The bridge to possible

Deploying QoS using Cisco Catalyst Center Application Policies

Dan “DQ” Quinlan – Systems Architect
dq@cisco.com
BRKOPS-2137

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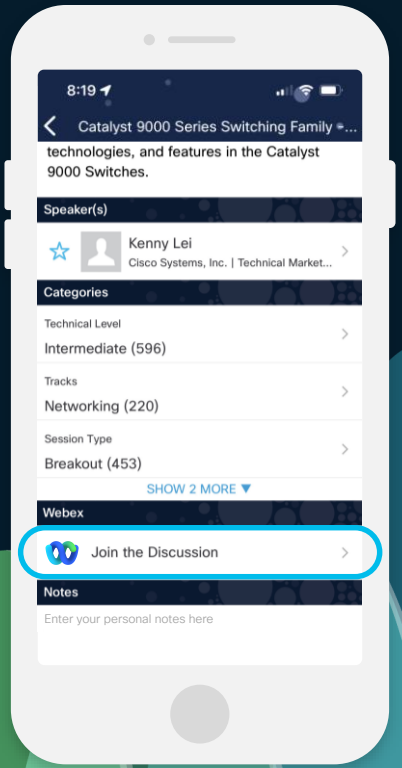

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Agenda

- Why This Session
- Quality of Service (QoS) Refresher
- Cisco Catalyst Center Application Policies Walkthrough
- Defining Custom Applications
- Deploying The Policy
- Maintaining The Policy
- Now What?

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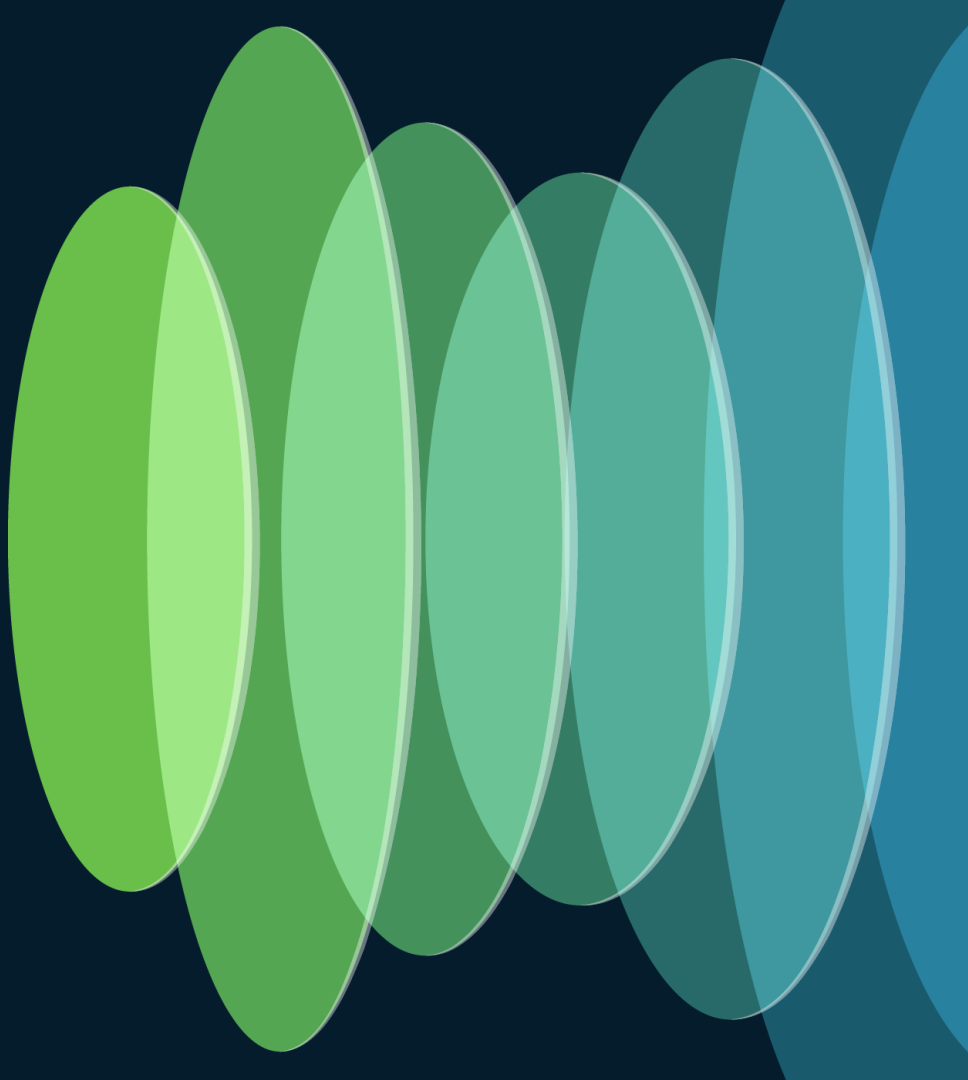
Why This Session



Why This Session – “It’s the network.”

- “The network is always slow on Tuesdays.”
- “Network shared drive transfers are bad.”
- A branch WAN link showed 100% utilization for 30 minutes straight

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Why This Session – “It’s the network.”

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By default, networks are “Best Effort”

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Why This Session – QoS can be complex

- Example QoS policy programming: 900 lines
  - 2 x 48-port switch stack
    - 440 lines of IP Access Lists
    - 120 lines of Class Maps
    - 90 lines of Policy Maps
    - 250 lines of Service Policy (Input / Output)
- QoS is different on different device models and license levels

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- QoS is different on different device models and license levels

Maintaining QoS policy “by hand” is complicated and error-prone.

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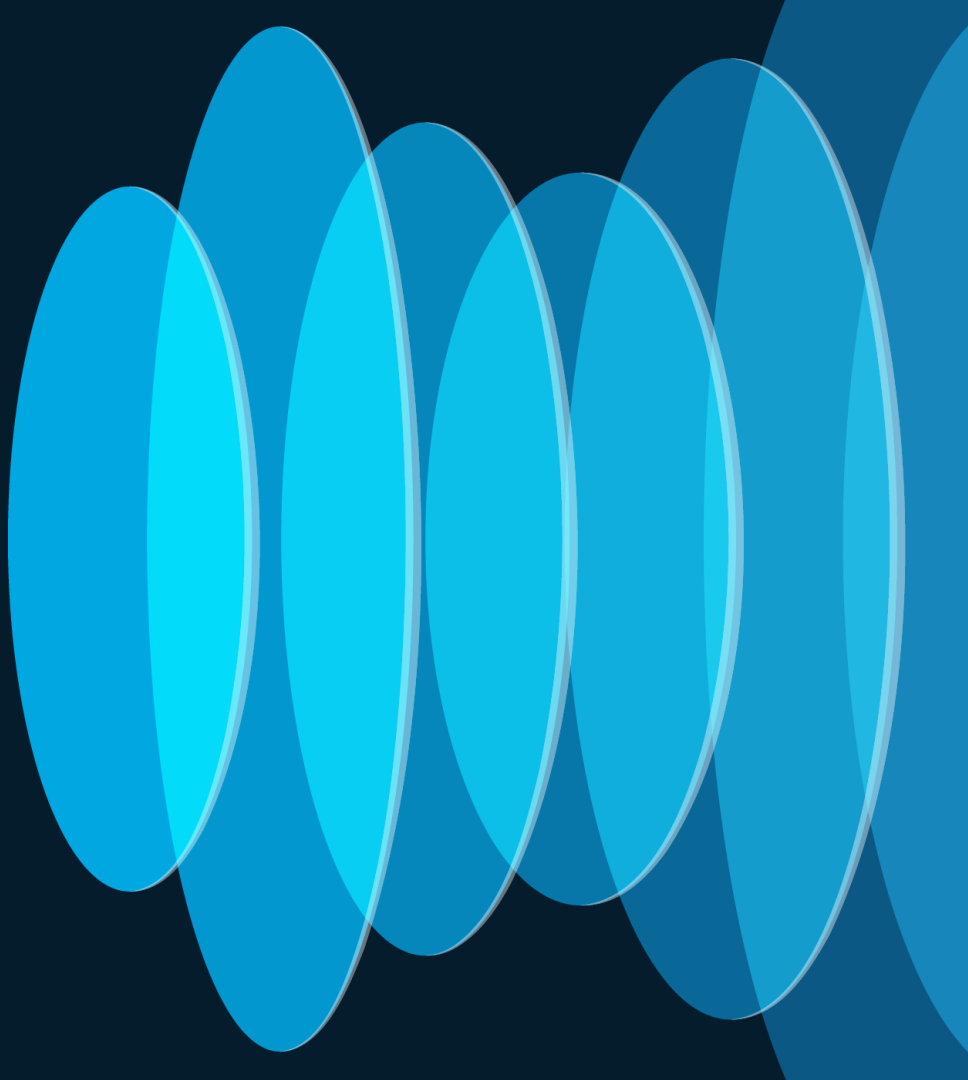
QoS Review



QoS Refresher - Basics

DSCP = Differentiated Services Code Point

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QoS Refresher - Basics

DSCP = Differentiated Services Code Point

Classify

Mark

Identify the traffic

- Access lists, Class maps

Mark the traffic

- Policy maps (inbound)

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QoS Refresher - Basics

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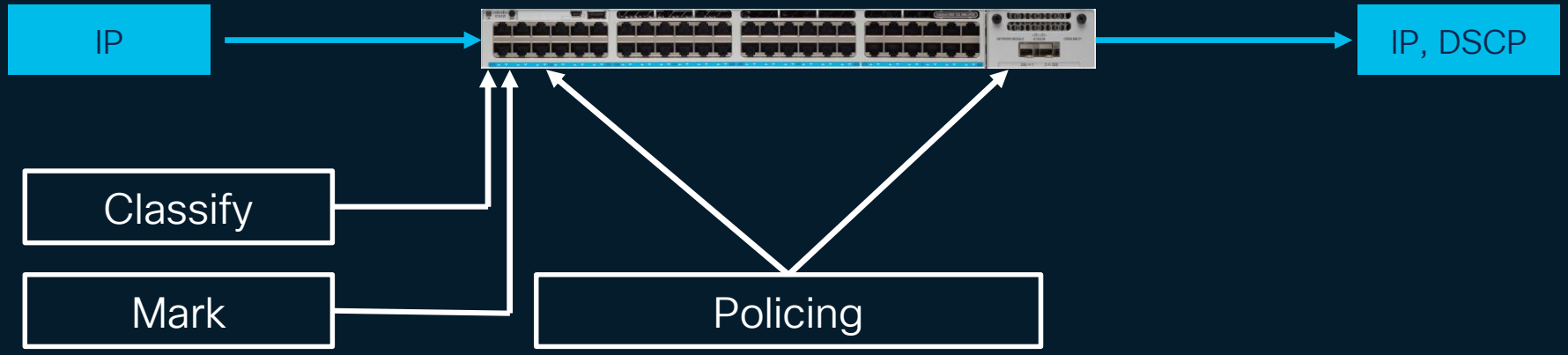

Identify the traffic

- Access lists, Class maps

Mark the traffic

- Policy maps (inbound)

Congestion Avoidance

- Remark, Drop
- Policy maps (inbound* / outbound)

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QoS Refresher - Basics

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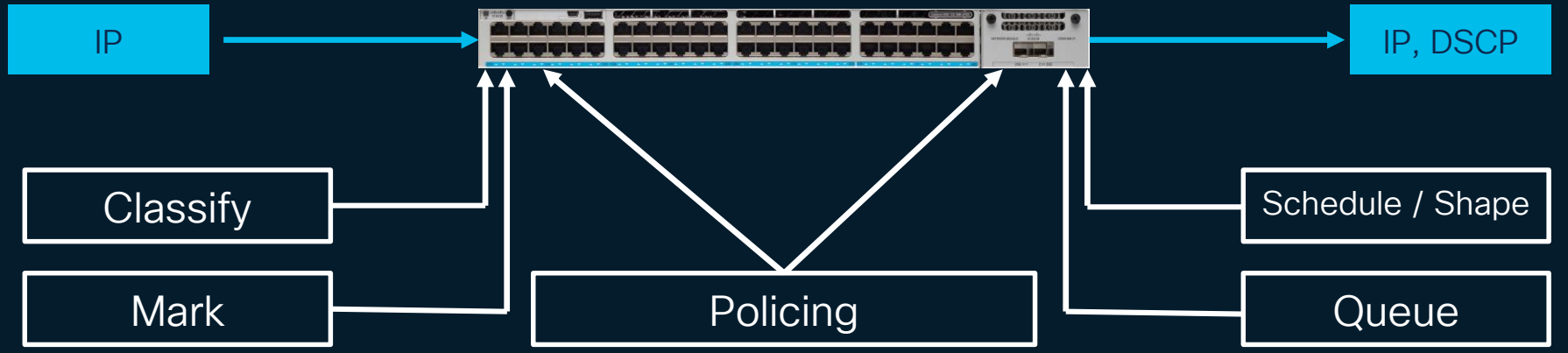

Identify the traffic

Access lists, Class maps

Mark the traffic

Policy maps (inbound)

Congestion Avoidance

Remark, Drop

Policy maps (inbound* / outbound)

Congestion Management

Policy maps (outbound)

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QoS Refresher – RFC 4594 / Cisco Validated Design (CVD) Traffic Classes

Traffic Class	CVD DSCP PHB / Value	Queuing and Dropping
VoIP Telephony	EF / 46	Priority Queuing (PQ)
Broadcast Video	CS5 / 40 (CS3 / 24 in RFC)	PQ
Real-Time Interactive	CS4 / 32	PQ
Multimedia Conferencing	AF41 / 34	Bandwidth (BW) Queue + DSCP Weighted Random Early Detection (WRED)
Multimedia Streaming	AF31 / 26	BW Queue + DSCP WRED
Network Control	CS6 / 48	BW Queue ONLY
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Operations, Administration, Management (OAM)	CS2 / 16	BW Queue + DSCP
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Default	BE / 0	Default + RED
Scavenger	CS1 / 8	Minimum BW + DSCP

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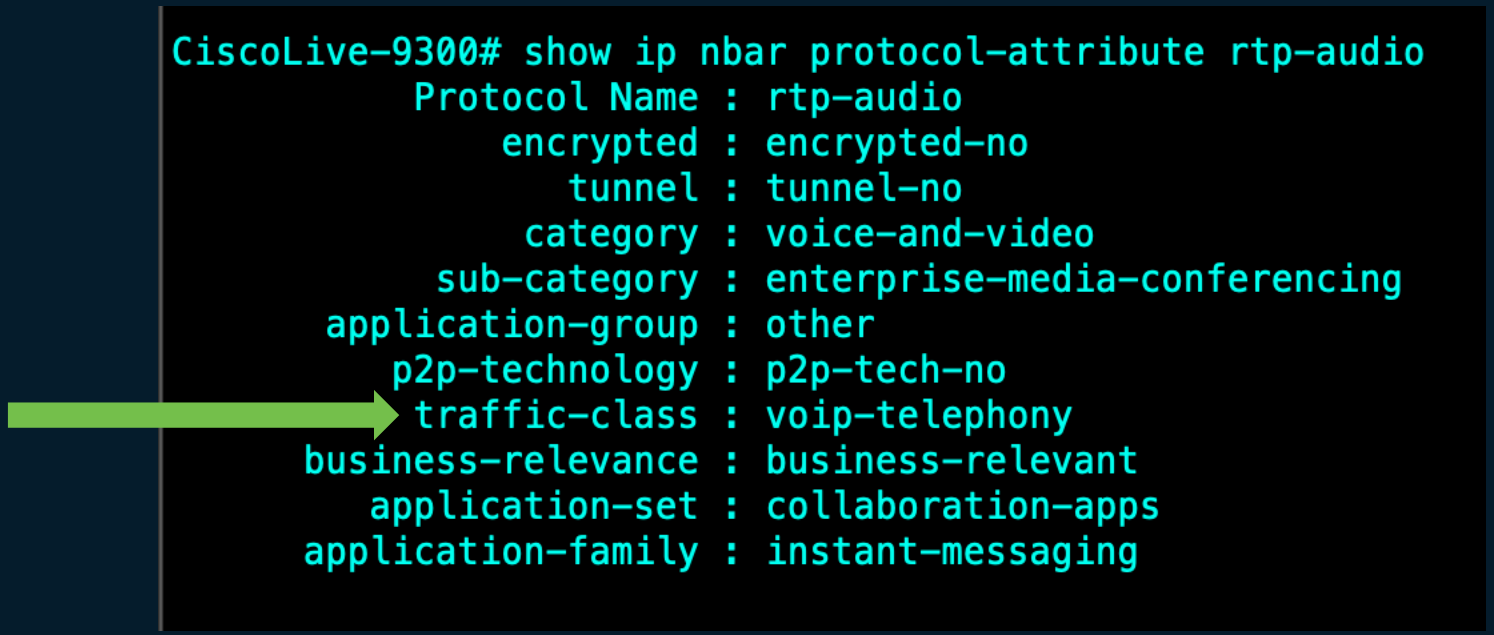
Network Based Application Recognition (NBAR)



