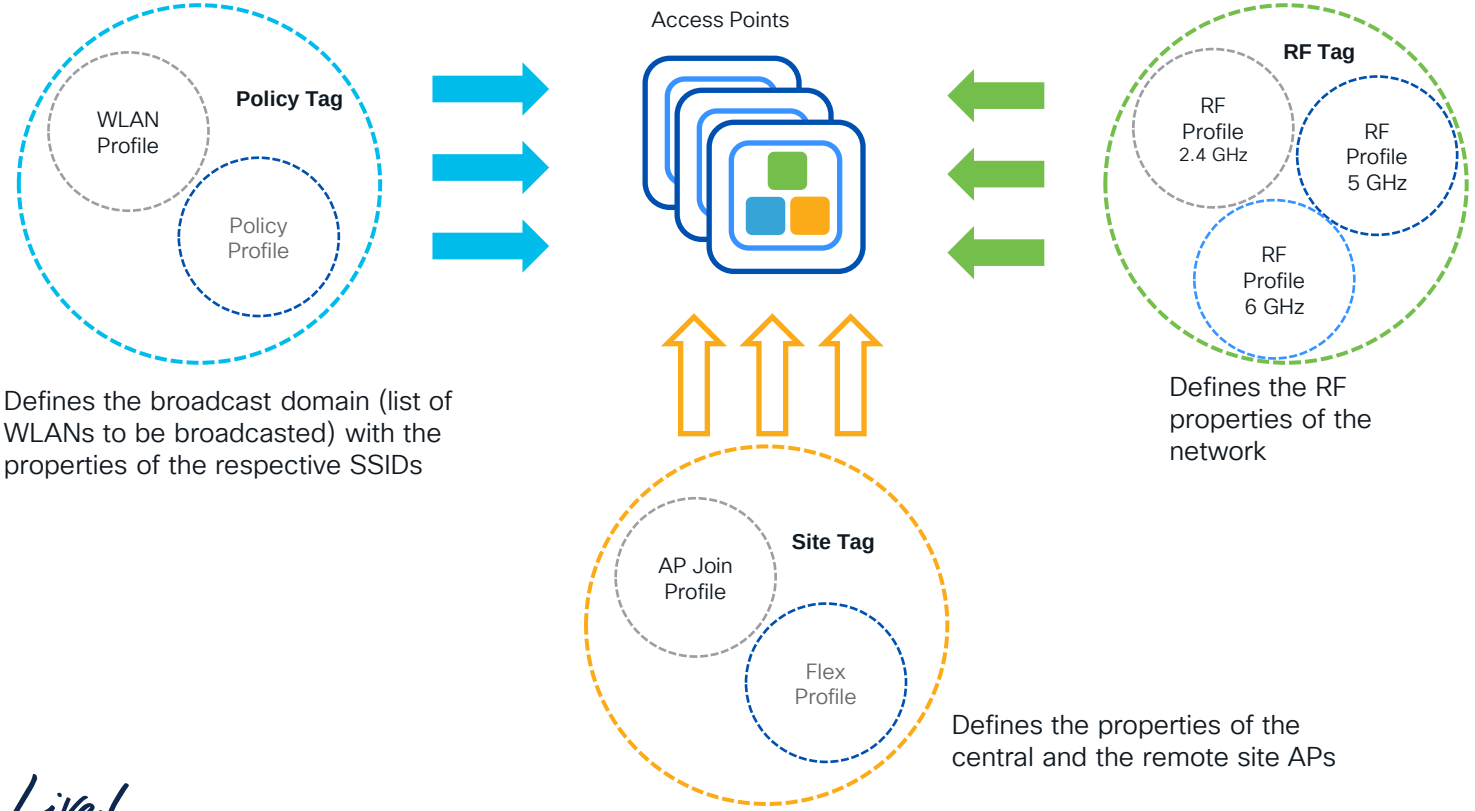
Wireless Profiles vs. Tags



Cisco Catalyst 9800 Config Model

for reference



Defines the broadcast domain (list of WLANs to be broadcasted) with the properties of the respective SSIDs

Defines the RF properties of the network

Defines the properties of the central and the remote site APs

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Components of Policy Tag

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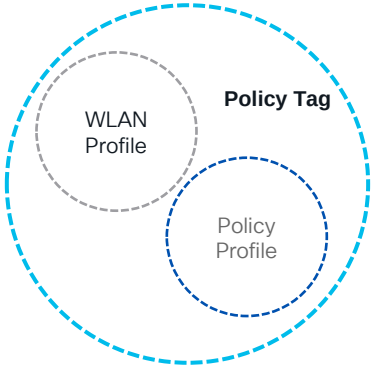

Components of WLAN Profile

Status
WLAN ID
SSID
Broadcast SSID
L2 Security
L3 Security
AAA Servers
Coverage Hole detection
Aironet IE
Diagnostic Channel
P2P blocking
Max Client connections
11v BSS transition Support
Off channel Scan defer
Load Balance
Band Select

Components of Policy Profile

VLAN - Mgmt. VLAN
Session timeout – 1800
Idle time out - 300
AVC profile - null
Client QoS(input/and output) – default
BSSID QoS(input/and output) – default
ACL – None
Local switching – disabled (all other related parameters are disabled)
Central switching – enabled
Central DHCP – disabled
Central Assoc – disabled
Central Authentication – enabled
Local profiling – disabled
Policy map - none
Authentication - Central

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Components of Site Tag

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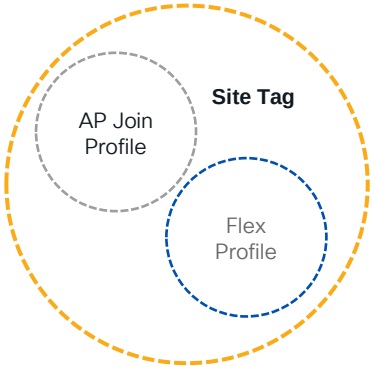

AP Join Profile – defaults

- LED state – Enable
- Heartbeat timer– 30 secs
- Primary discovery timer – 120 sec
- Primed join timeout – 0 seconds
- Discovery timeout - 10 secs
- Fast heartbeat timer – 1 sec
- Fast heartbeat – disabled
- TCP/MSS - enabled (set to 1250)
- Retransmit count – 5 secs
- Retransmit interval – 15 secs
- Dot1x authentication – disabled
- UDP lite – disabled
- Username/password – “current default”
- Preferred mode – IPV4
- 11u venue group – unspecified
- 11u venue type – unspecified
- Client QinQ – disabled
- DHCP QinQ – disabled
- Reset - Disable
- Static nameserver/domain name – “current default”
- Backup primary/secondary – “current default”
- Core dump - “current default”
- Syslog - “current default”
- Hyperlocation – disable

Components of Flex Profile

- Native VLAN ID
- HTTP Proxy Port
- HTTP Proxy IP Address
- Fallback Radio Shut
- ARP Caching
- Efficient Image Upgrade
- Local Authentication
- Local Auth Users
- Policy ACL
- VLAN Name and ID

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Components of RF Tag

for reference

Components of RF Profile

- Data Rates
- MCS Settings
- Maximum and Minimum Power Level Assignment
- Power Threshold v1/v2
- DCA Channel Width
- DCA Foreign AP Interference Avoid Enable
- DCA Channel list
- Coverage Hole Detection Parameters (Data/Voice RSSI, Coverage Exception, Coverage Level)
- Profile Threshold for Traps (Interference/Clients/Noise/Utilization)
- Maximum Clients
- Multicast Data Rates
- Rx Sop Threshold
- Load Balancing (window & denial)
- Band Select Parameters (Applicable only for 802.11bg)

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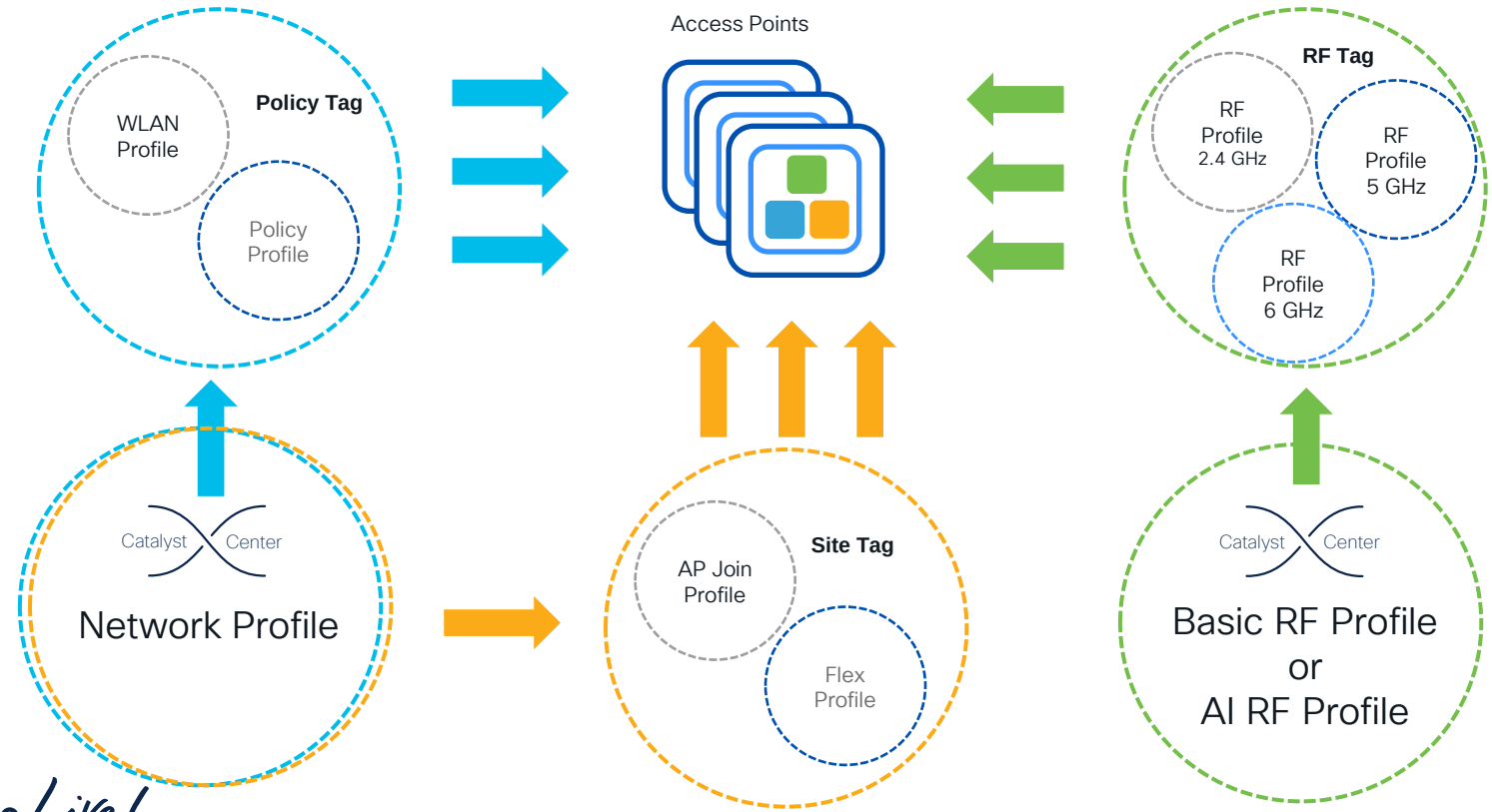
How Catalyst Center simplifies the Config Model

for reference



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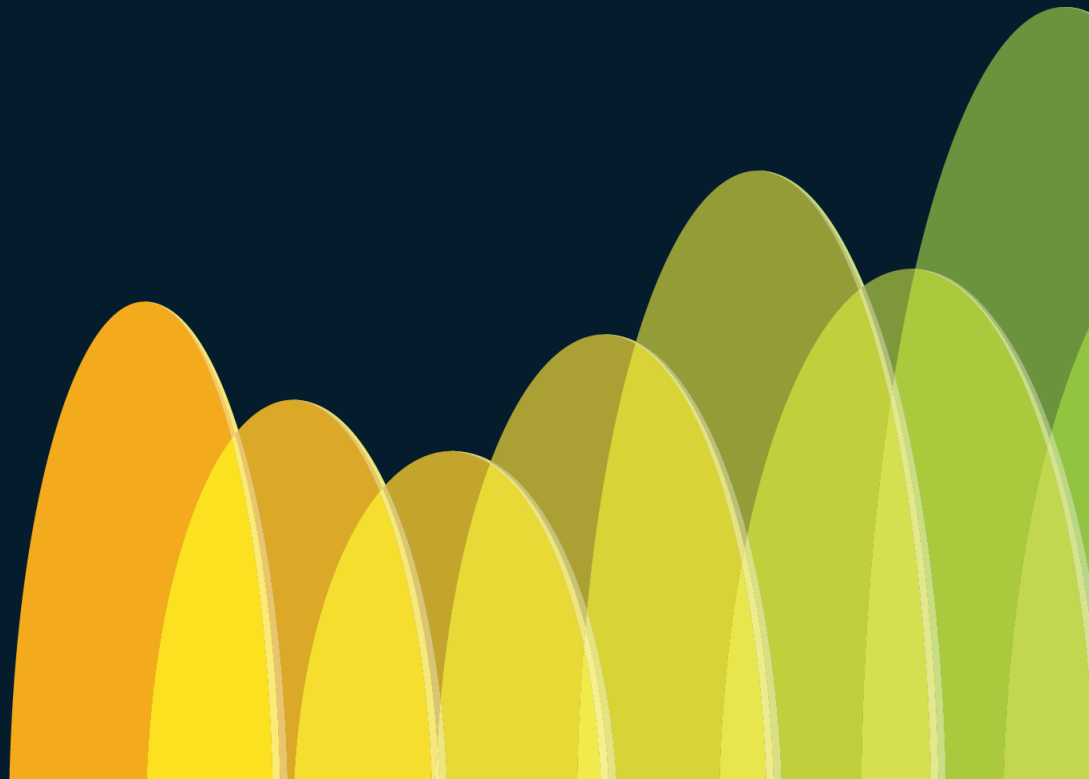
Planning and Deployment



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Workflow

- Create Hierarchy in Catalyst Center
- Export Maps to Ekahau Project
- Plan in Ekahau, final names for APs (naming convention)
- Import back into Catalyst Center
- Add APs via PnP or other method

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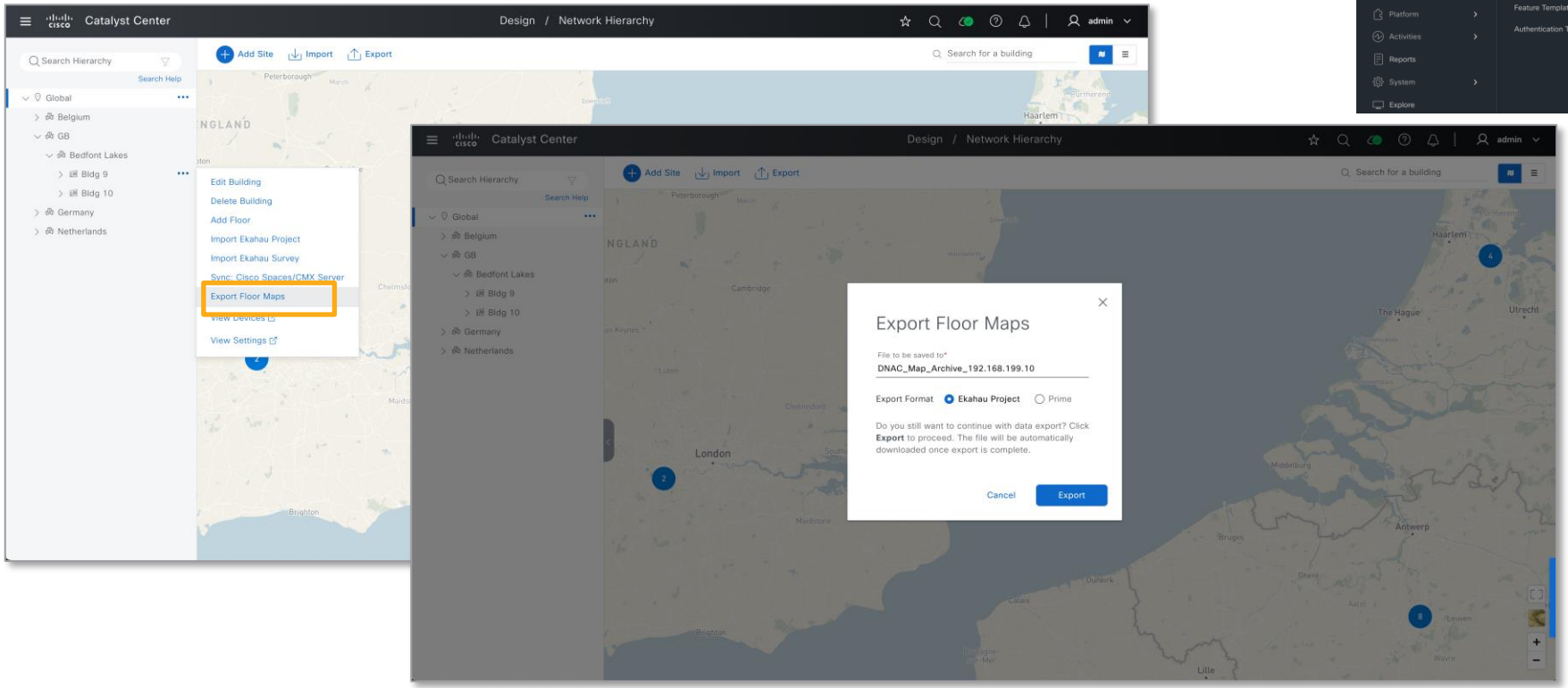
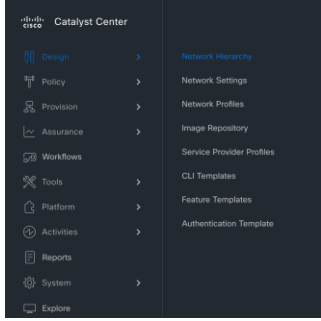
Create Floors in Catalyst Center and export





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Ekahau AI Pro

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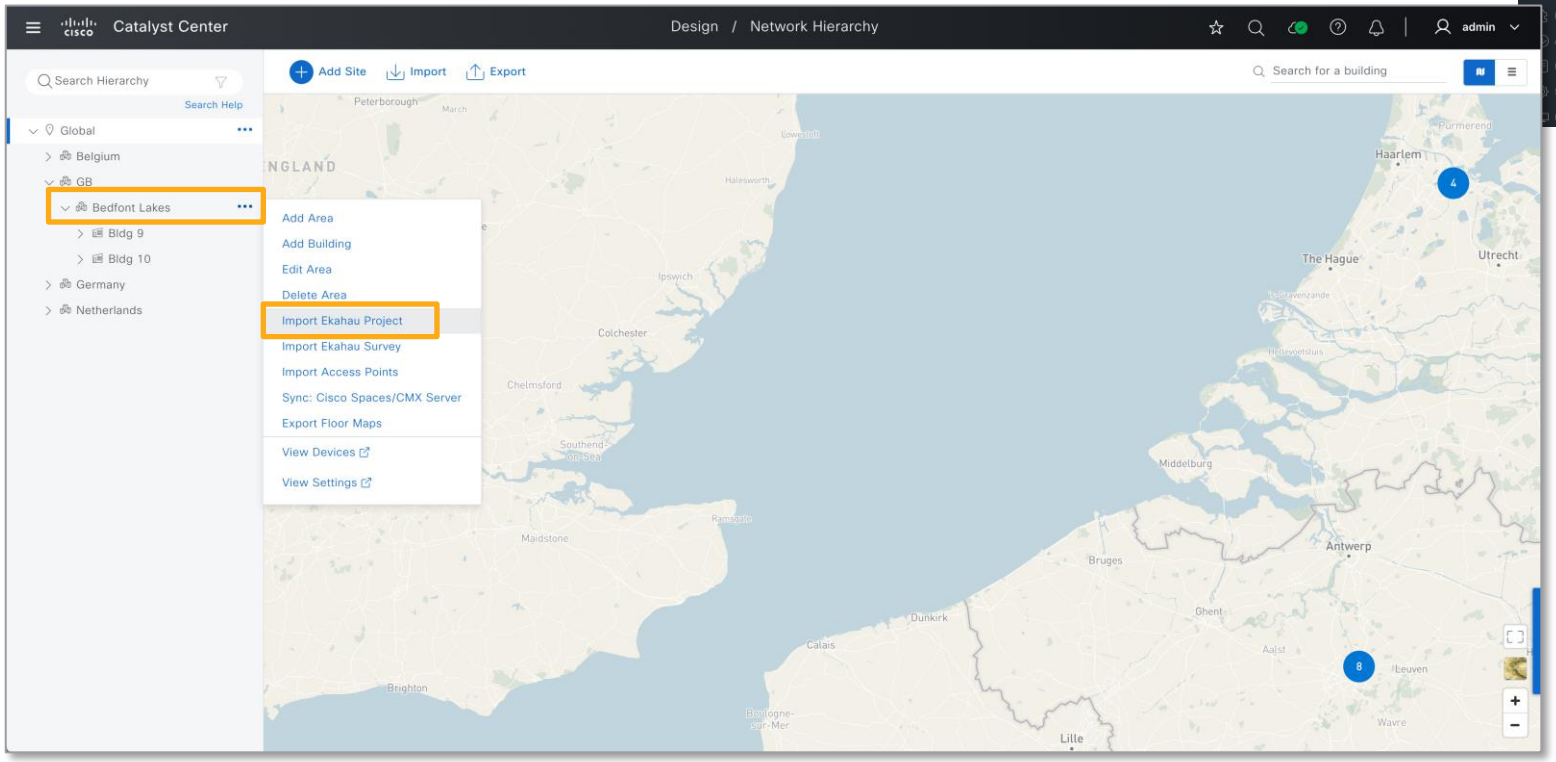
Import Ekahau Project into Catalyst Center



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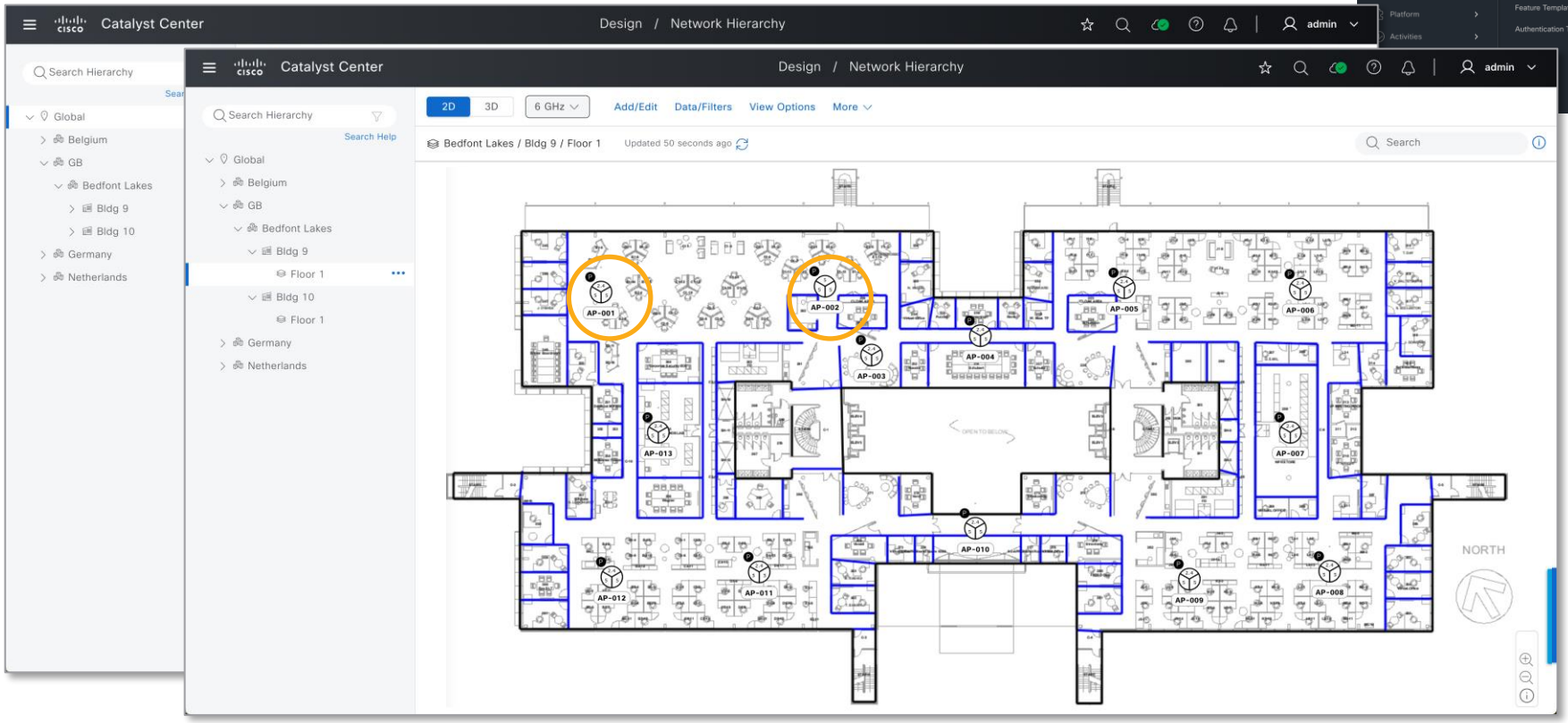

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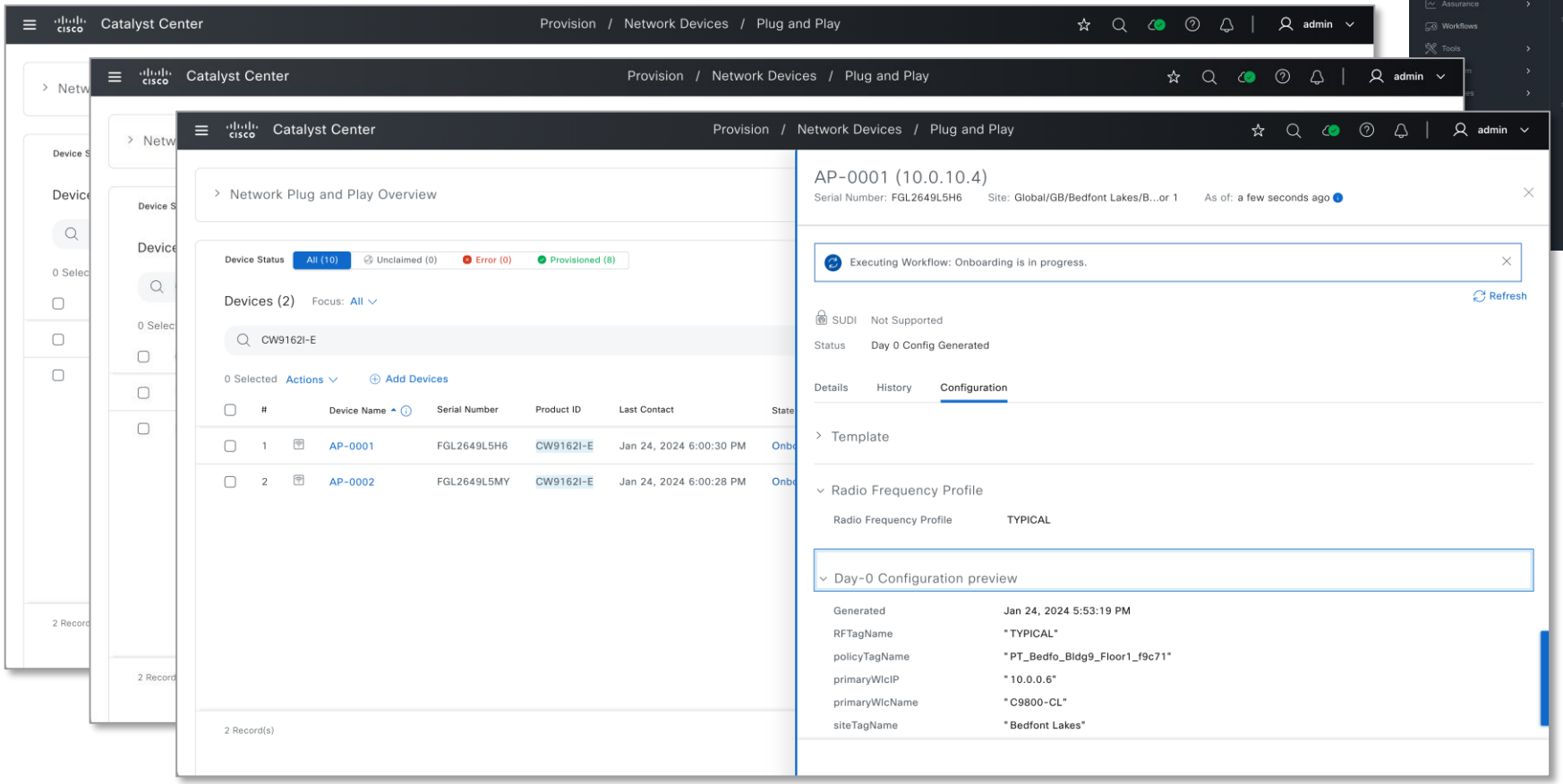
Use Plug and Play to onboard APs



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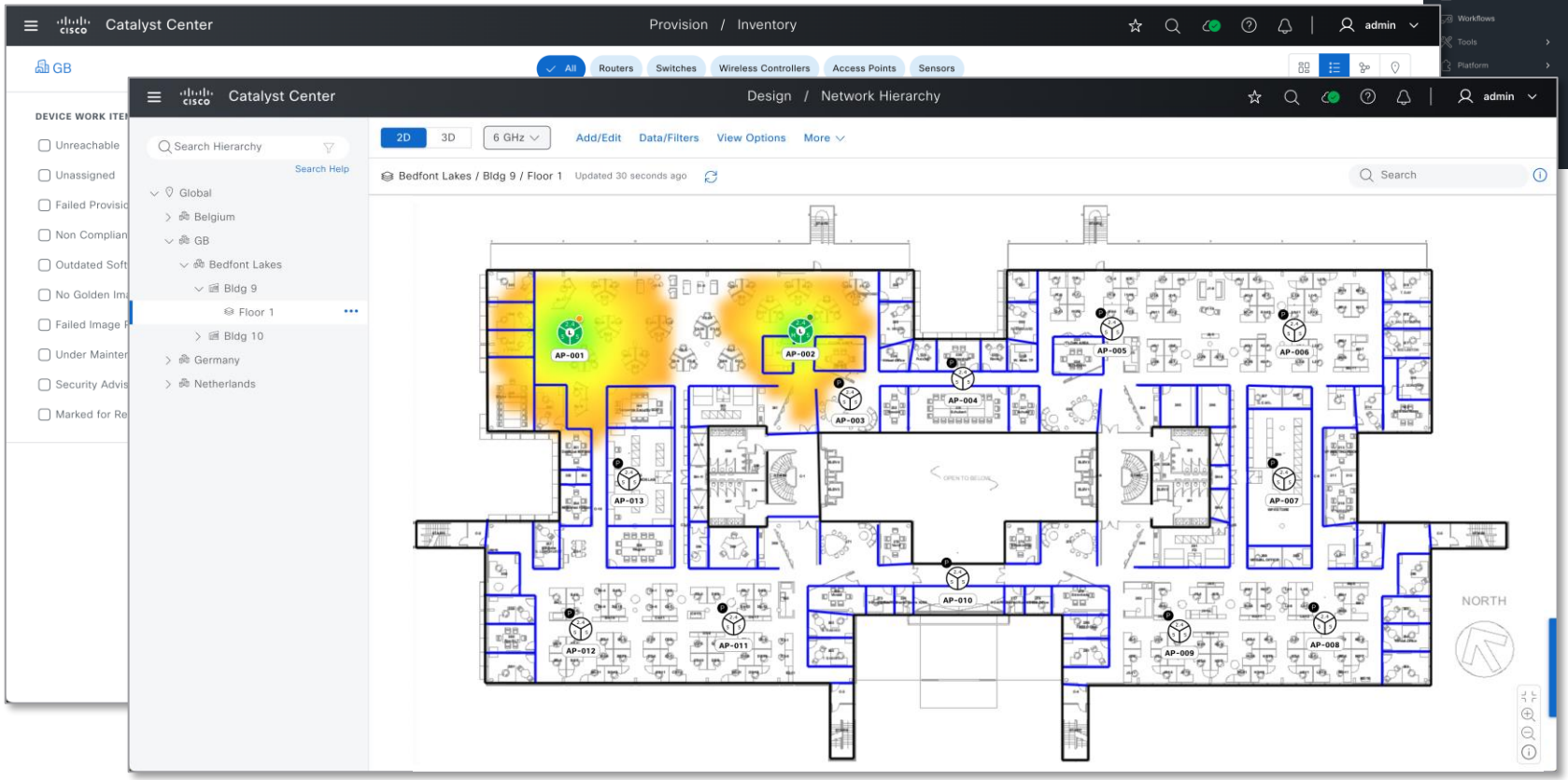
Planned APs replaced automatically



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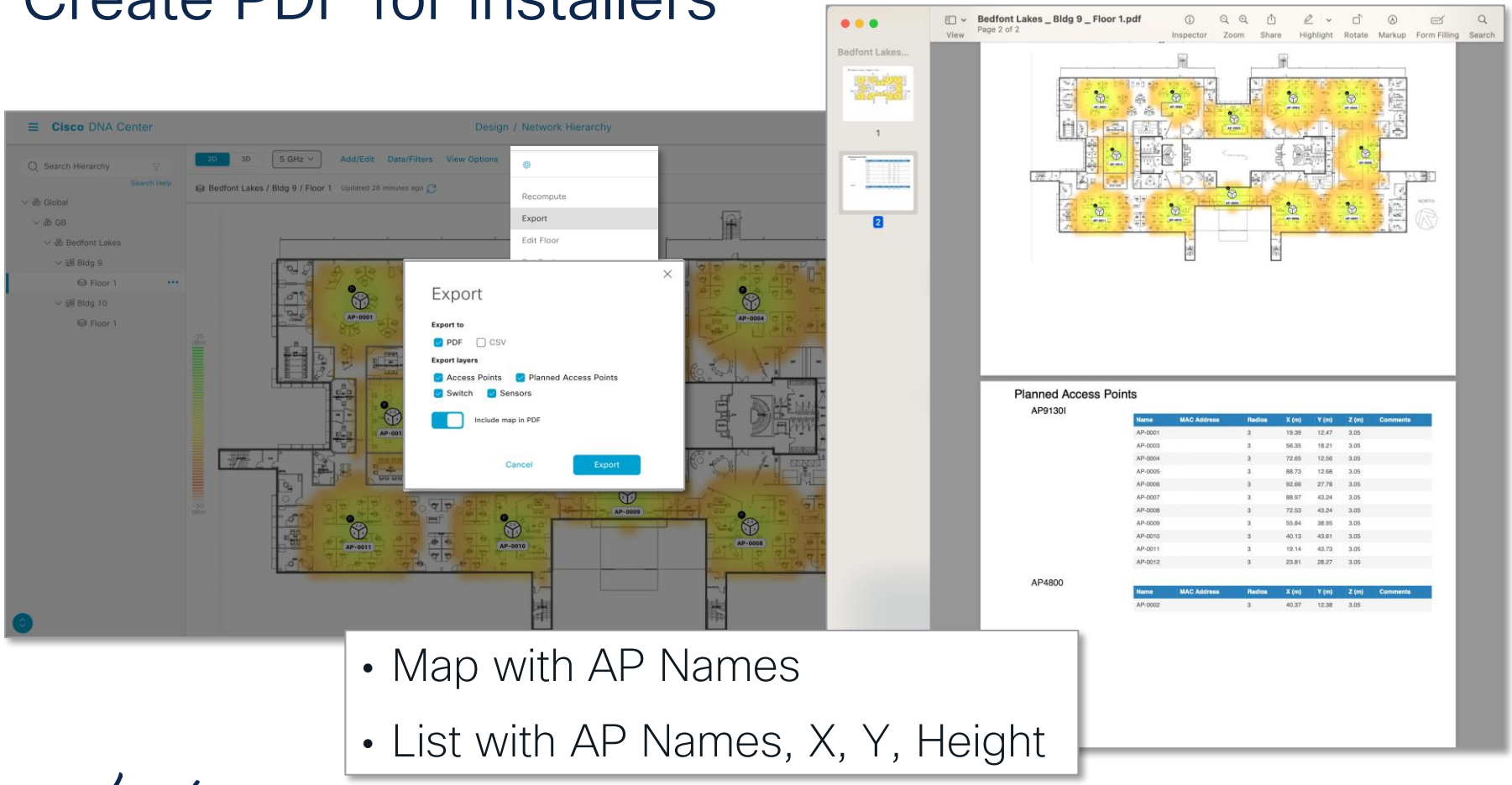
Create PDF for installers



- Map with AP Names
- List with AP Names, X, Y, Height

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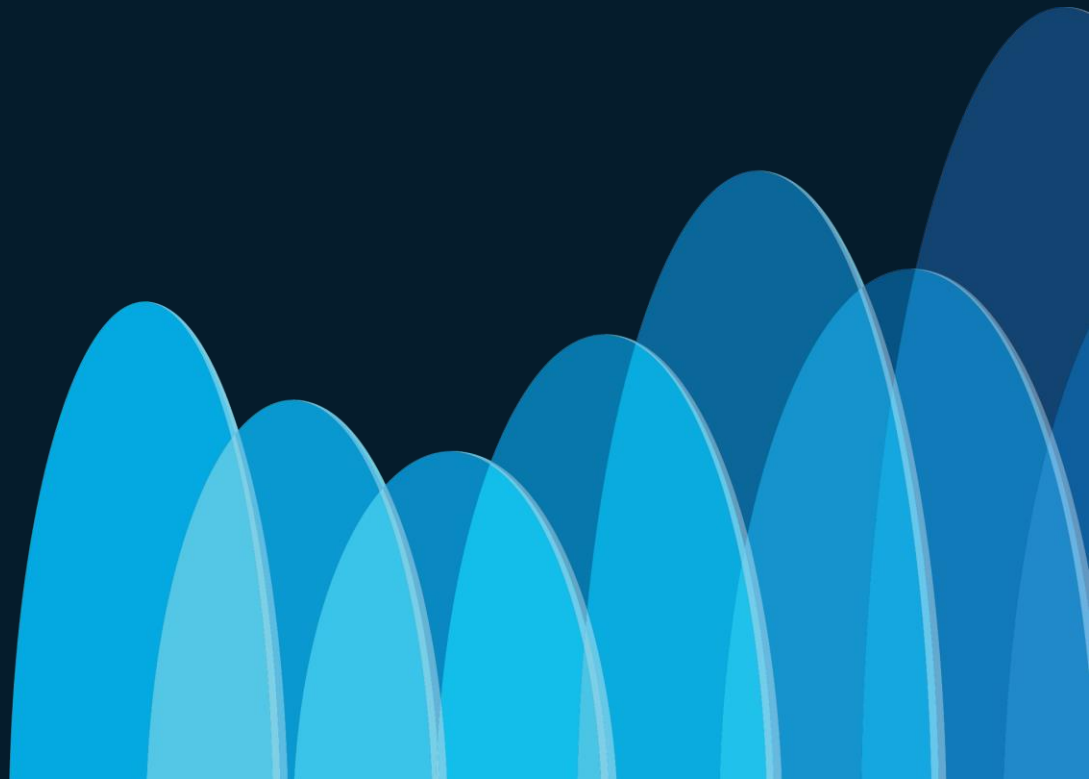
Catalyst 9800 Onboarding



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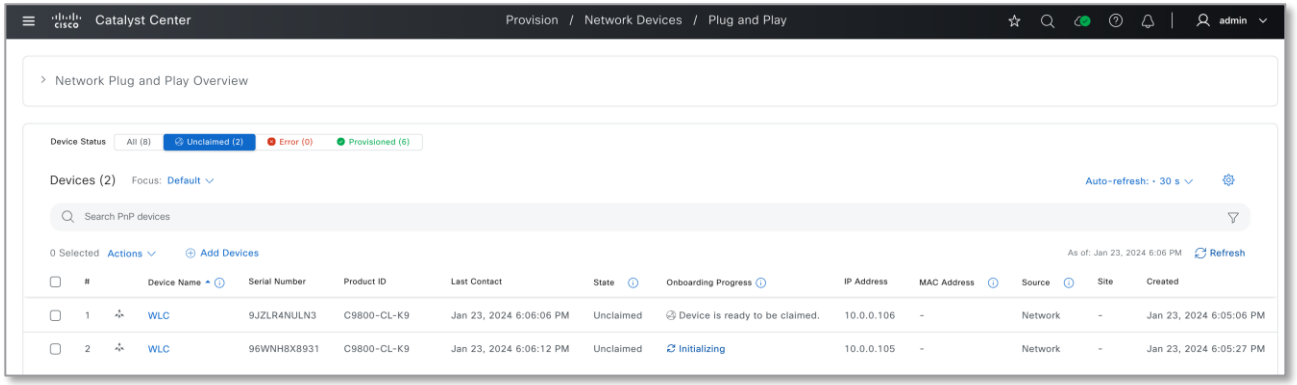
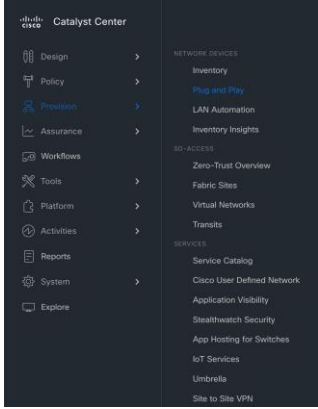
Catalyst 9800 PnP





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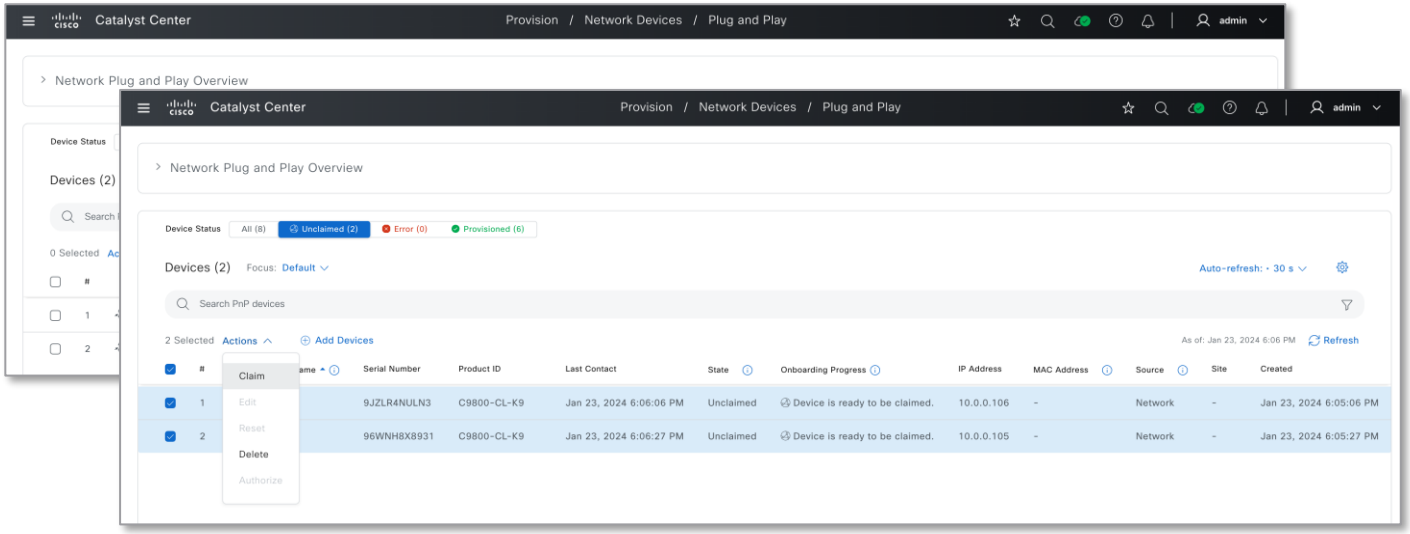