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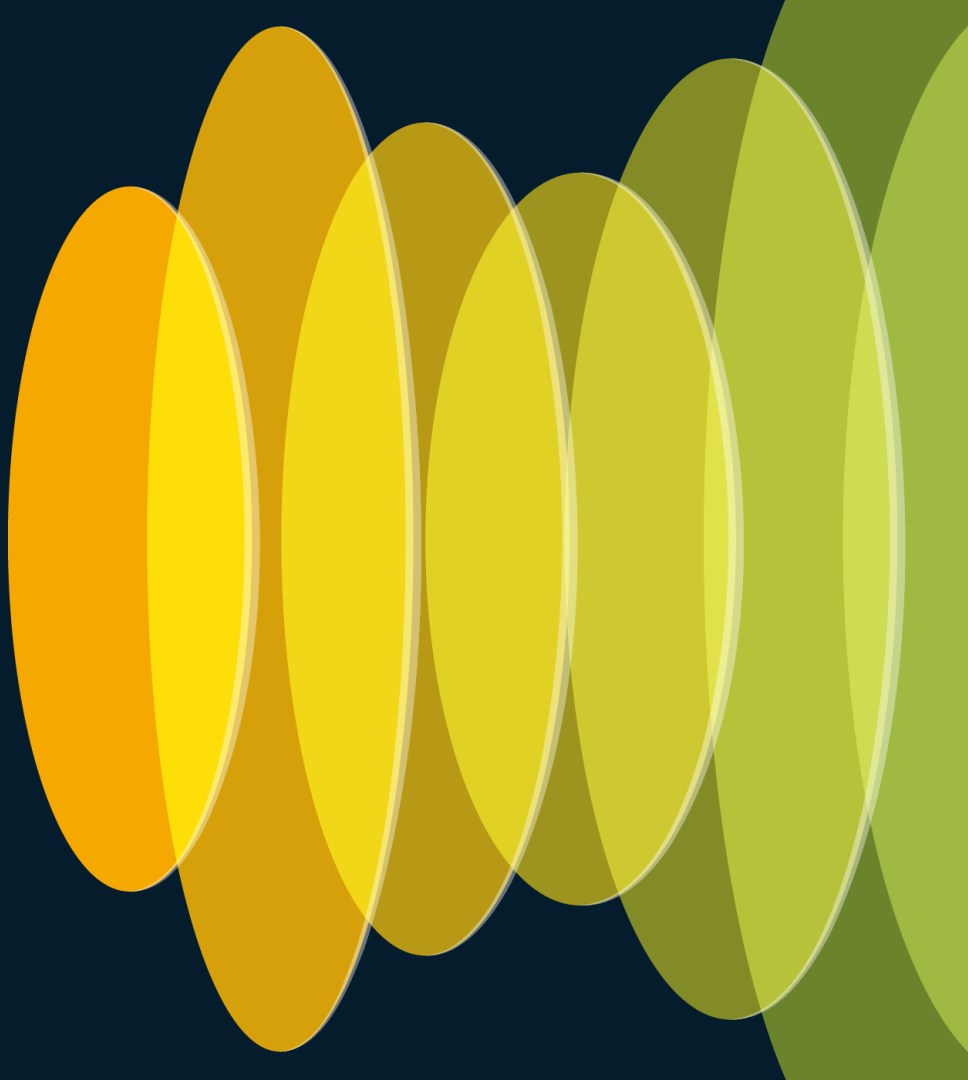
Cisco Catalyst Center Application Policies Walkthrough



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Catalyst Center Application Policies – The “Why”

- Centrally define / maintain / deploy QoS policies
- Centrally remediate “out-of-compliance” QoS policies
- Cisco Catalyst Center translates the policy into the the proper CLI commands for each device / license level

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Catalyst Center Application Policies – Prerequisites

- Devices must be “Application Policy Compatible”
- Devices must be fully managed by Cisco Catalyst Center
- “Device Role” must be correctly assigned in Cisco Catalyst Center
- Device license level should be properly configured.

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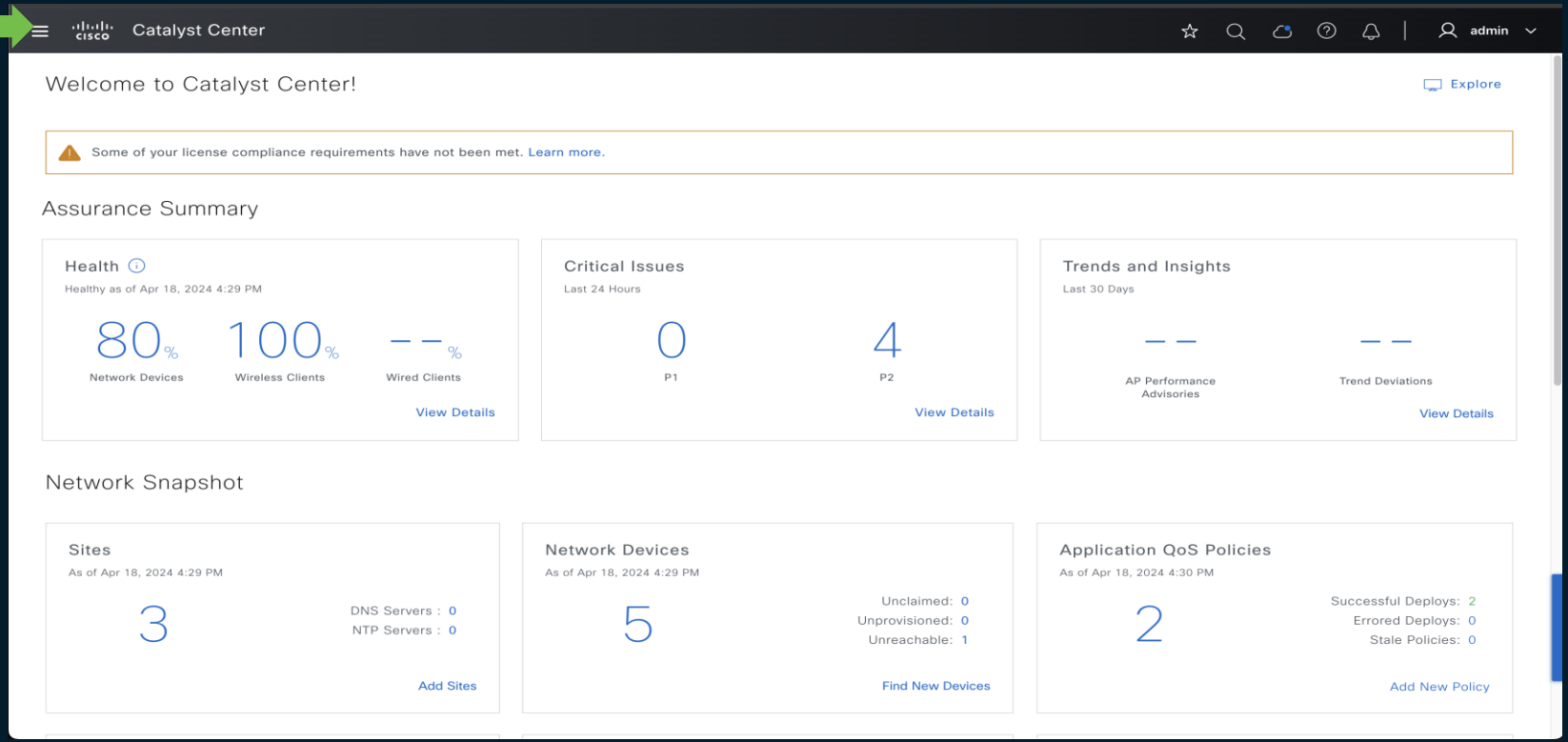
Catalyst Center Application Policies – Getting There



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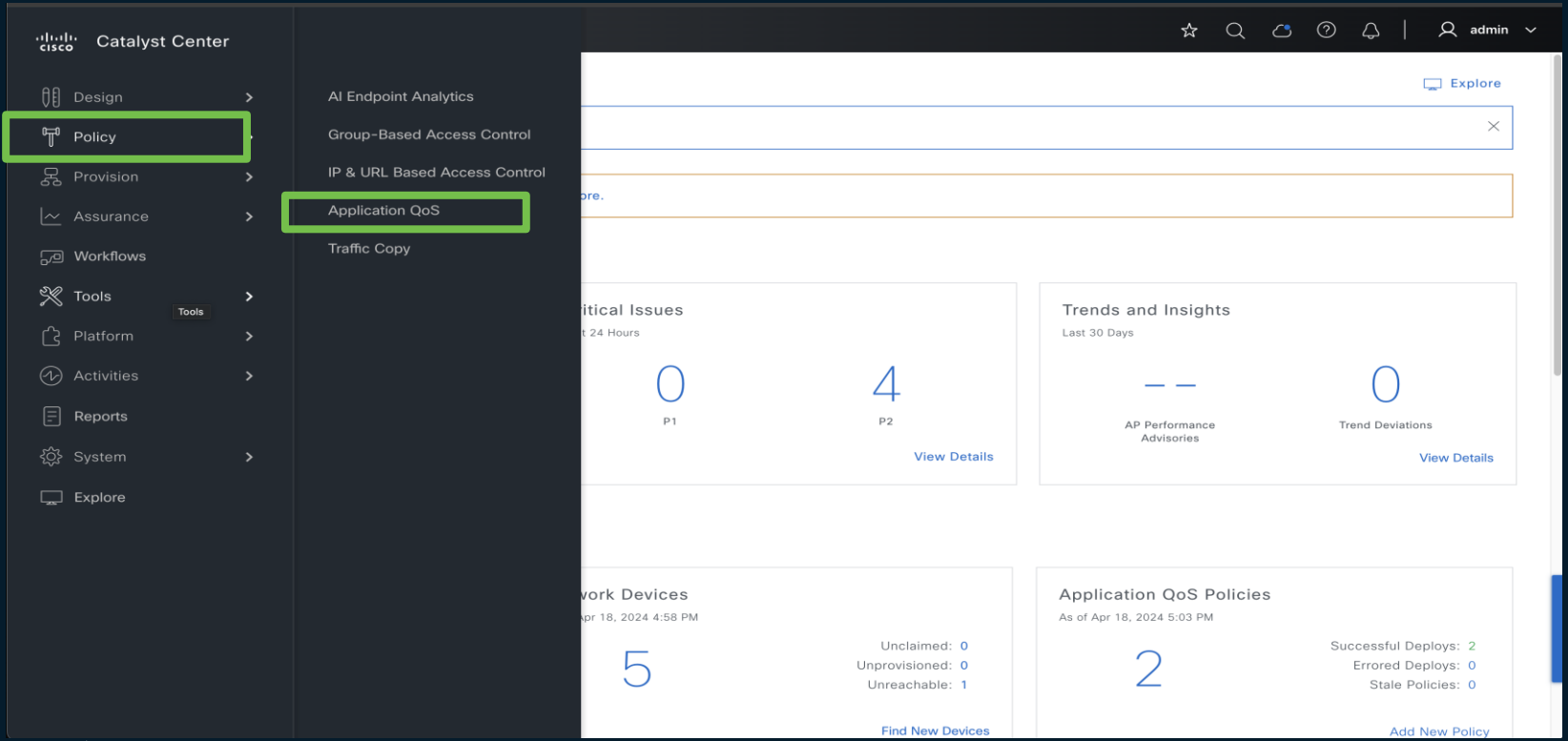
Catalyst Center Application Policies – Getting There



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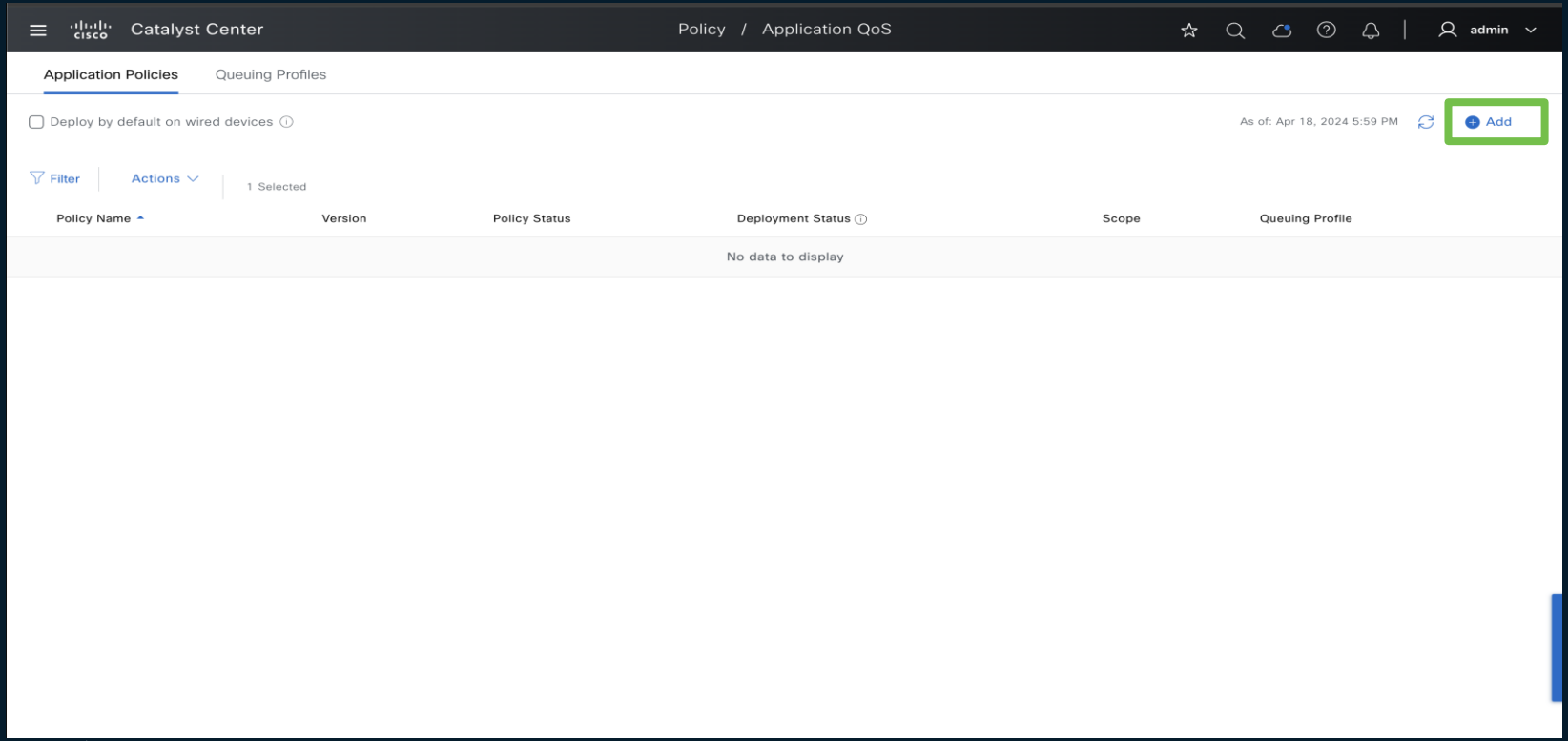
Catalyst Center Application Policies – Adding a Policy



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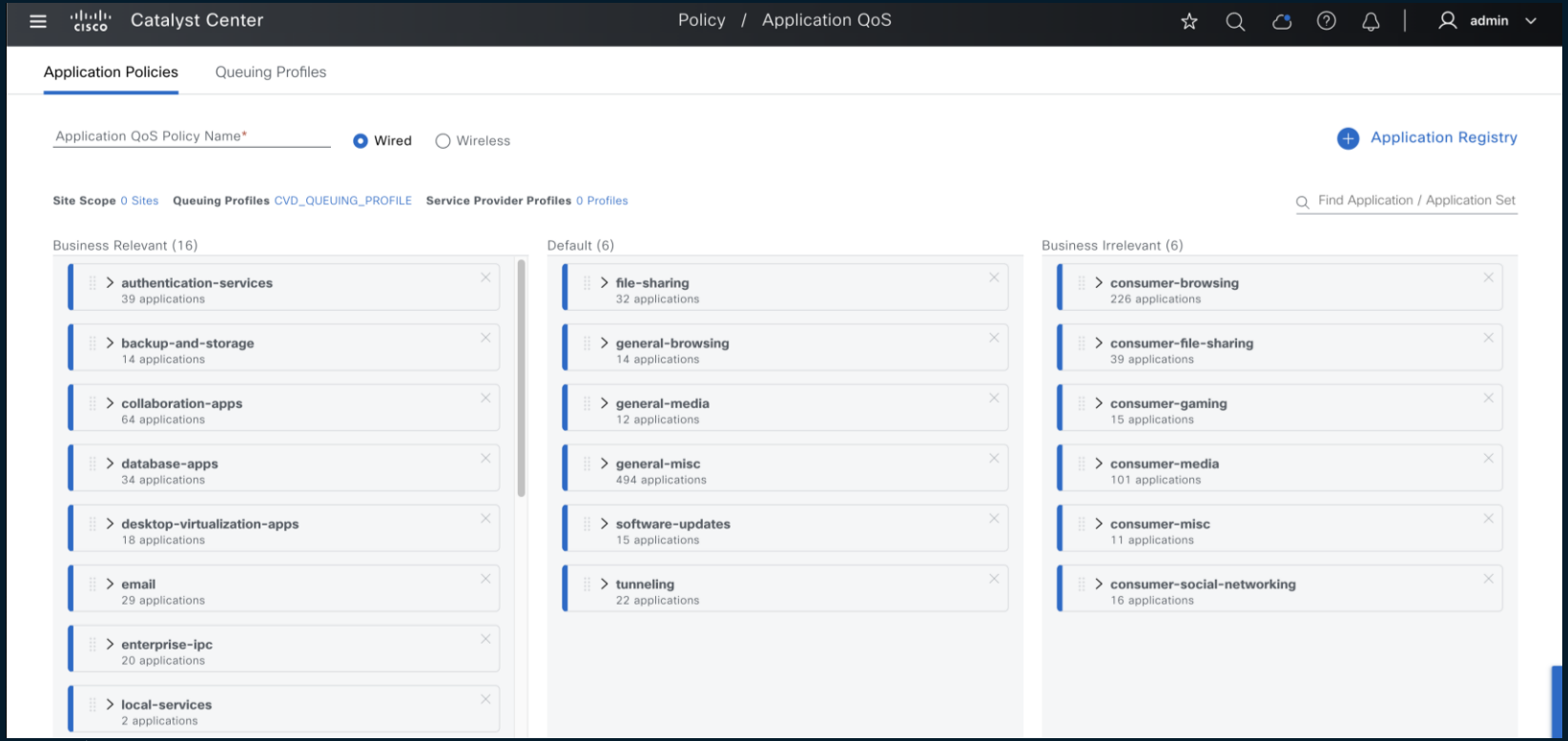

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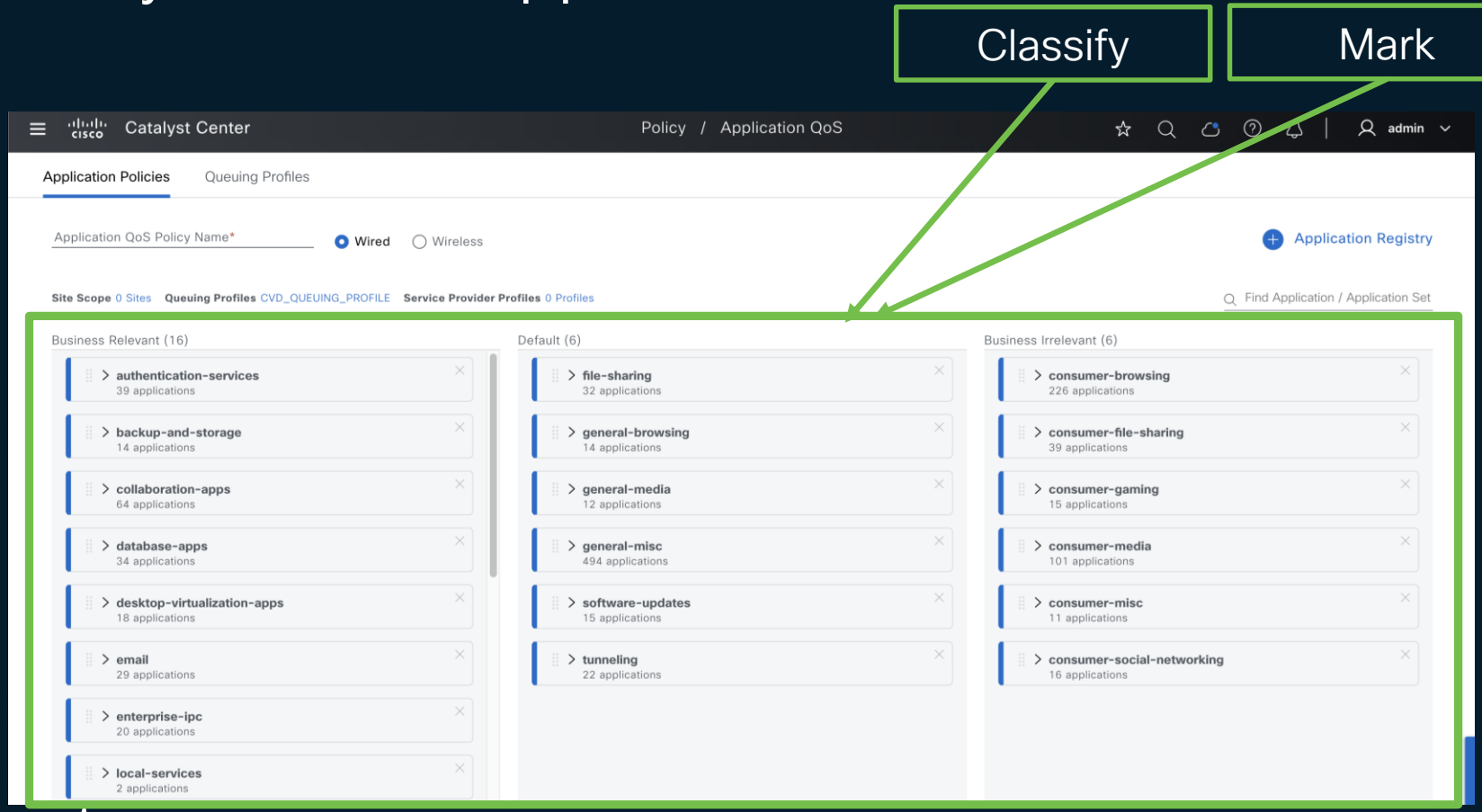
Catalyst Center Application Policies



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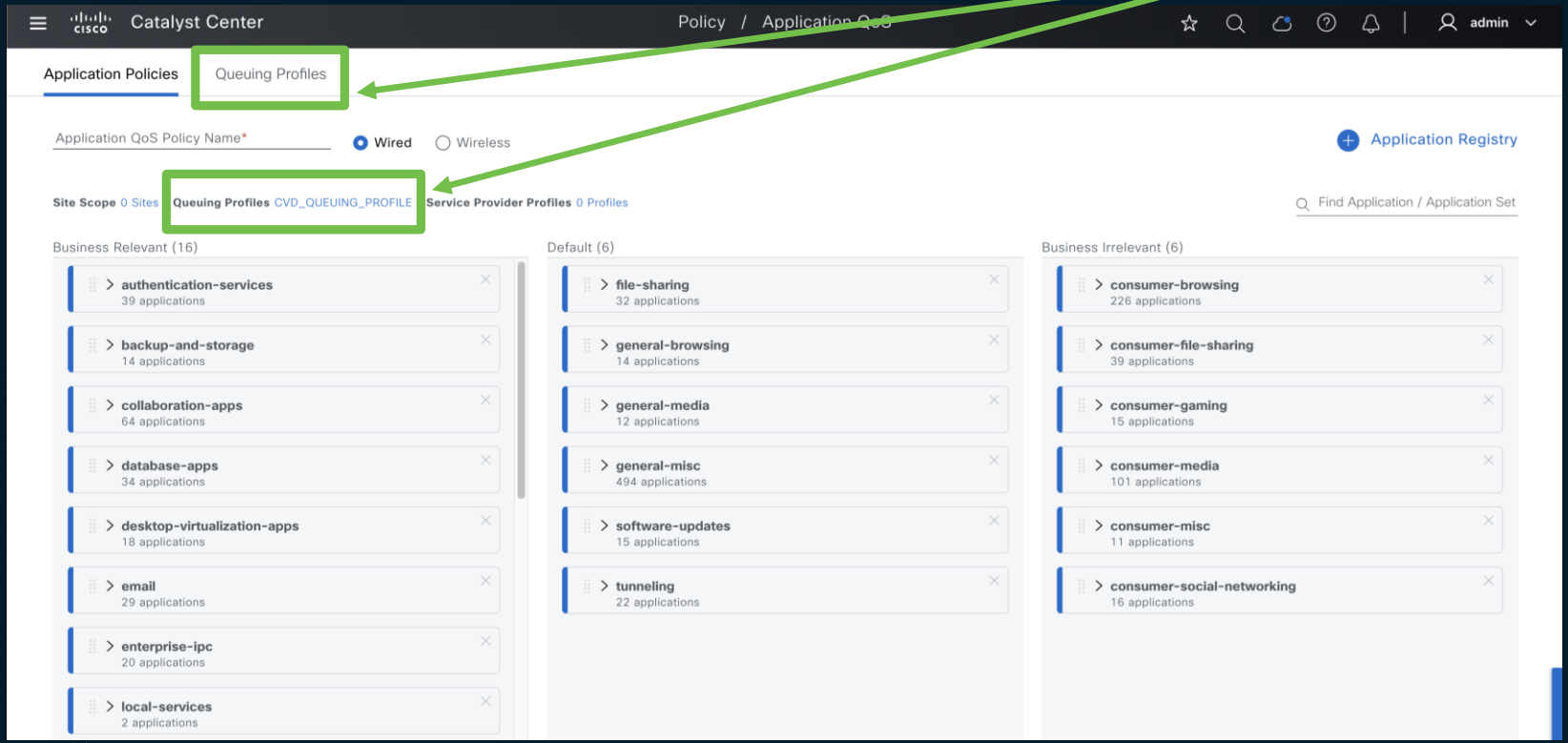
Catalyst Center Application Policies

Police, Queue, Schedule and Shape



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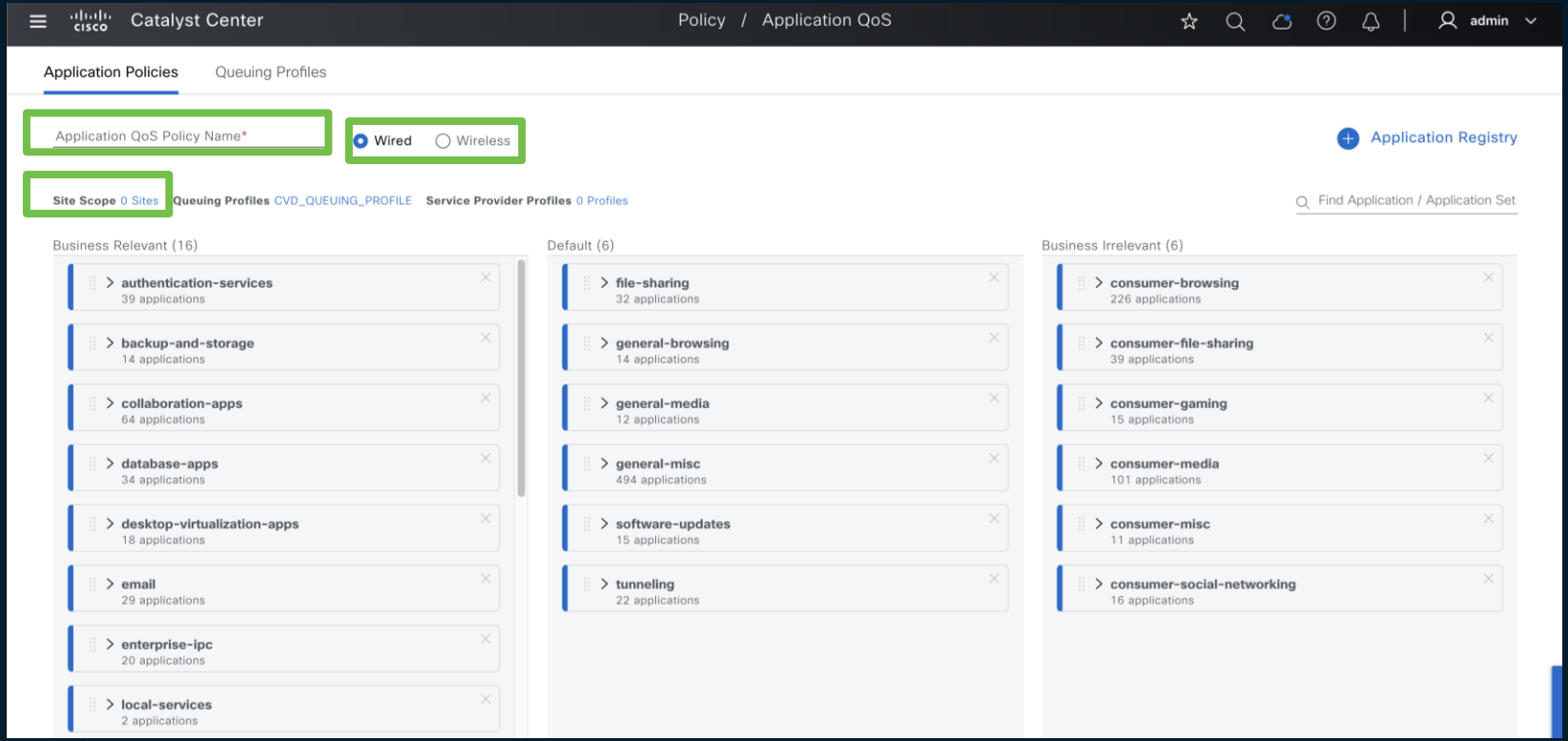