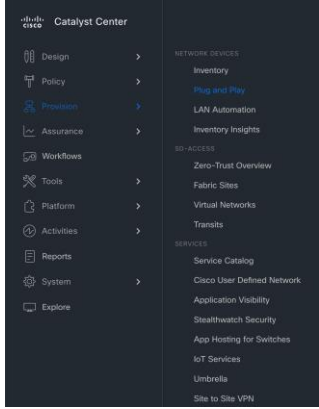

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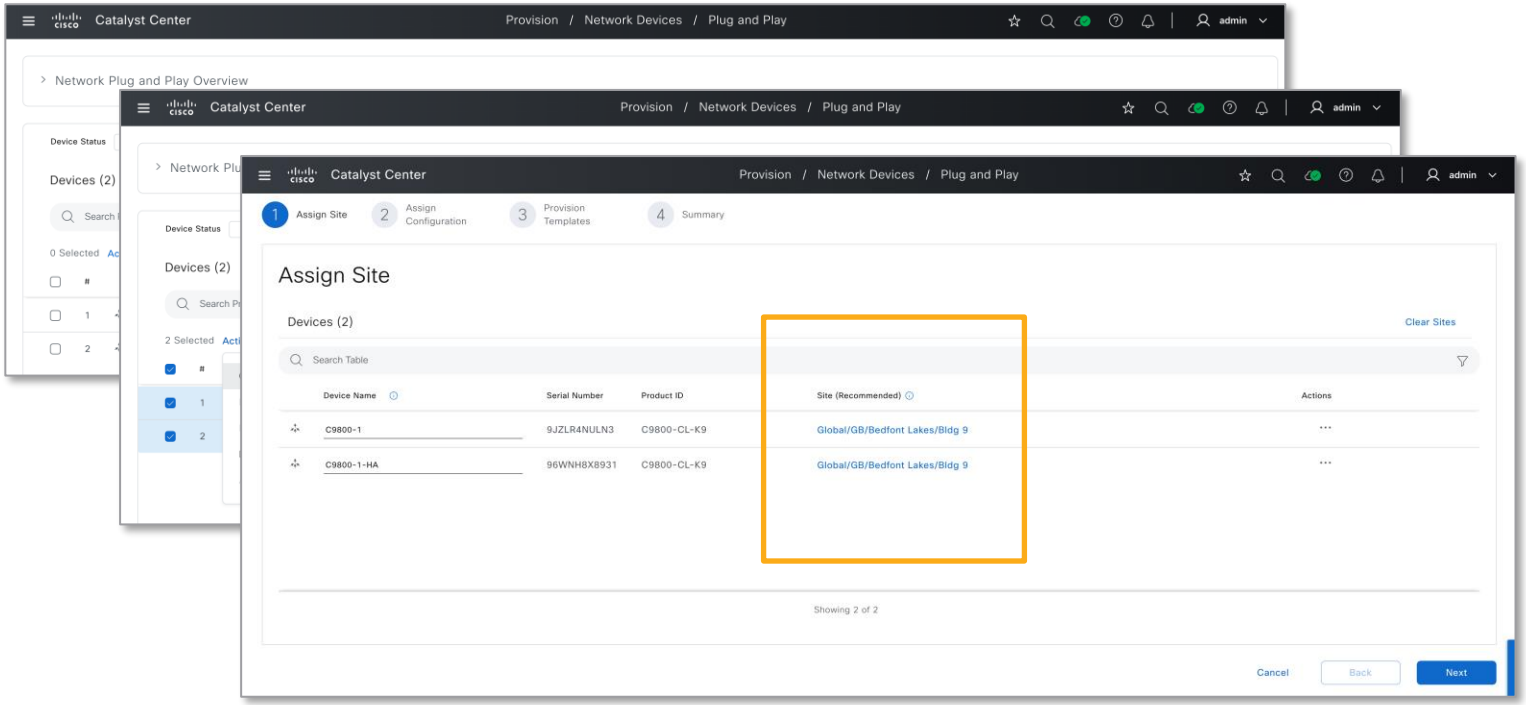

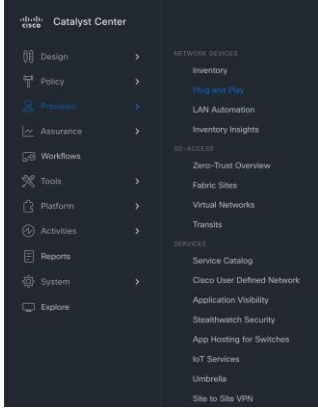

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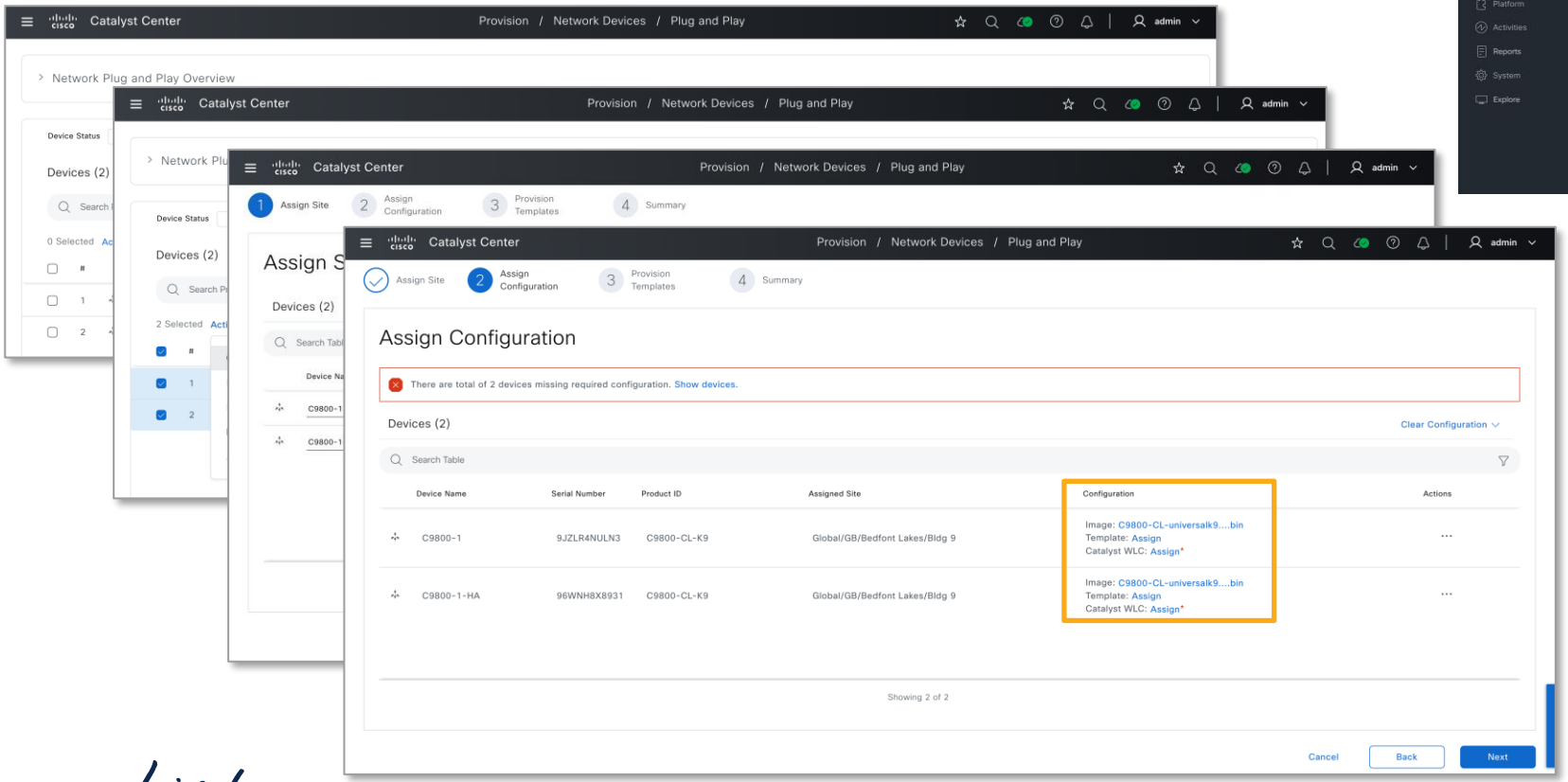

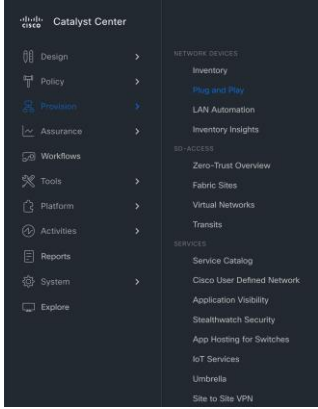

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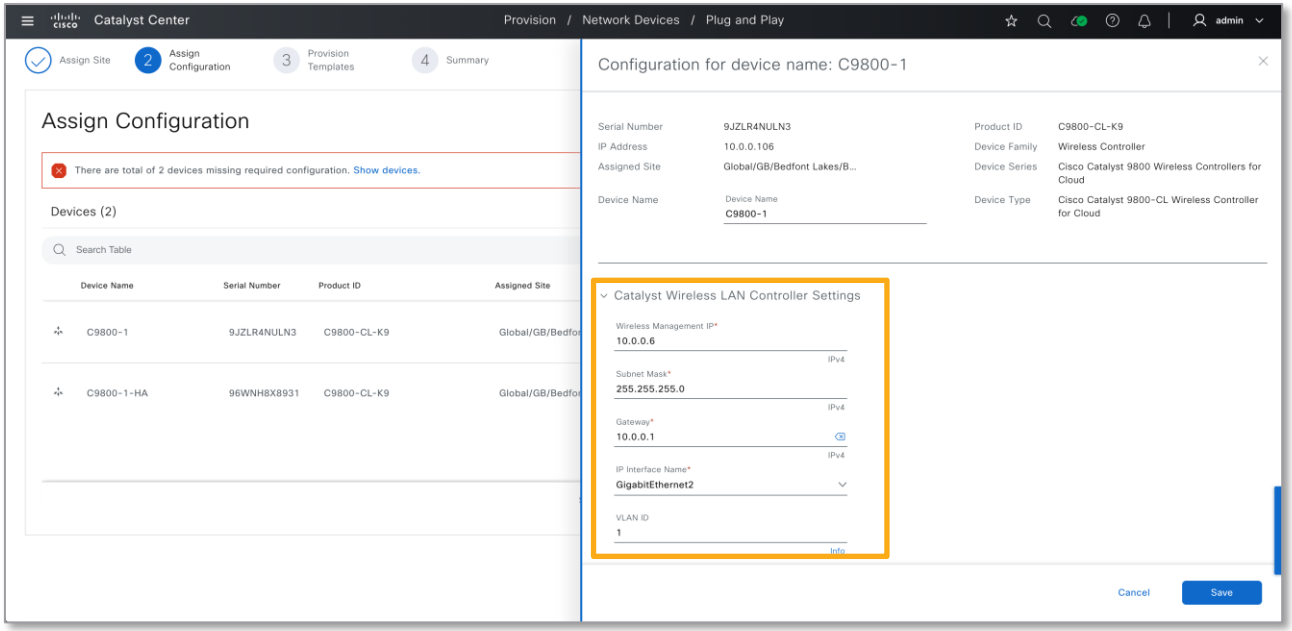

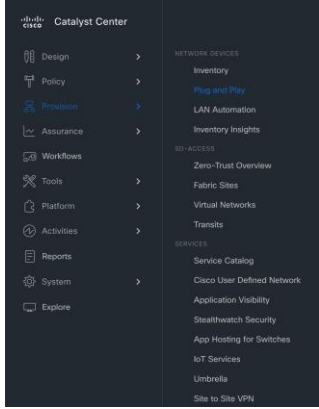

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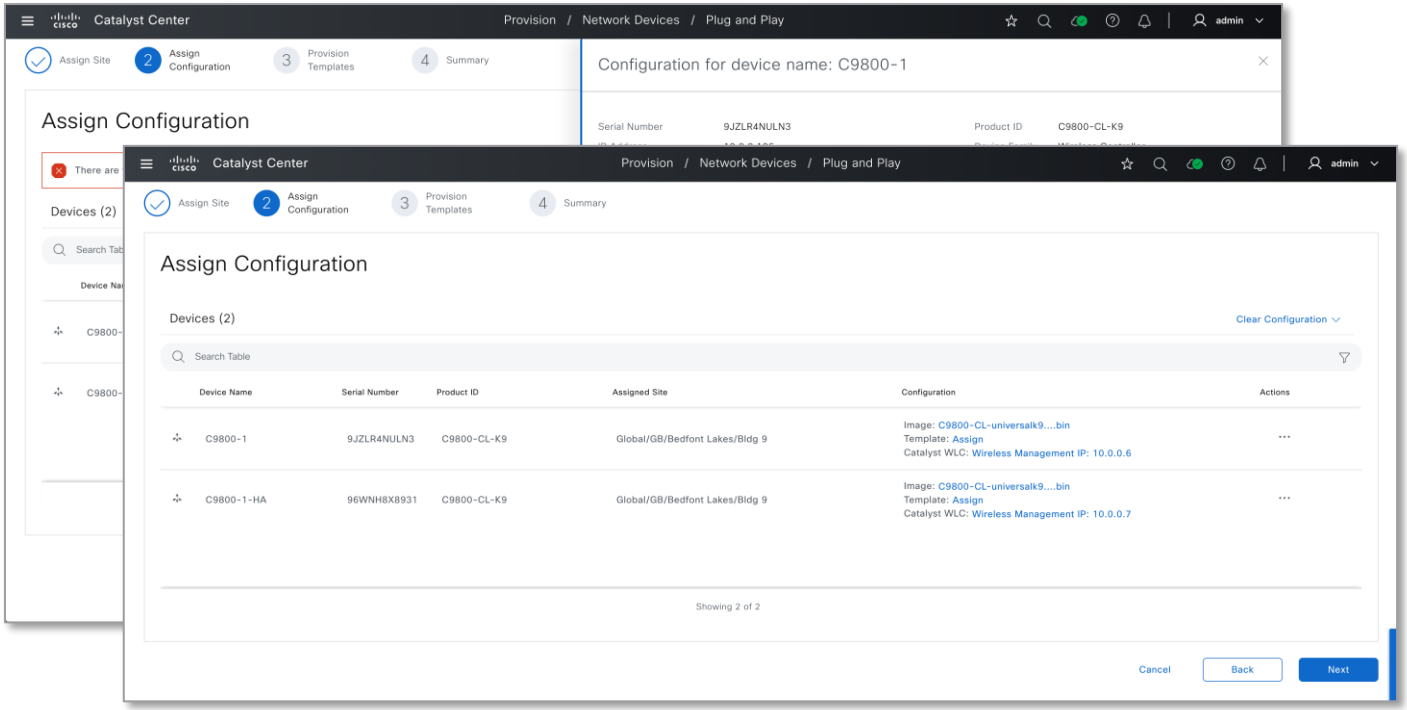

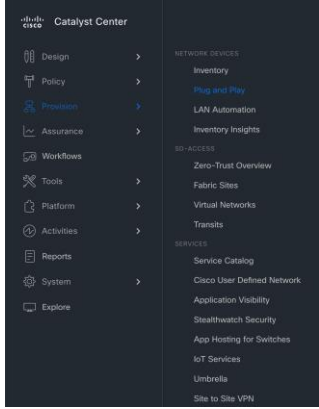

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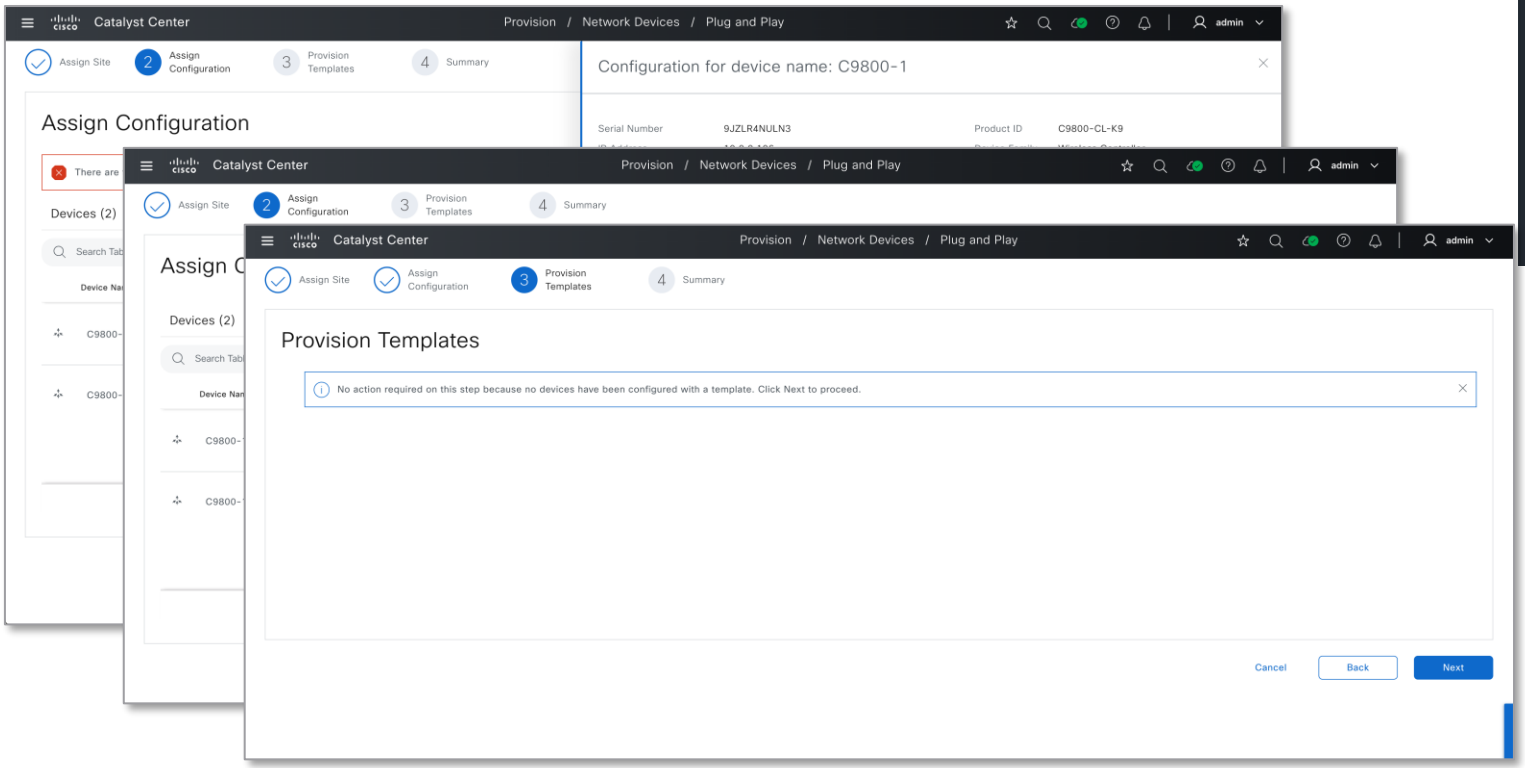

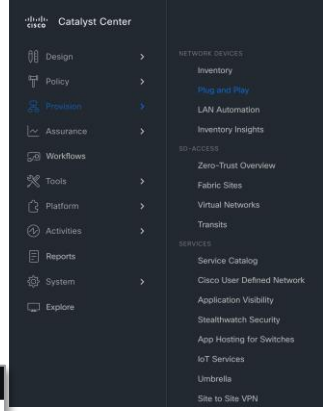

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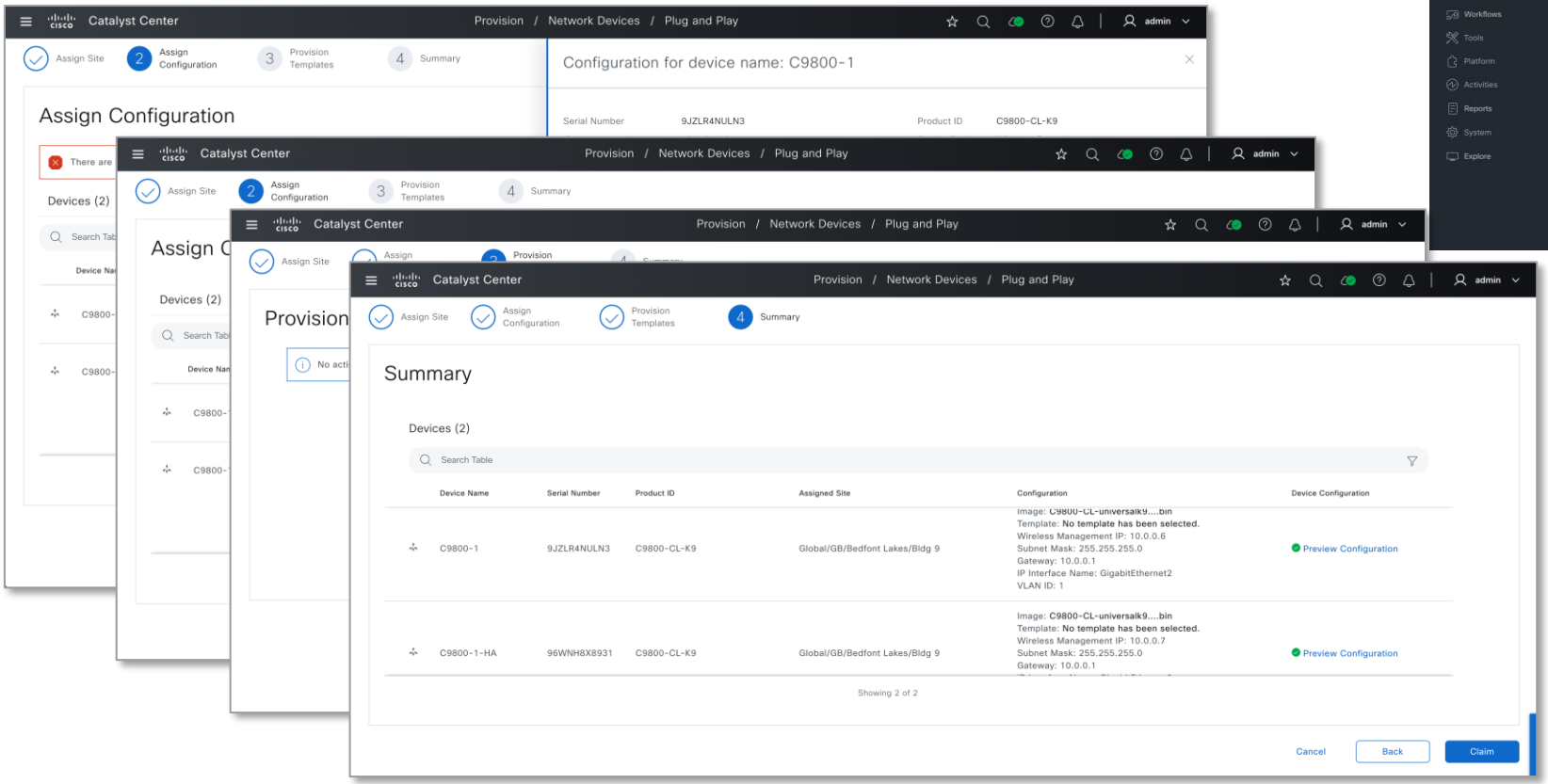

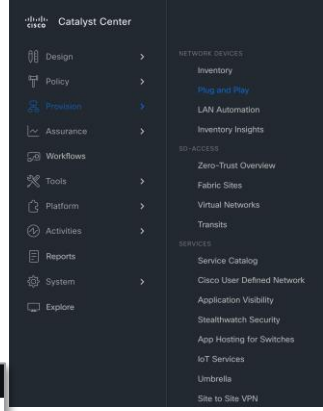

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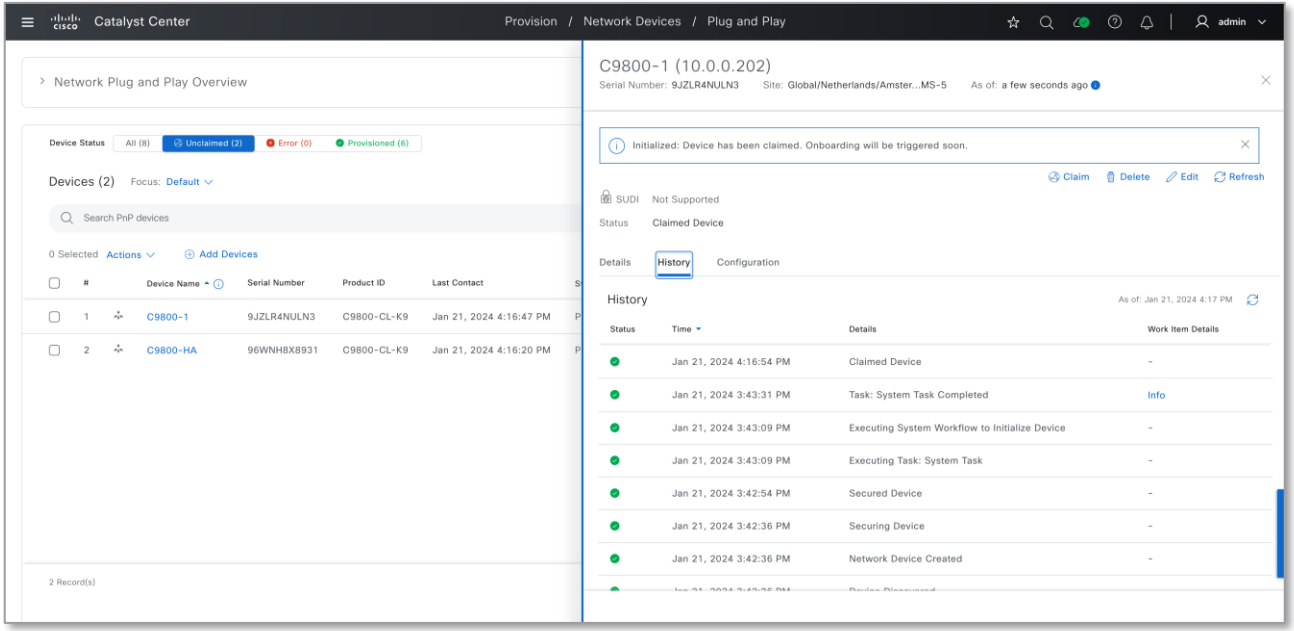

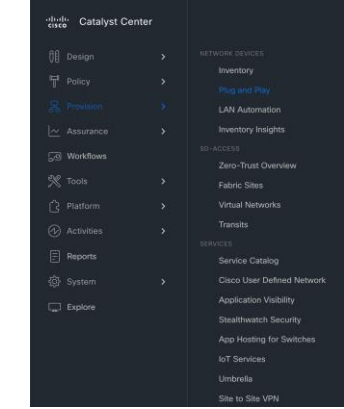

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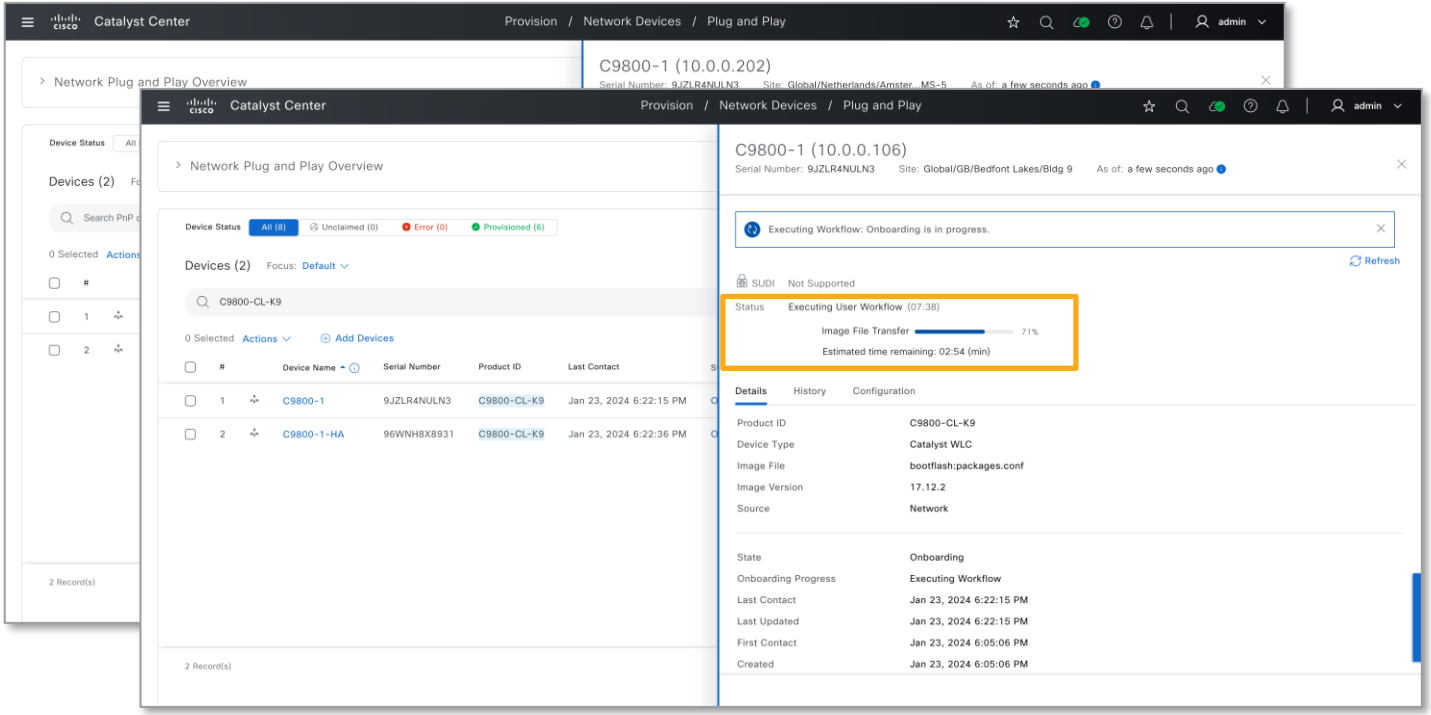

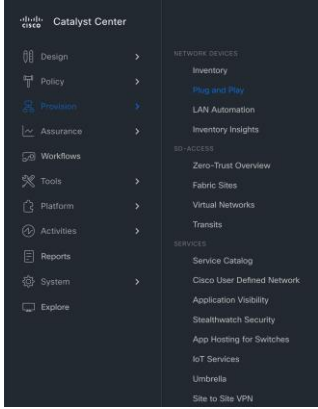

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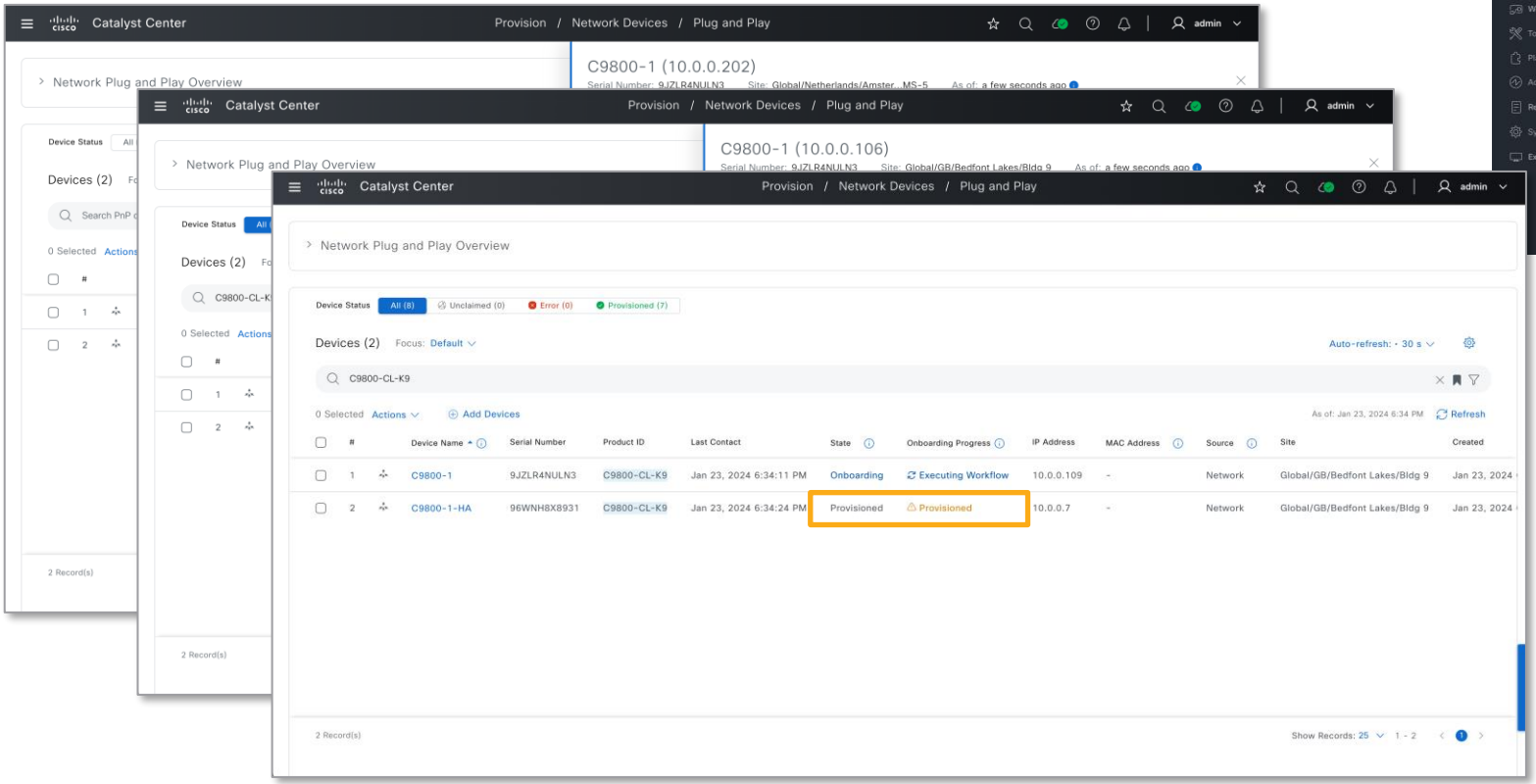

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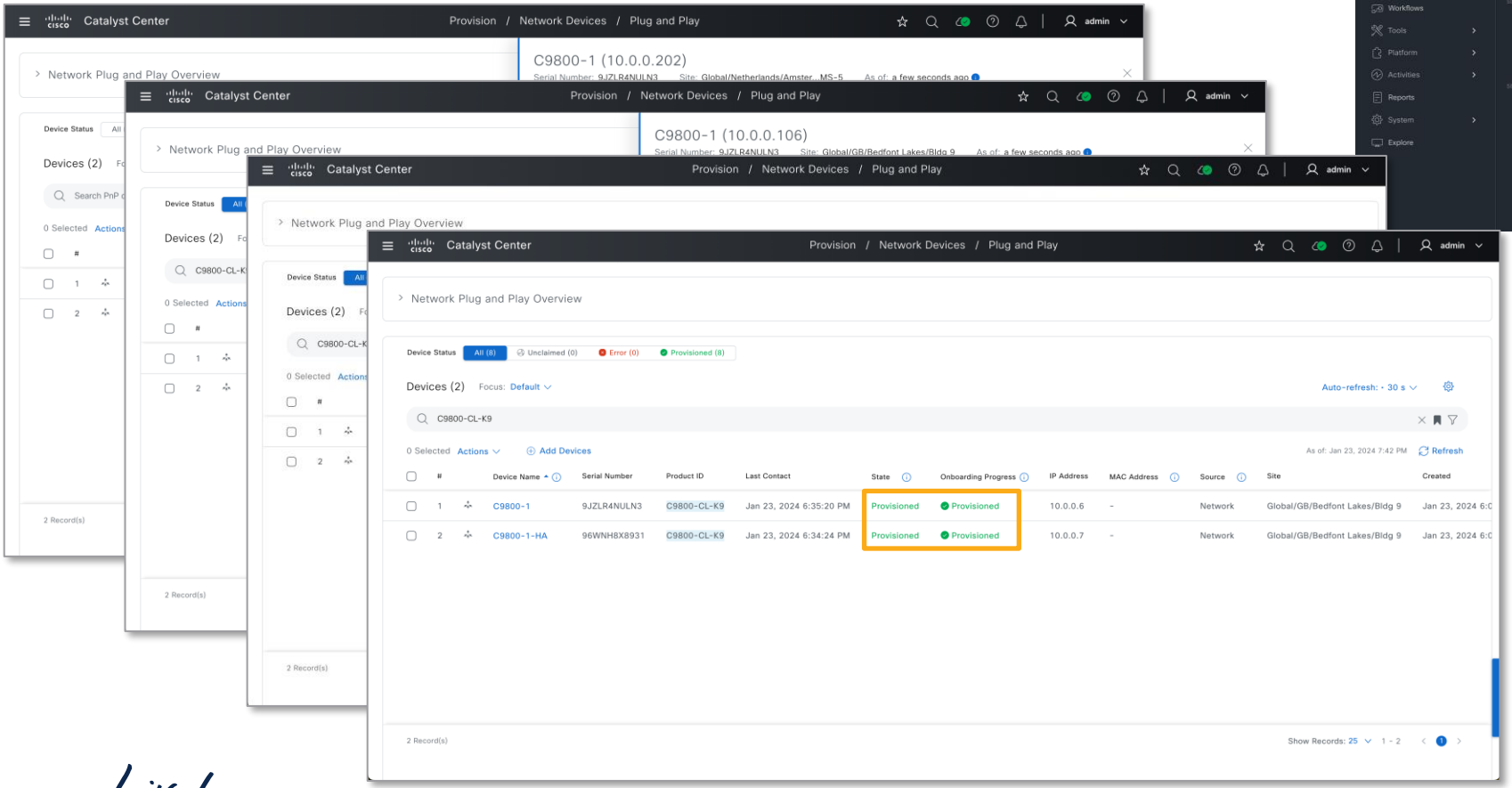

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Prepare Catalyst 9800 for discovery without PnP

- Basic Config required (Day-0)
  - Hostname
  - Admin user / enable secret
  - SNMP / SSH / netconf-yang
  - Interface config
  - Wireless management interface (Trustpoint for C9800-CL)
  - Wireless country code
  - Reload device

Using the Day-0 flow on C9800 optionally creates SSID and AAA config, which should be removed before discovery

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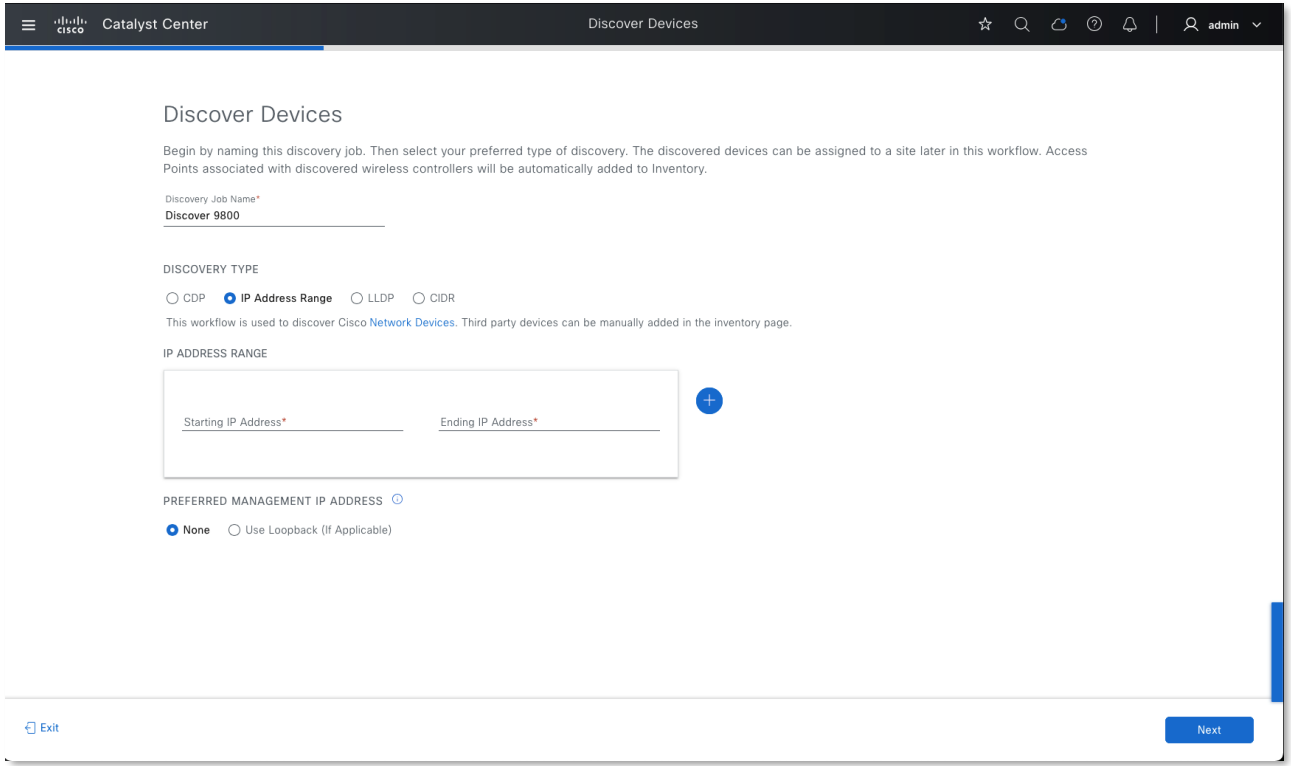
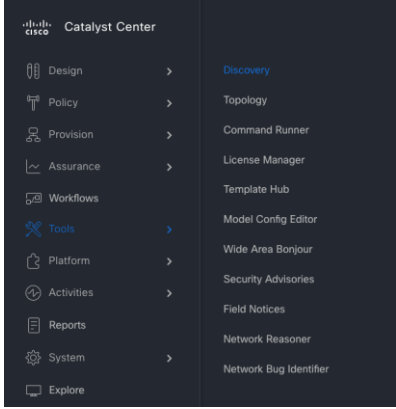
Discovery Workflow