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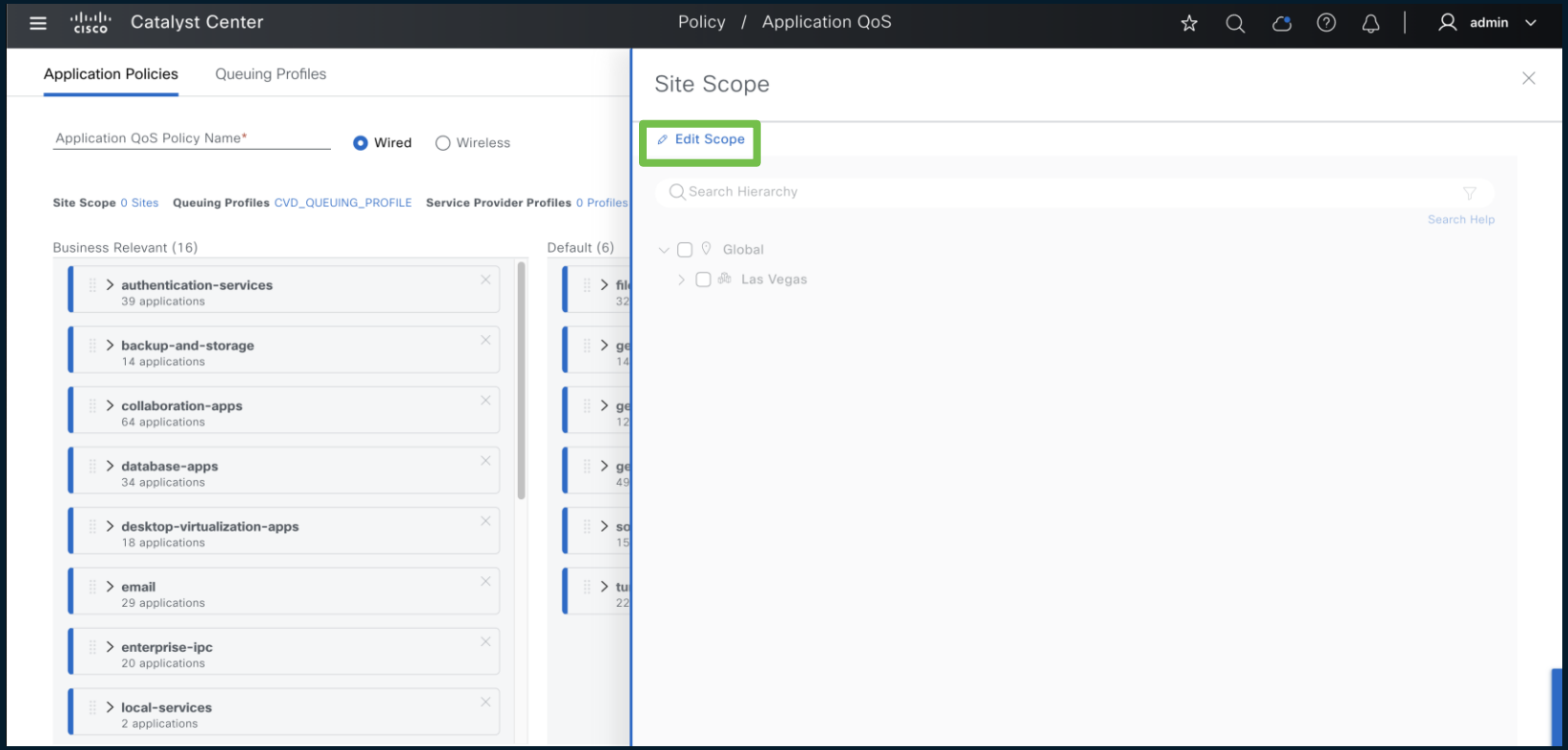
Catalyst Center Application Policies – Policy Scope



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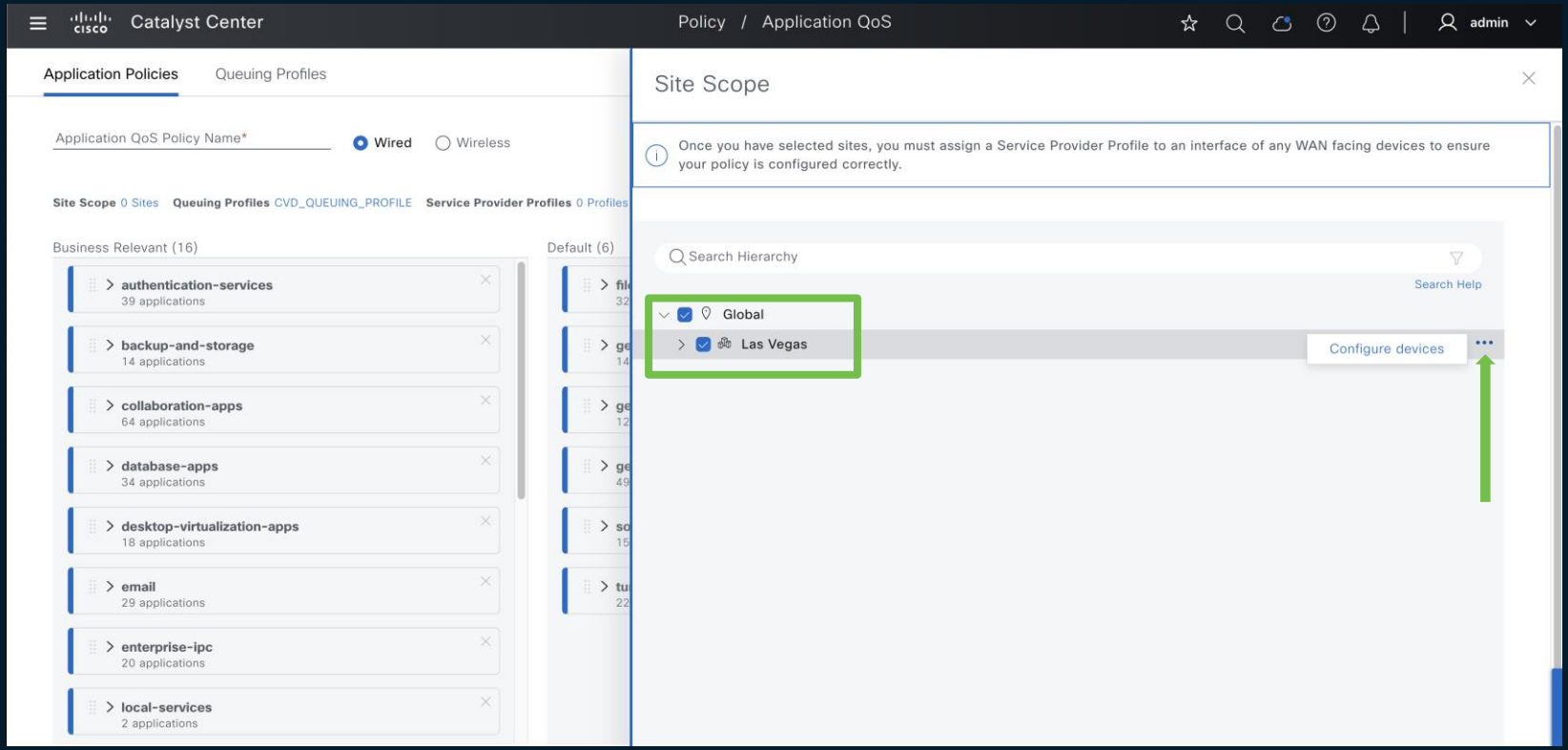

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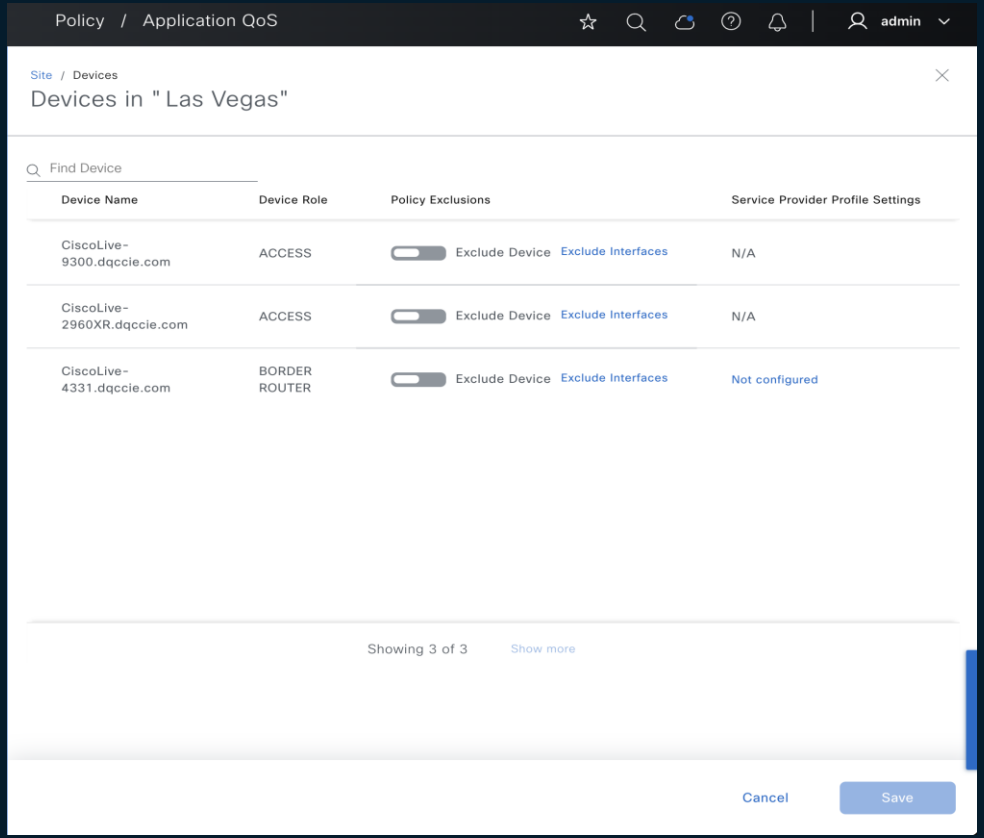

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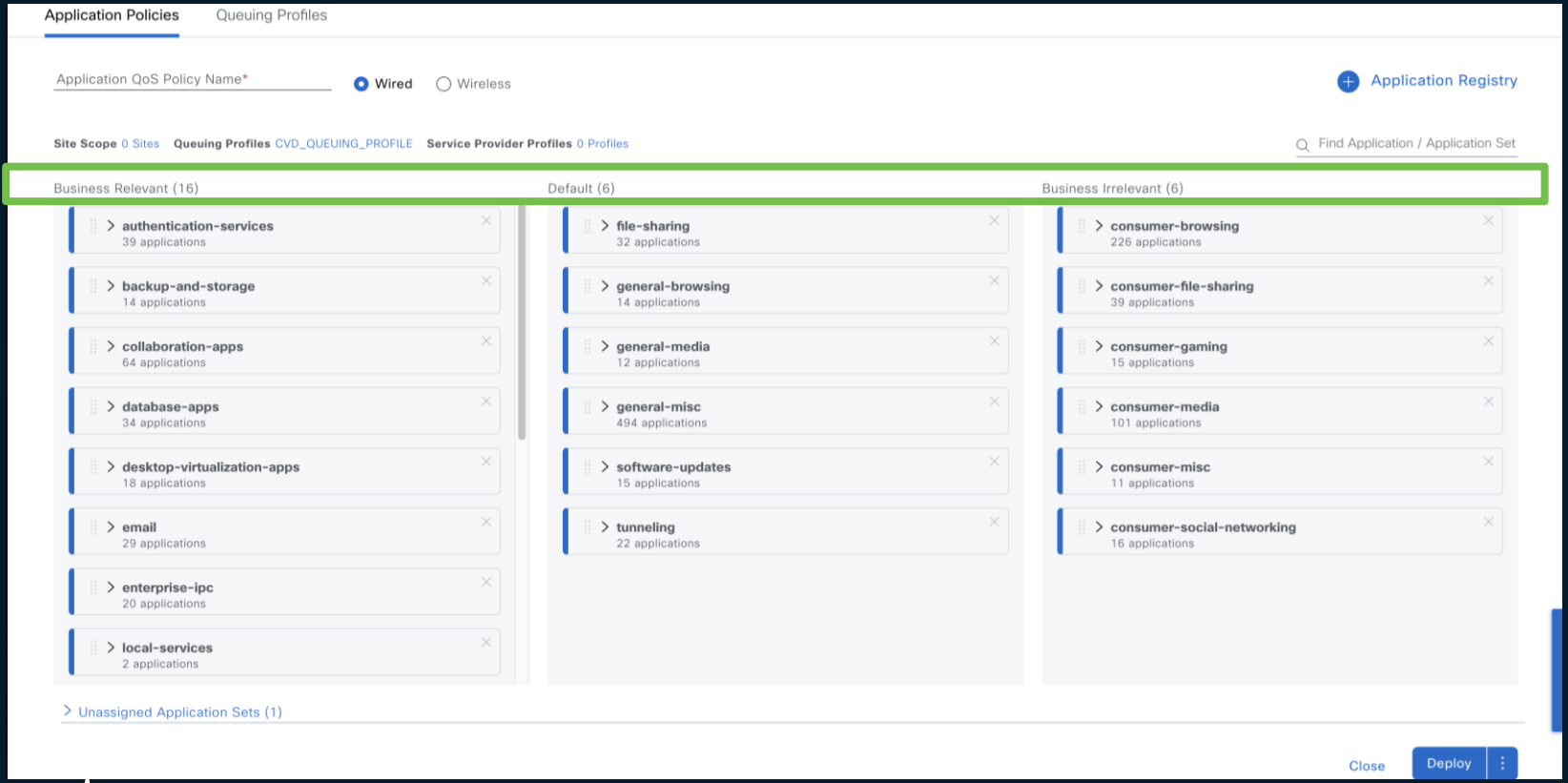
Catalyst Center Application Policies – Relevance Groups



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Catalyst Center Application Policies – Business Relevance Groups

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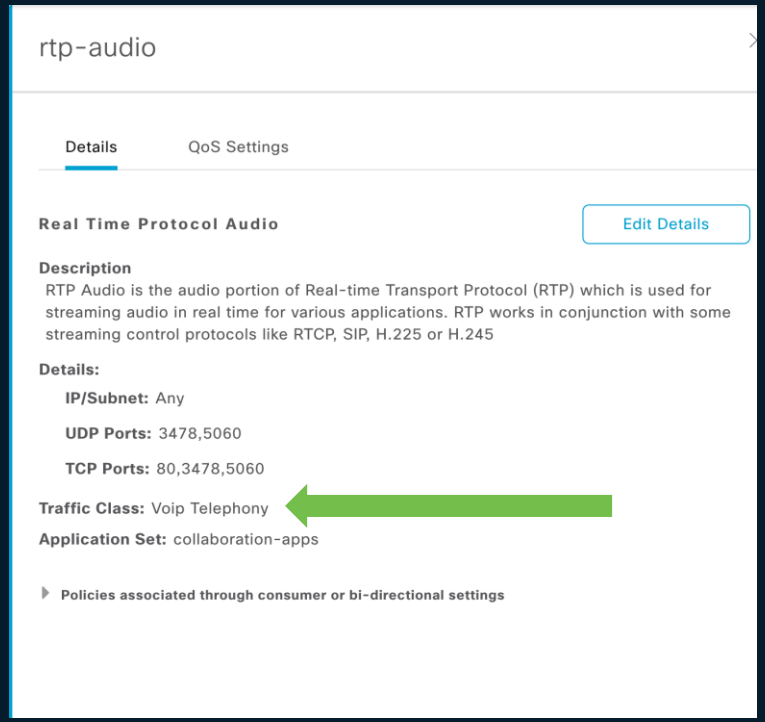
Traffic Class – Defined Per Application



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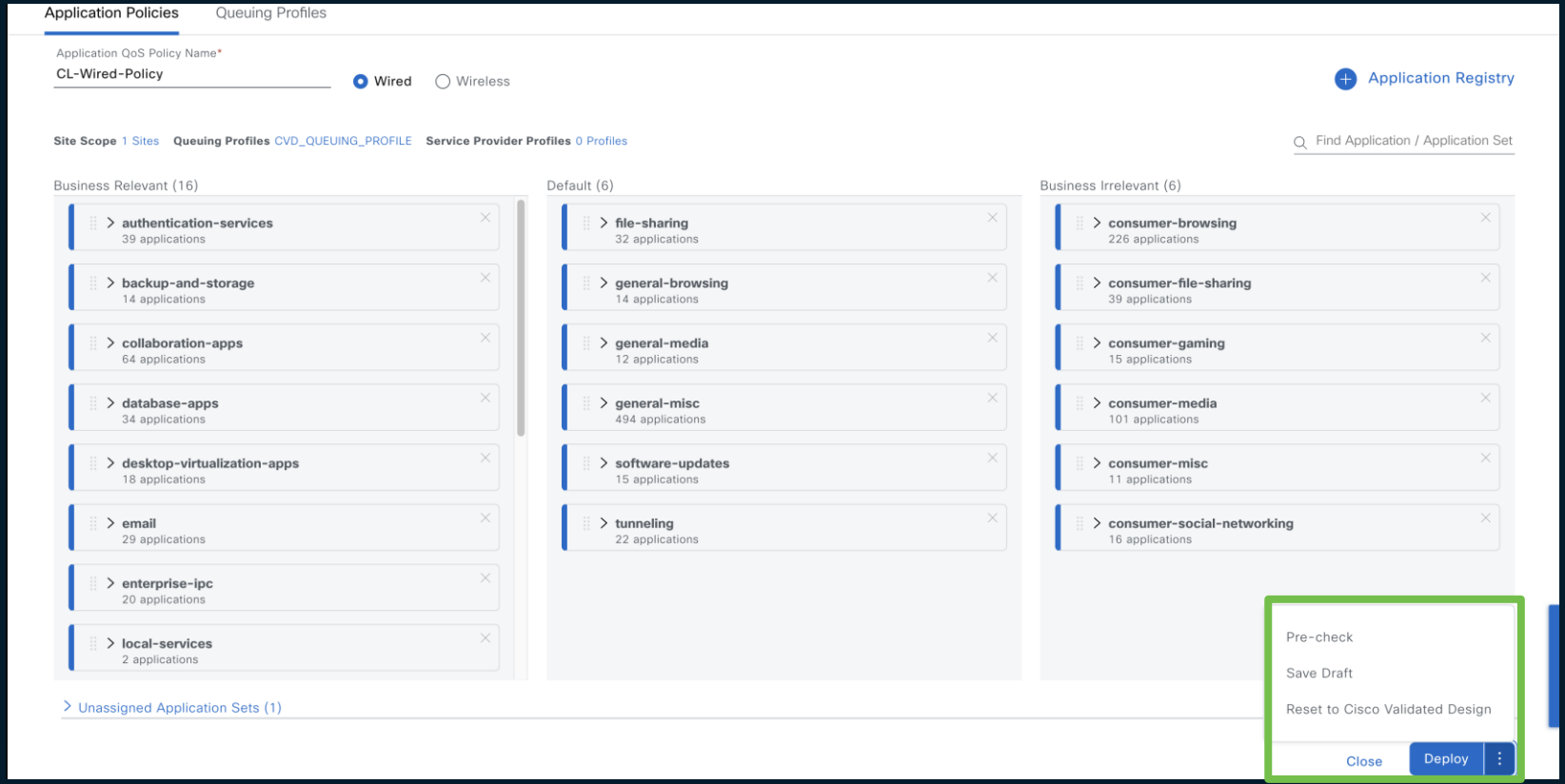
Catalyst Center Application Policies – Administration



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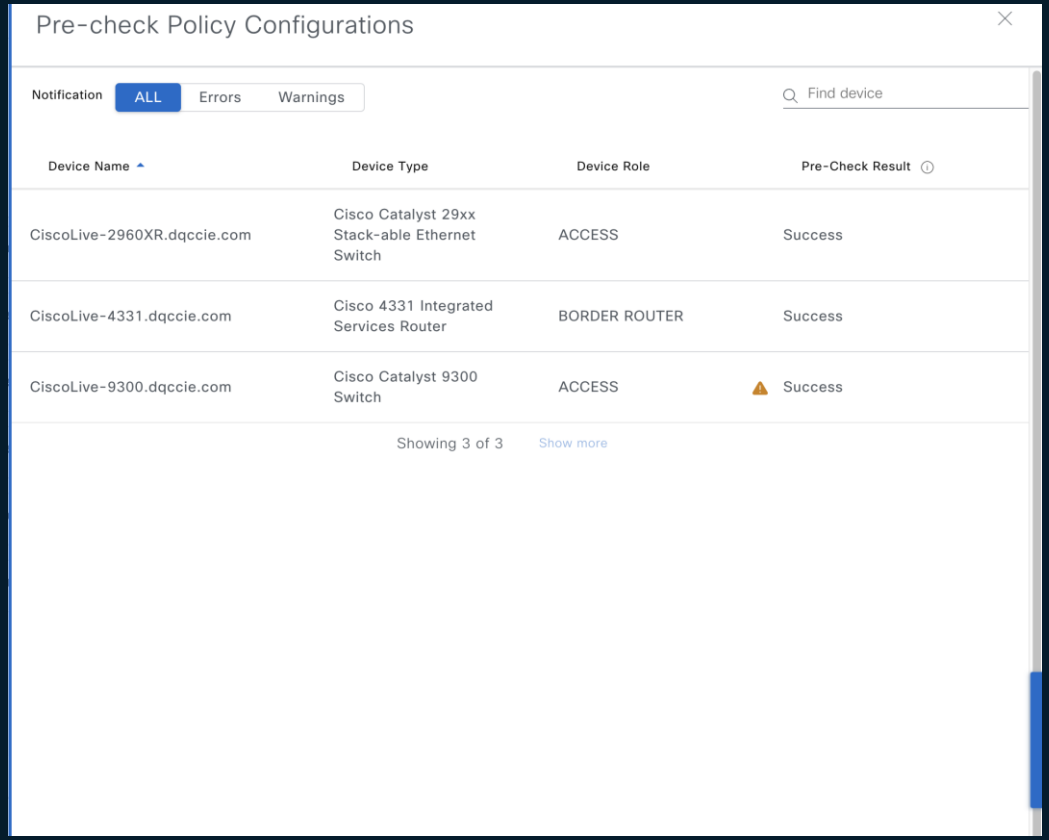
Catalyst Center Application Policies - Pre-check



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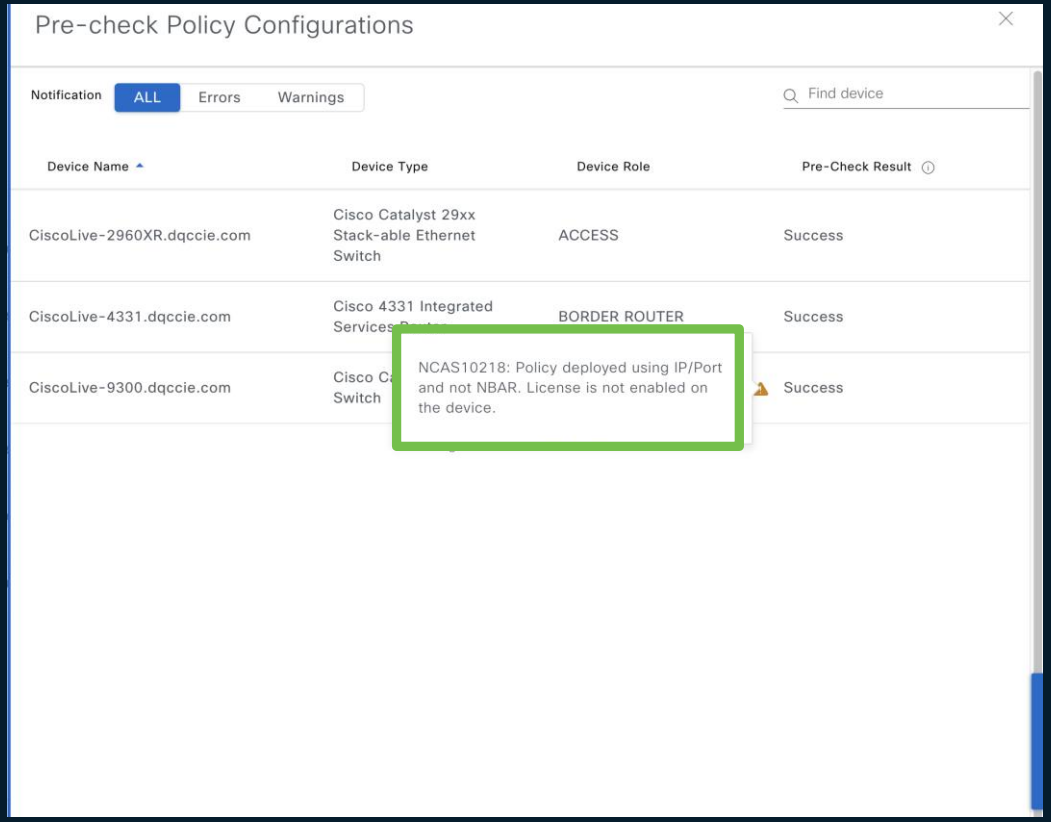

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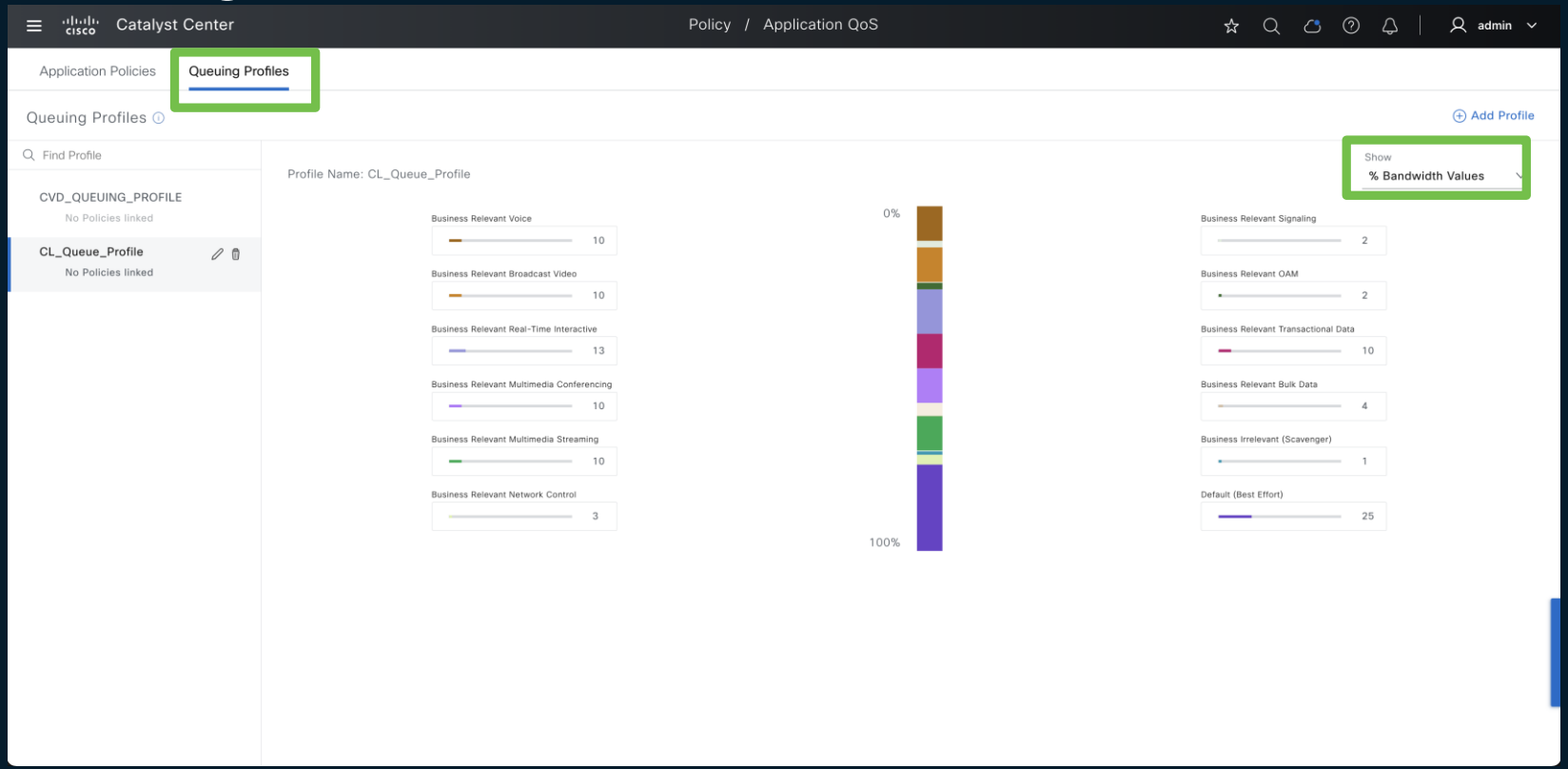
Catalyst Center Application Policies – Queuing Profiles



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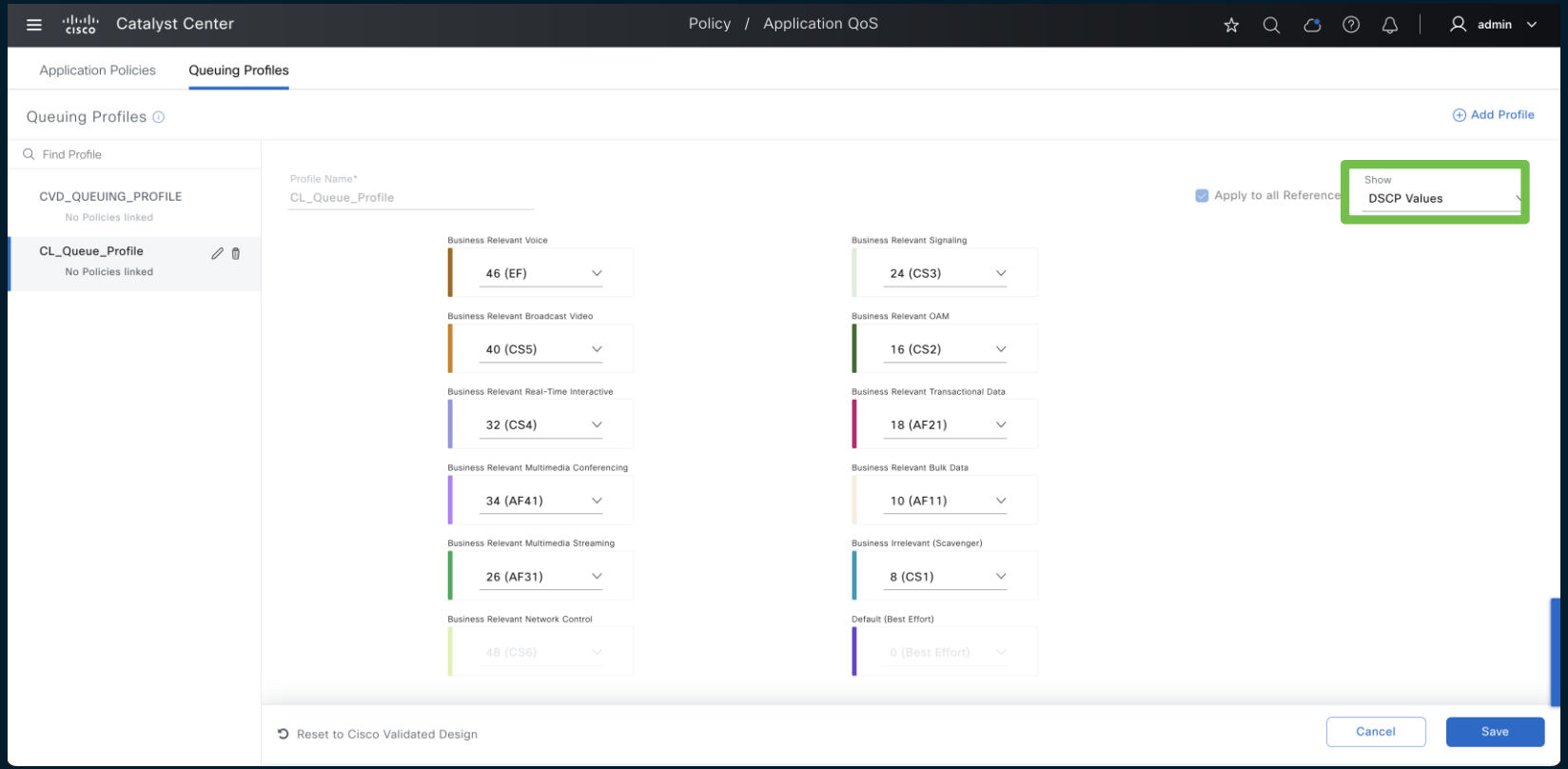