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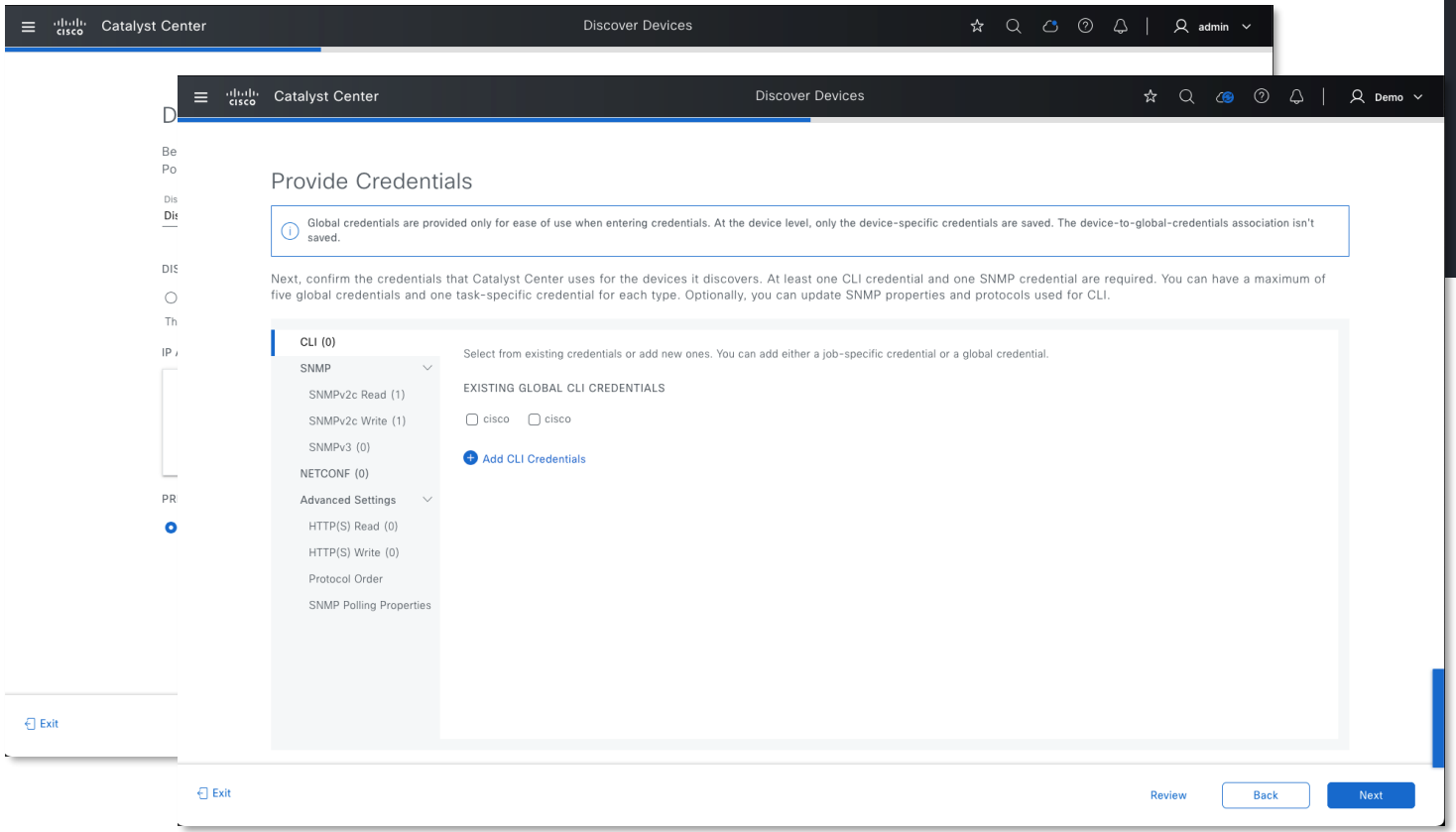
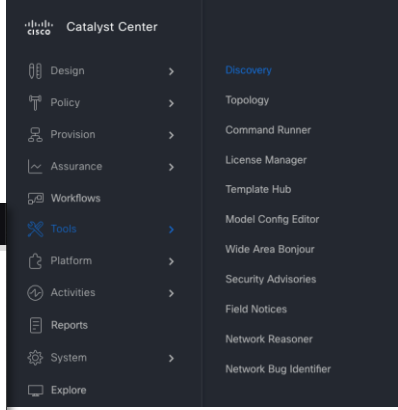
Discovery Workflow





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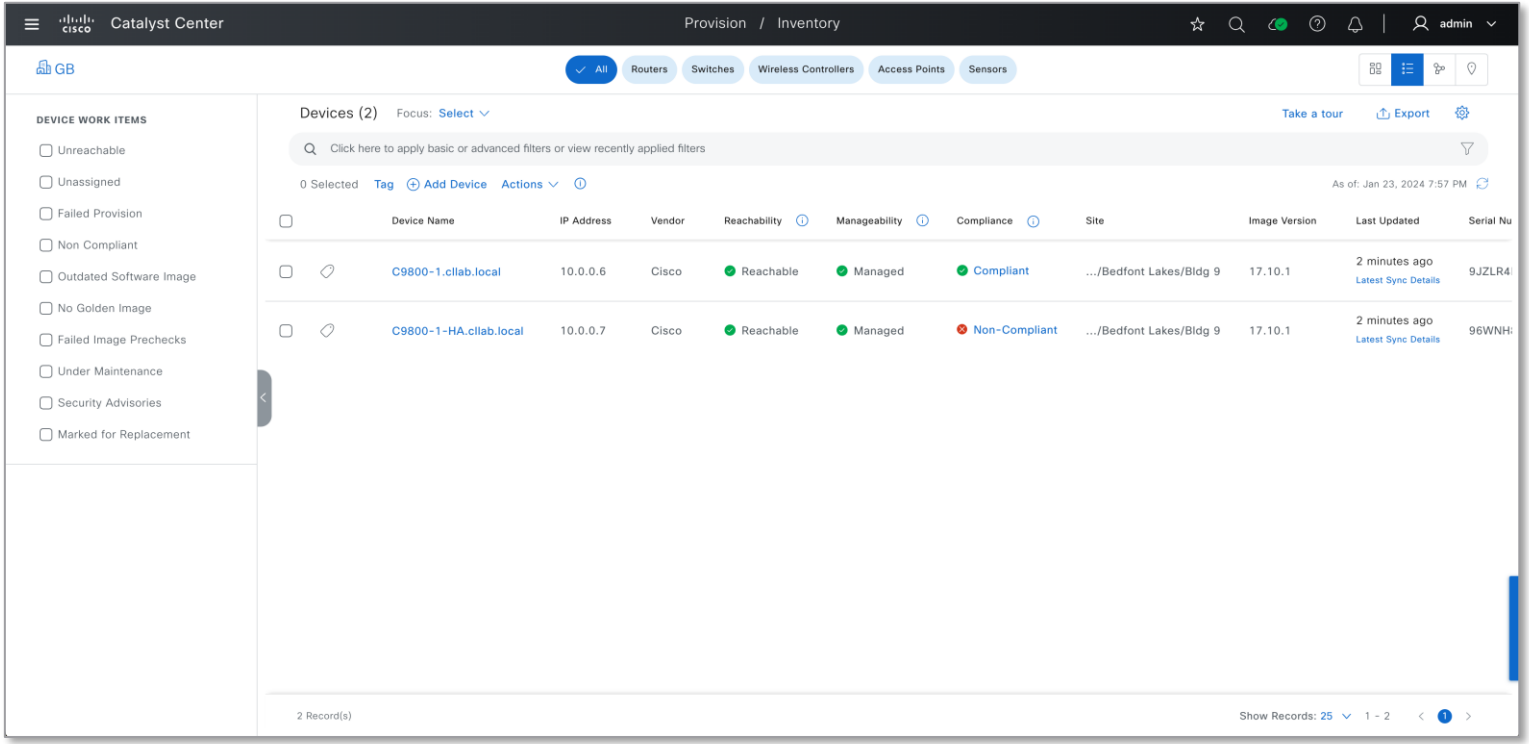
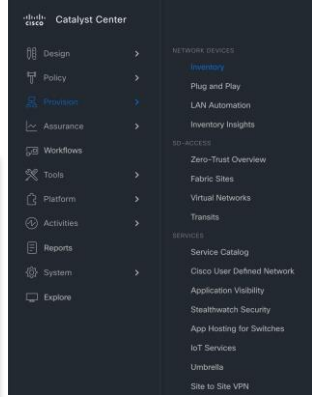
Inventory





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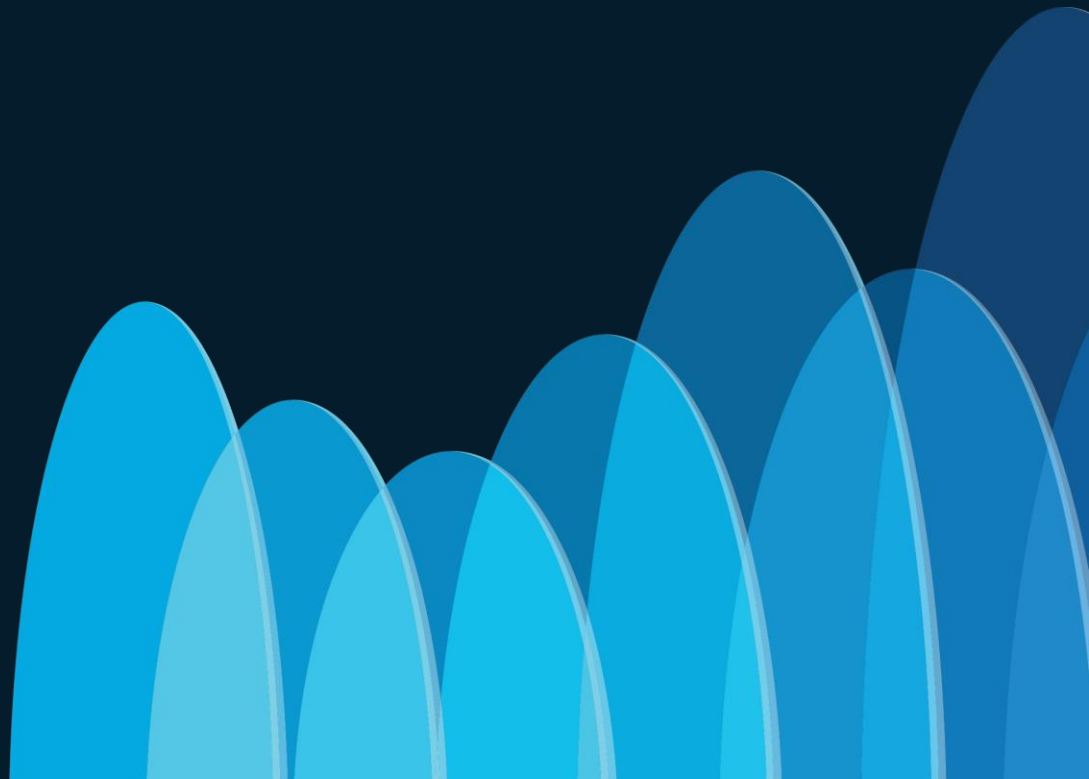
Catalyst 9800 High Availability



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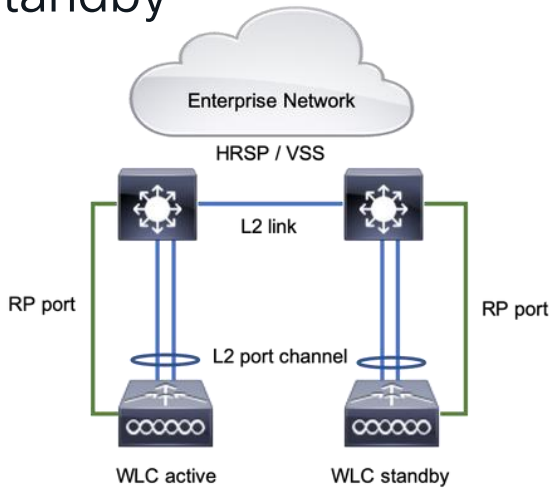
Prerequisites

- Active and Standby Controllers added to inventory
- Both Controllers of the same type and version
- Wireless Management Interface configured on Standby
- Best way: use PnP to onboard Standby



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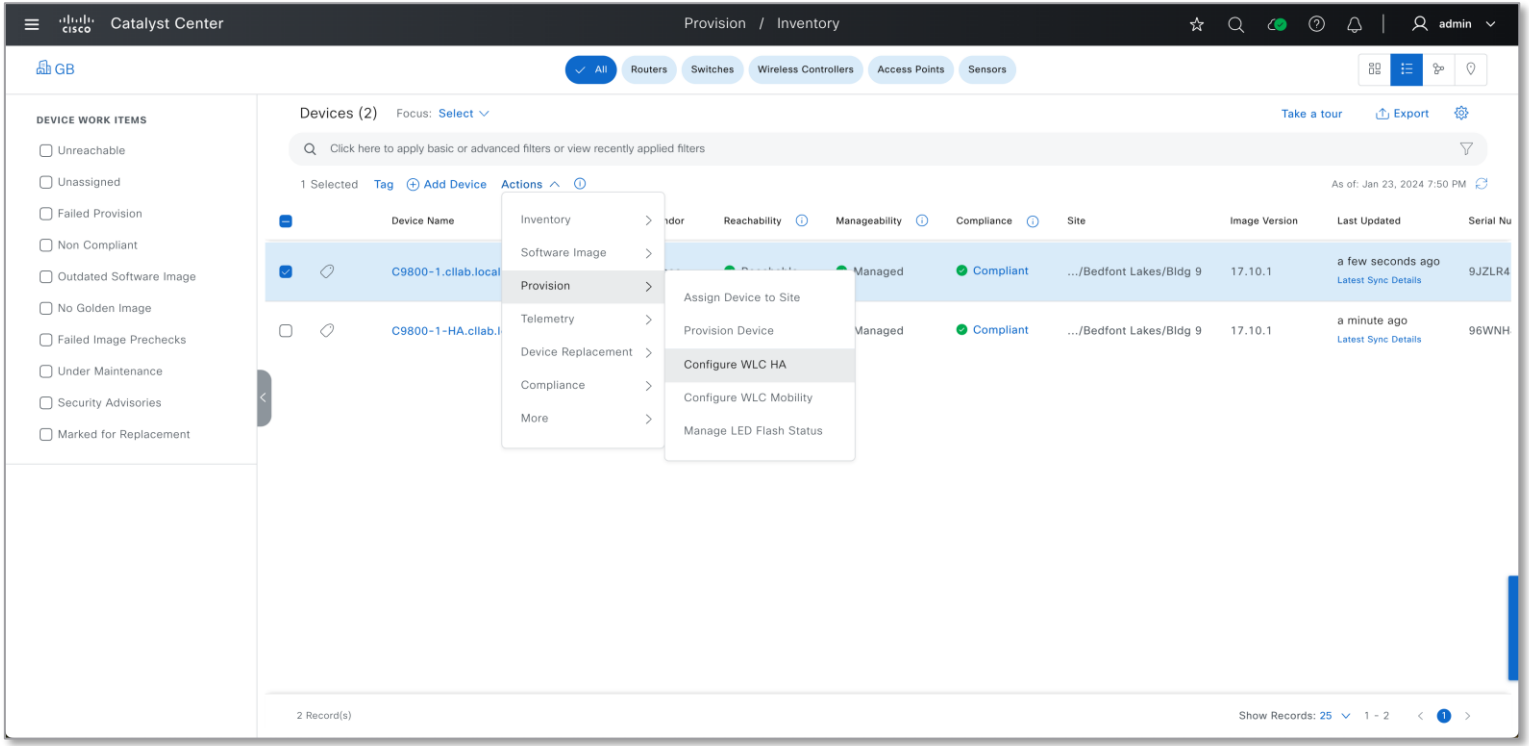
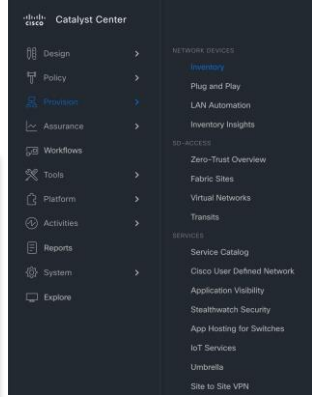
High Availability with AP SSO





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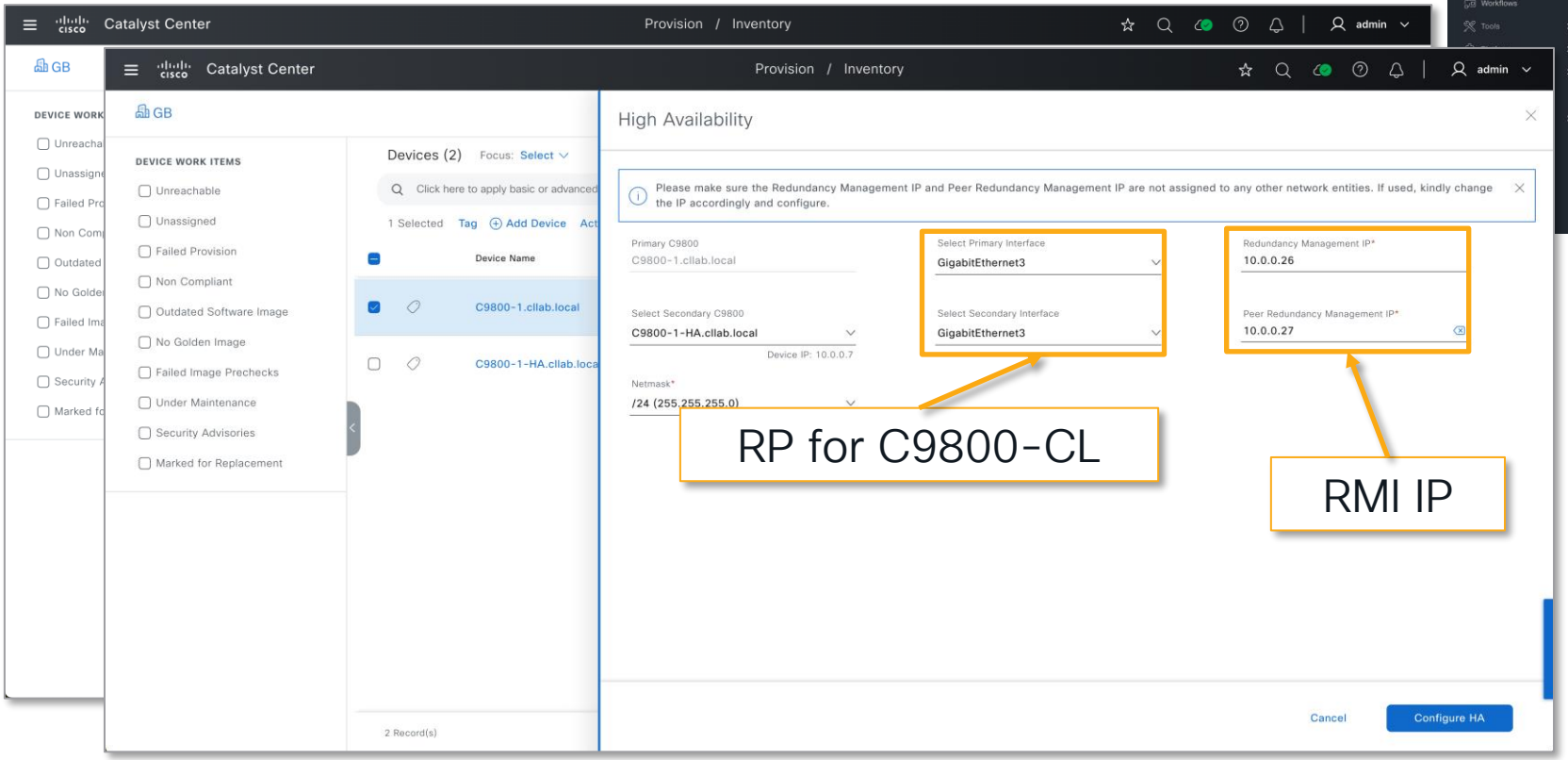

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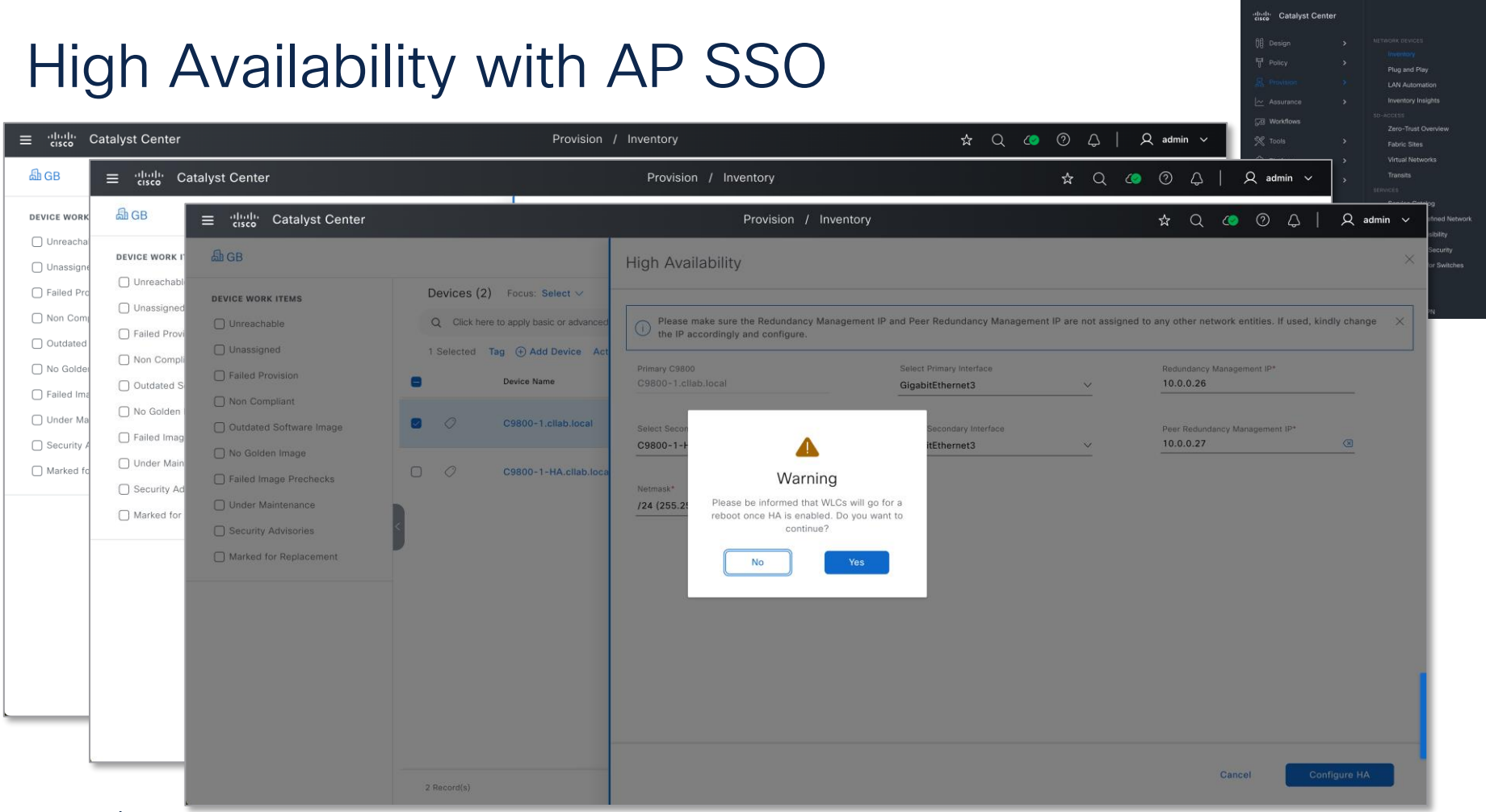

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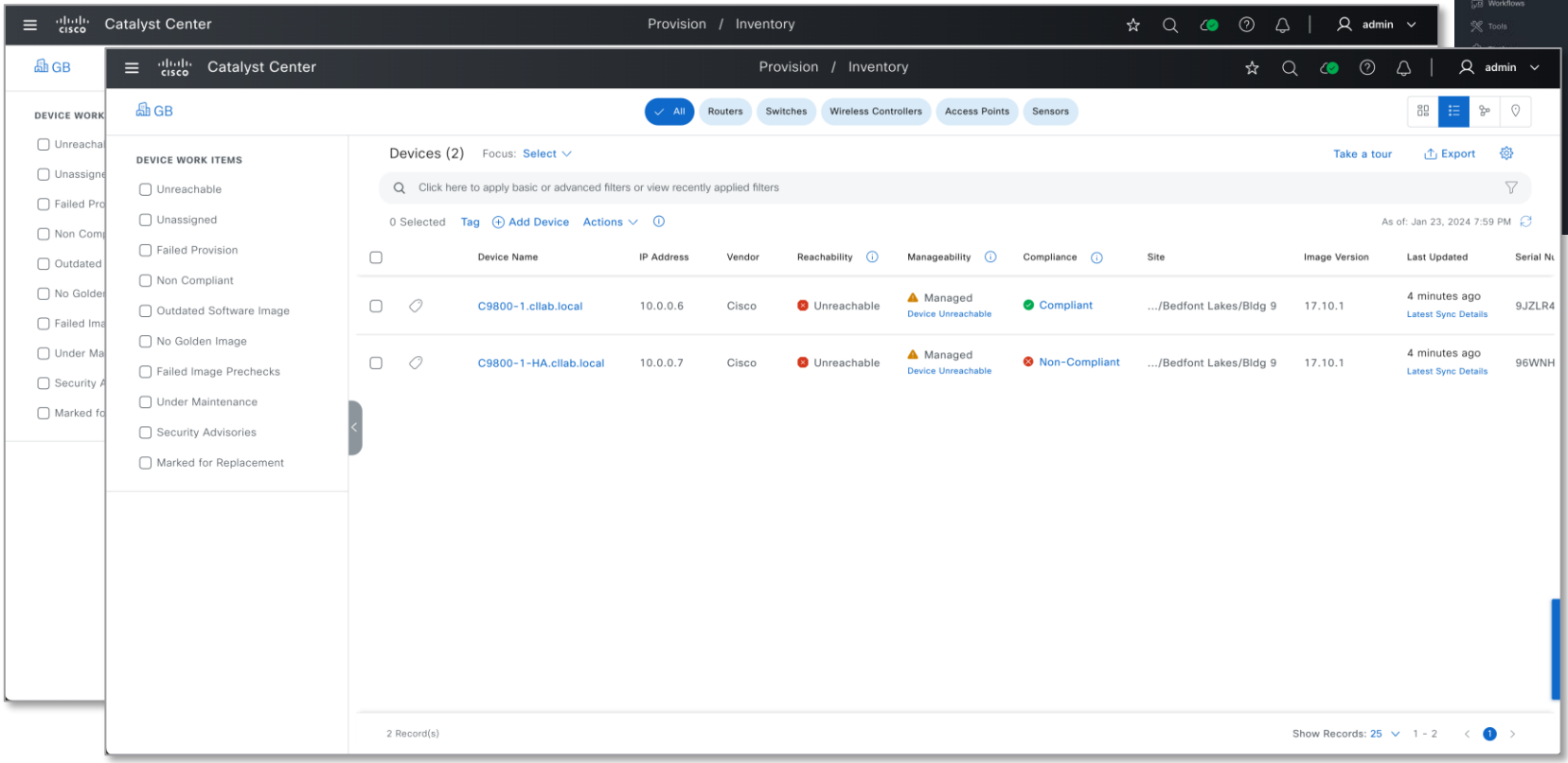

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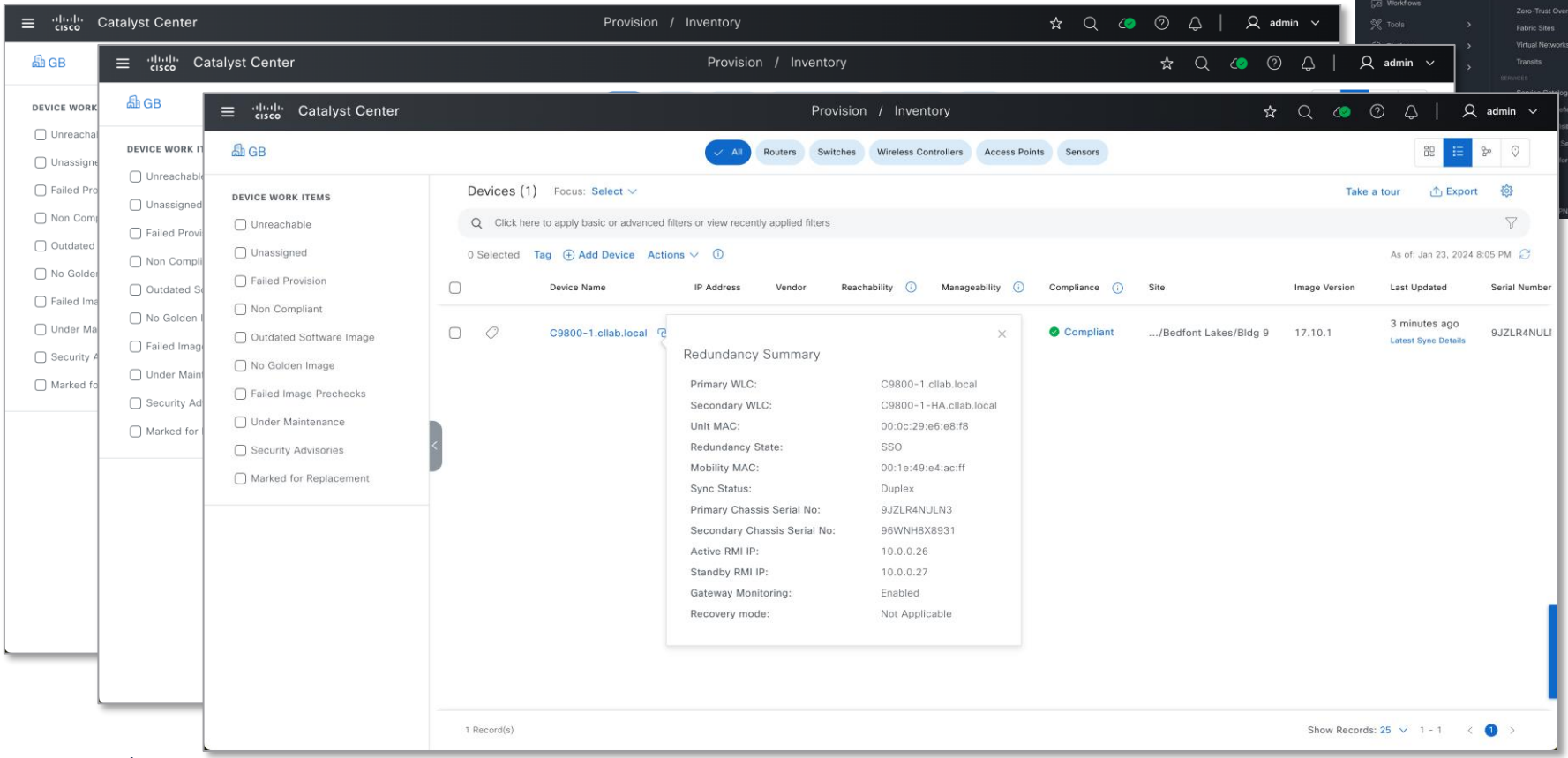

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C9800 – High Availability with AP SSO

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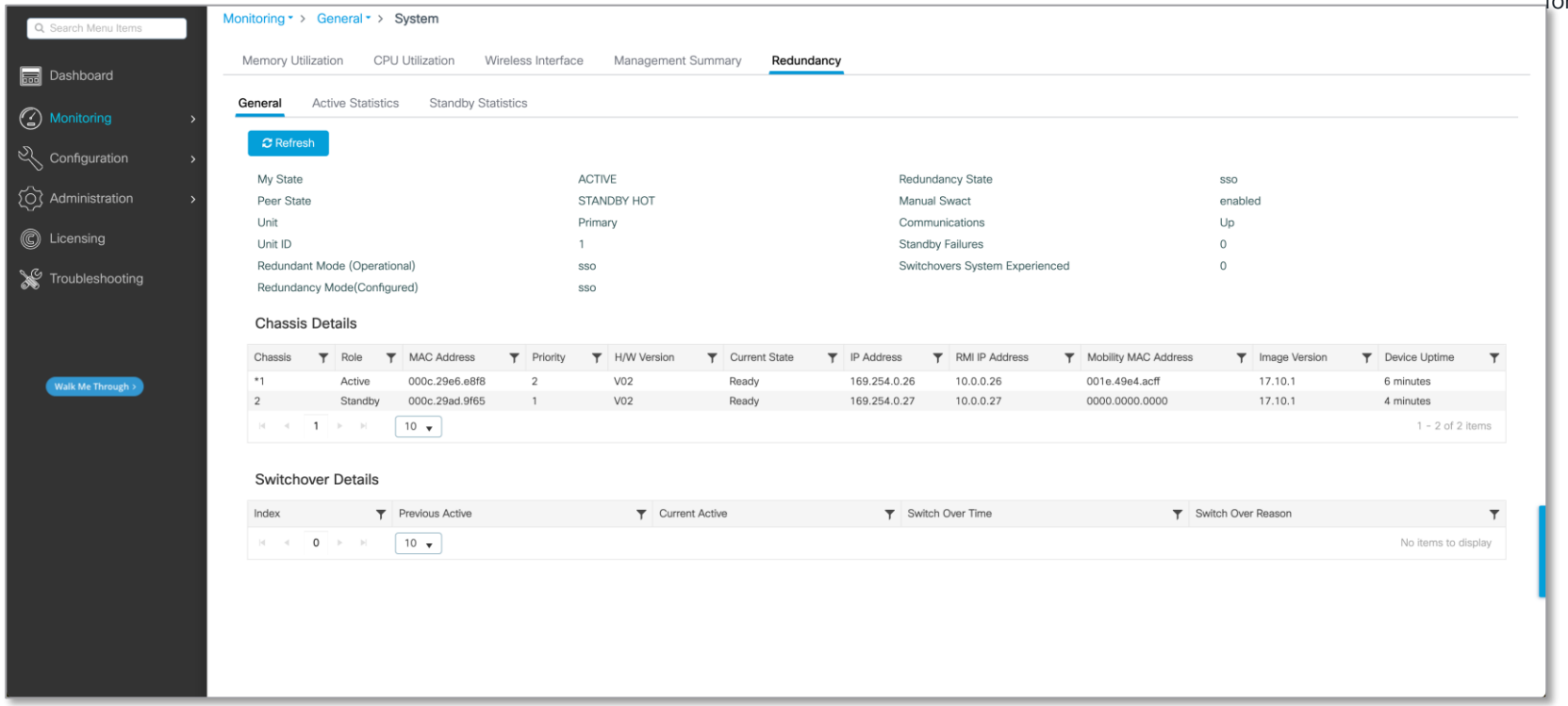

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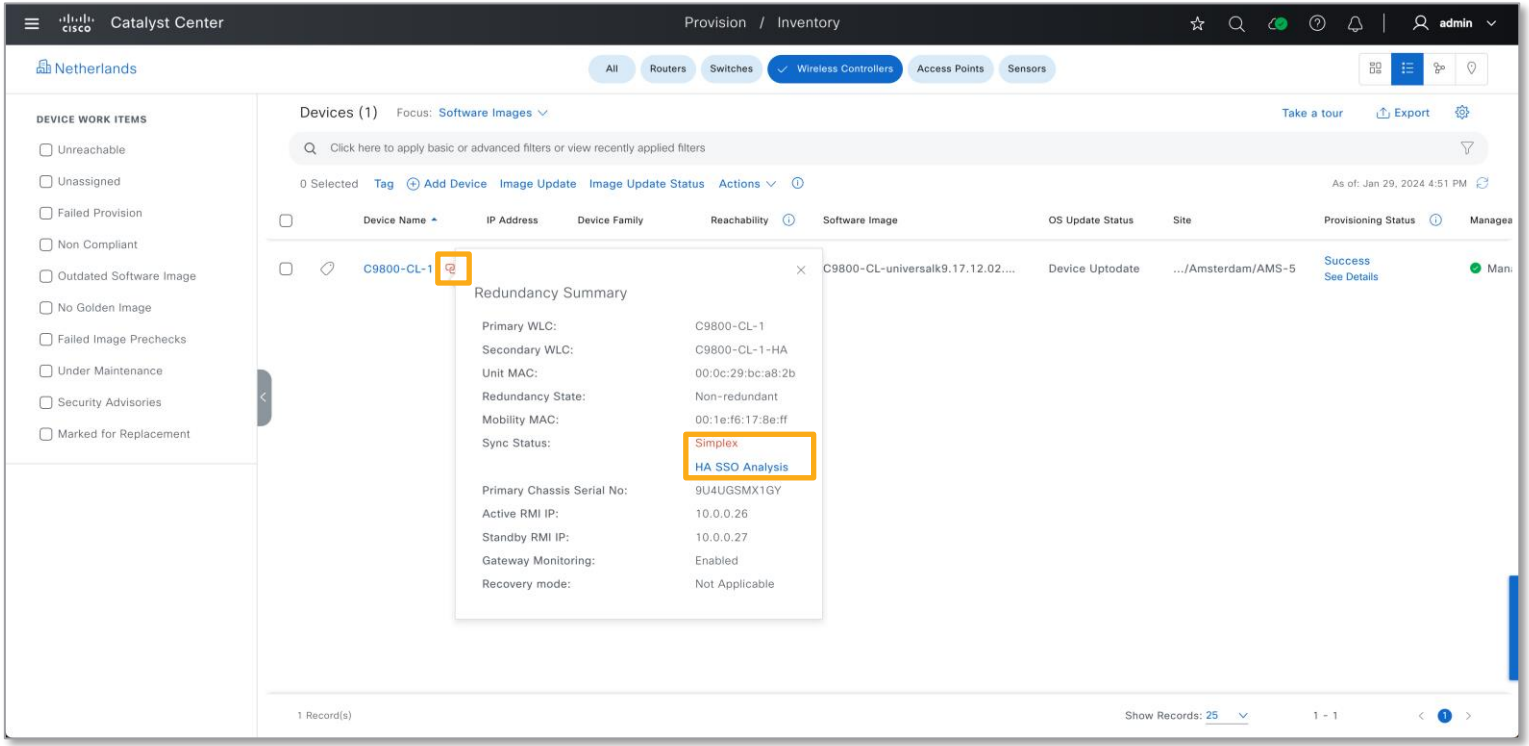

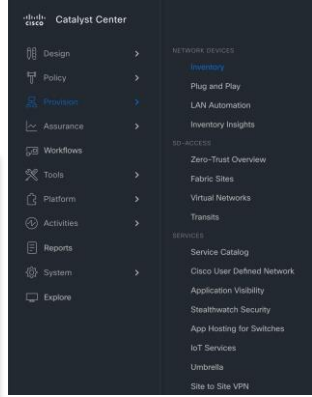

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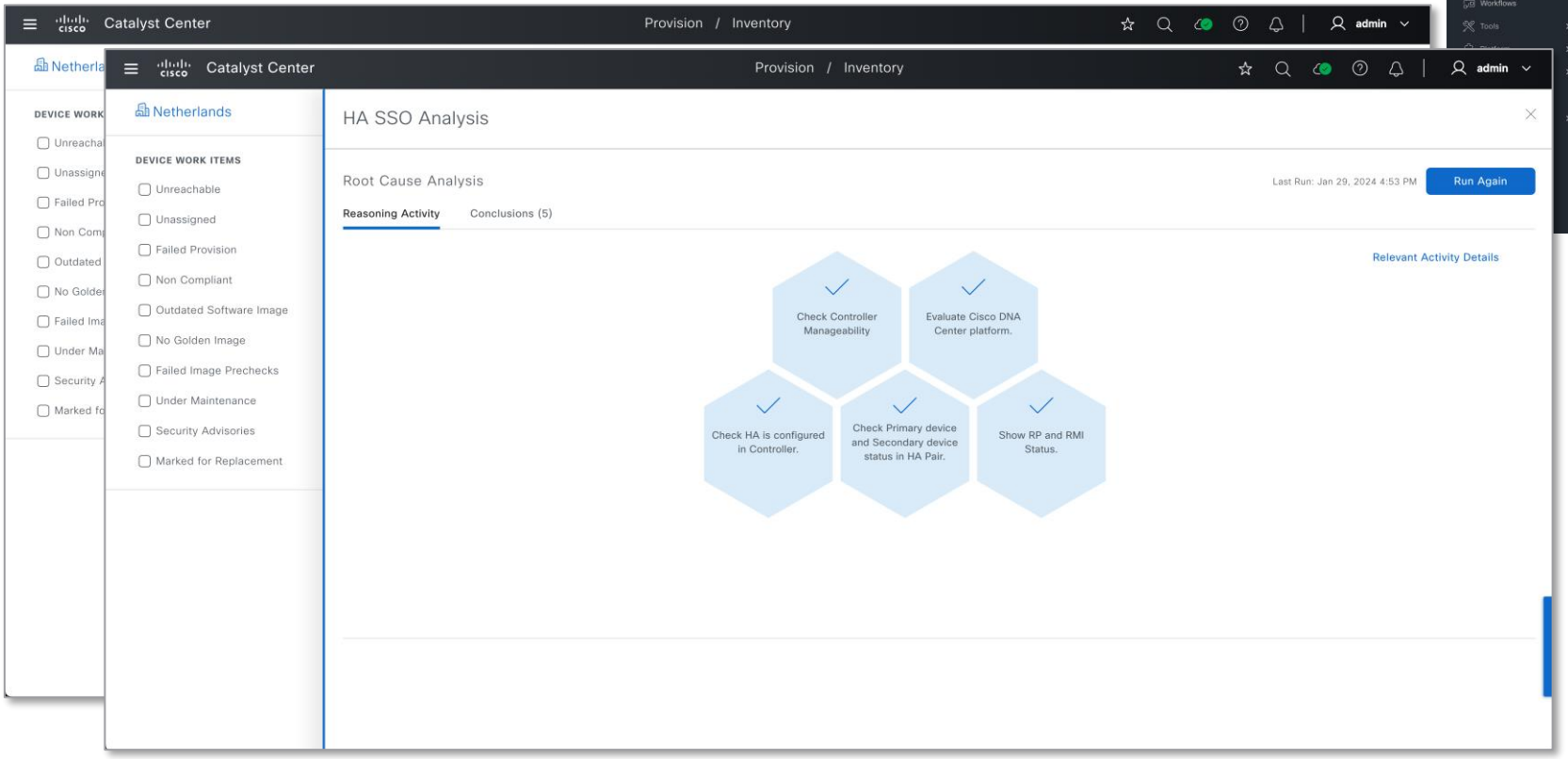