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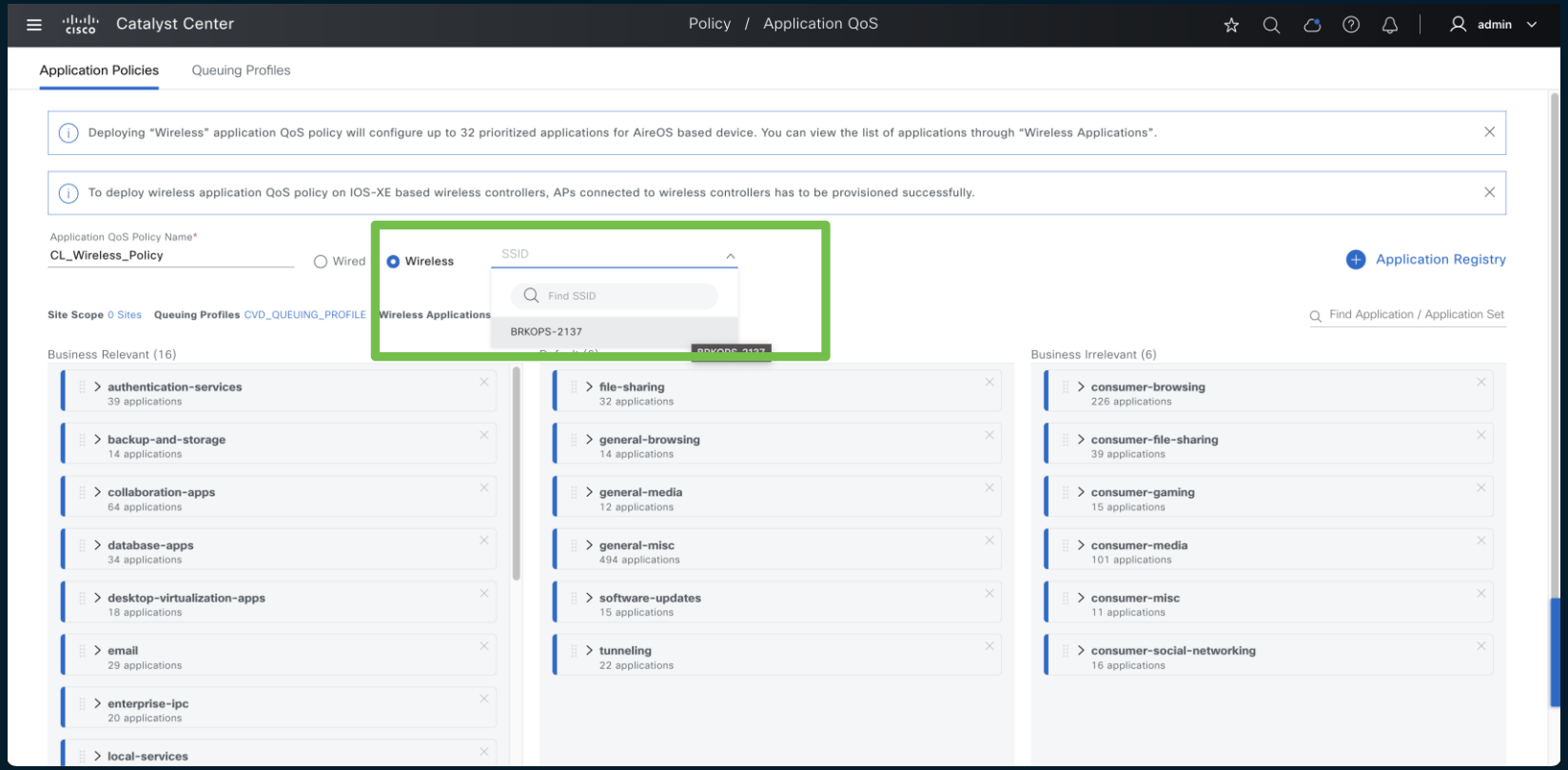
Catalyst Center Application Policies – Wireless



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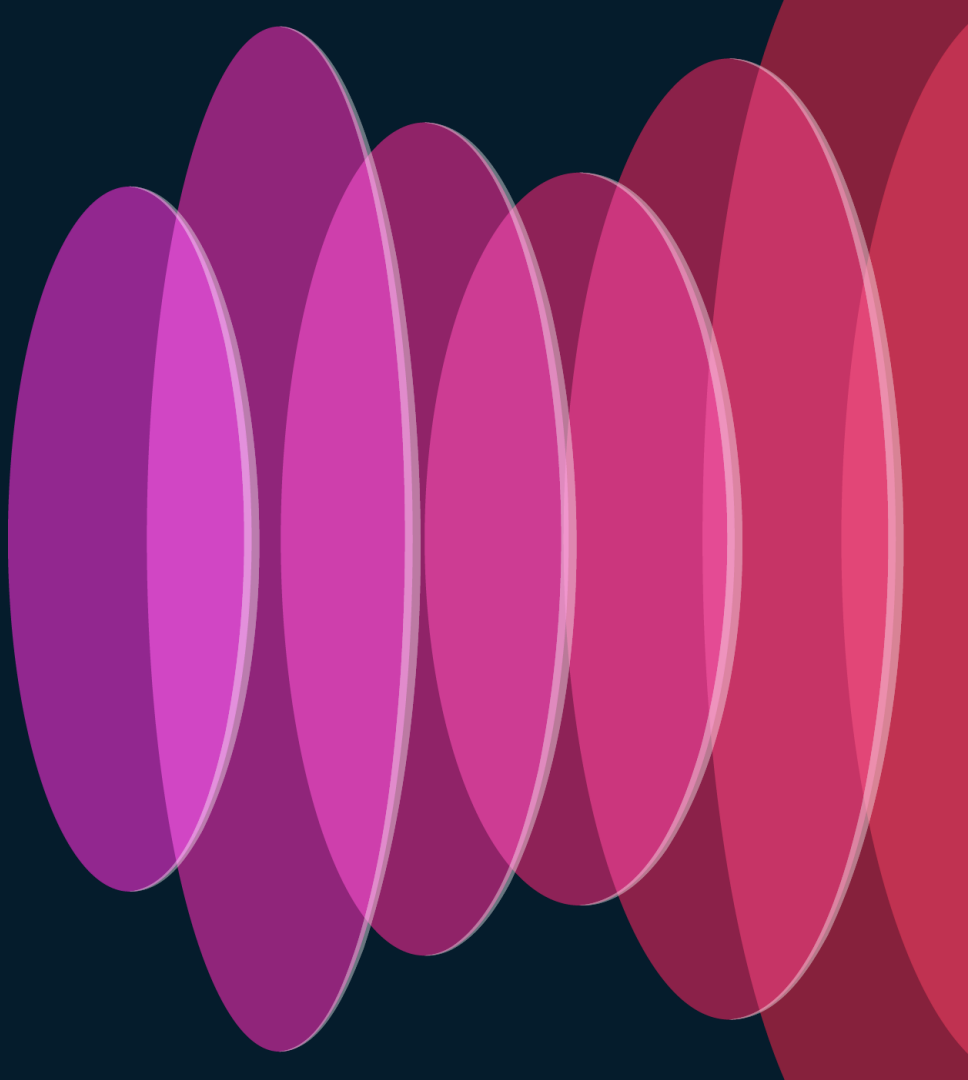
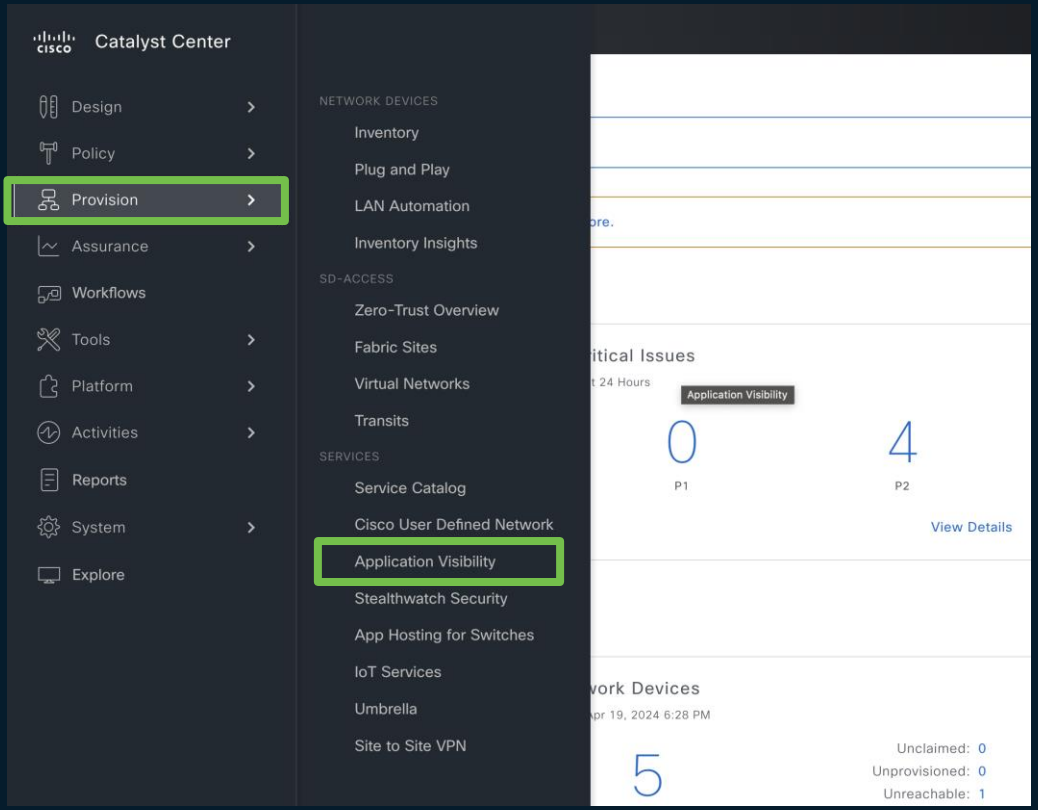
Defining Custom Applications



Custom Applications



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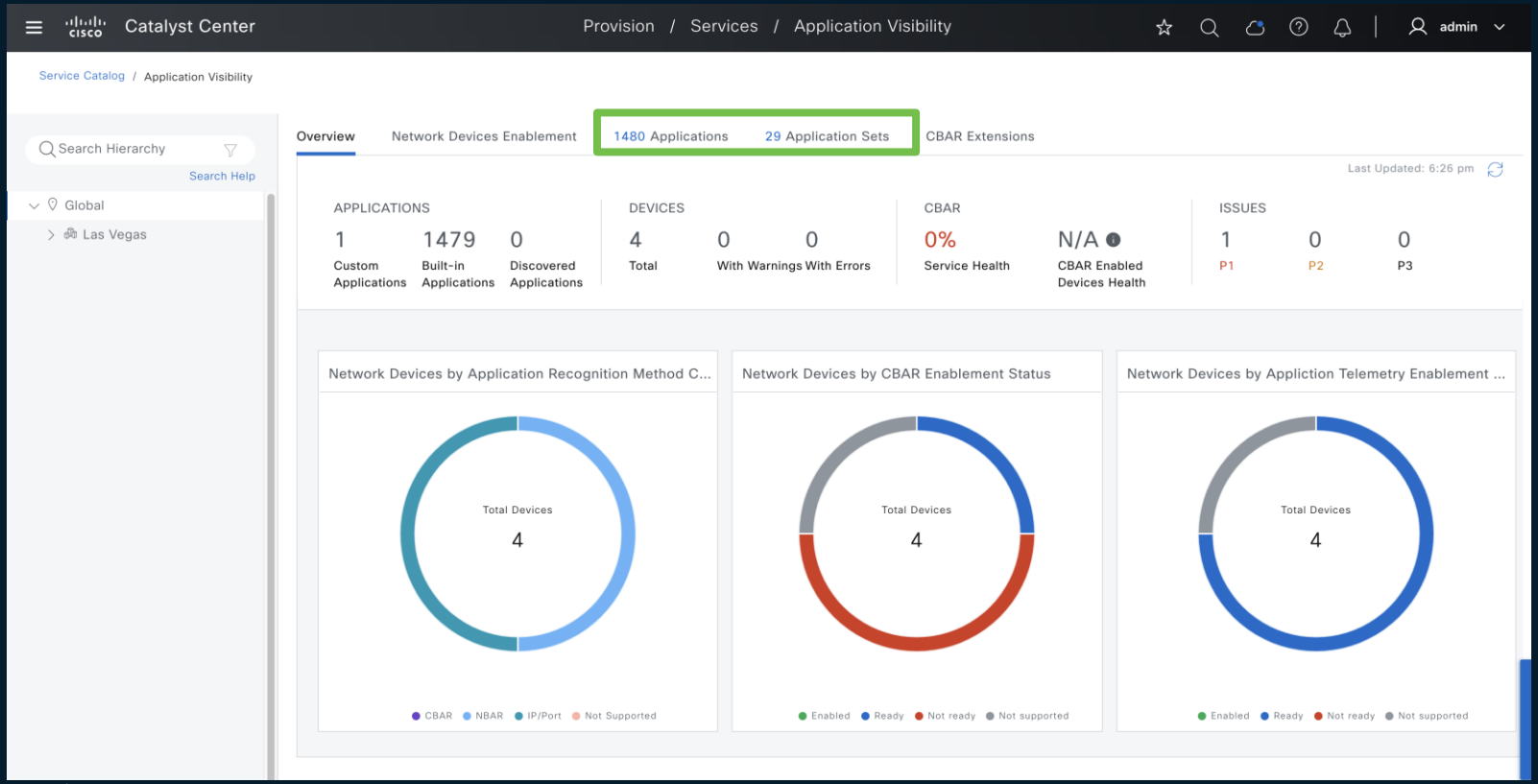
Custom Applications – Application Registry



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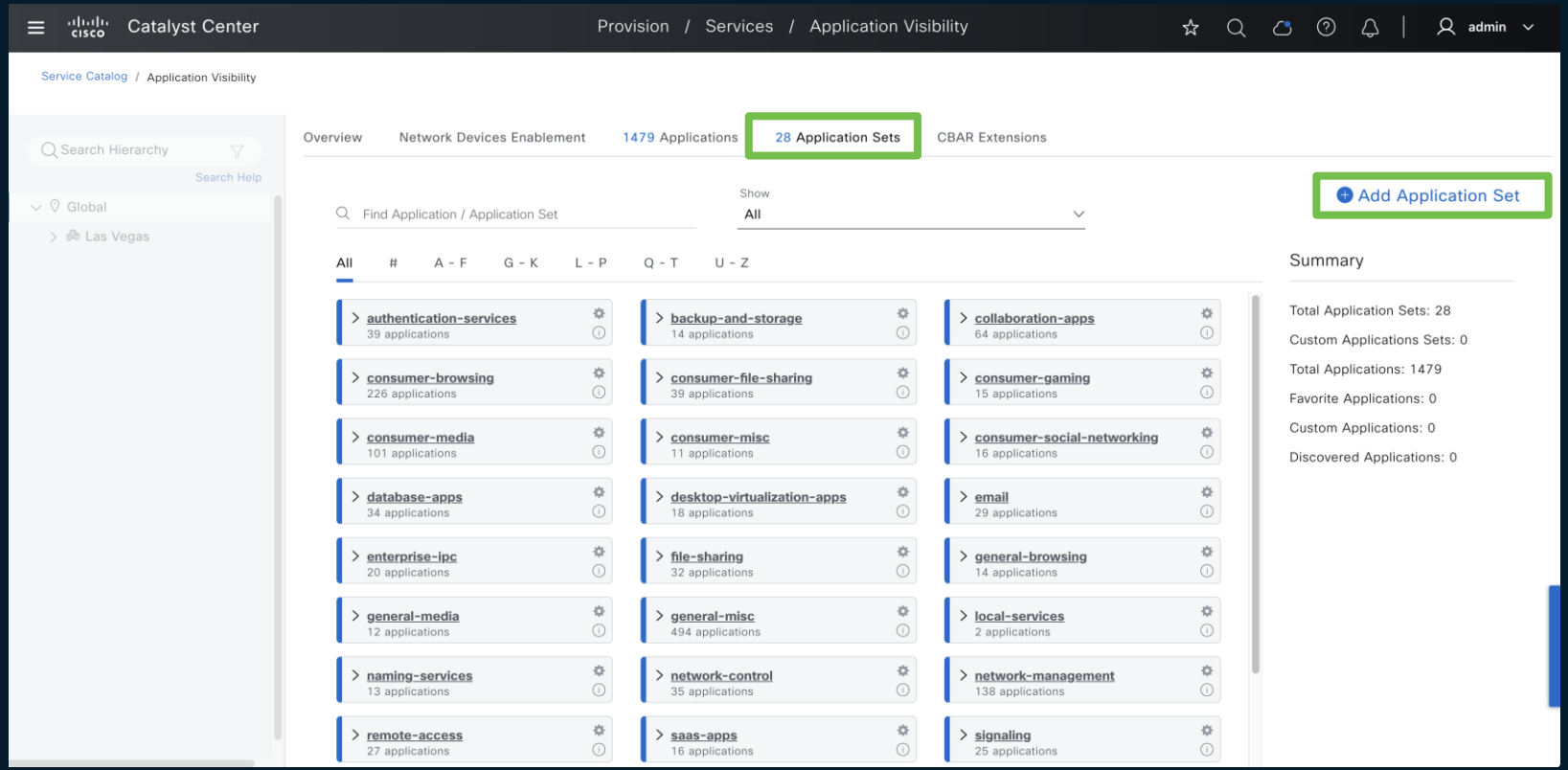
Custom Applications – Add Application Set