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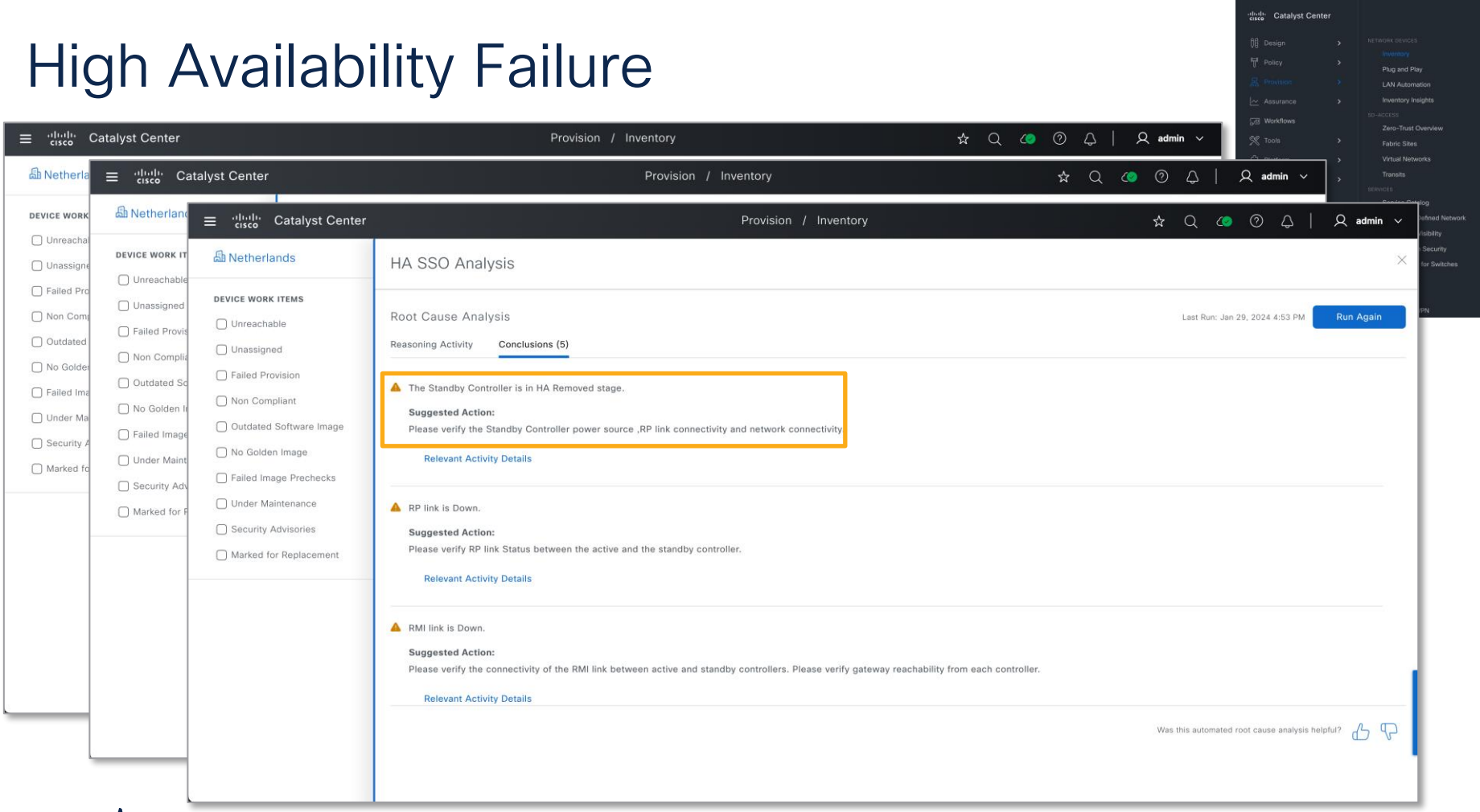

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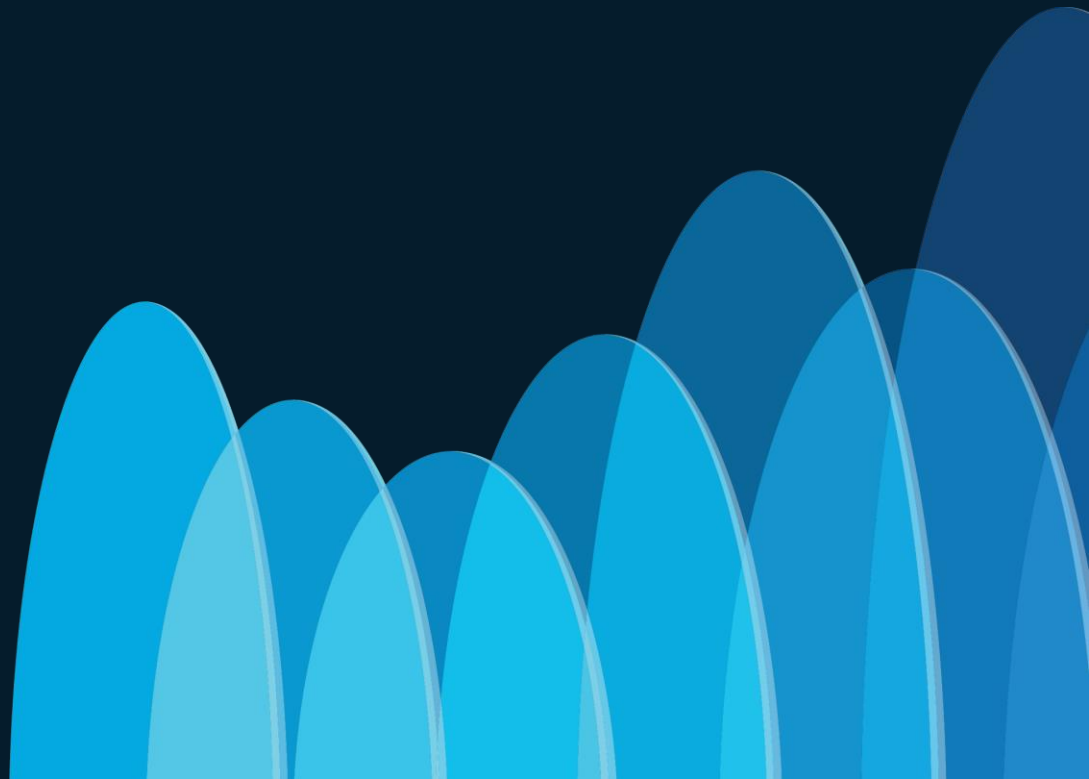
Provision C9800



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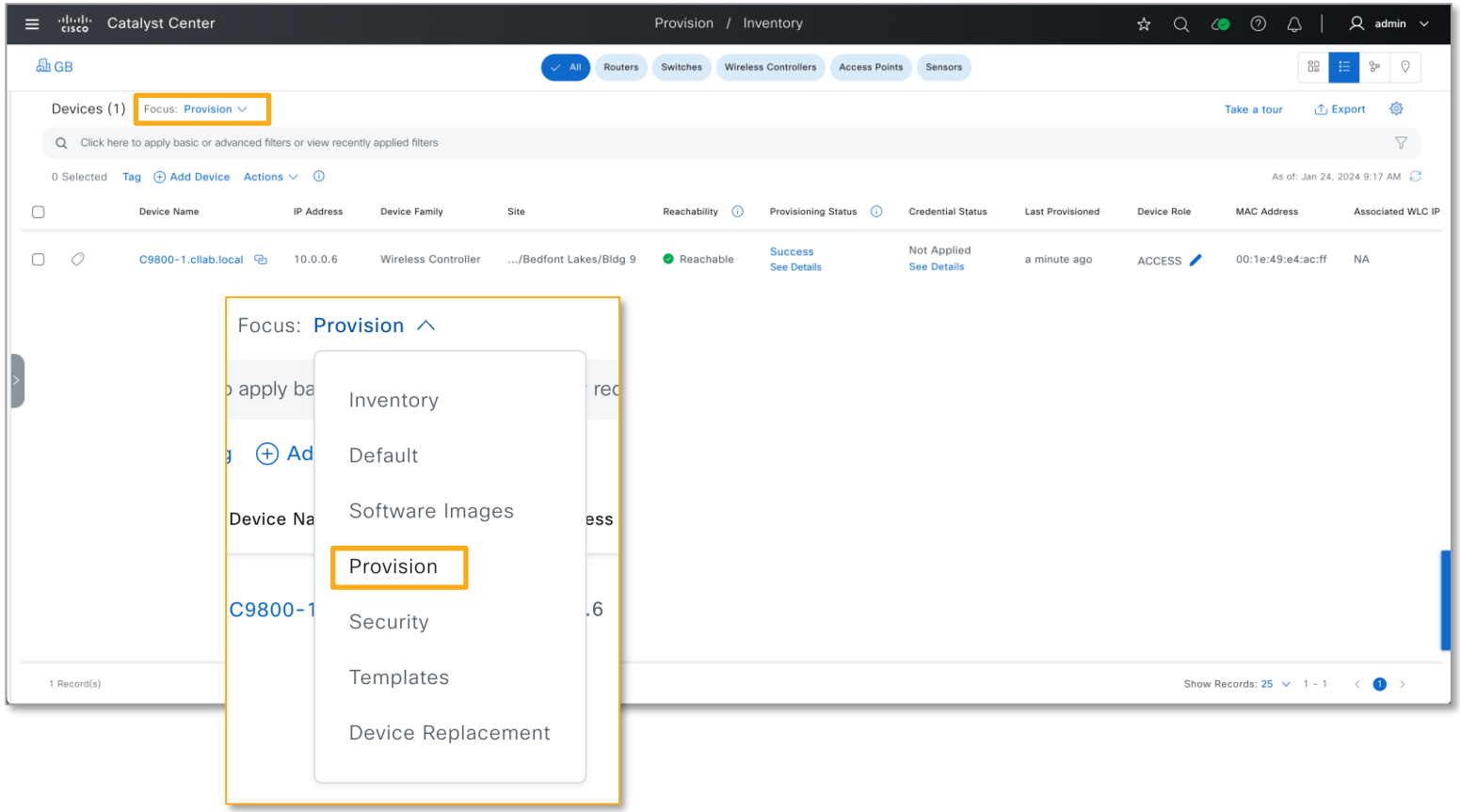
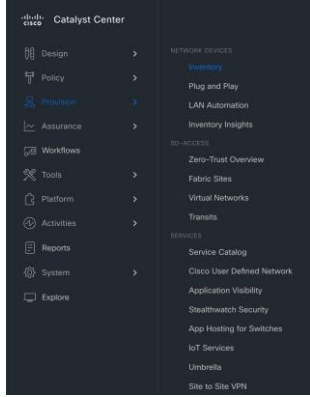
Monitor Provisioning Task





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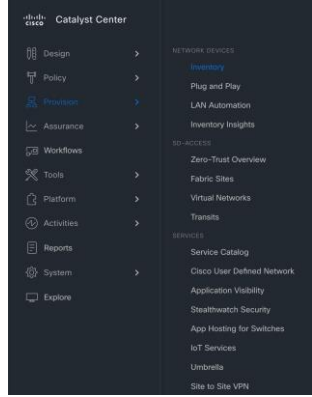
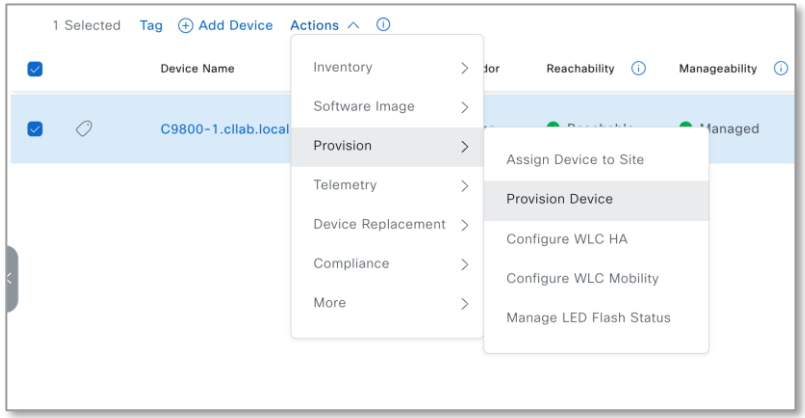
Provision Device

- Assign Site
  - Site needs to have a wireless profile assigned
- Managed AP Locations
- Interfaces
- Model Config
- Advanced Config





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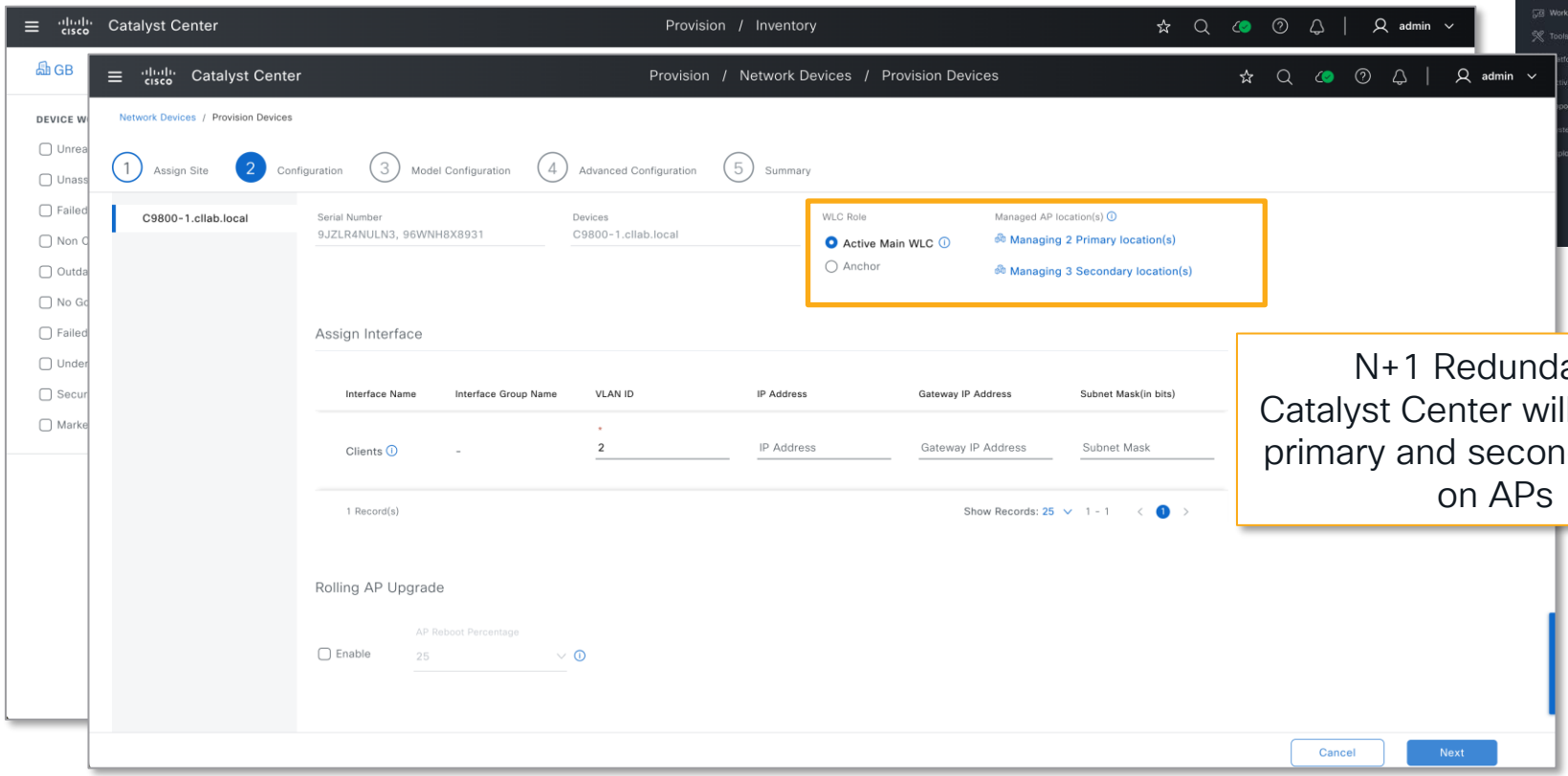
Provision C9800



N+1 Redundancy
Catalyst Center will provision primary and secondary WLC on APs

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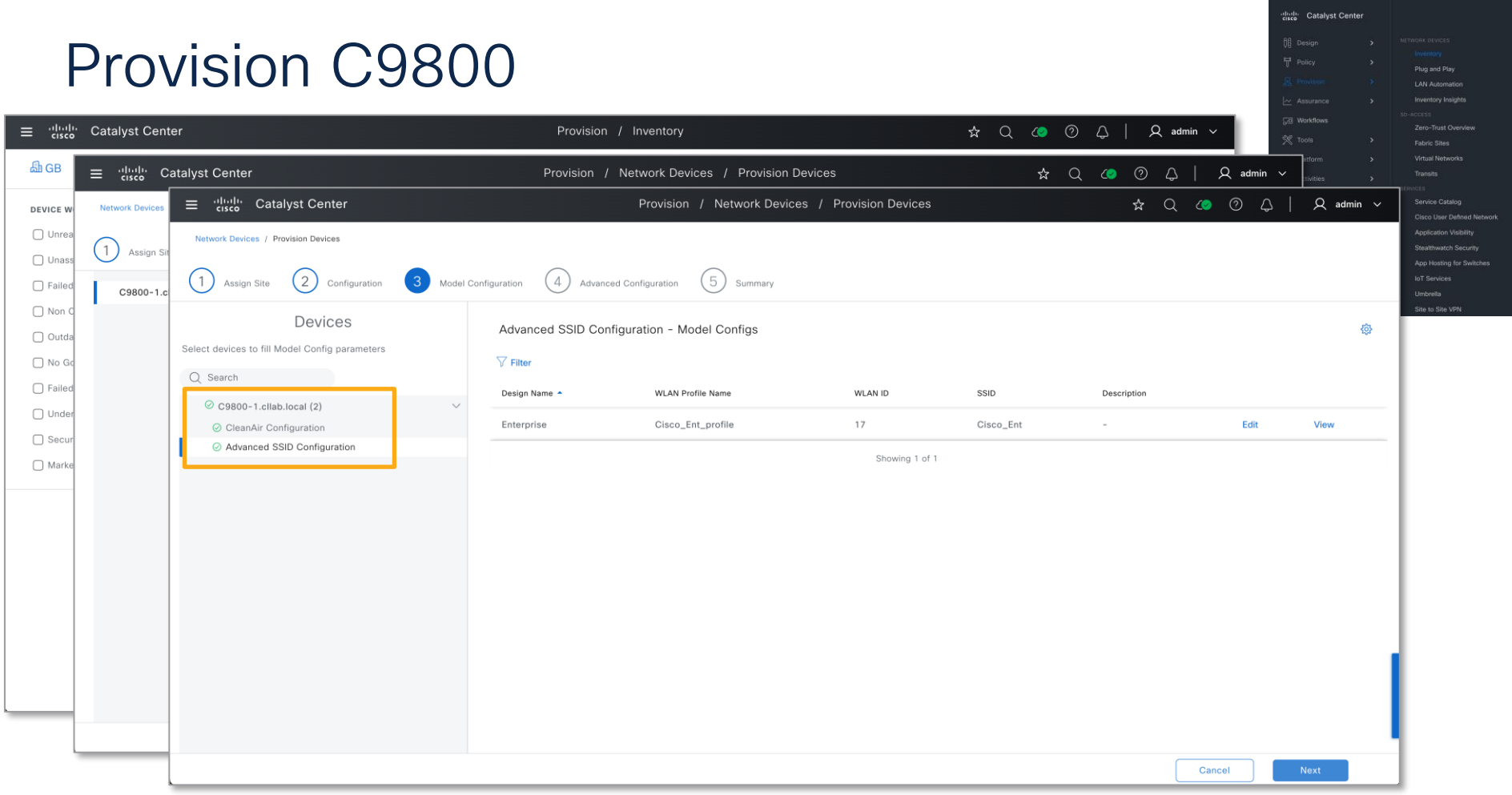

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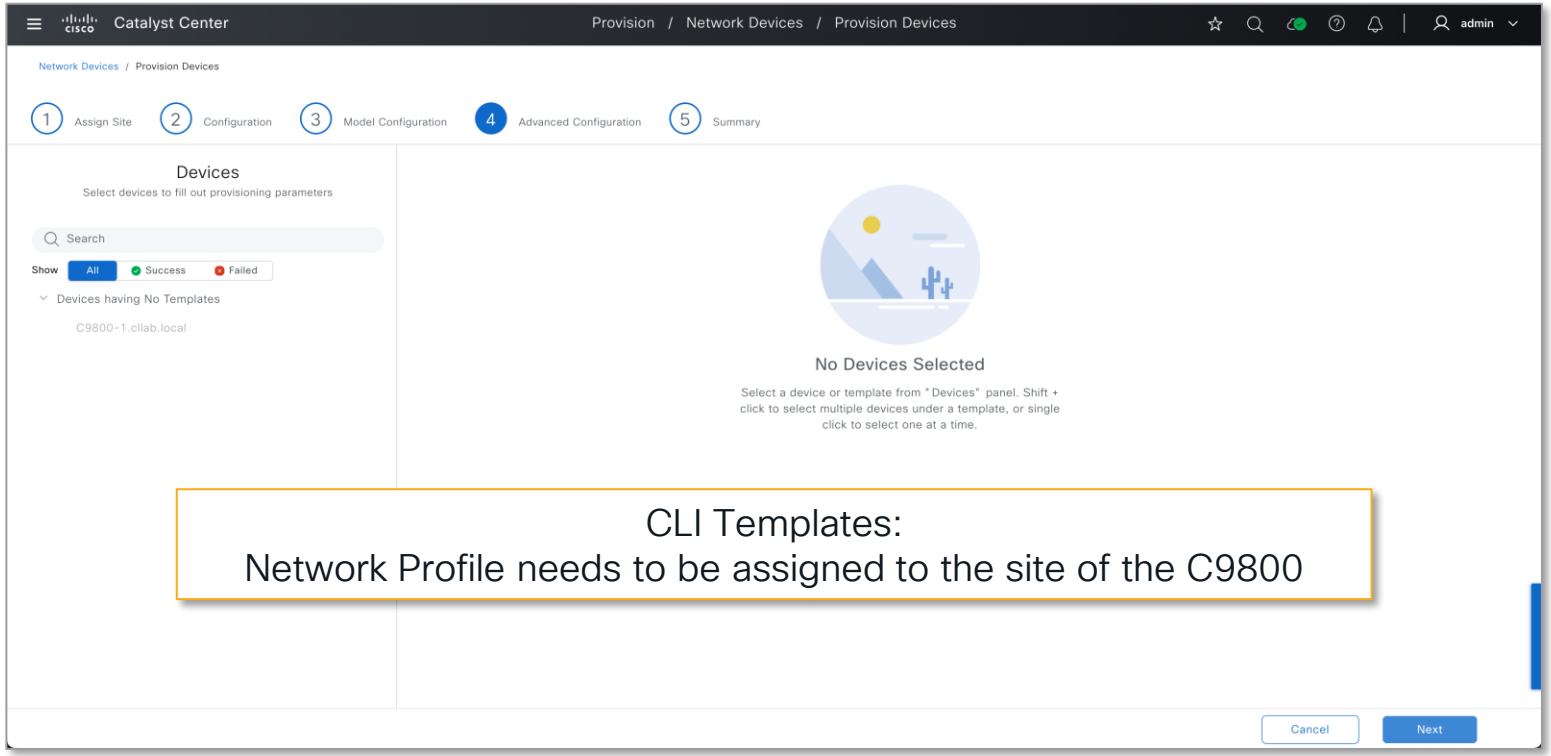

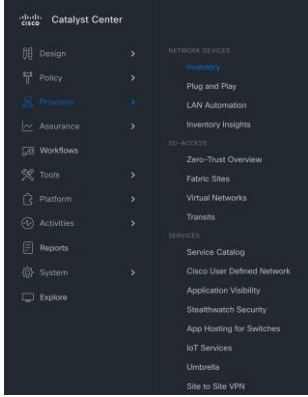

CLI Templates:
Network Profile needs to be assigned to the site of the C9800

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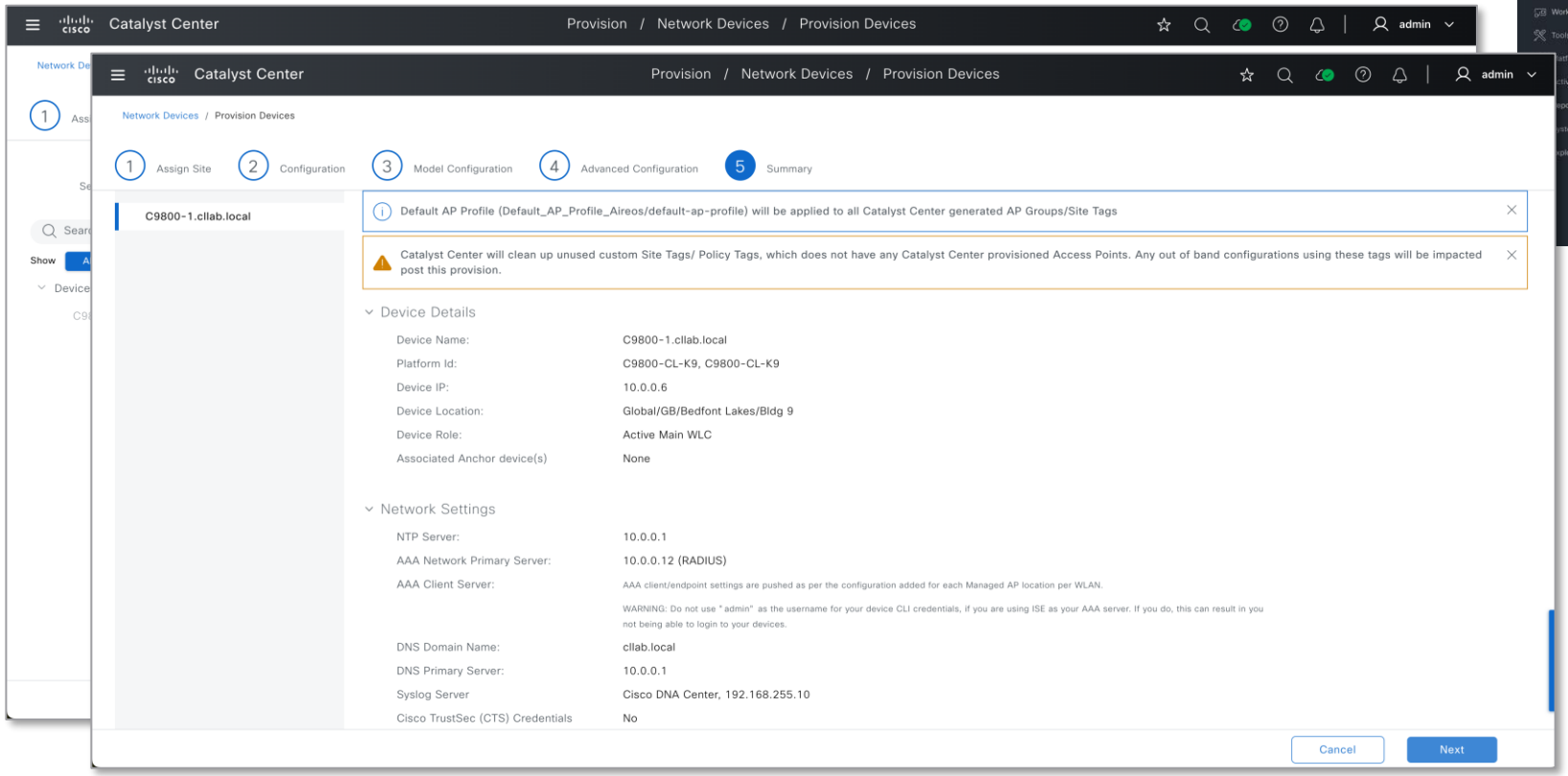
Provision C9800



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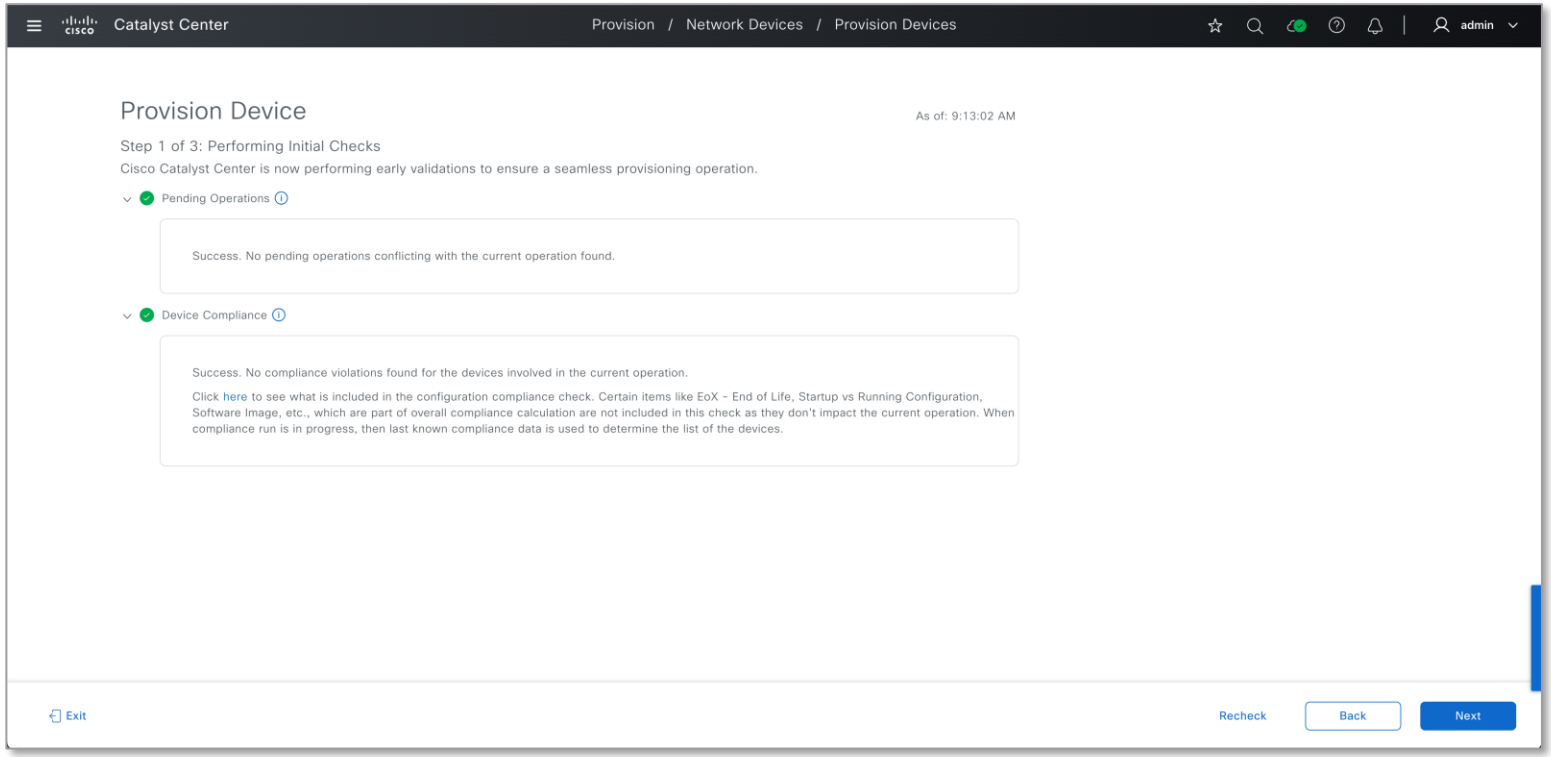

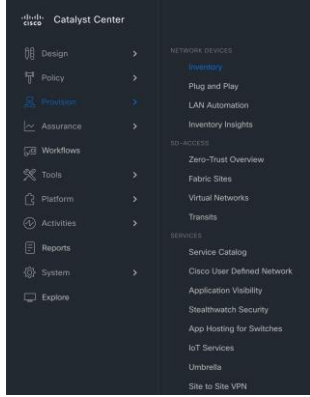

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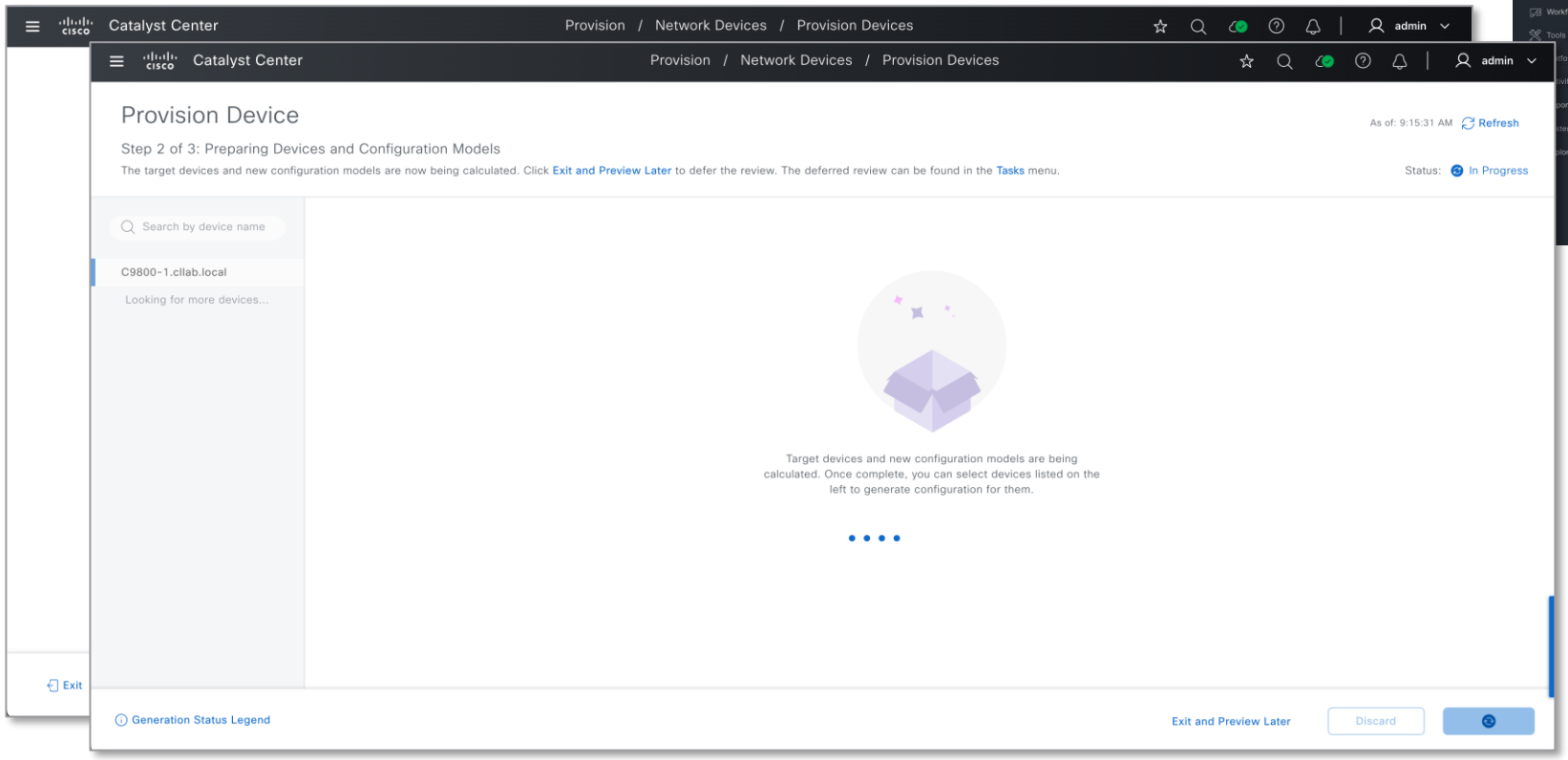

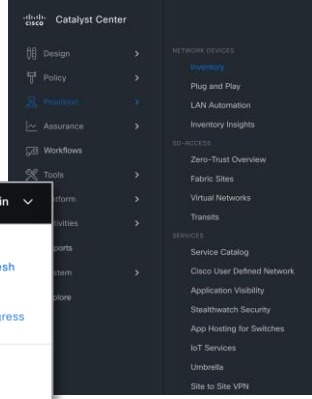

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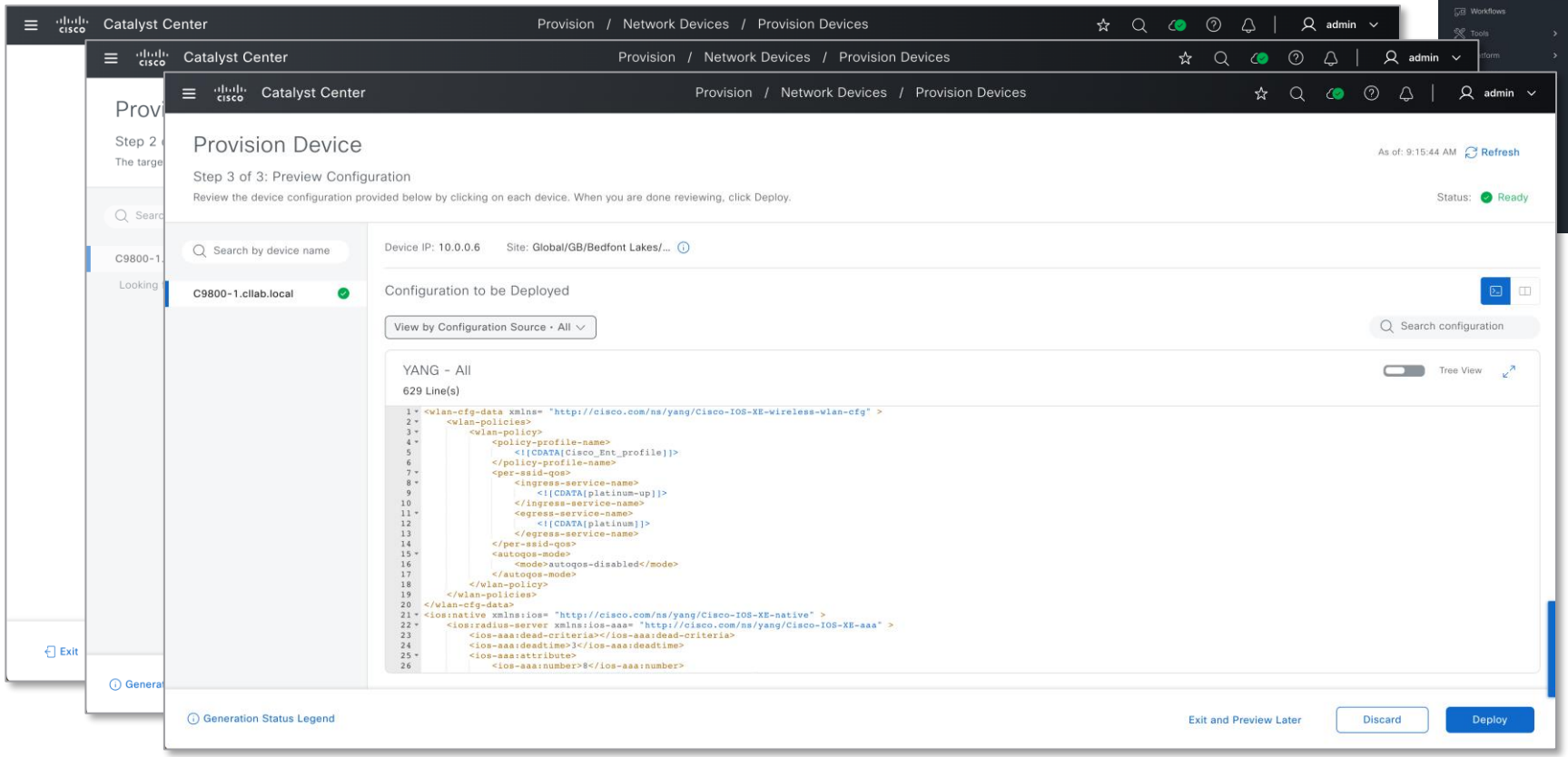

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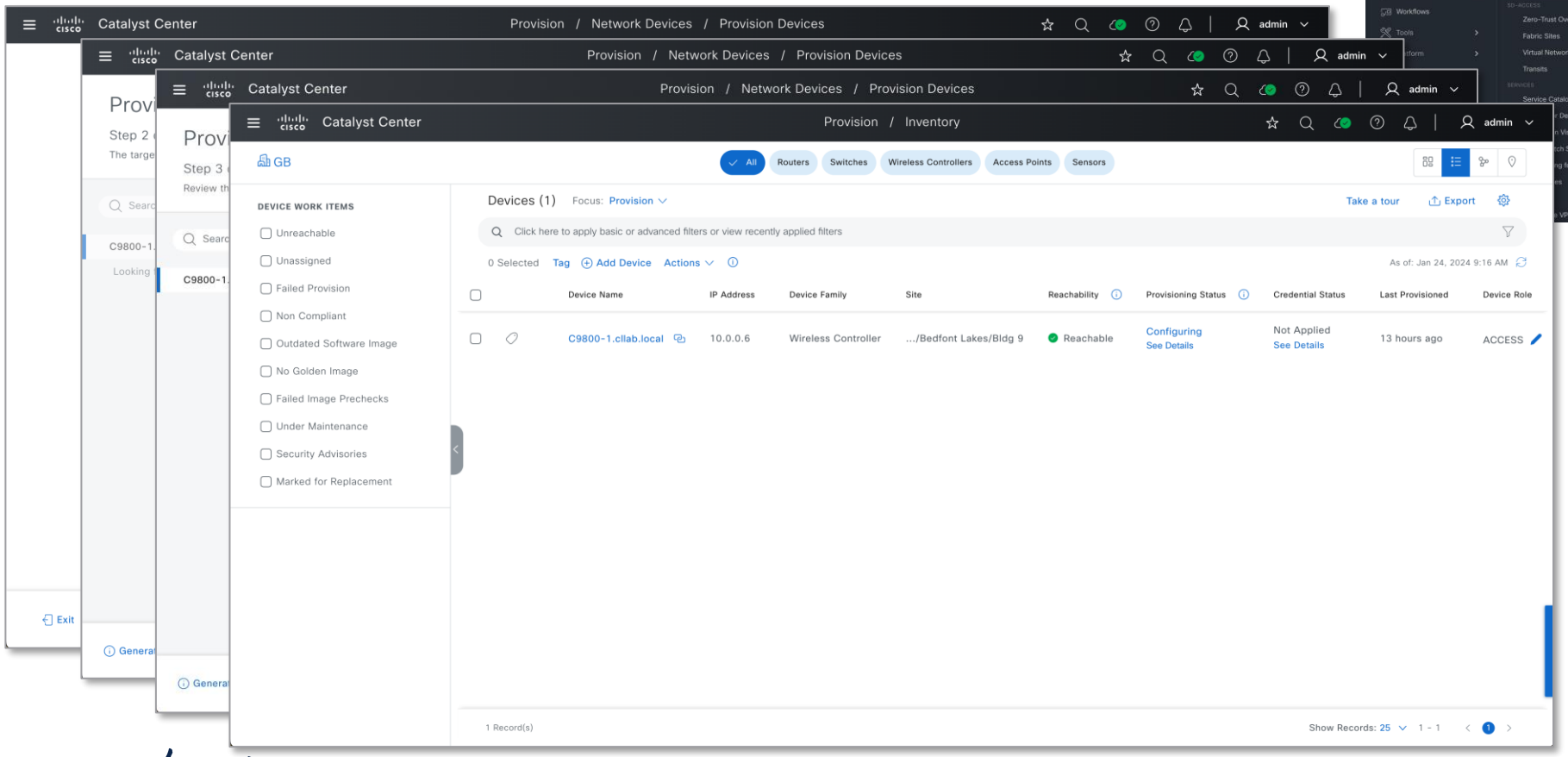

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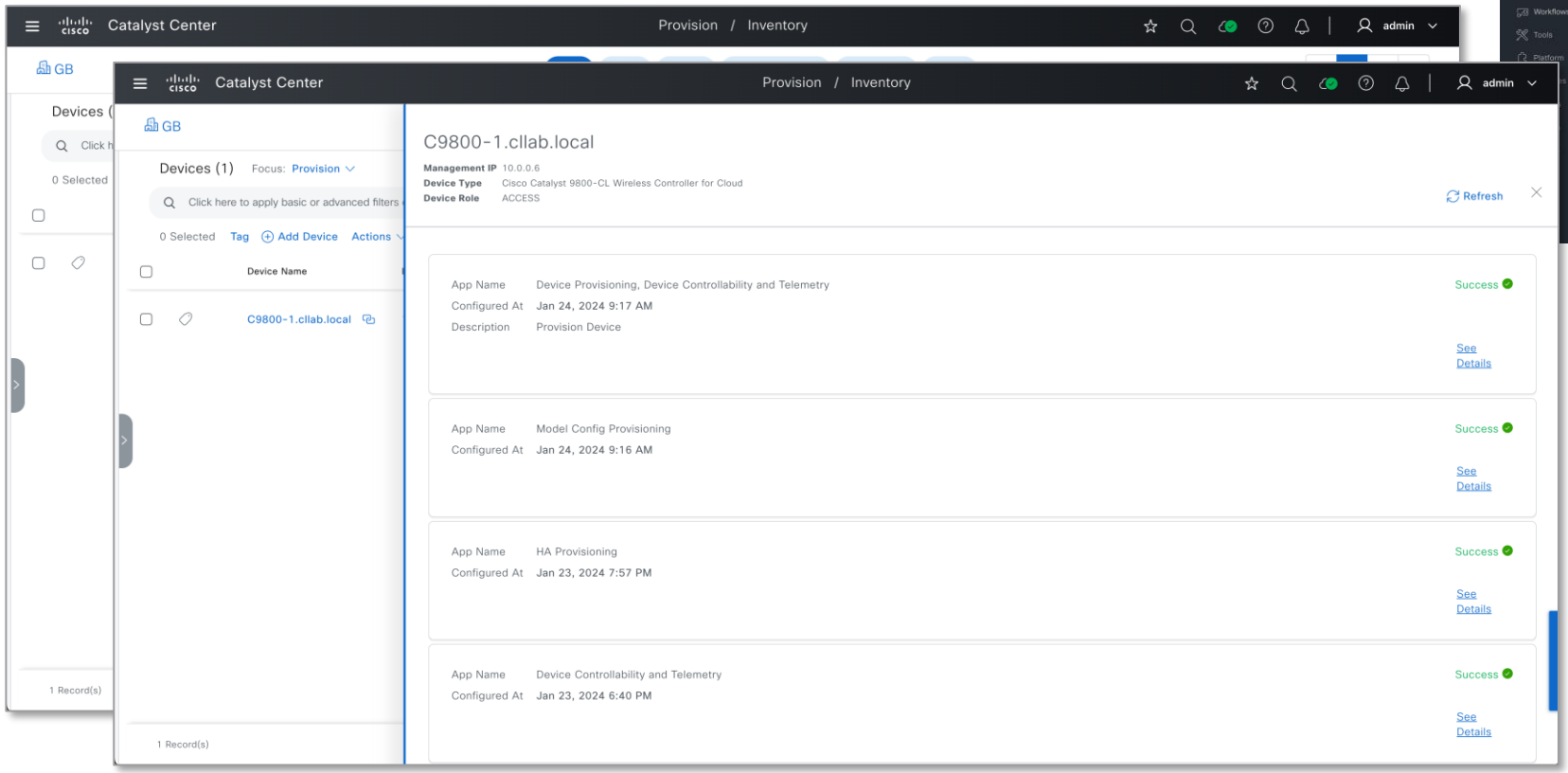
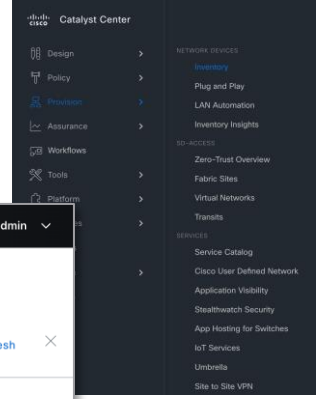
Monitor Provisioning Task





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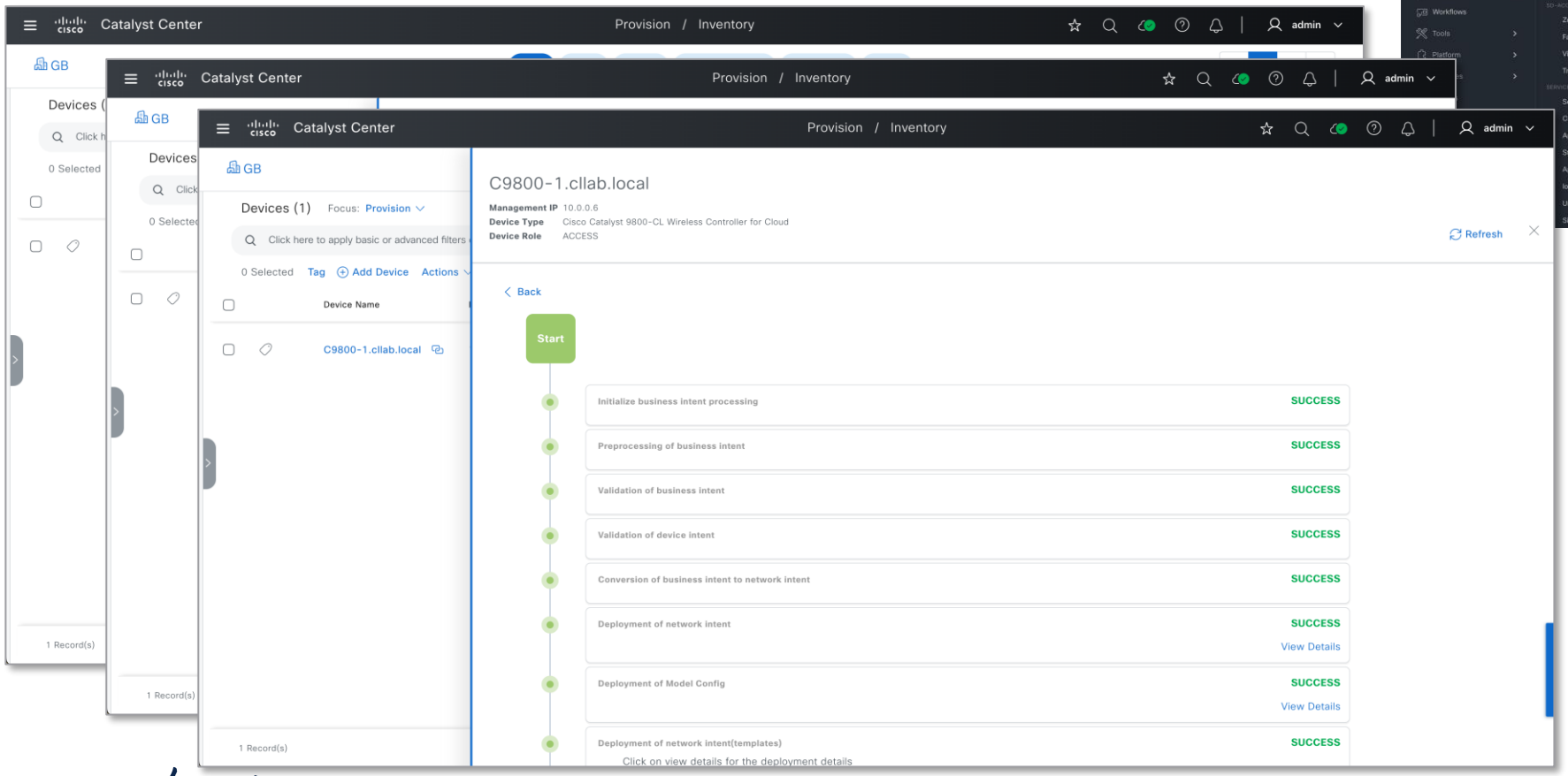

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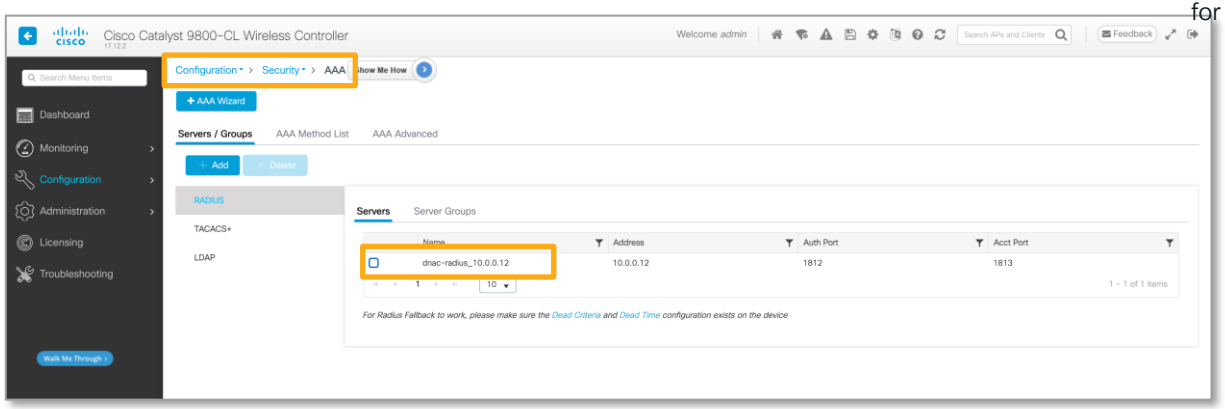
What gets configured on Catalyst 9800

- AAA
- Policy Profiles
- WLANs
- Site Tags

for reference



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What gets configured on Catalyst 9800

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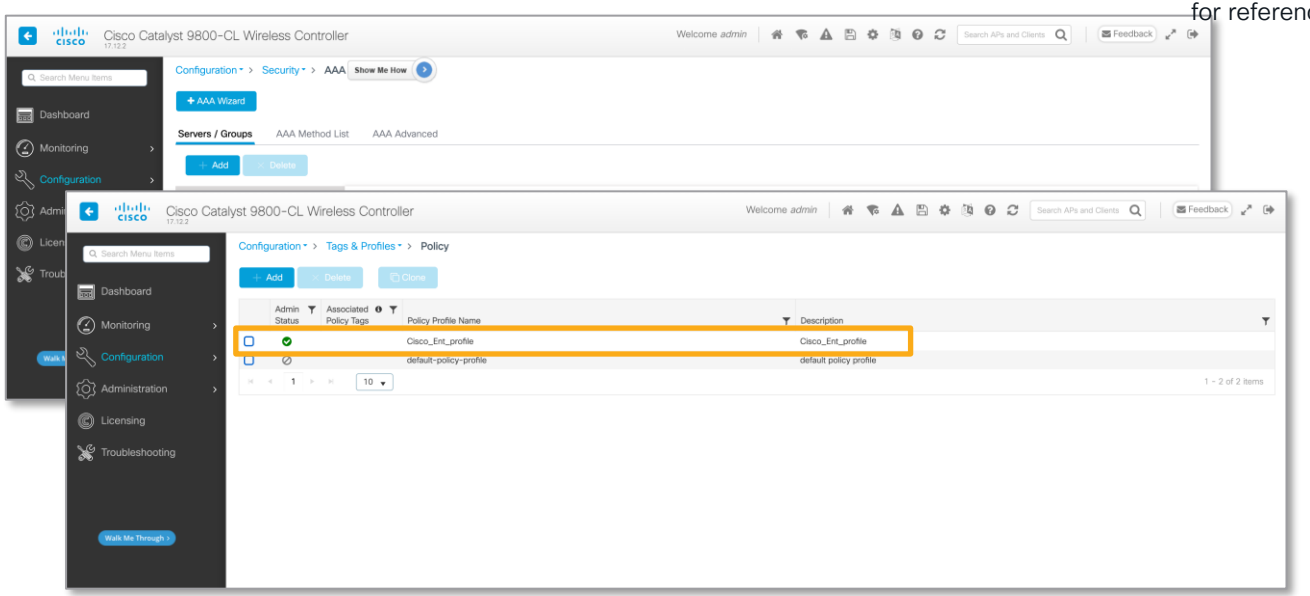

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What gets configured on Catalyst 9800

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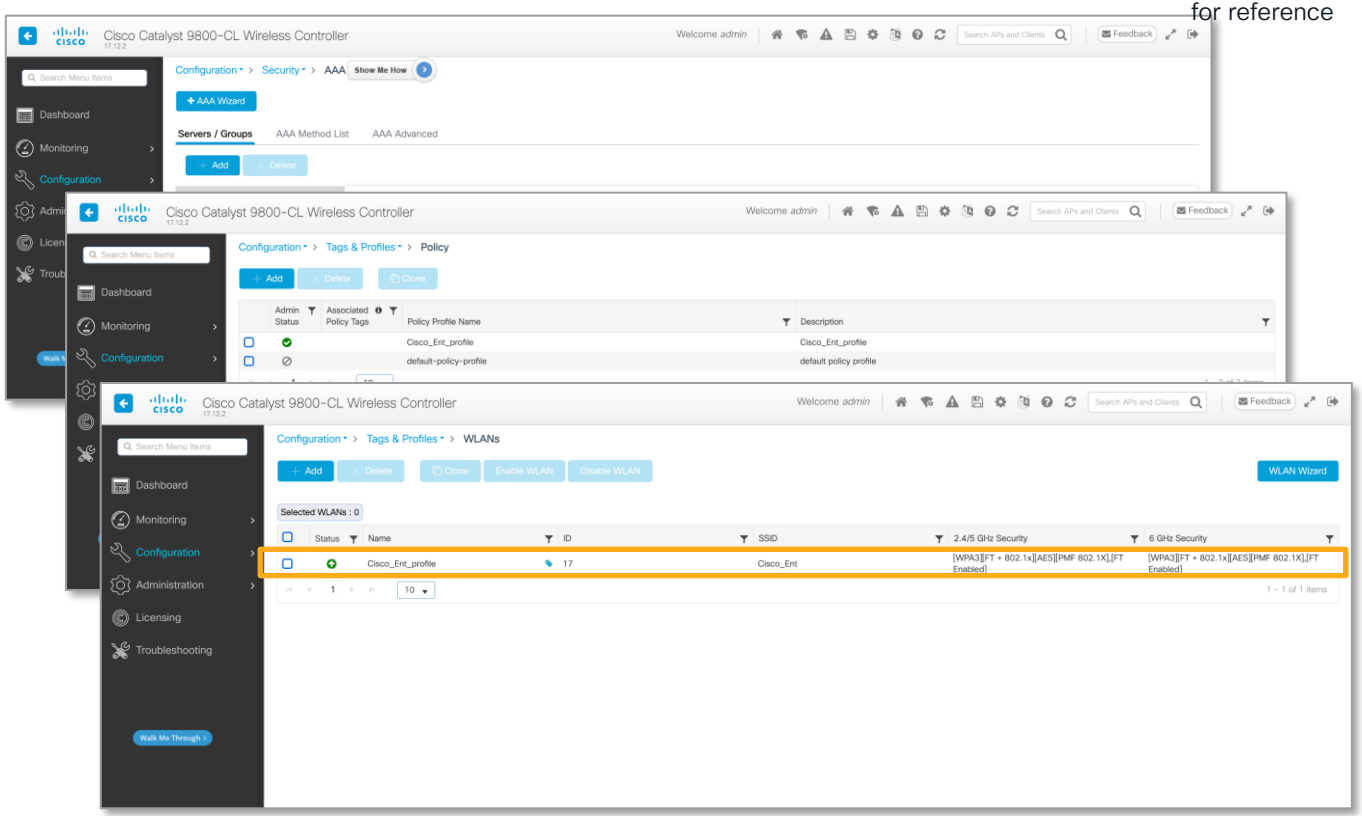
for reference



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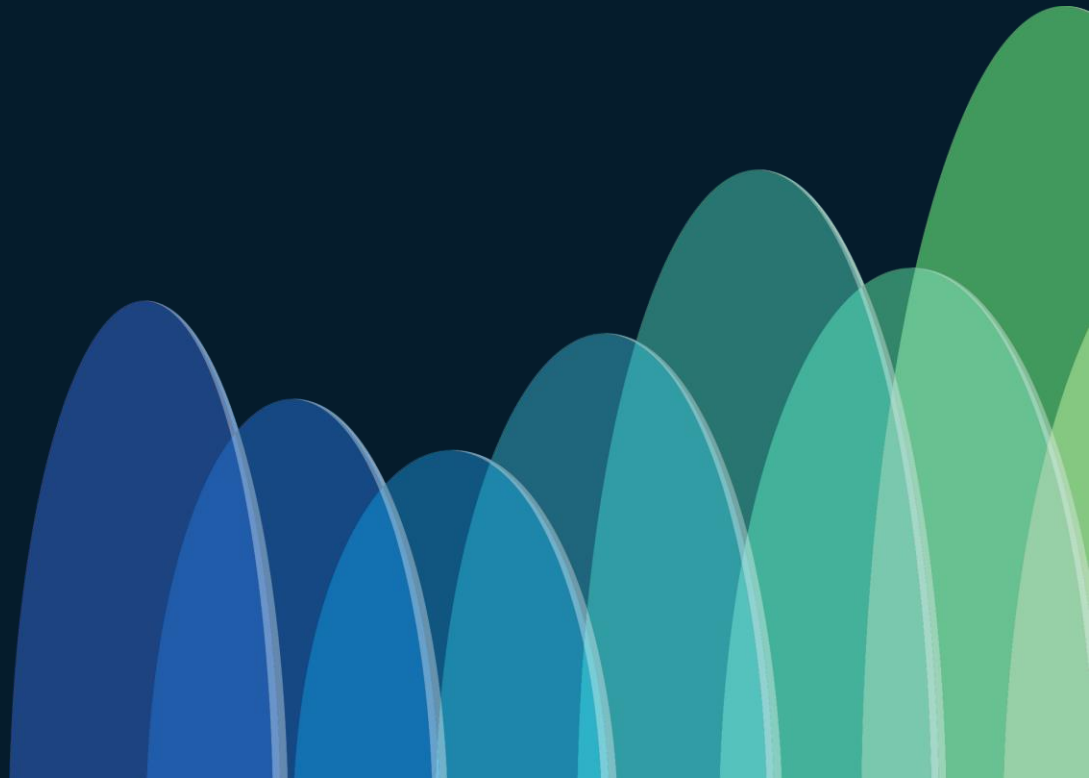
Flex Connect with Cisco Catalyst Center

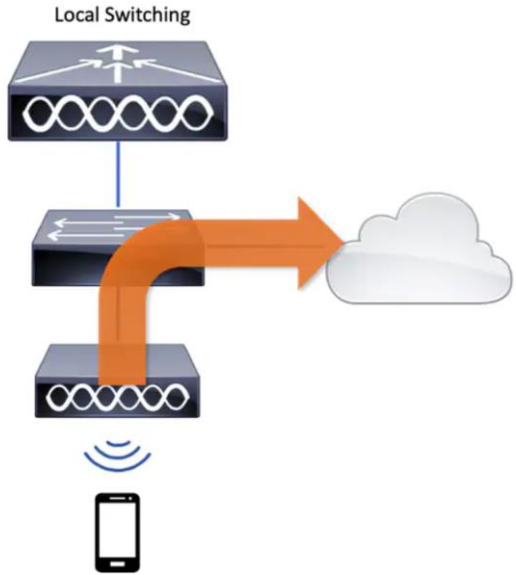


cisco Live!

How to deploy Flex Connect with Catalyst Center

Flex Connect has site specific settings

- Network Design
  - Native VLAN for APs
  - VLAN mapping for AAA override
- Network Profile
  - Enable FlexConnect local switching
  - Default VLAN for WLAN



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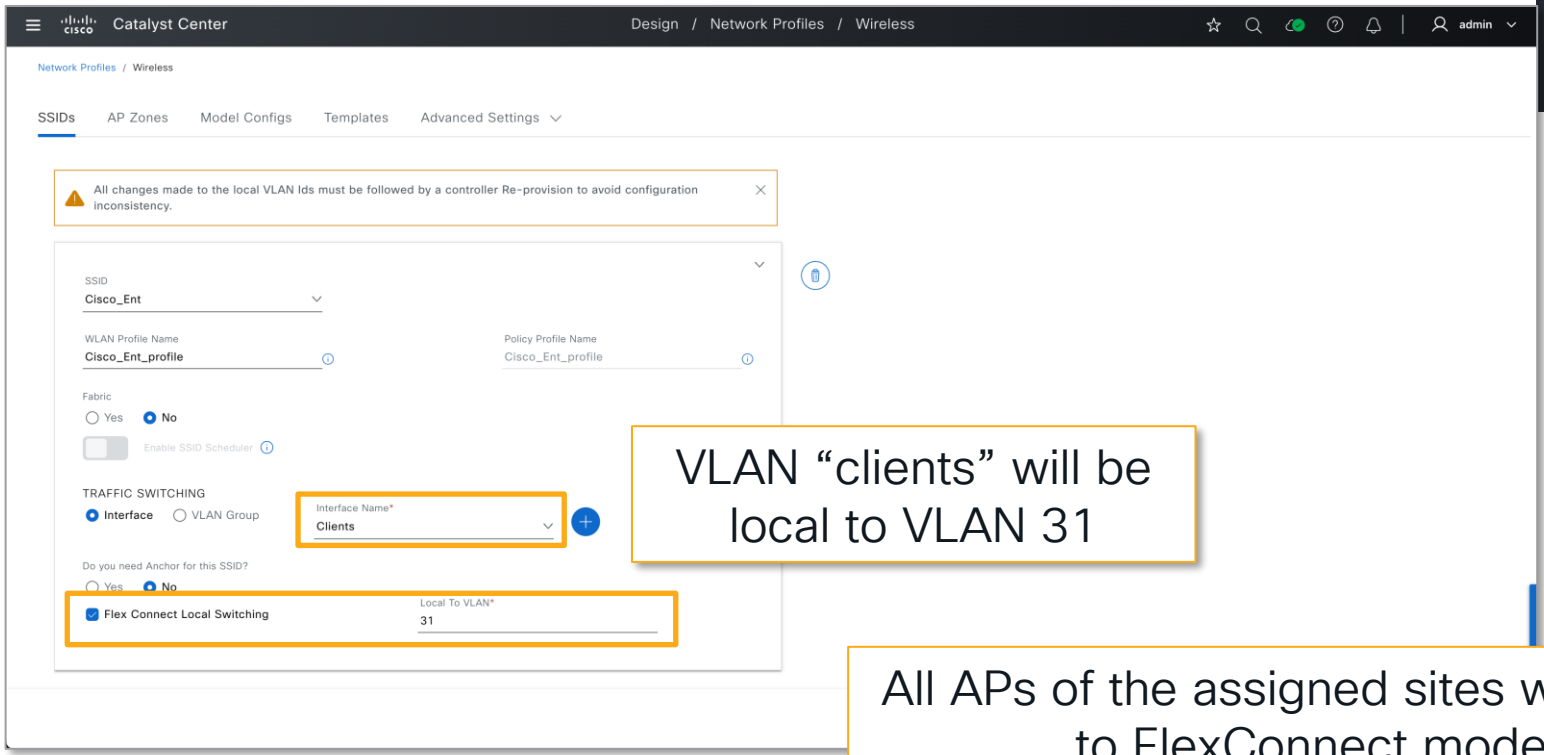
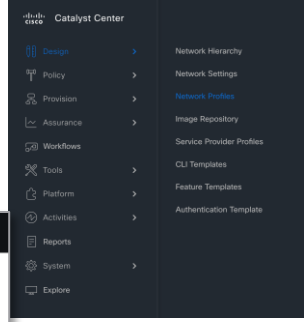
Site specific Flex Connect VLANs





VLAN “clients” will be local to VLAN 31

All APs of the assigned sites will be set to FlexConnect mode

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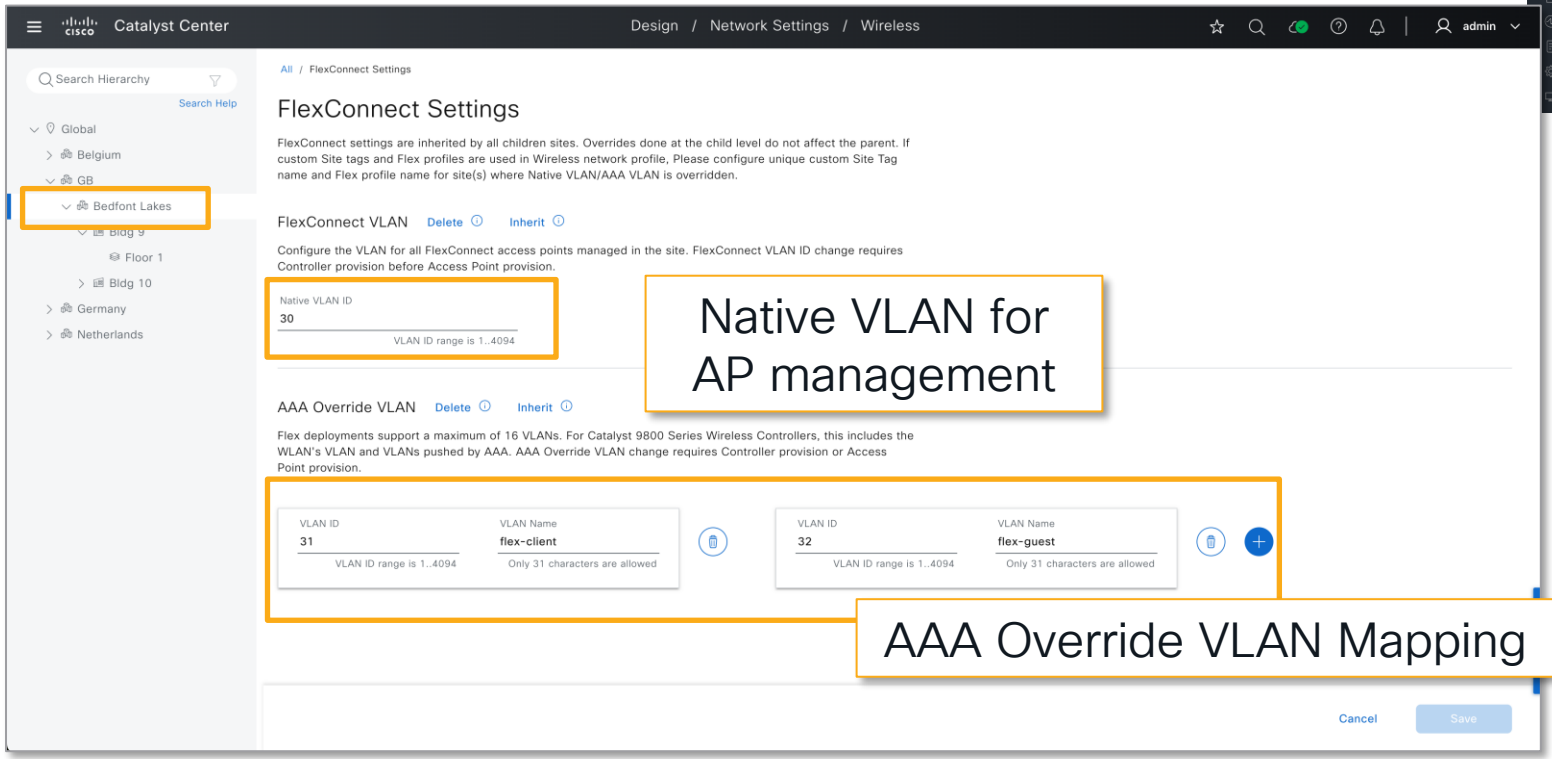
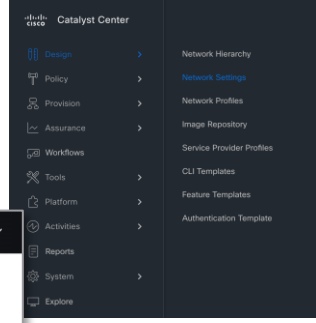
Site specific Flex Connect VLANs





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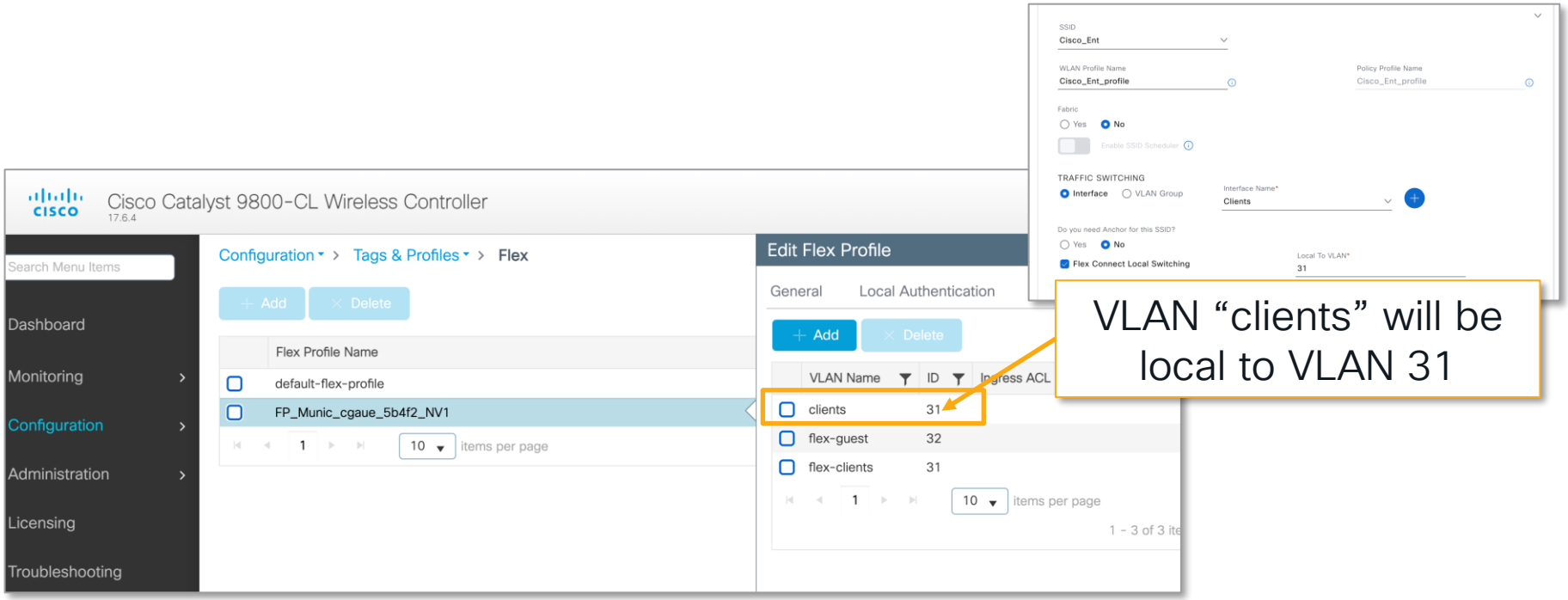
C9800 Flex Profile



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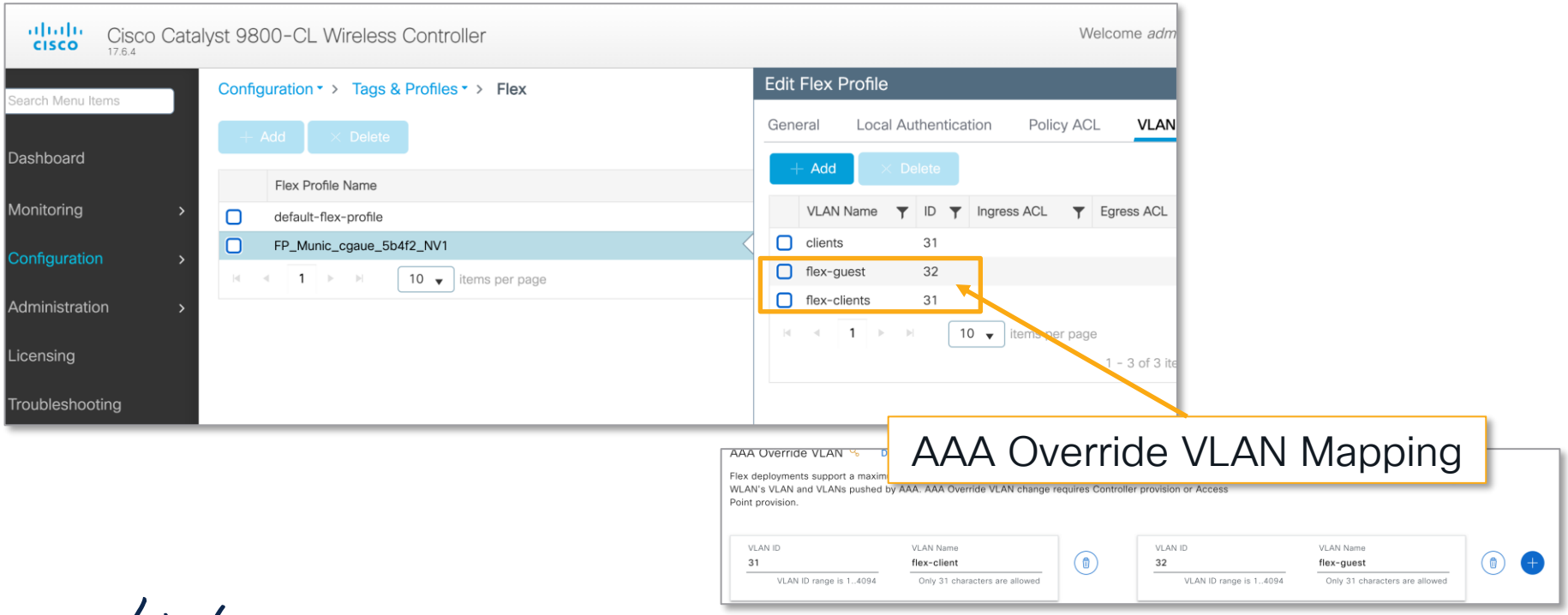
C9800 Flex Profile



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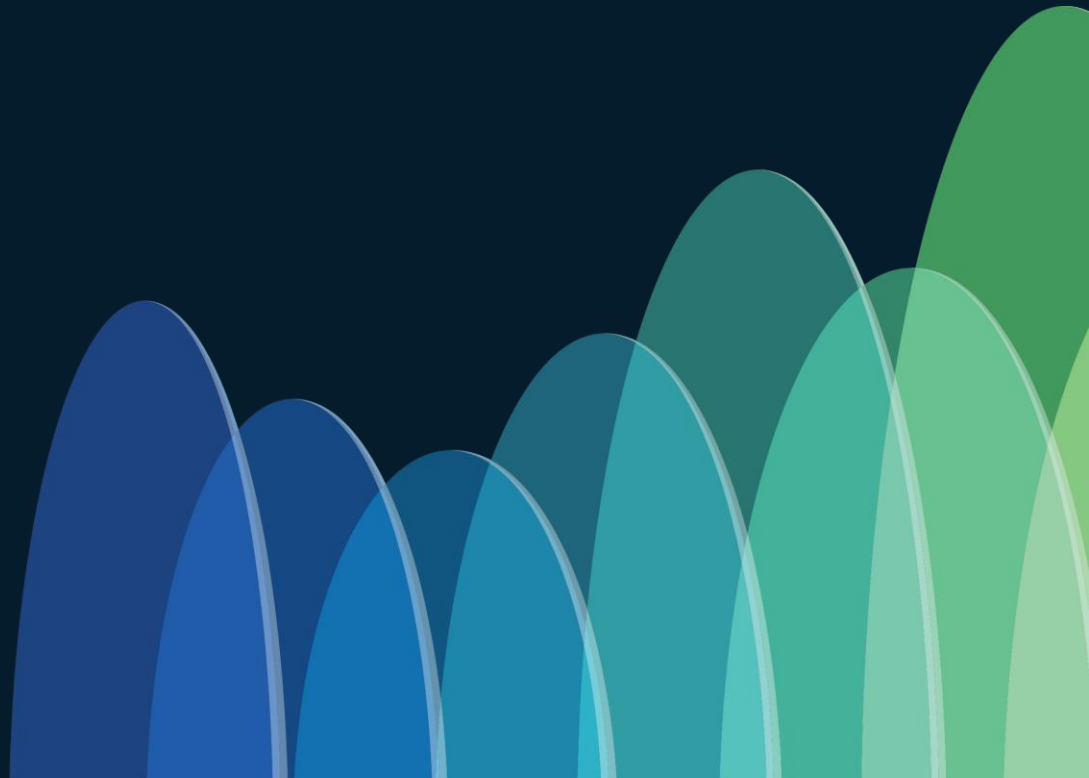
Access Points



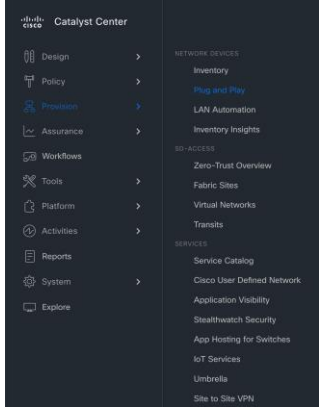
PnP discovery

- Use DNS
  for PnP via Catalyst Center `pnpserver.localdomain`
  Do not use `cisco-capwap-controller.localdomain`
- or DHCP Option 43 for PnP

  `5A1N;B2;K4;I198.18.129.100;J80`

  Do not use Hex string pointing to WLC
- Claim APs via Catalyst Center Plug and Play
- joined APs:
  - automatically show up in inventory (skipping PnP)
  - Require manual site assignment and provisioning

Catalyst Center Enterprise IP address



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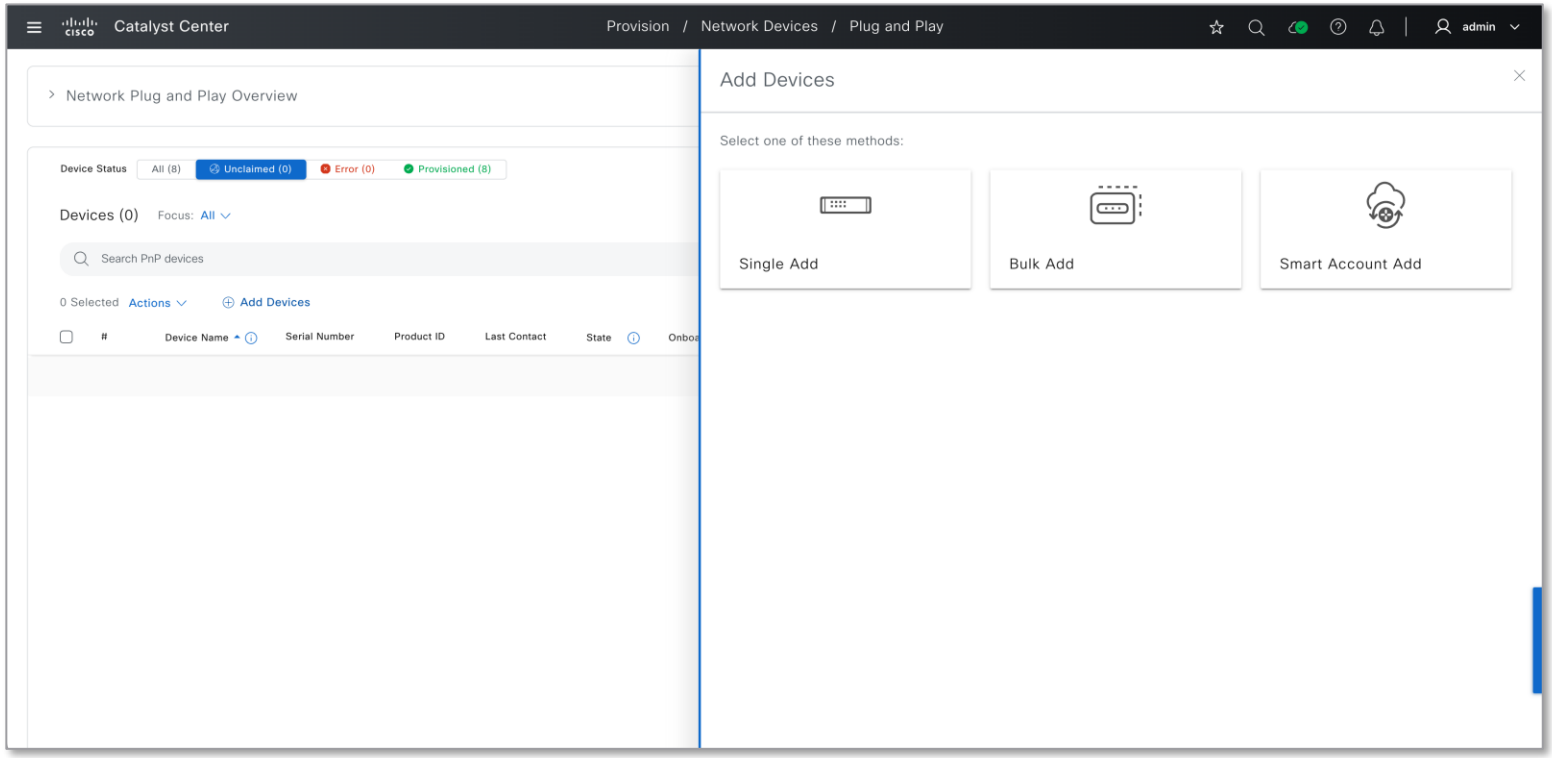
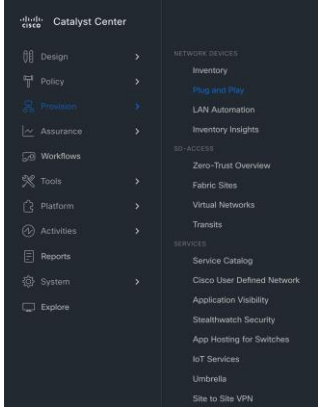
AP Plug and Play: Bulk Add