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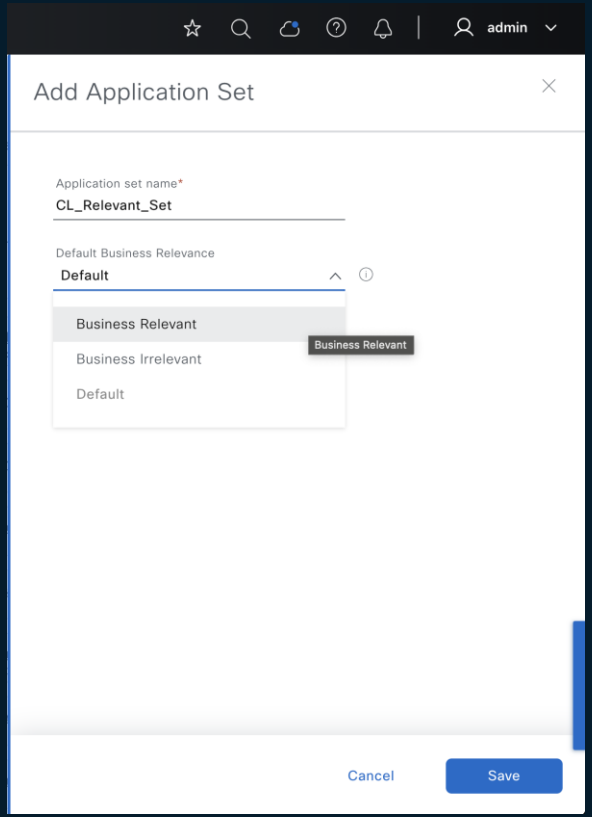

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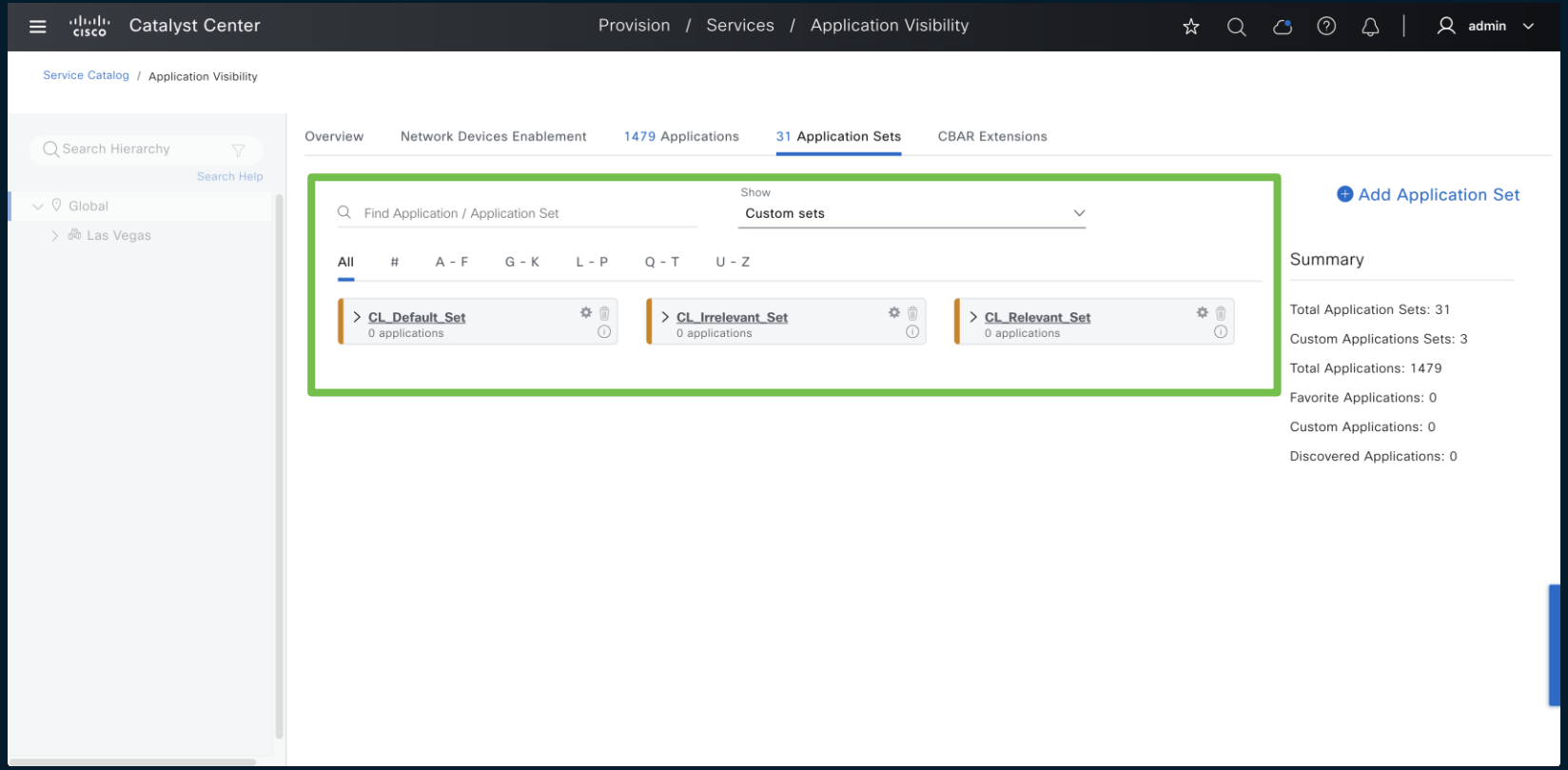

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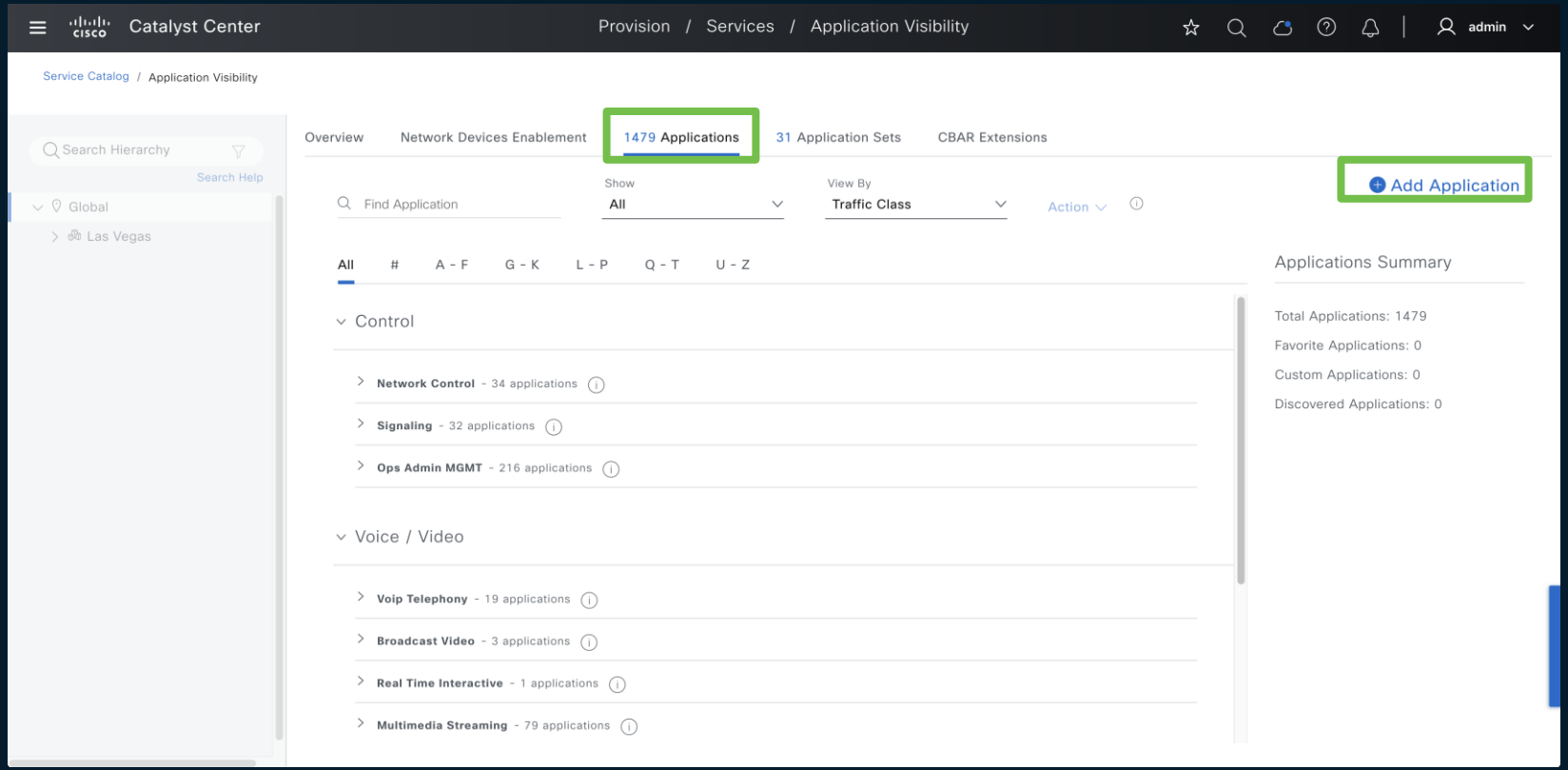
Custom Applications – Add Application



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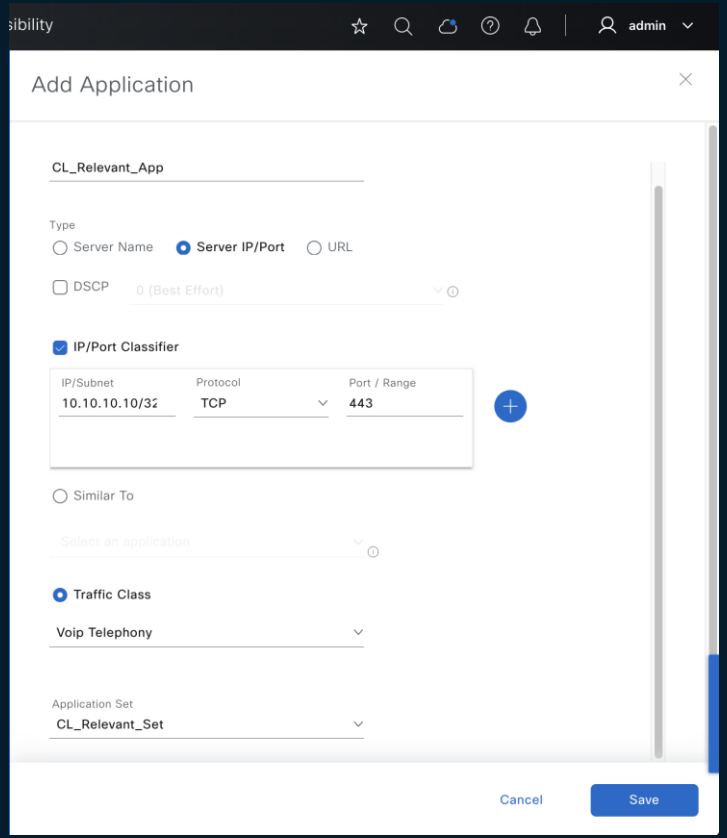

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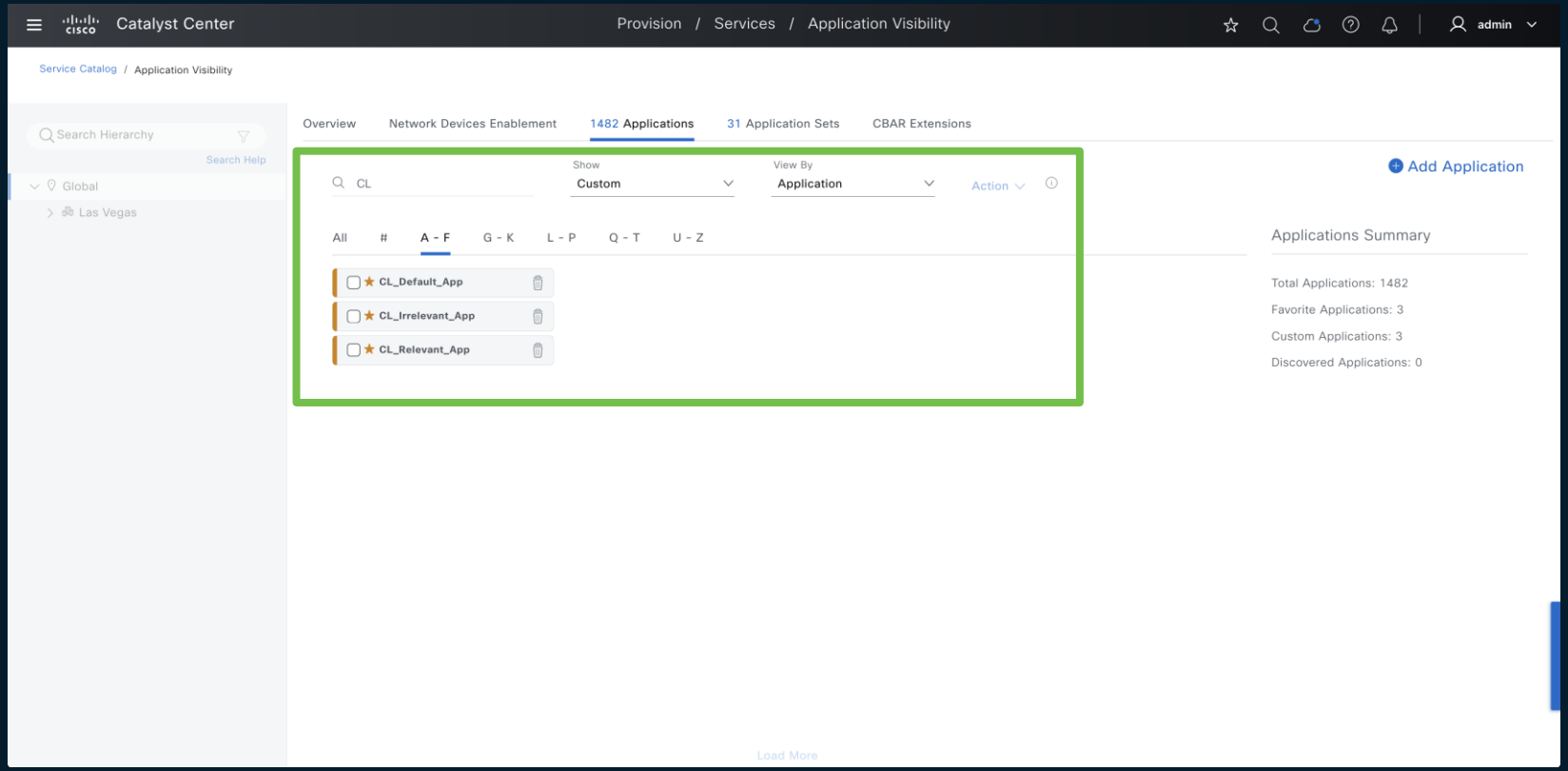
Custom Applications – Add Application