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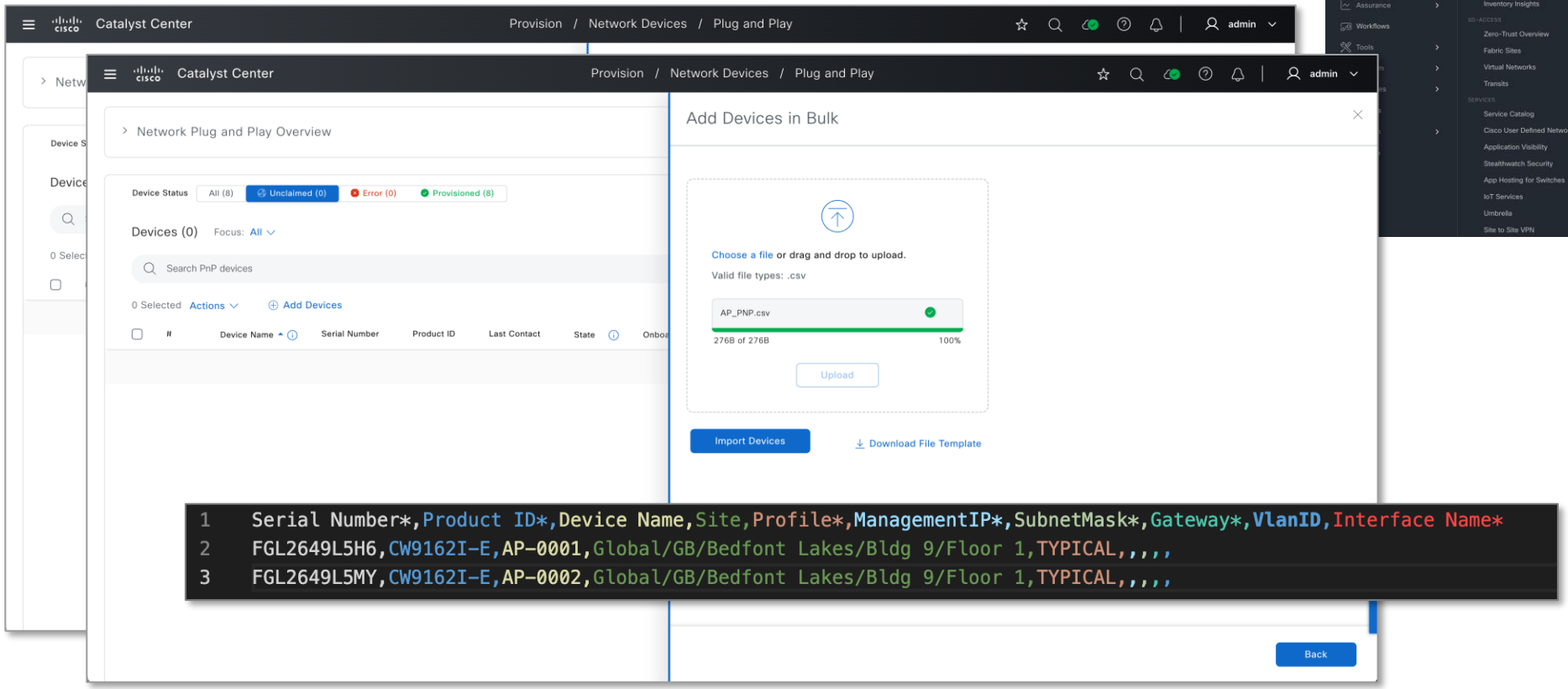


```
1  Serial Number*,Product ID*,Device Name,Site,Profile*,ManagementIP*,SubnetMask*,Gateway*,VlanID,Interface Name*
2  FGL2649L5H6,CW9162I-E,AP-0001,Global/GB/Bedfont Lakes/Bldg 9/Floor 1,TYPICAL,,,,,
3  FGL2649L5MY,CW9162I-E,AP-0002,Global/GB/Bedfont Lakes/Bldg 9/Floor 1,TYPICAL,,,,,
```


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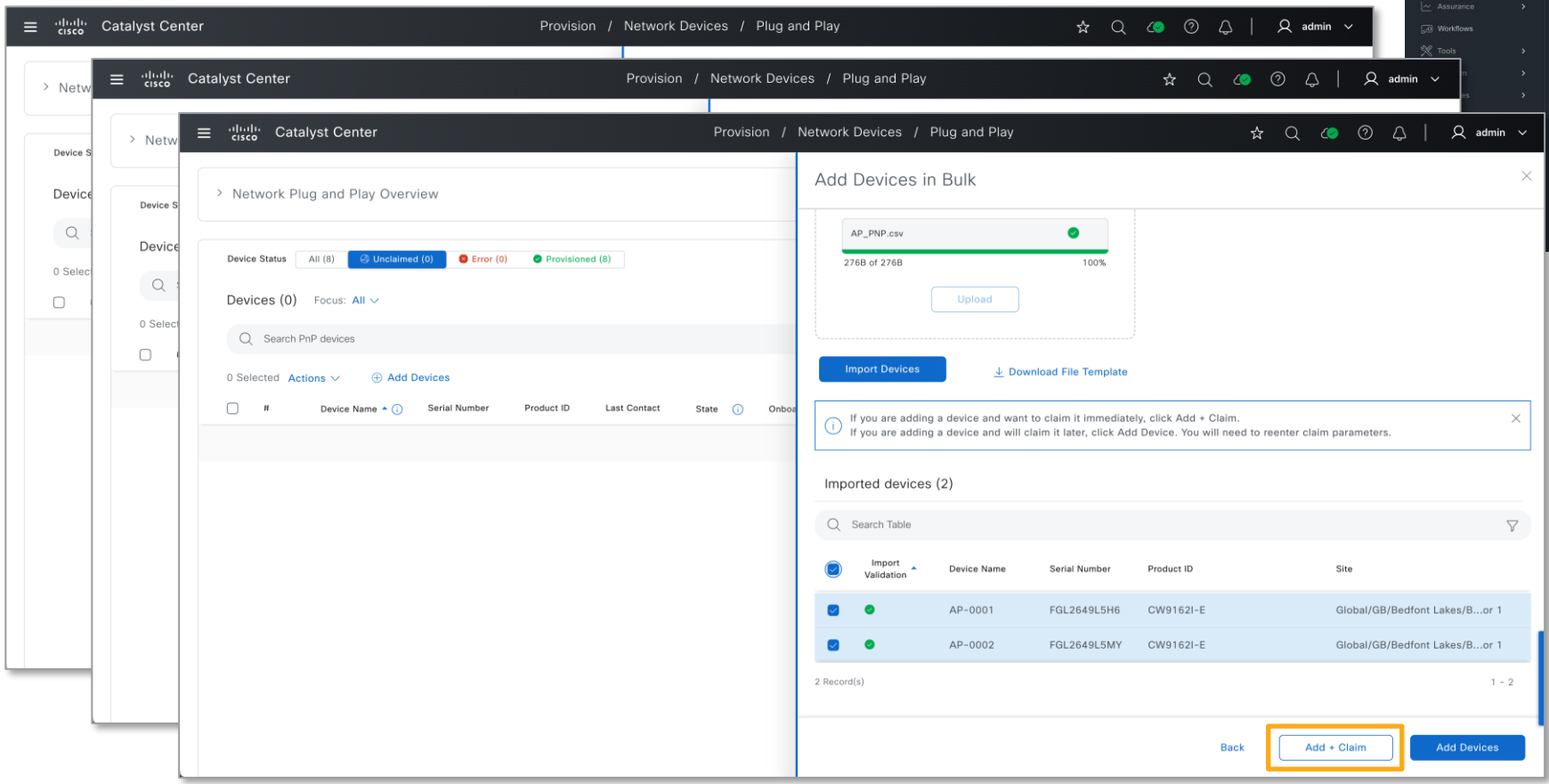

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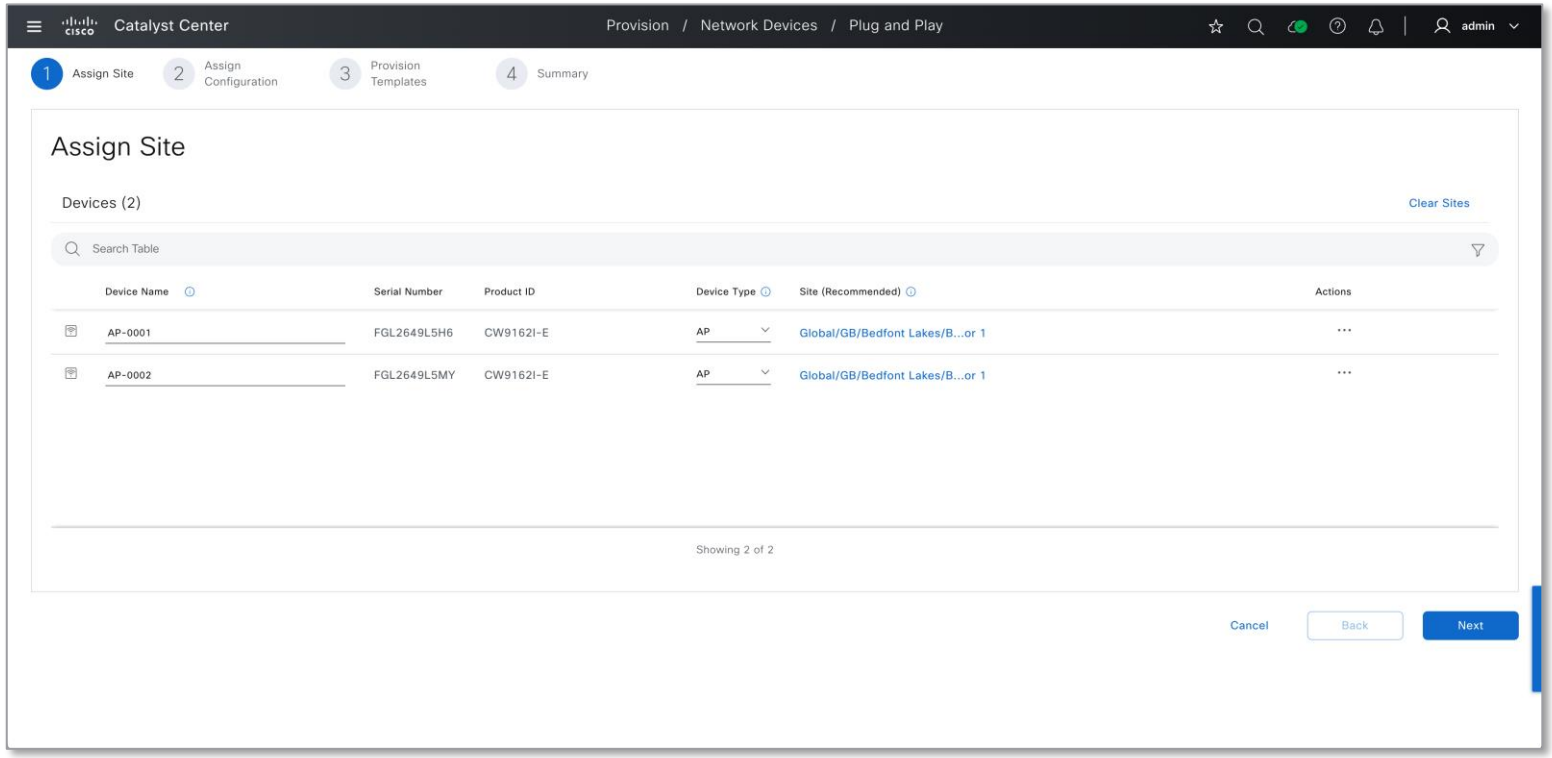

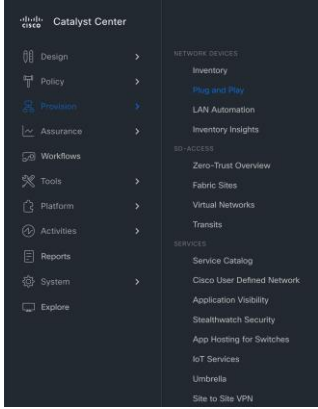

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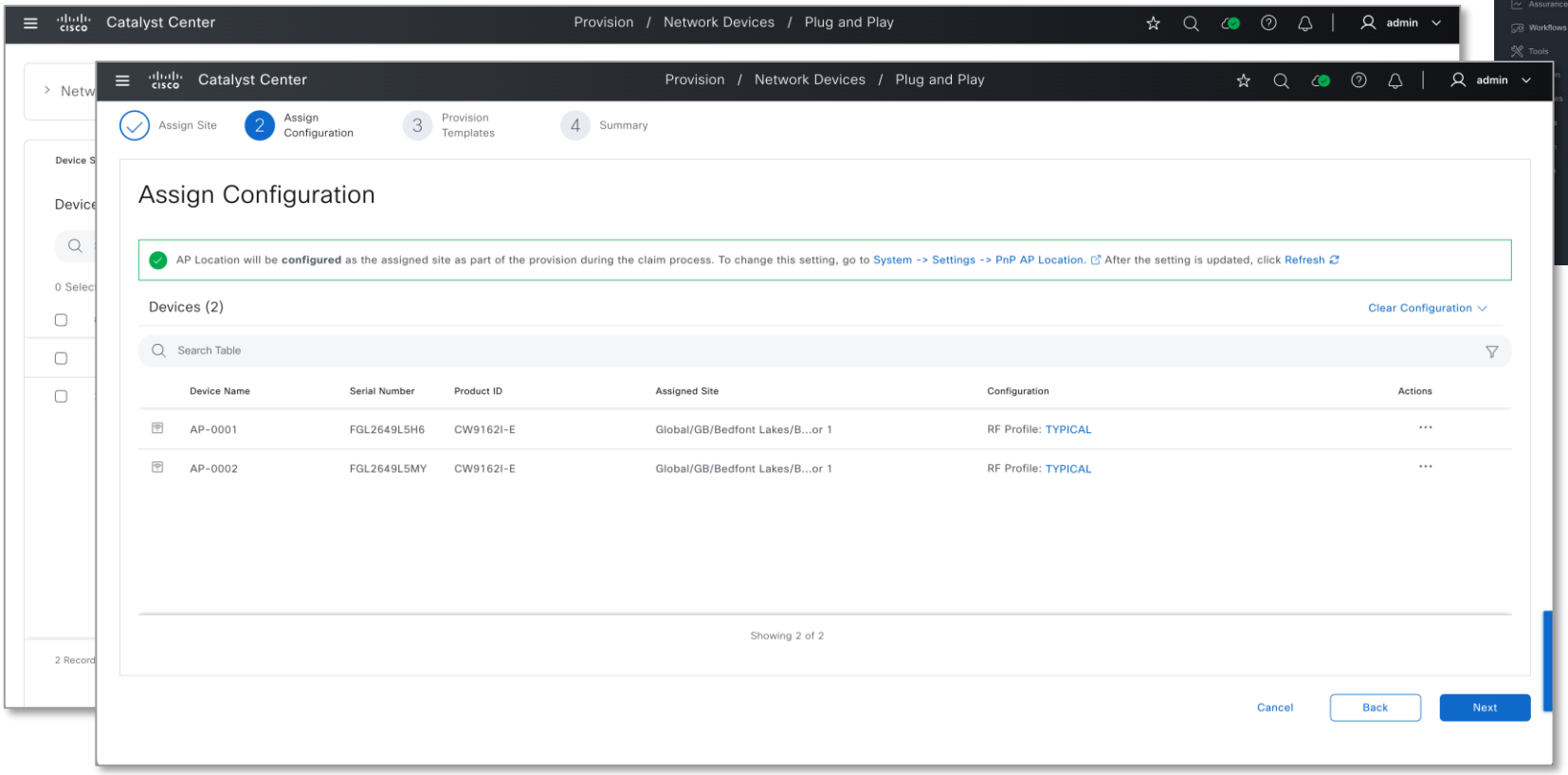

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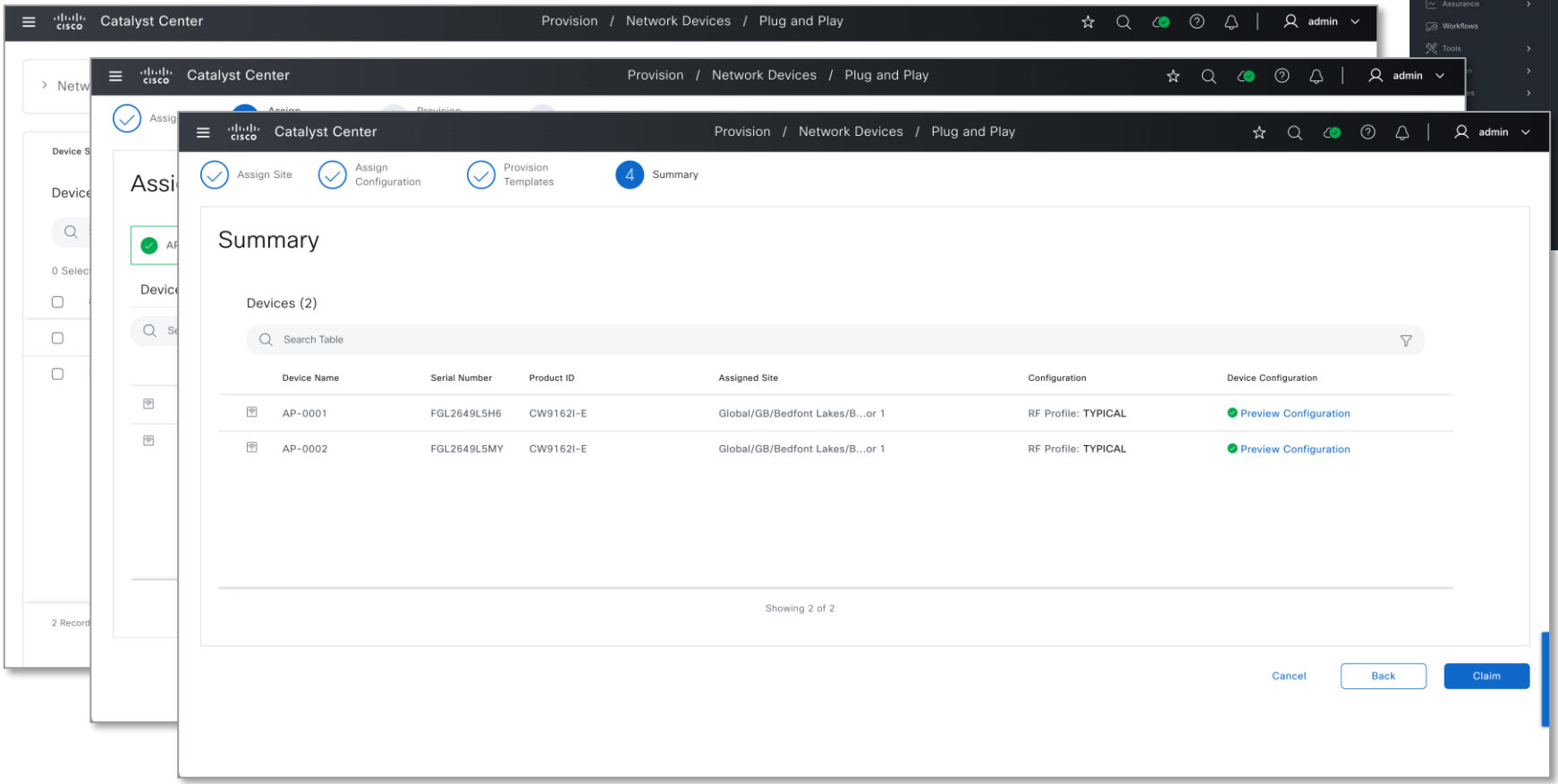

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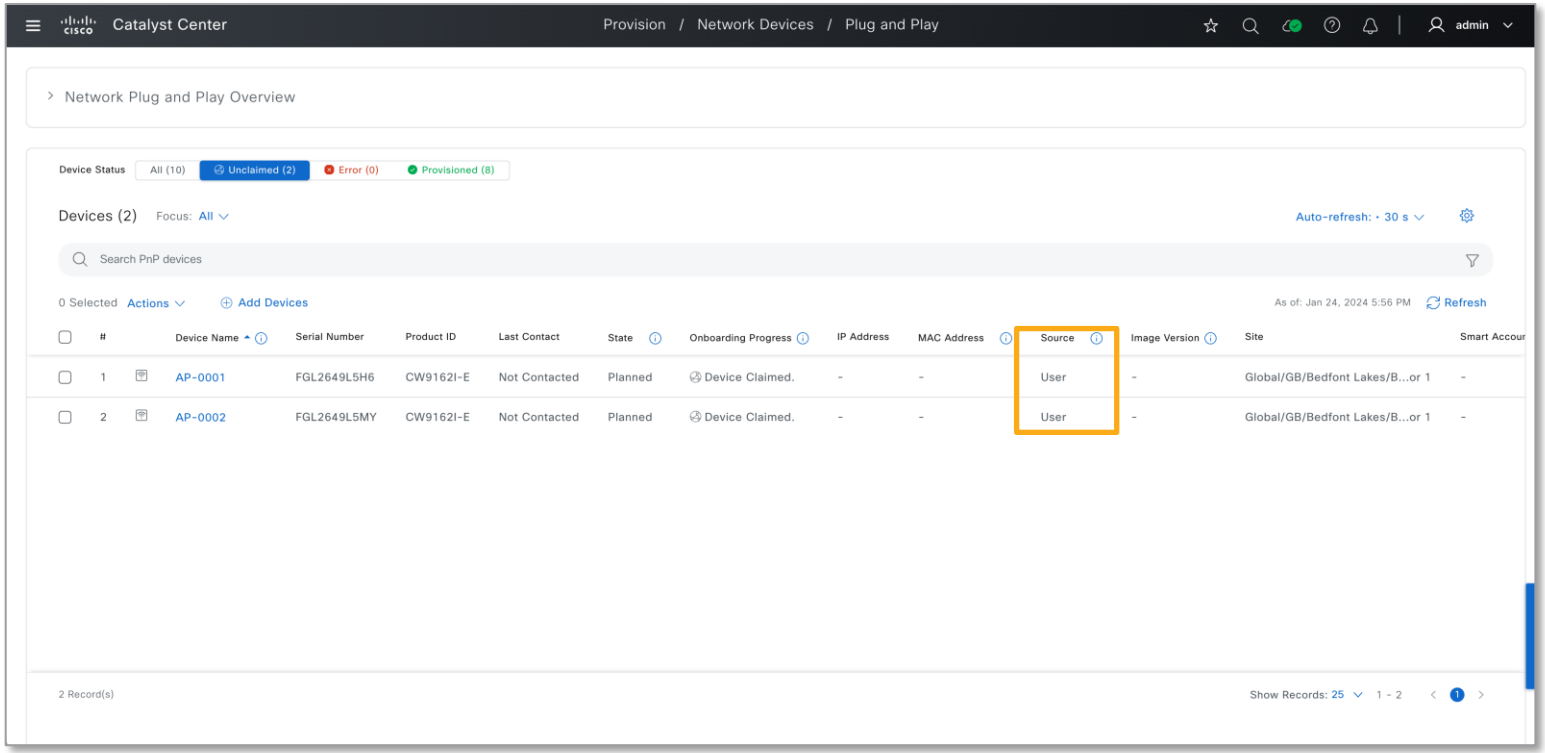

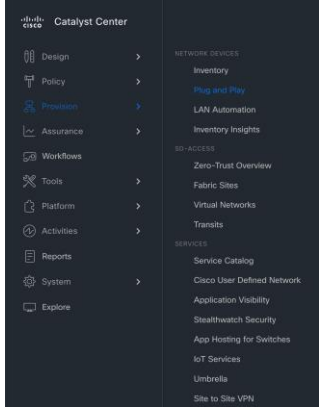

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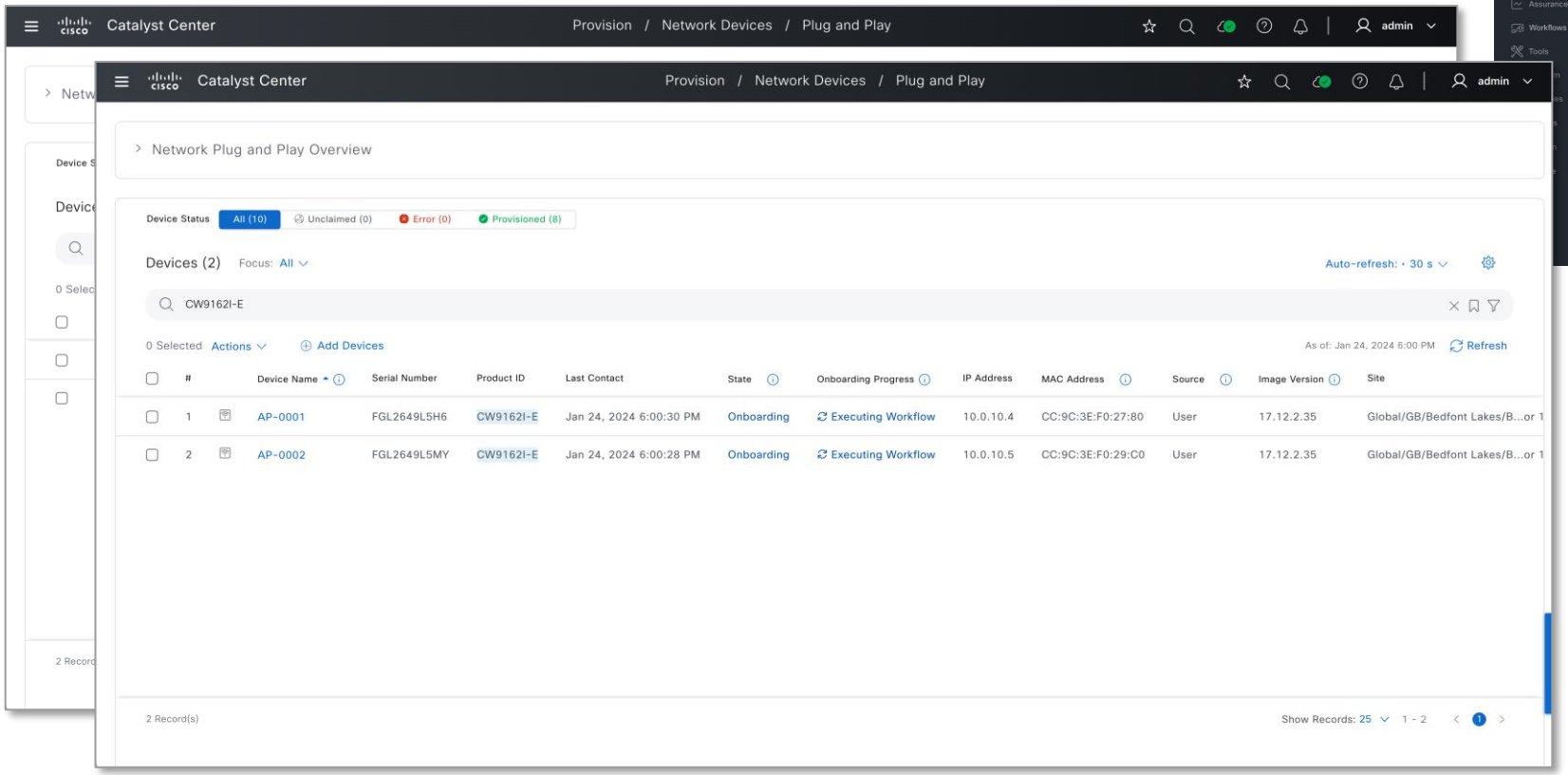

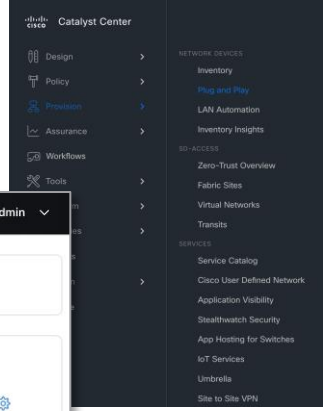

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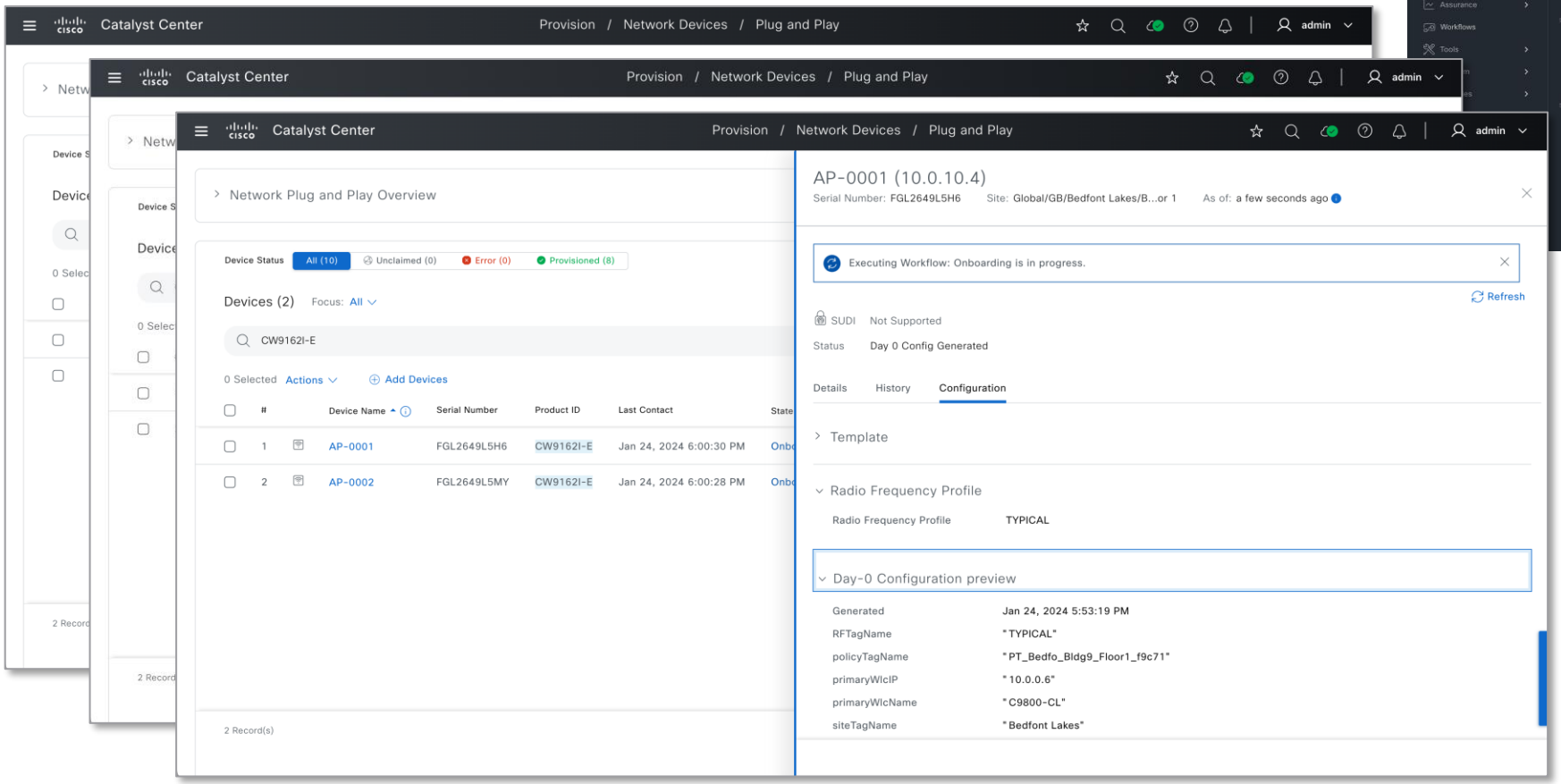

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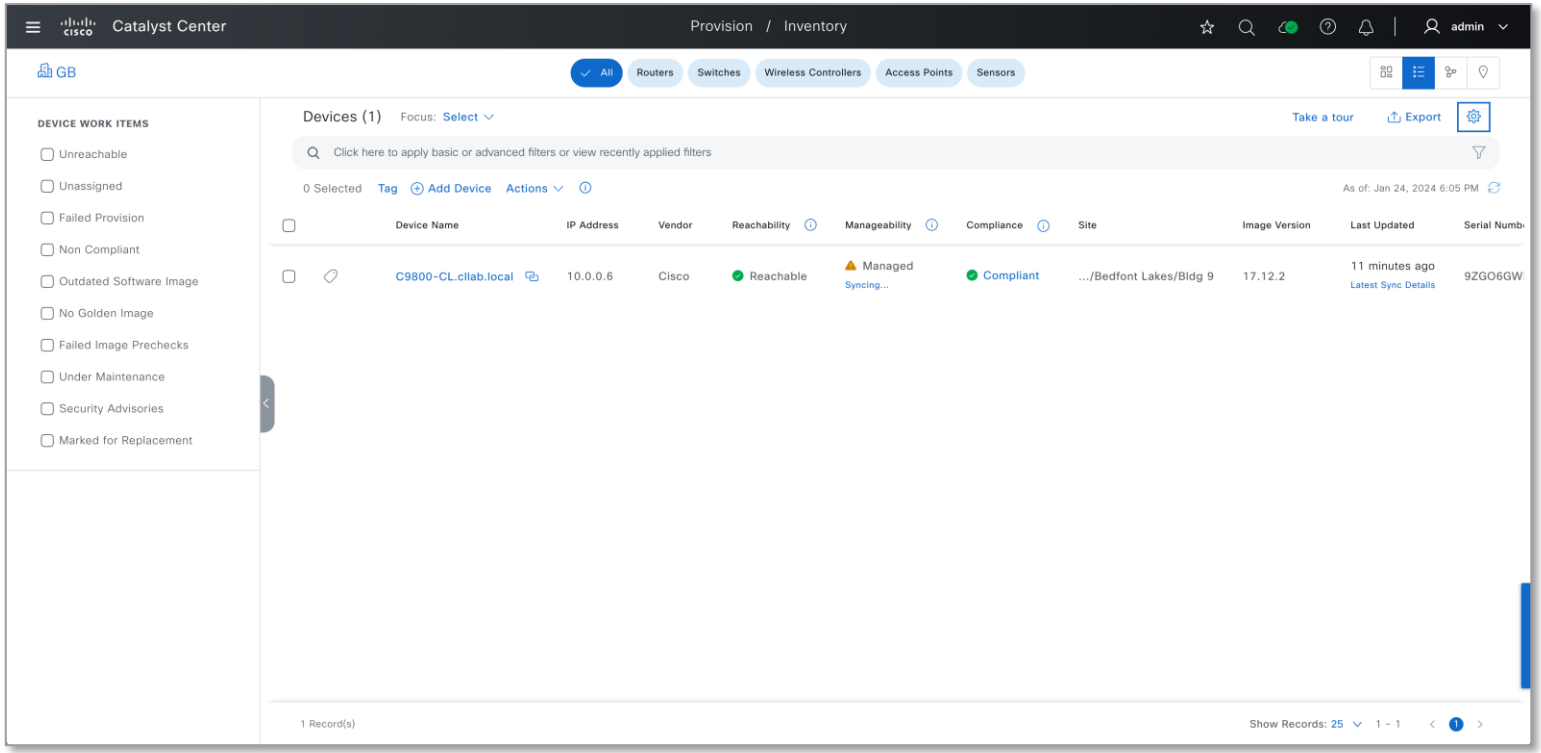

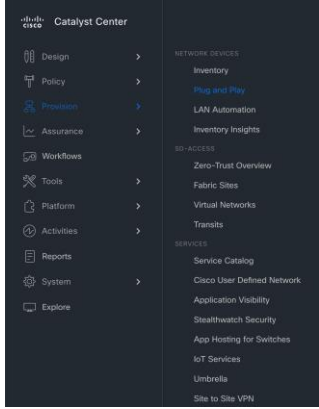

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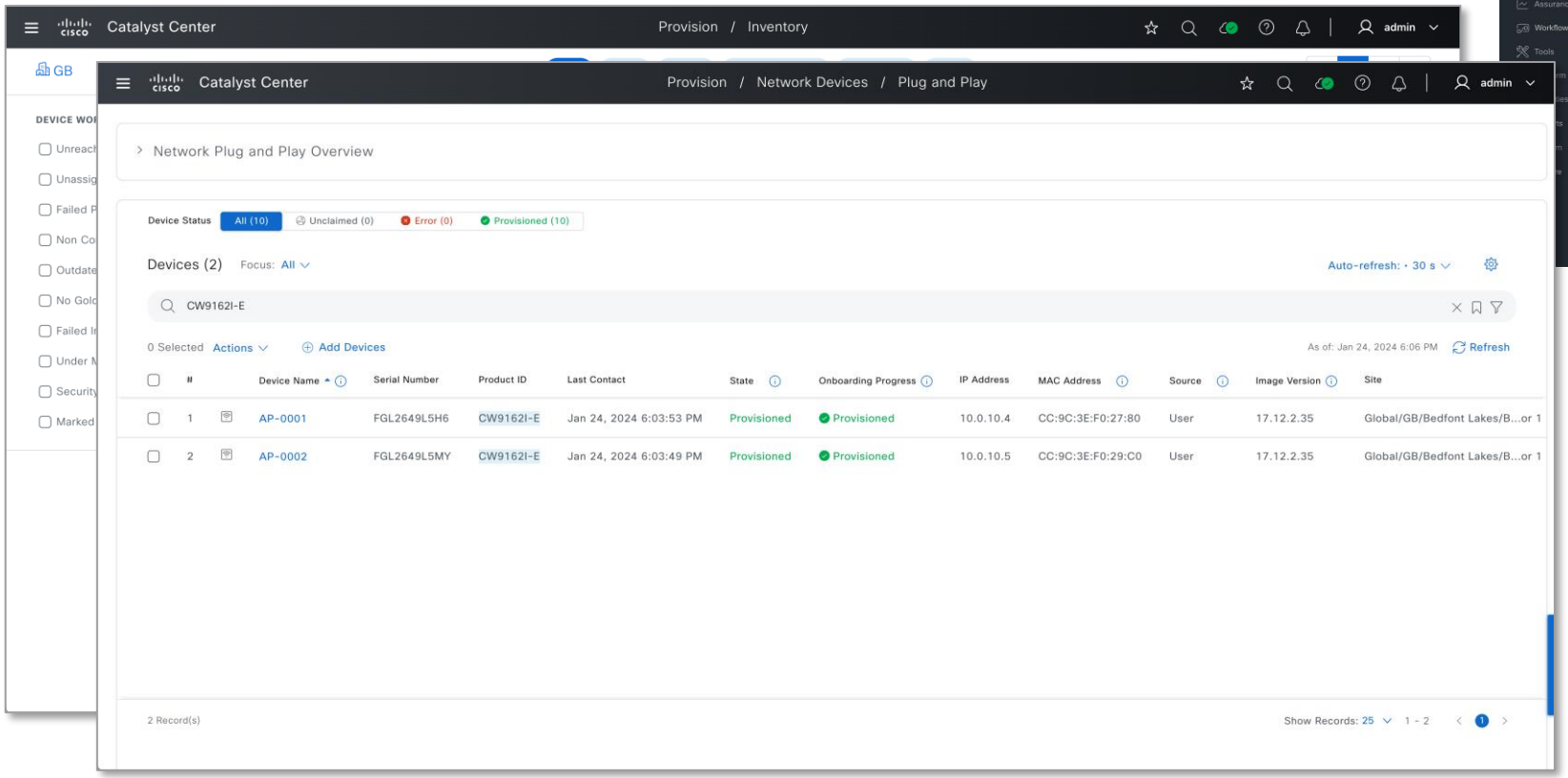

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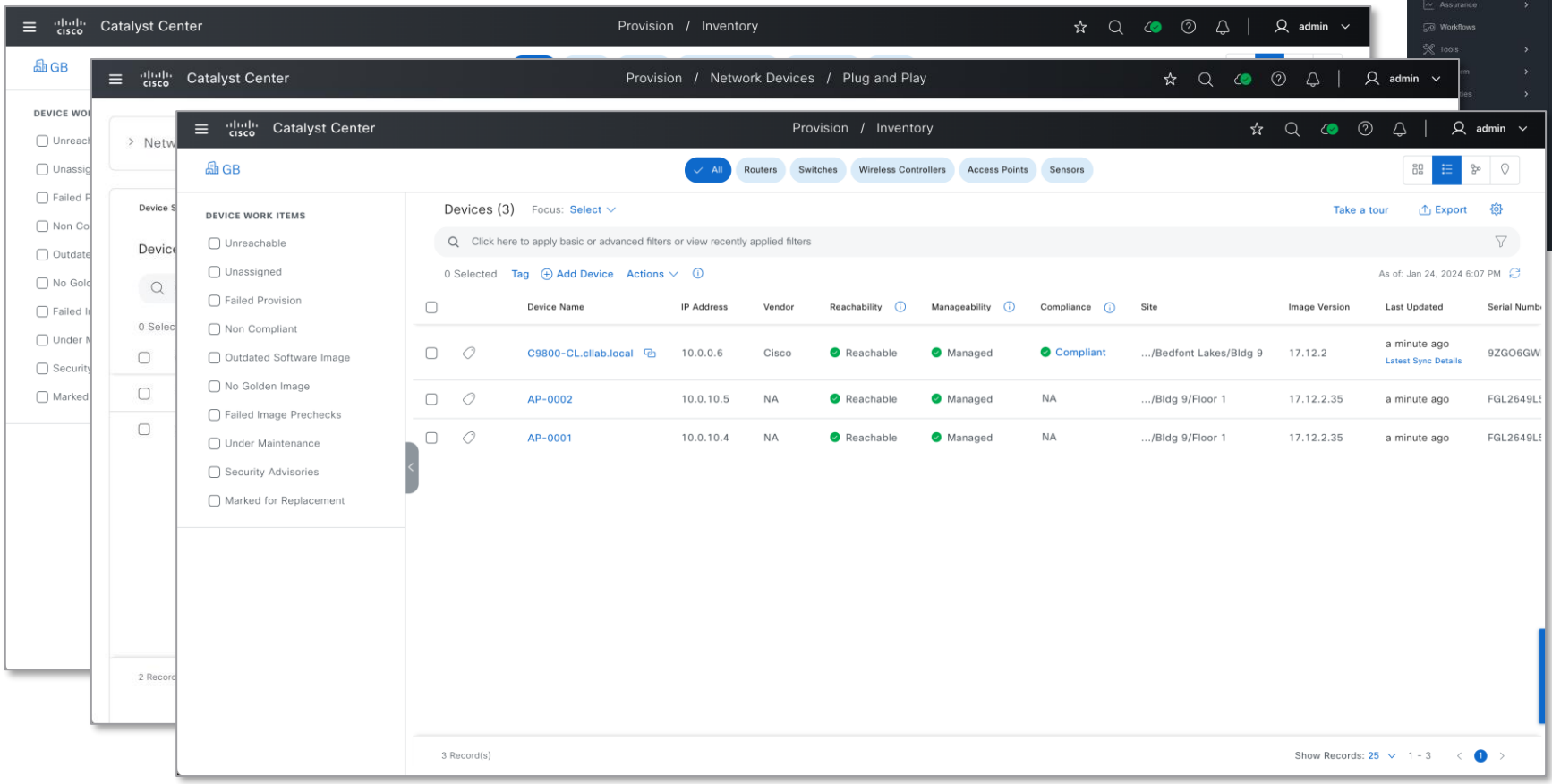

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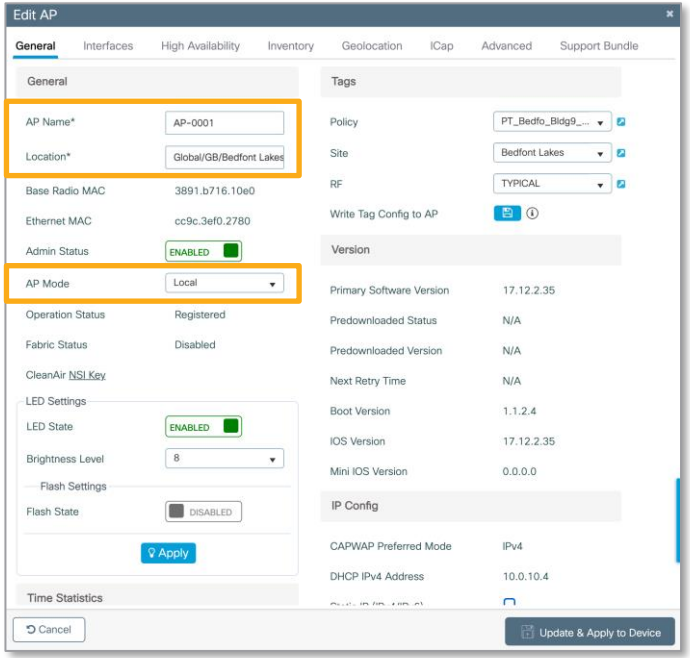
What gets configured on Access Points?

for reference

- AP Name and Location
- AP Mode (Fabric, Local, Flex)
- Country code based on geographic location



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What gets configured on Access Points?

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- AP Name and Location
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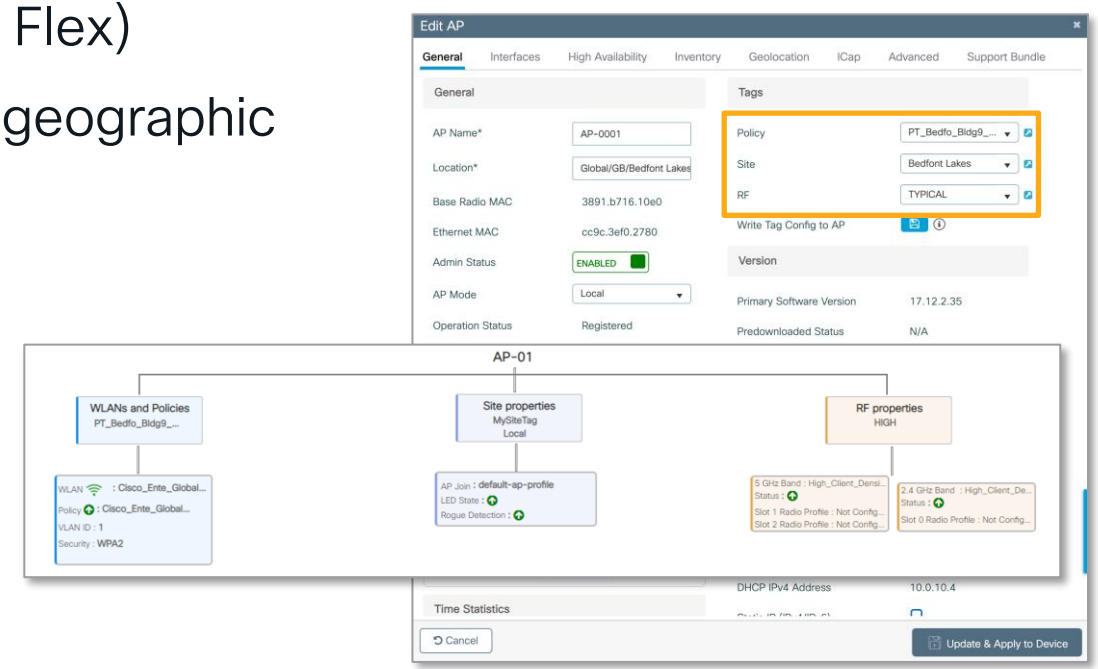
- Country code based on geographic location
- Tags
  - Policy Tag
  - Site Profiles and Tags
  - RF Profiles and Tags
- best practice settings



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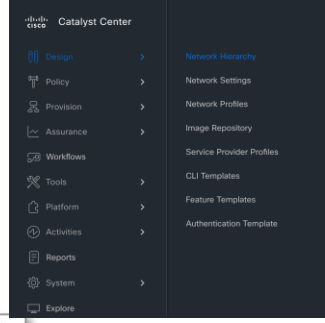
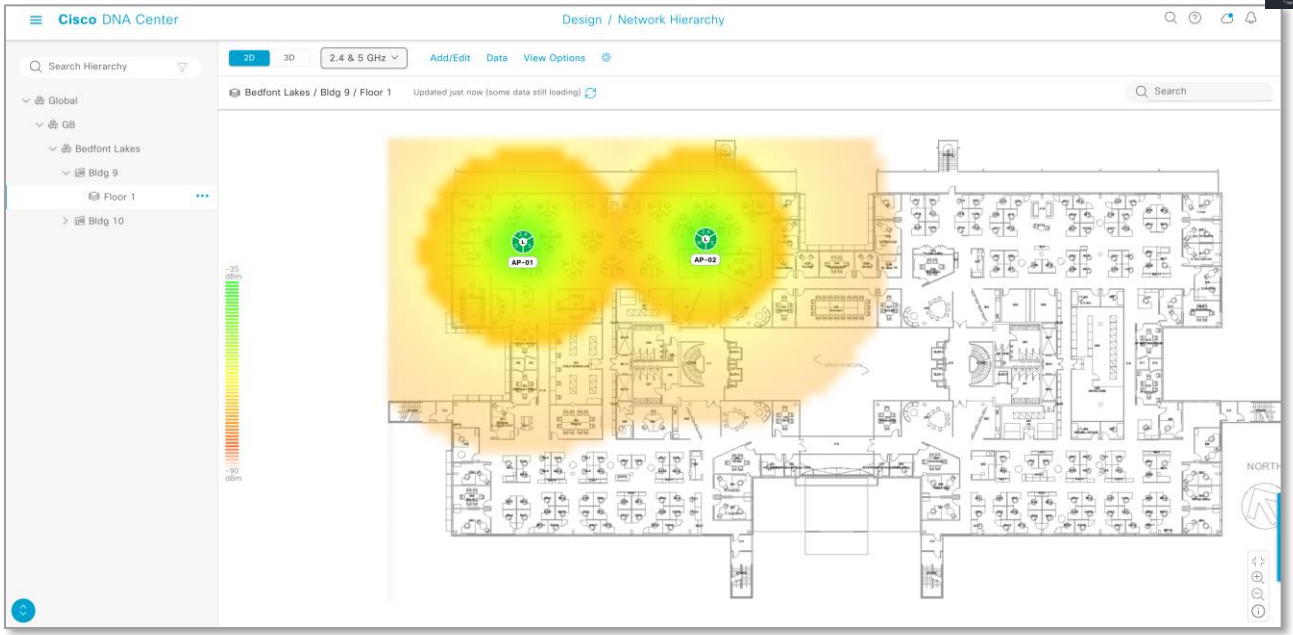
Wireless Maps

- Select Floor in Hierarchy
- Add/Edit → Access Points → Position





*View Options → Global Map Properties → Units → Feet/Meter

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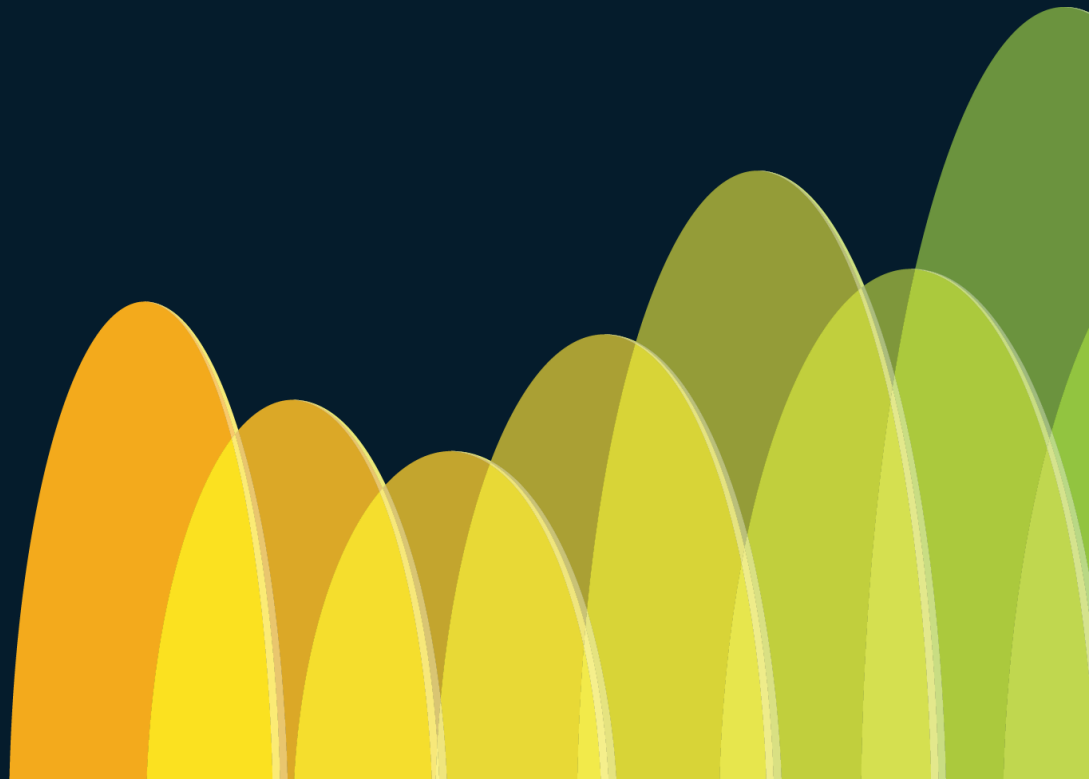
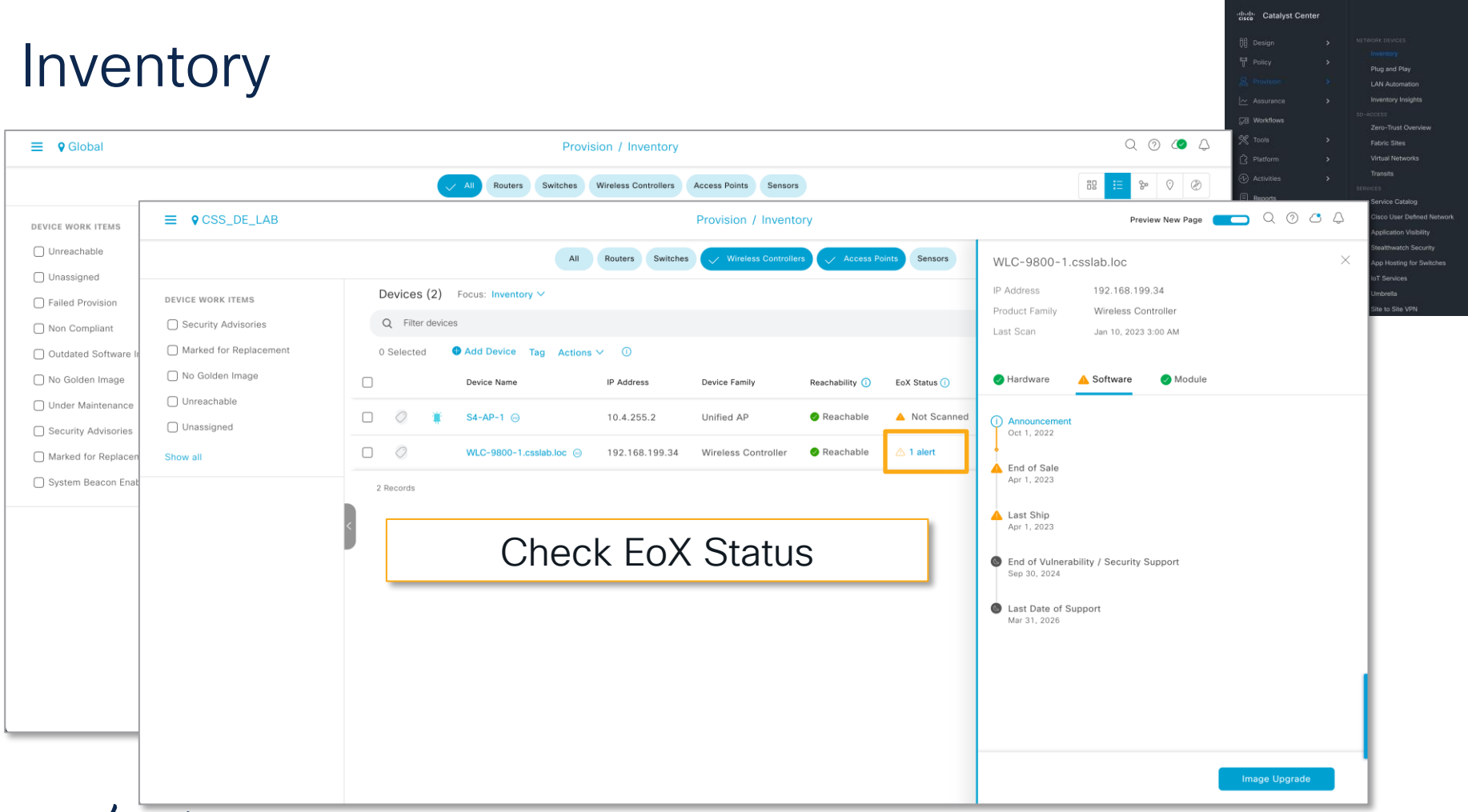
Software Image Management (SWIM)



cisco Live!

Inventory



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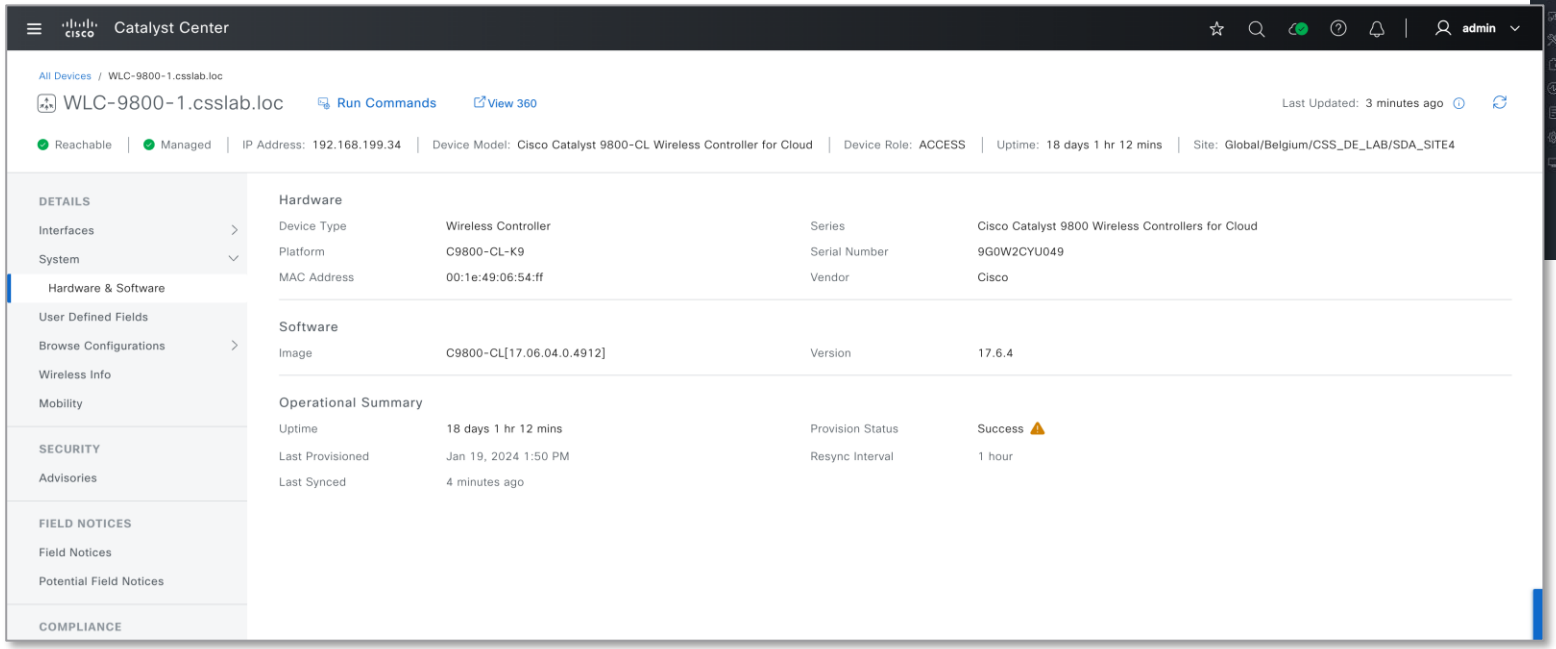
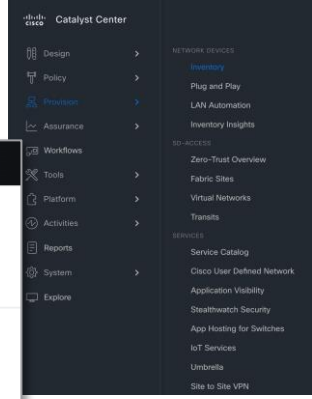
View Device Details





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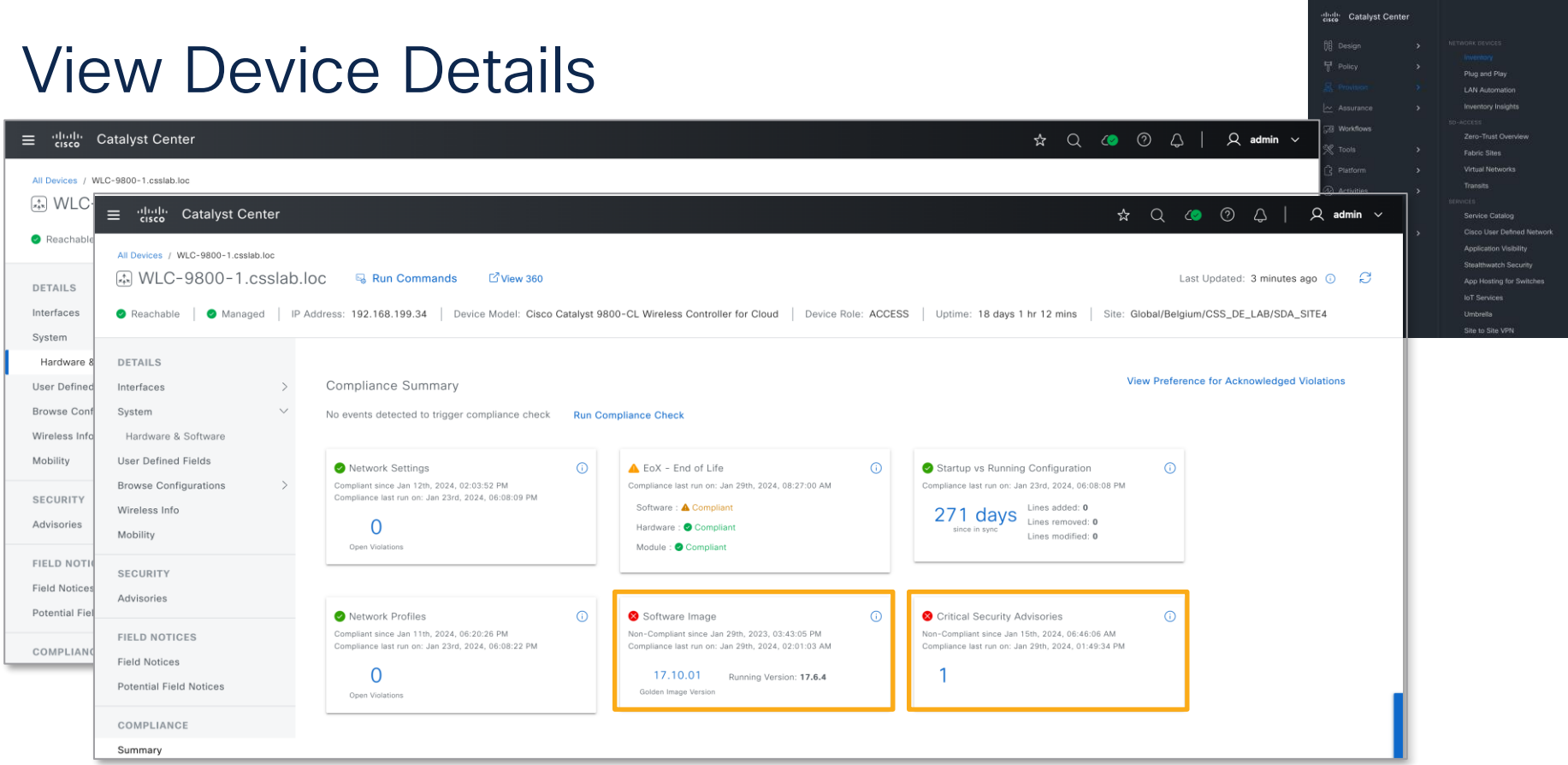

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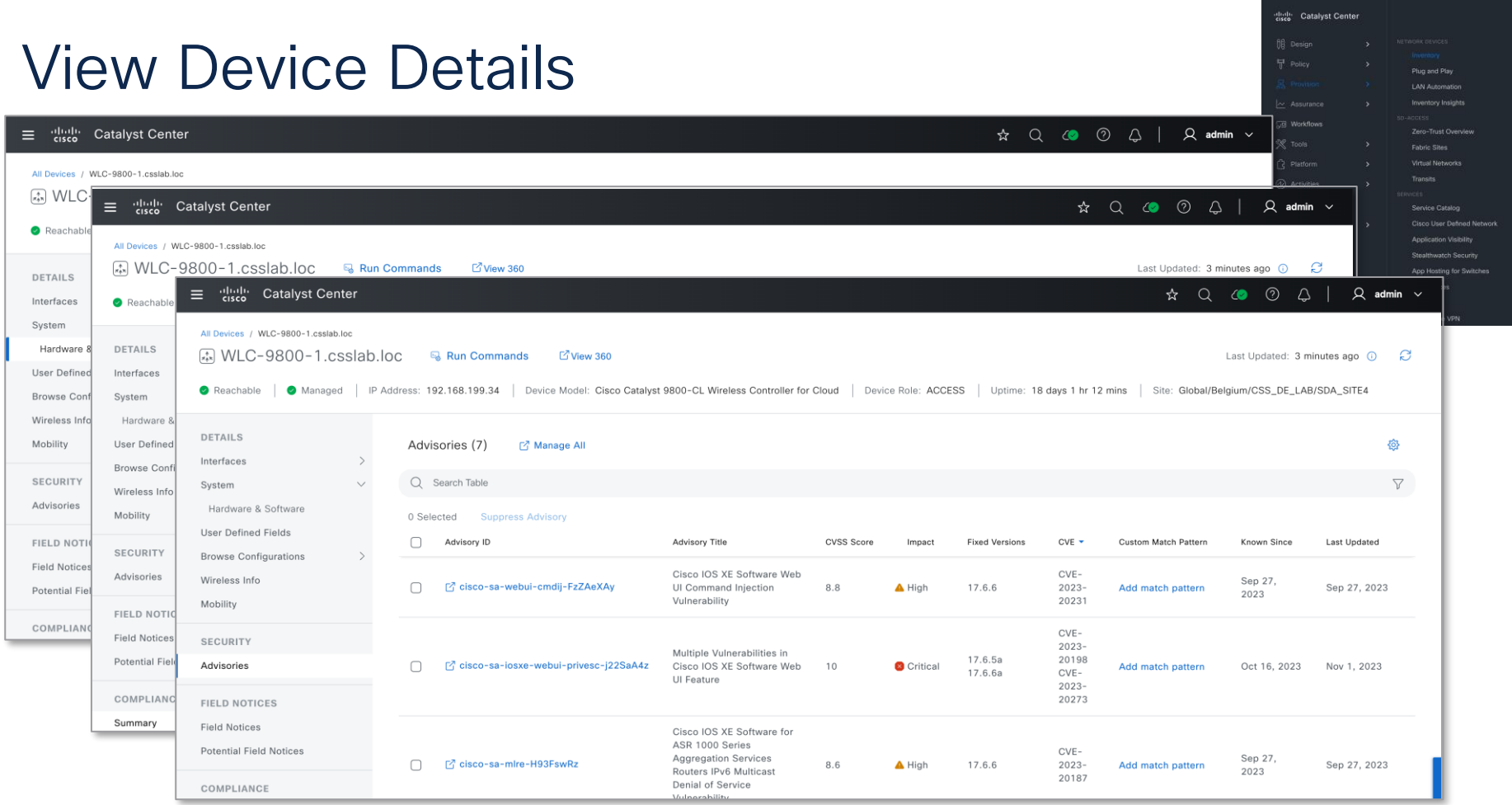

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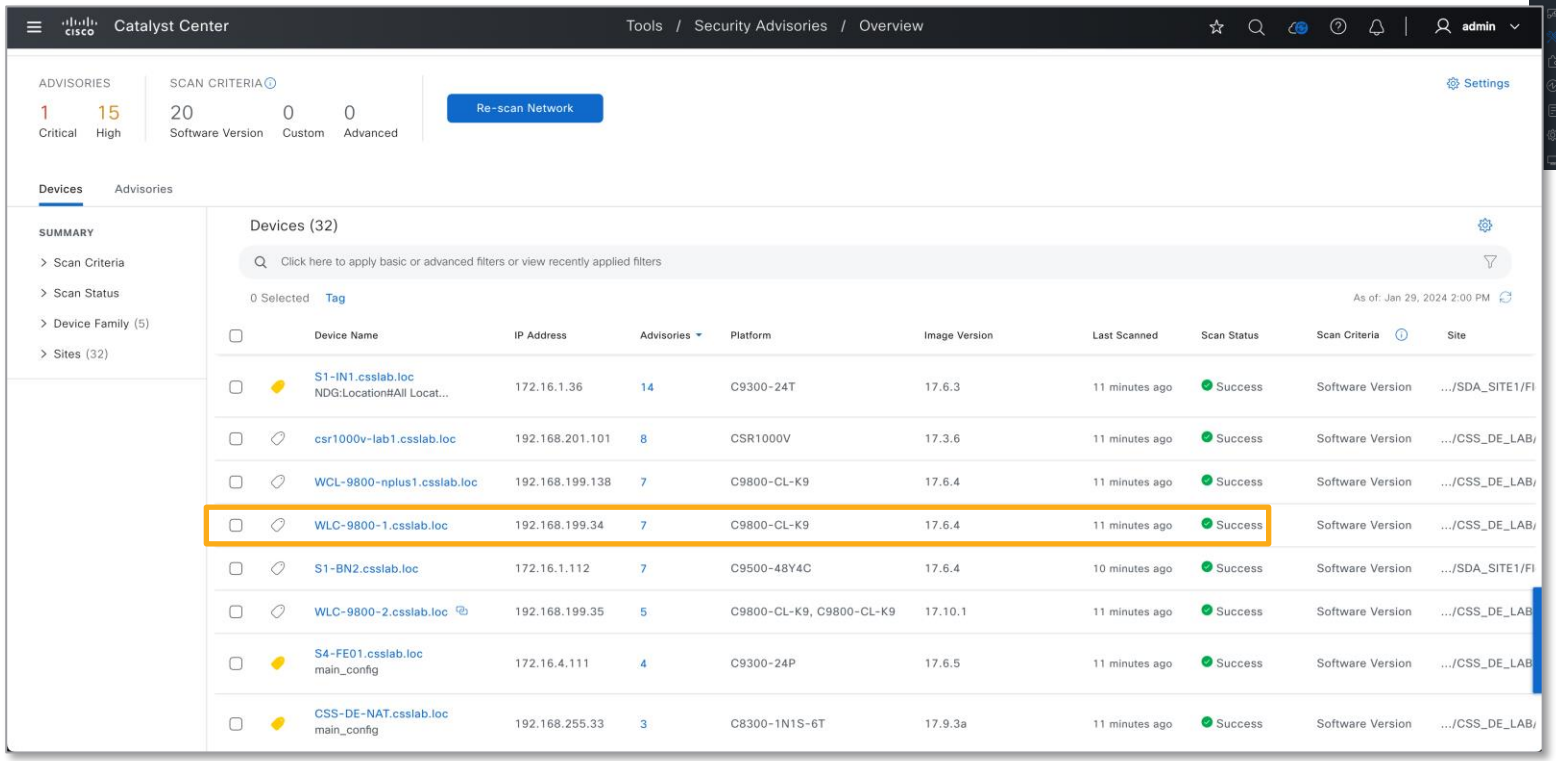
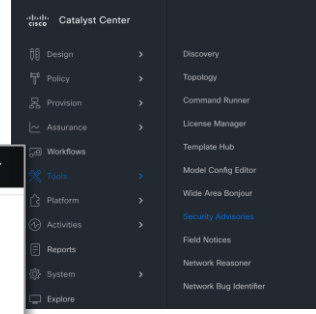
Security Advisories





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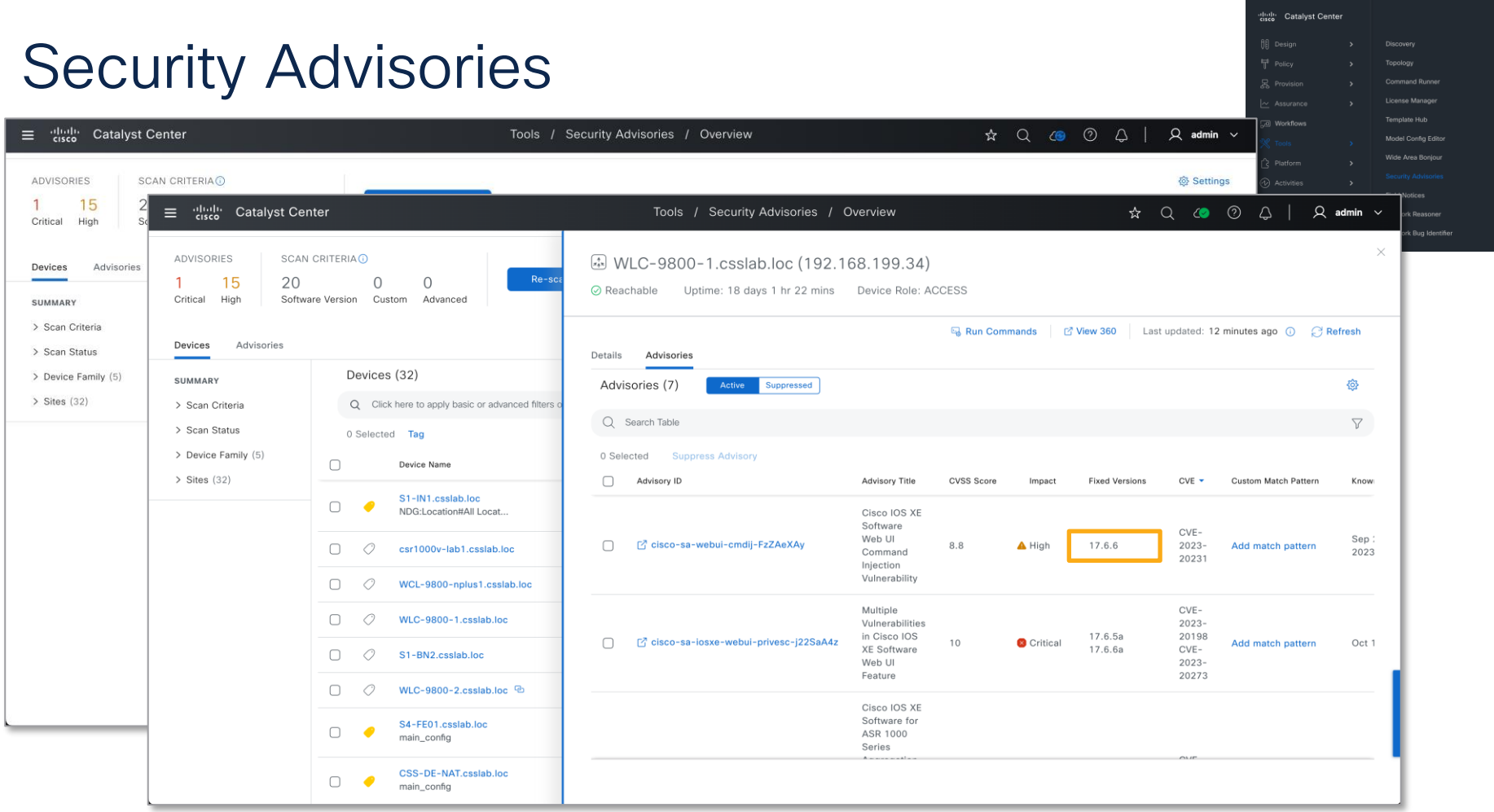

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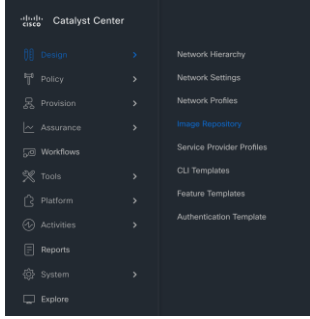
SWIM – Software Image Management

- Import Images from Cisco CCO Repository
  - CCO Credentials & Accept EULA
- Mark Version as Golden Image
- Golden Image will be offered during PnP



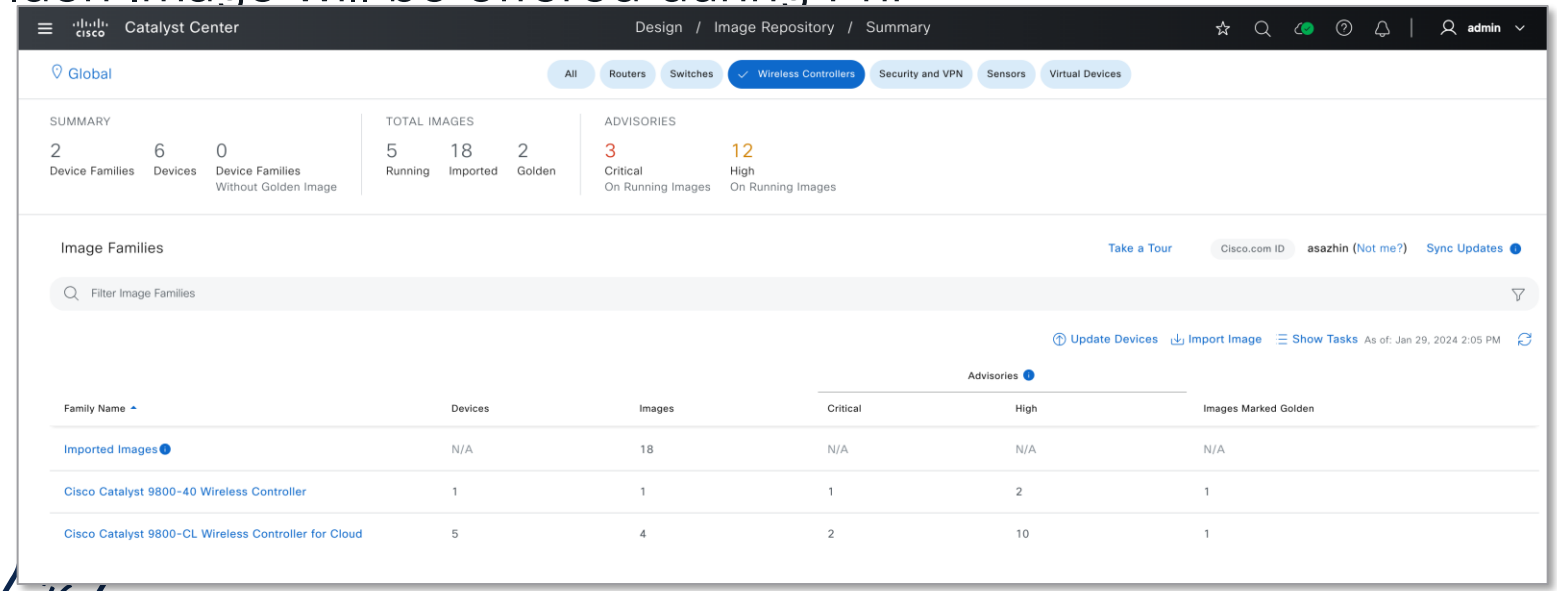


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Image Repository

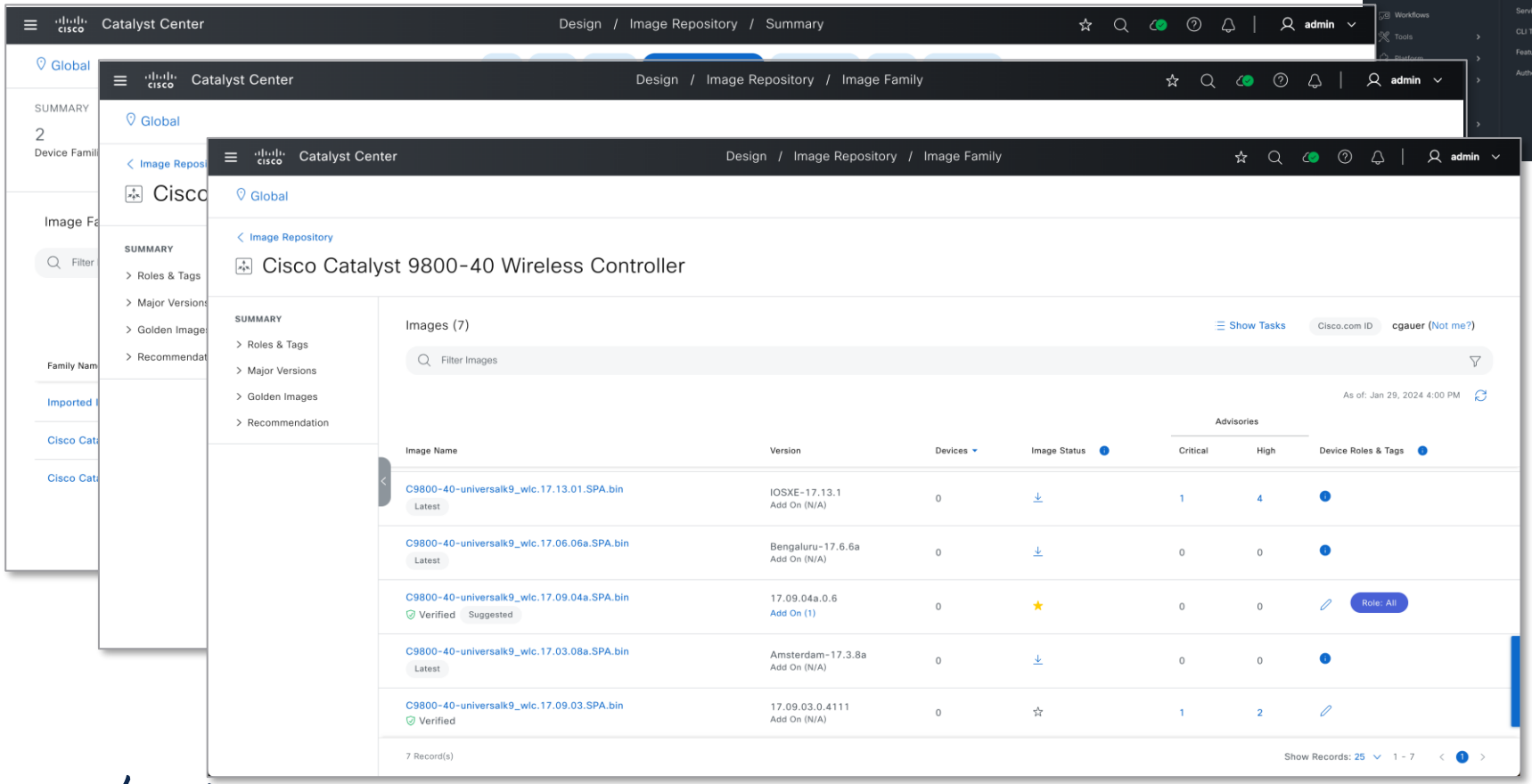

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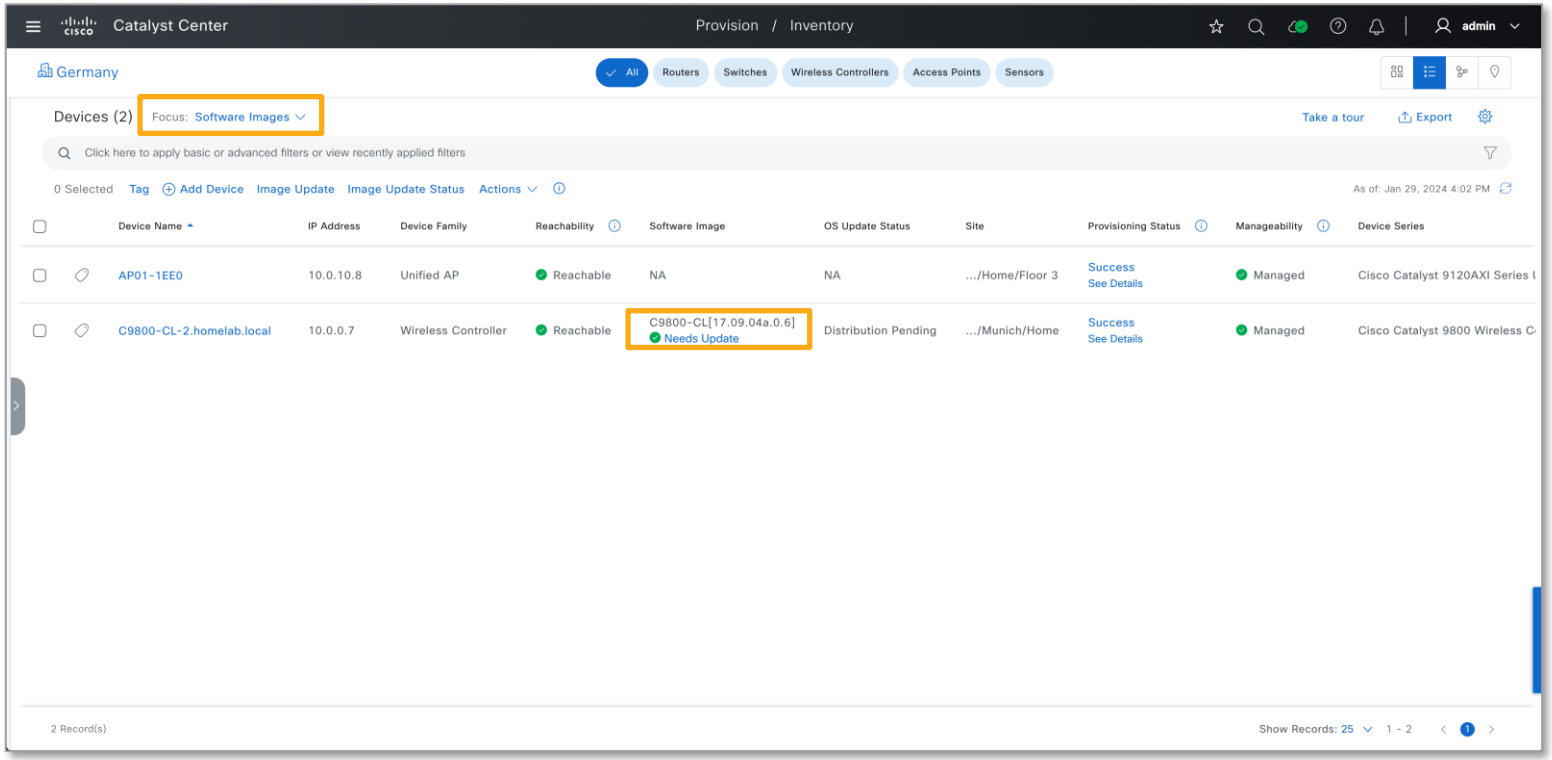
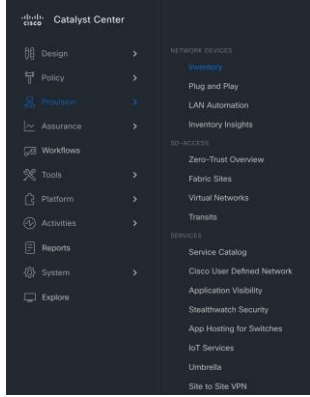
Image Upgrade Steps





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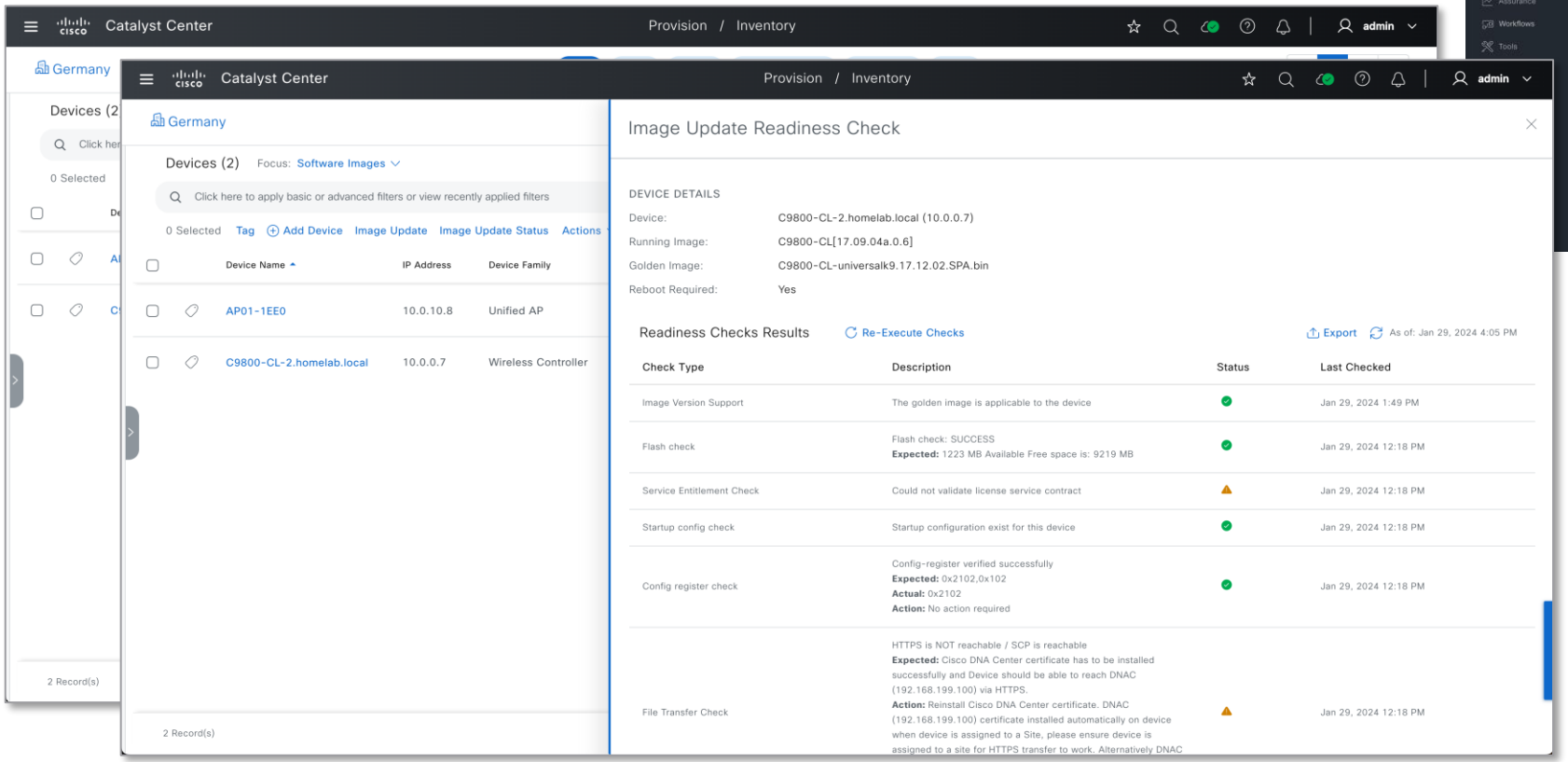

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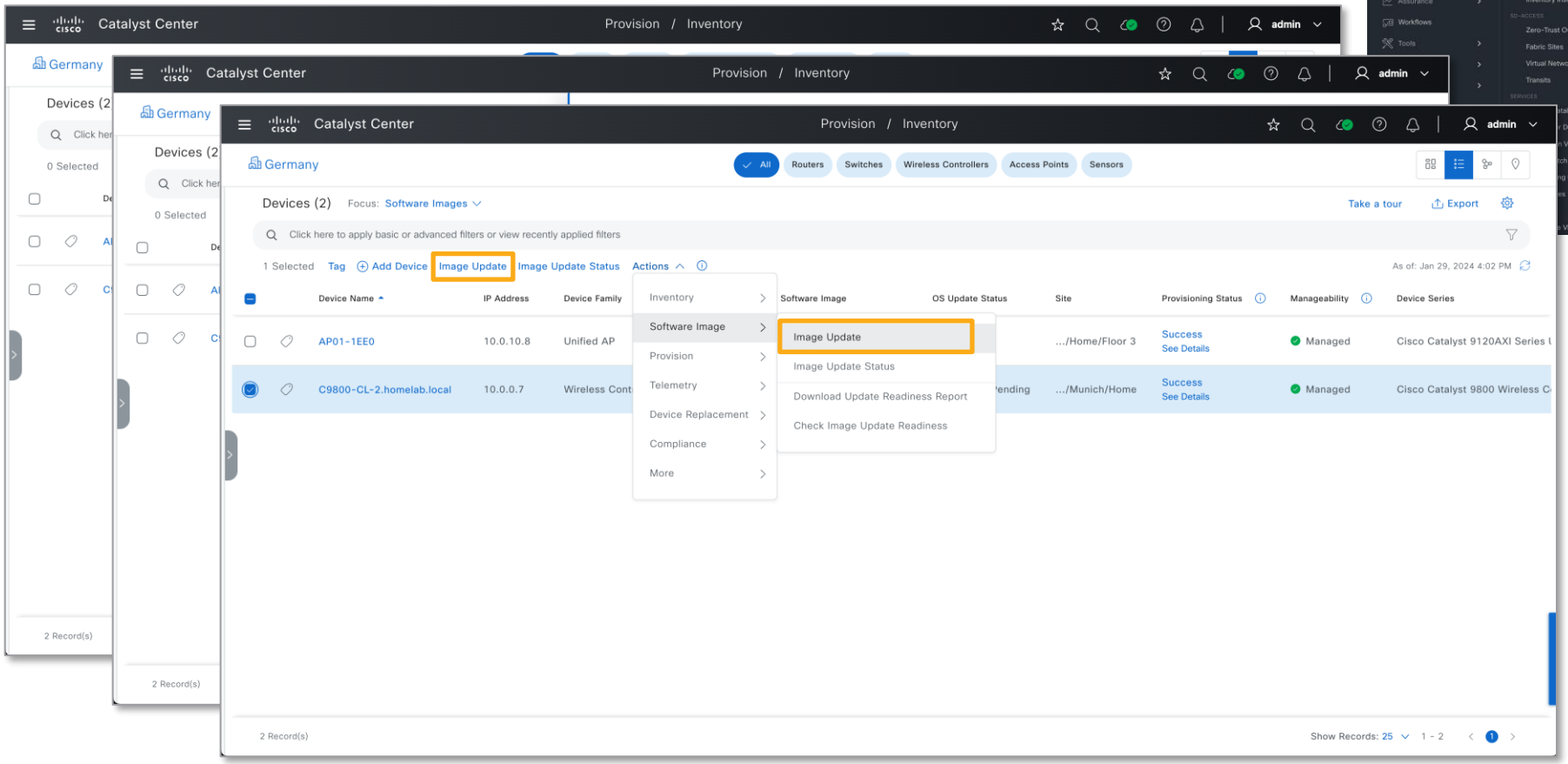

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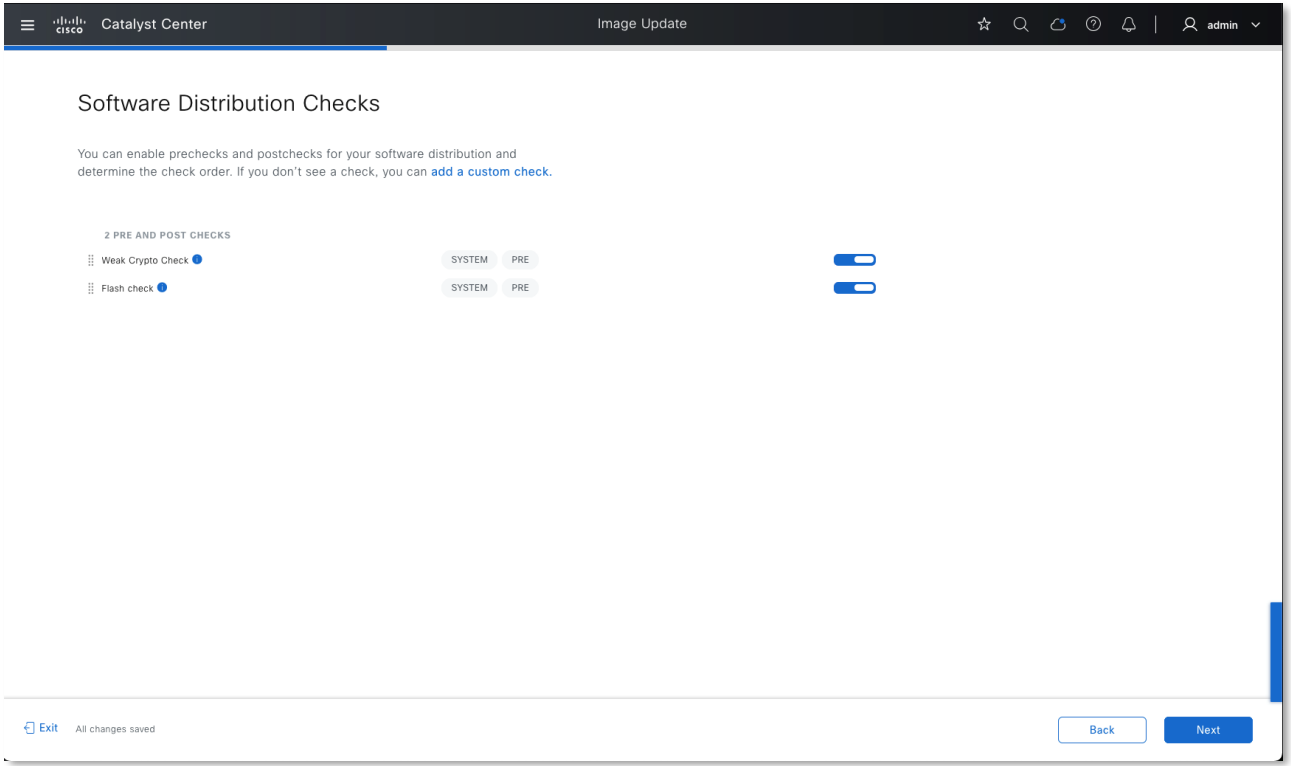

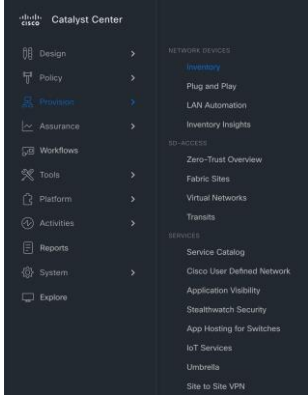

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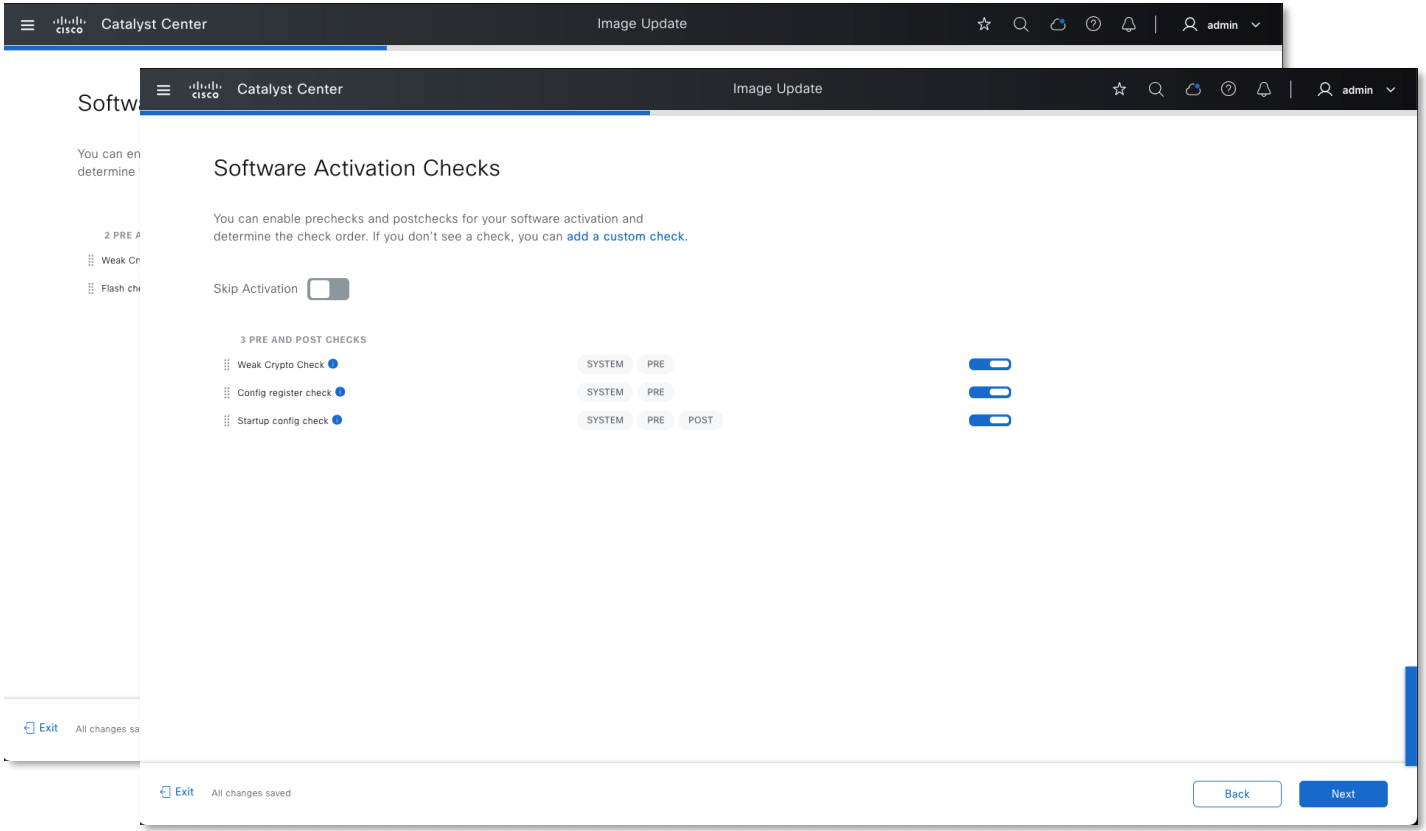

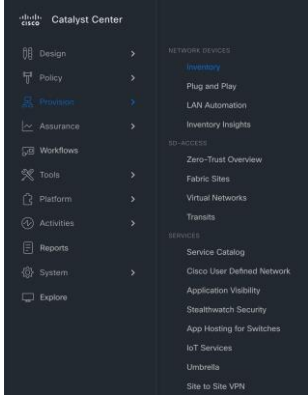

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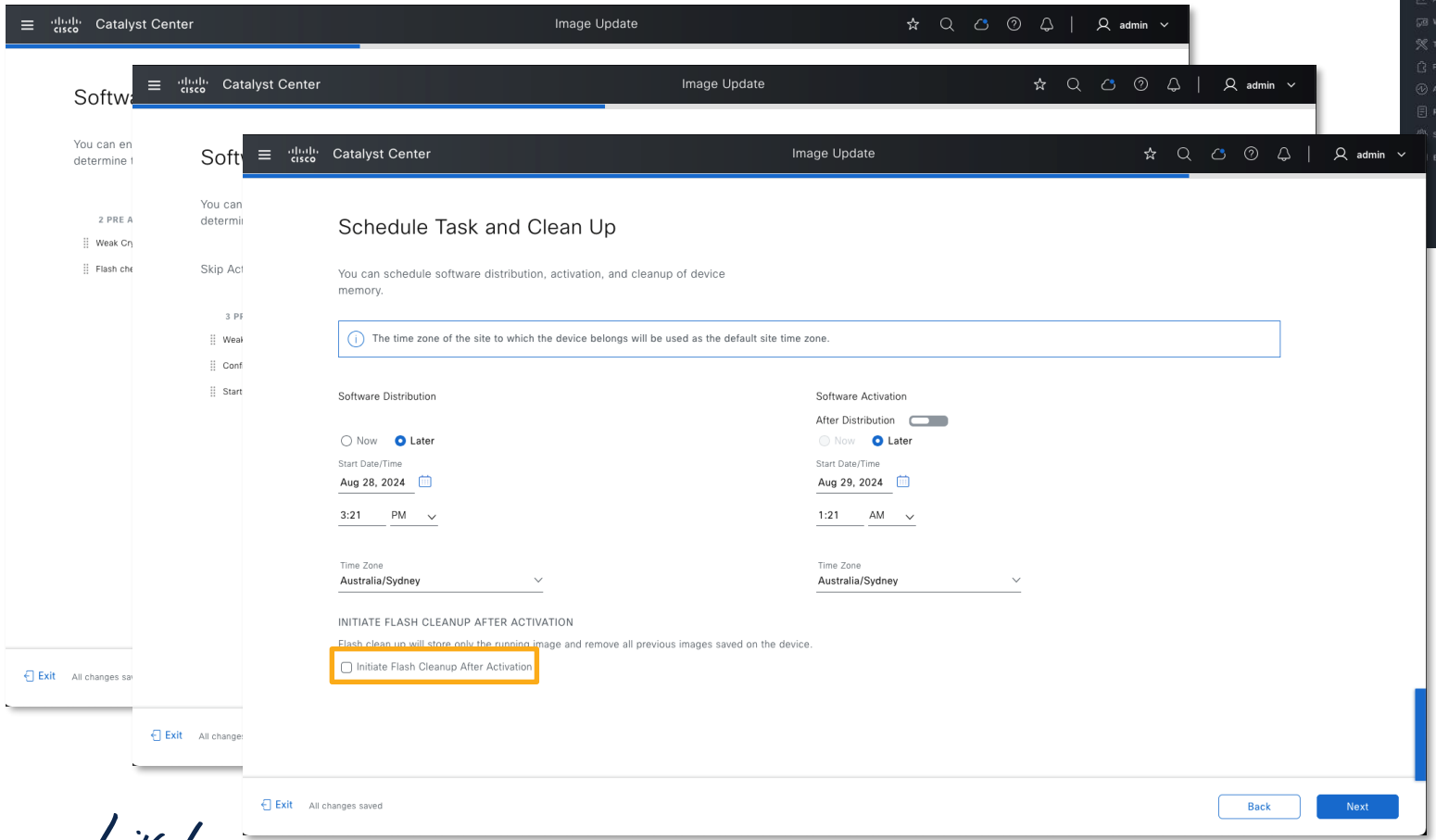

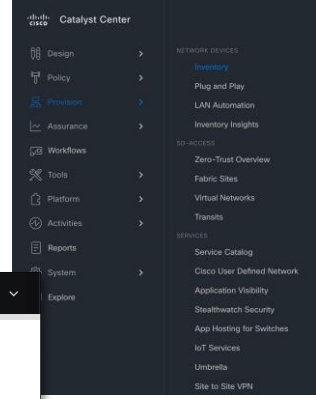

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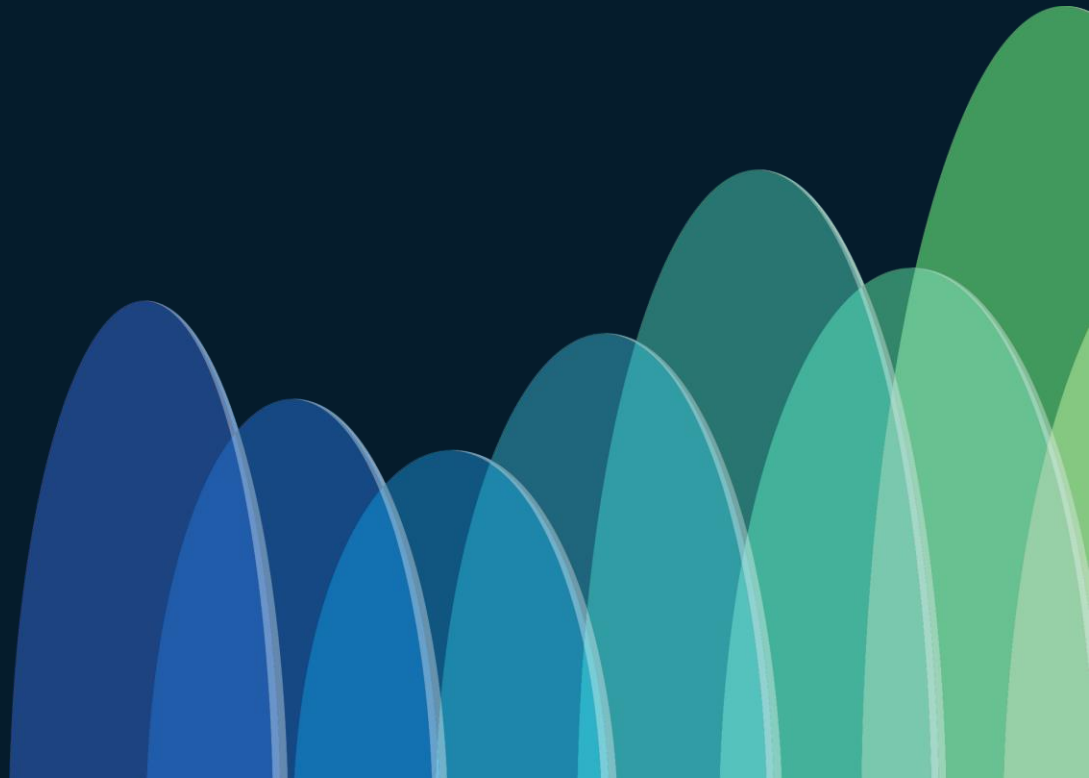
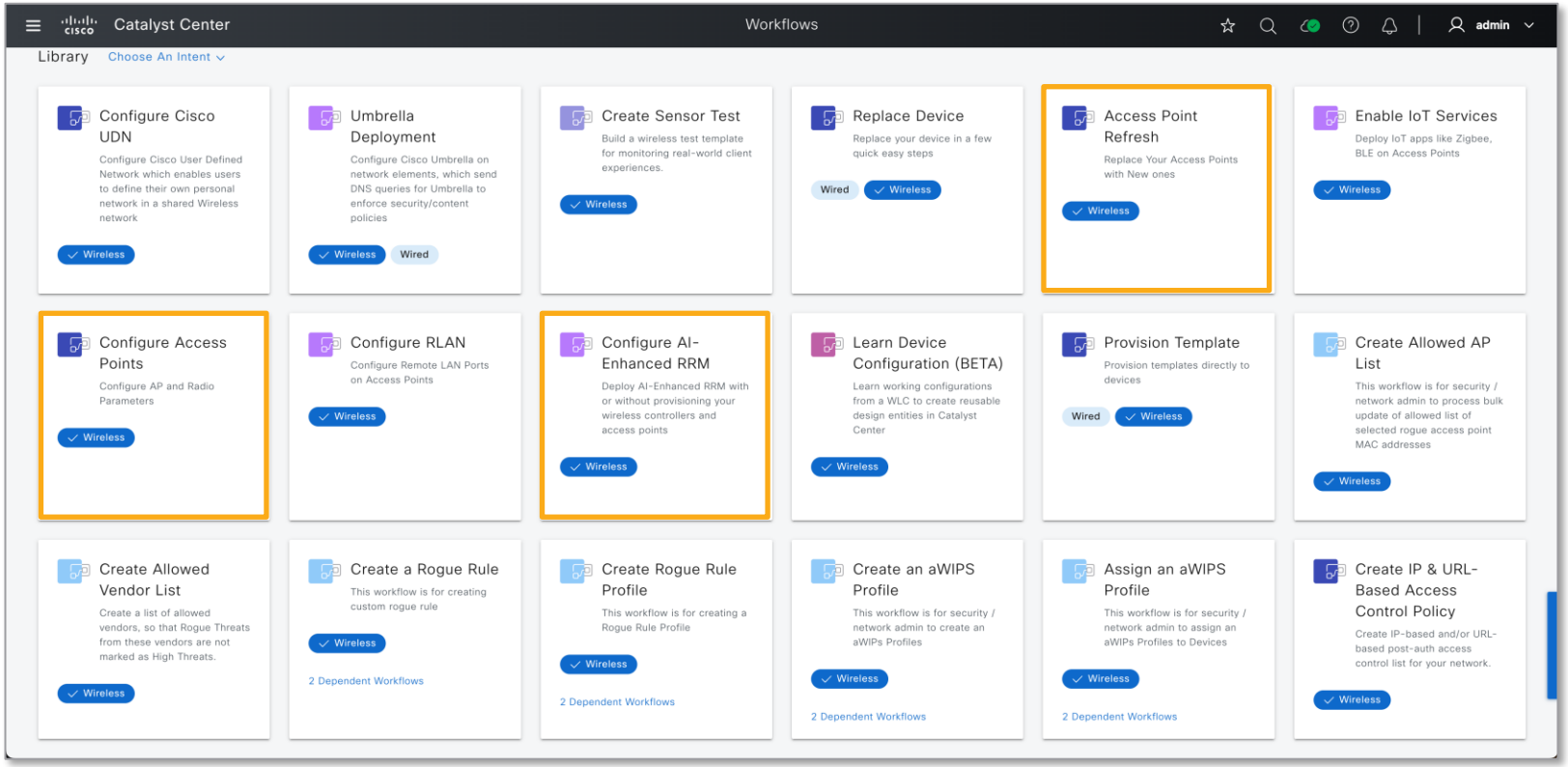
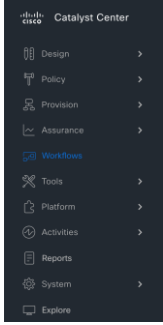
Day-N Operations



Workflows





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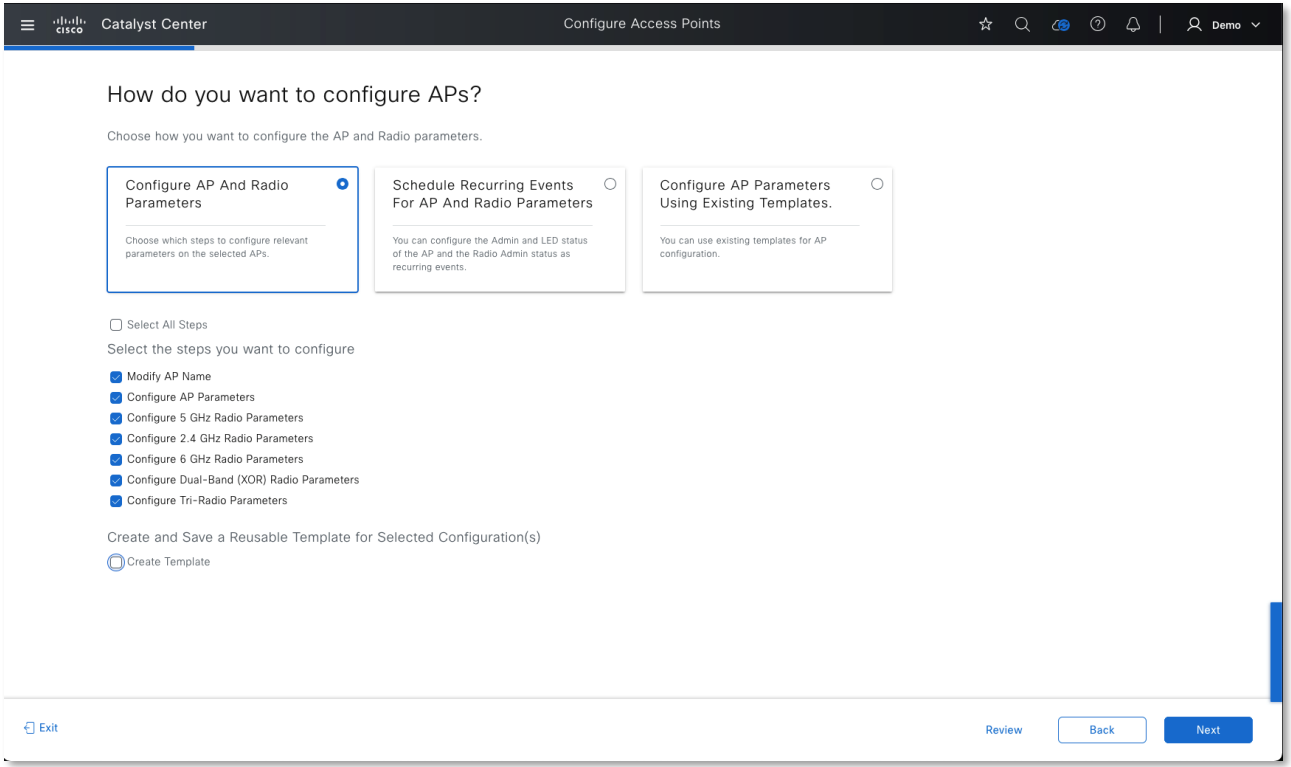
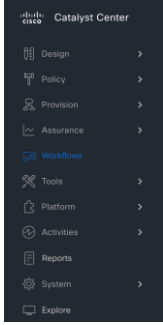
Configure Access Points





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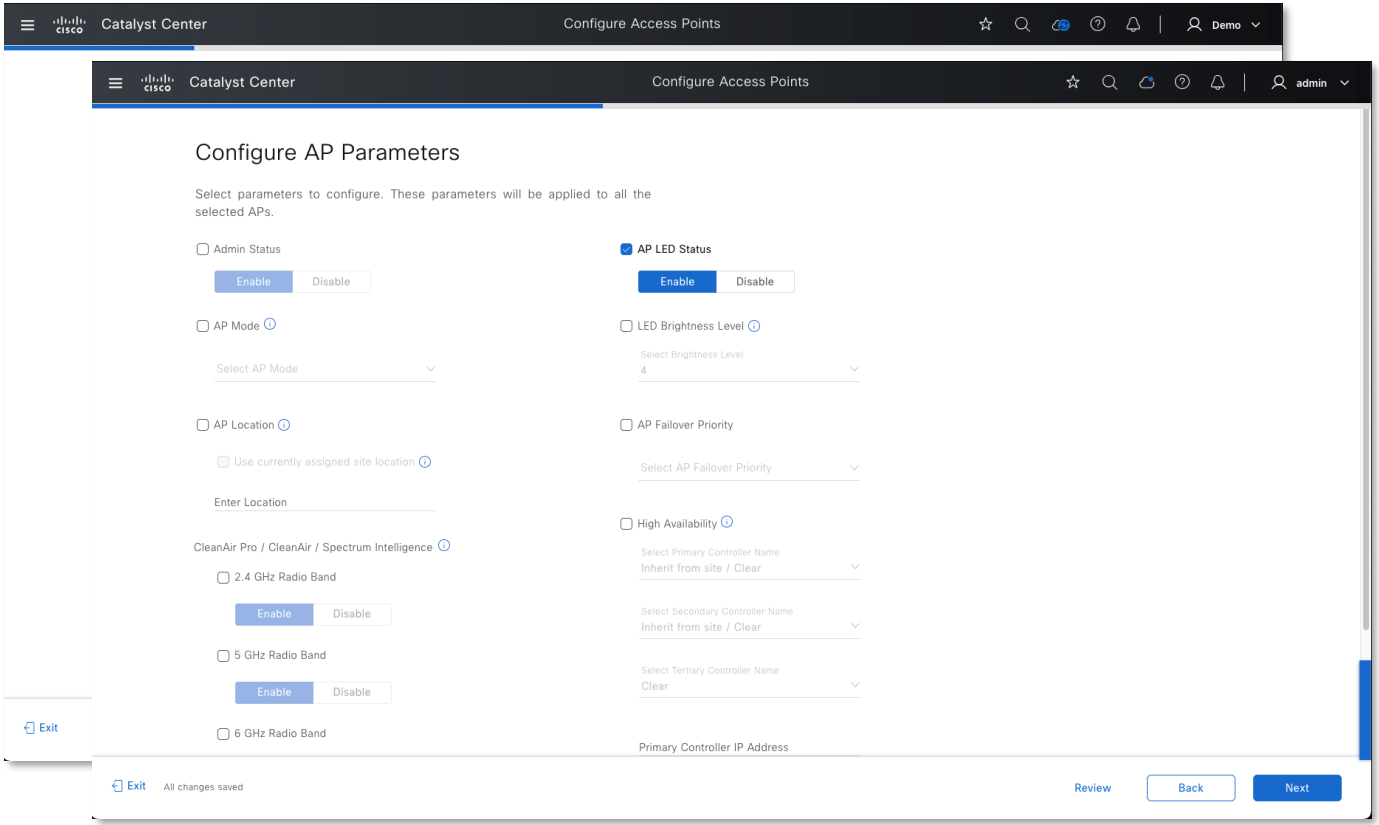

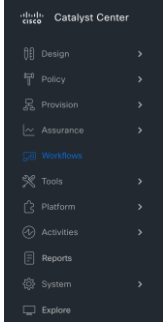

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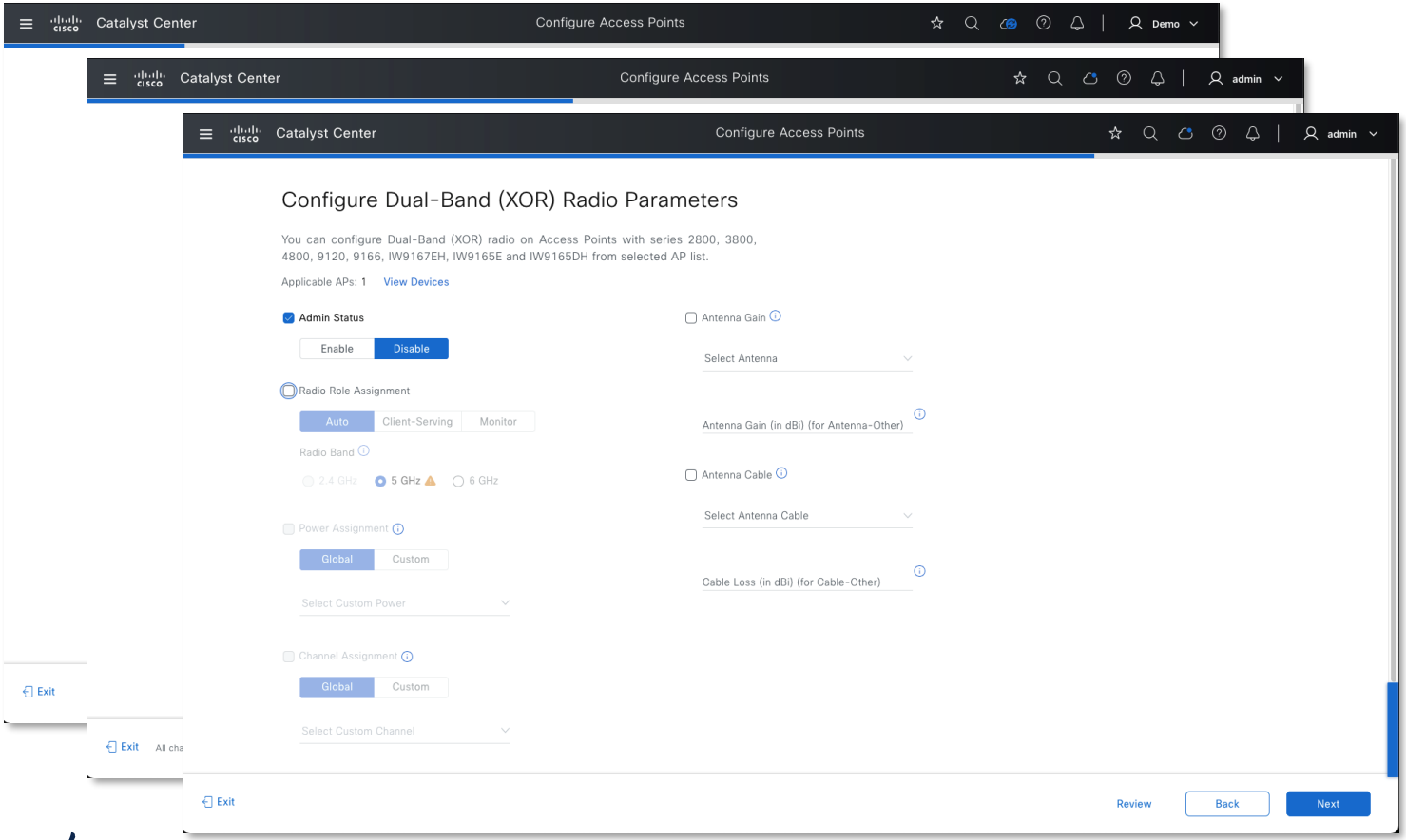

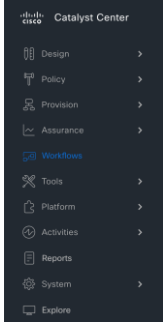

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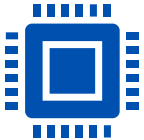
Wrapping things up

Scale and standardise your wireless deployments



Onboard Wireless Controllers, AP's effortlessly with PnP

Manage Day N operations & compliance to ensure reliability

Shall we mention SDA? API's?

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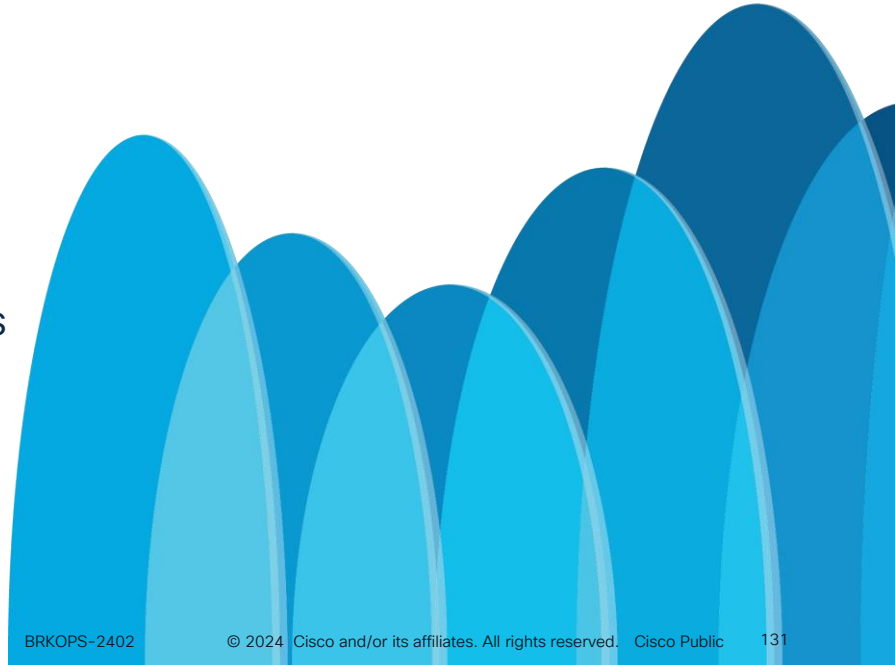
Meet the Expert

Wednesday 9:30 – 11:30 in World of Solutions



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Keynote Deep Dives

Wednesday
10:30am –11:30am

Experiences Amplified: How AI Can Fuel Better Employee and Customer Experiences

Level 1
Room 106

Smart, Secure, Seamless: Transforming Experiences with Next-Generation Networking

Level 2
Room 204

Harness a Bold New Era: Transform Data Centre and Service Provider Connectivity

Level 2
Room 203

Securing User to Application and Everything in Between

Level 2
Melbourne Room 2

Unlocking Digital Resilience through Unified Observability

The HUB
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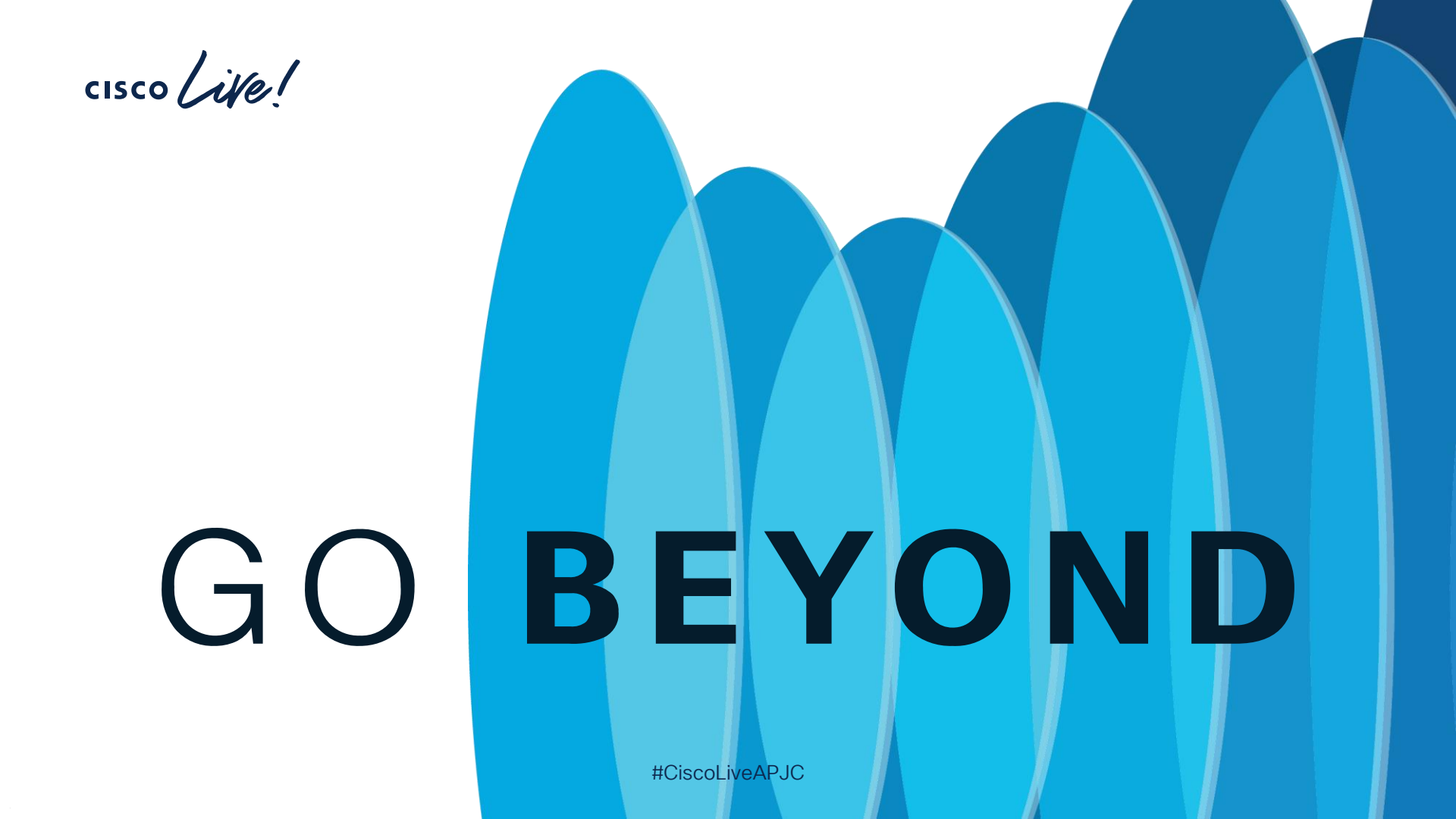
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