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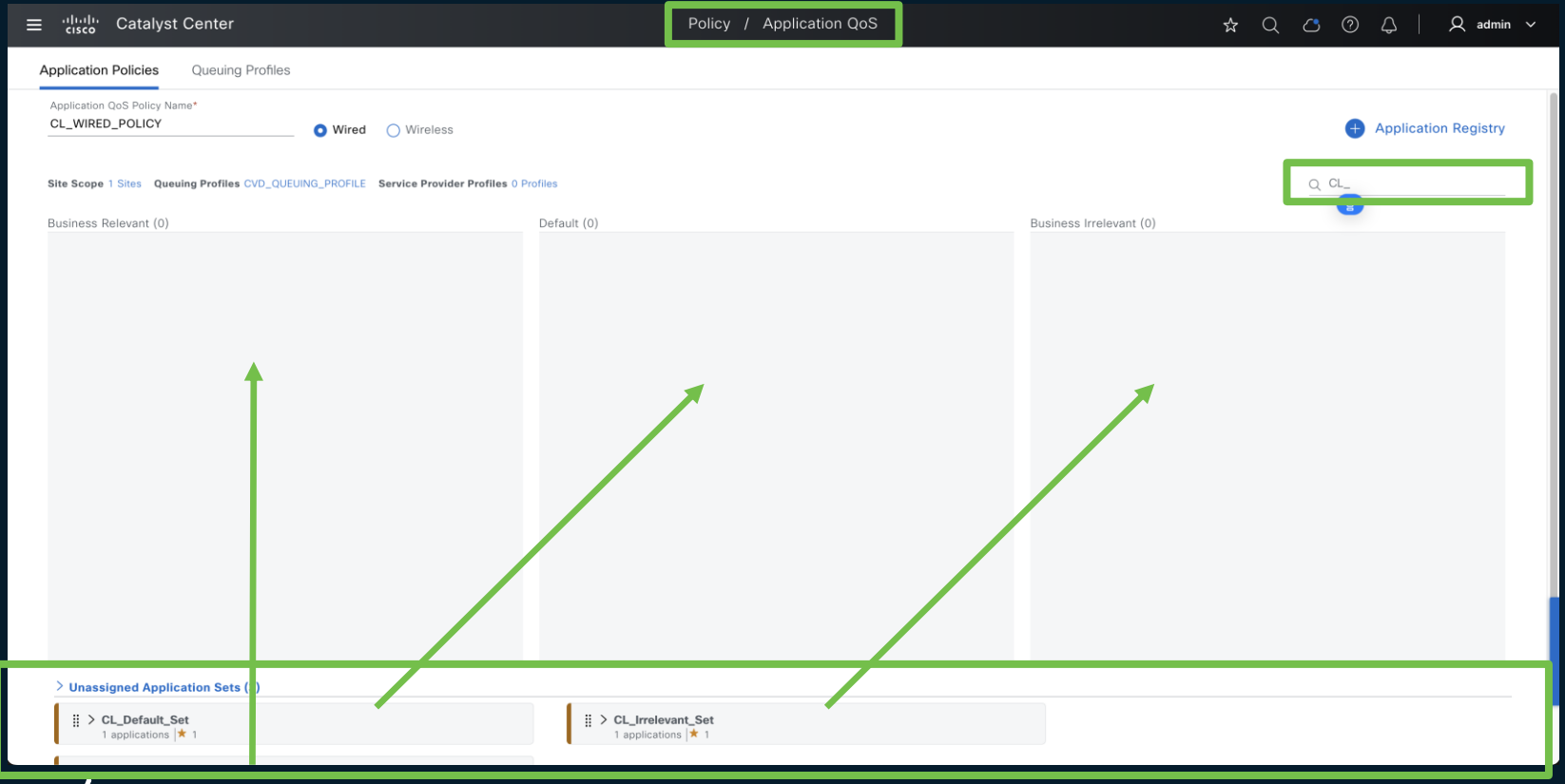
Custom Applications – Add To Policy (Drag and Drop)



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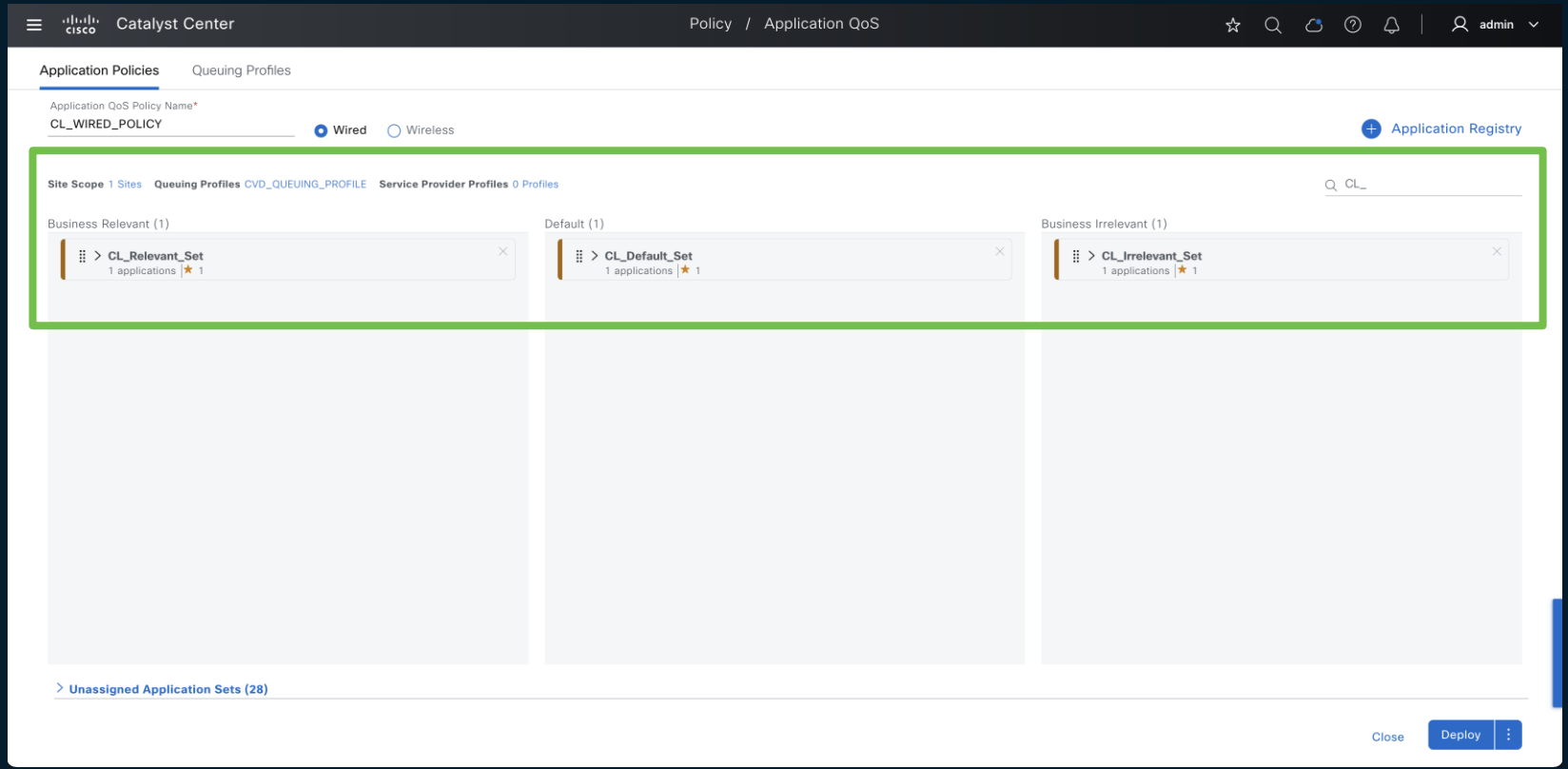
Custom Applications – Add To Policy



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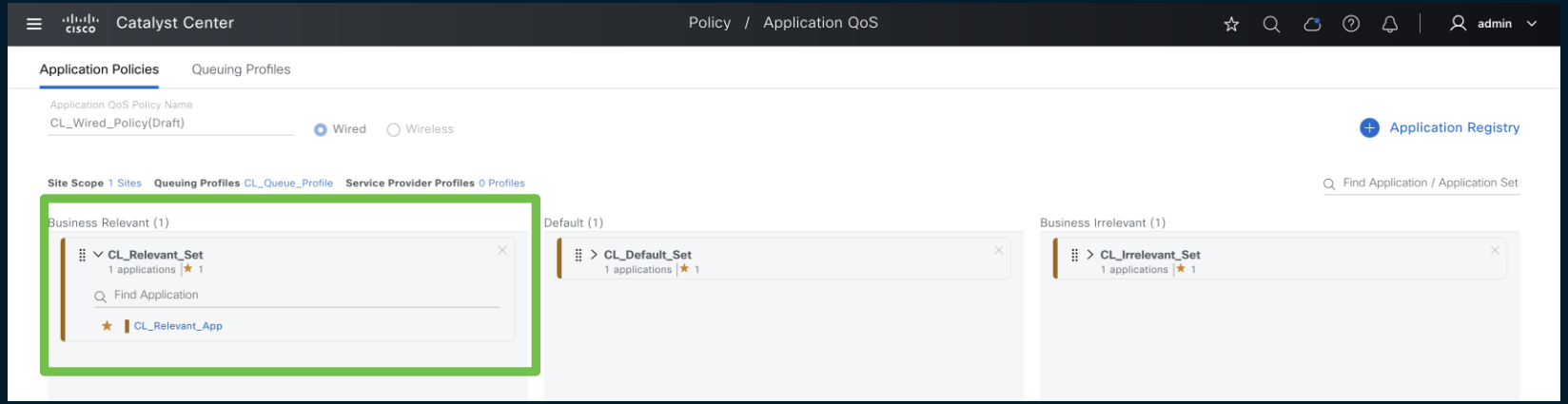
Custom Applications – “Consumer” Settings



Producer = Destination of traffic (think ACL)
Consumer = Source of traffic (think ACL)

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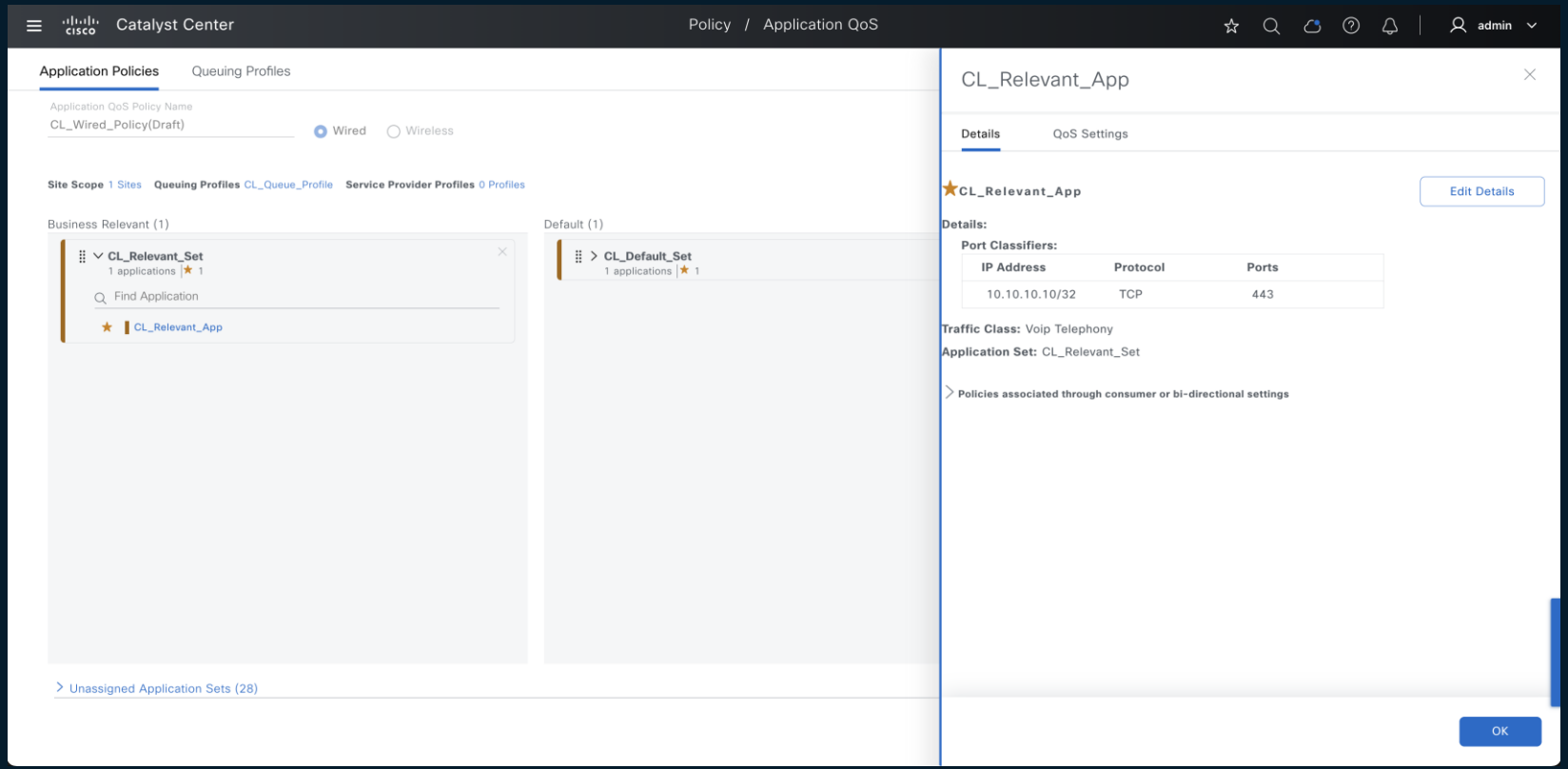
Custom Applications – “Consumer” Settings



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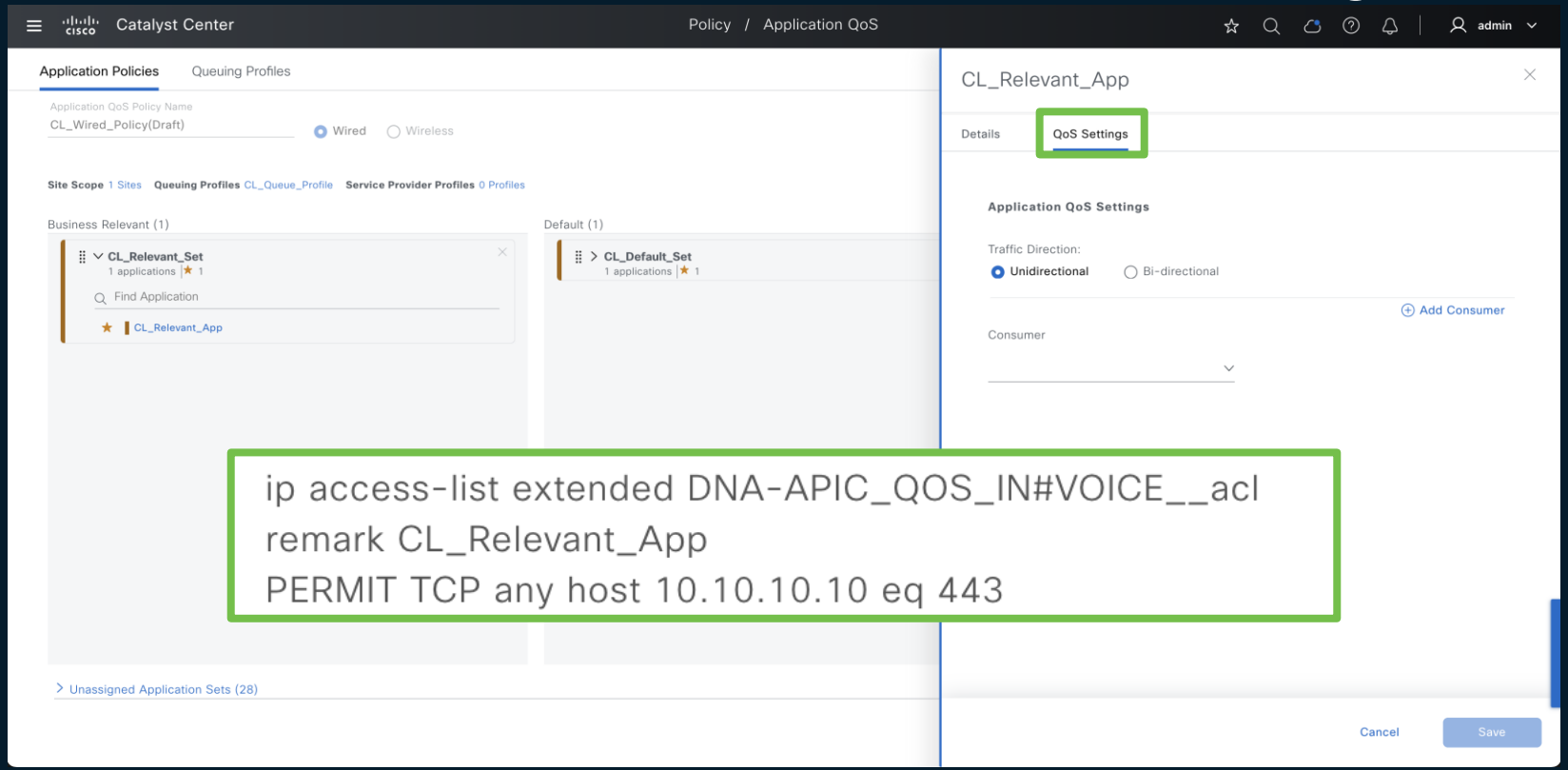
Custom Applications – “Consumer” Settings



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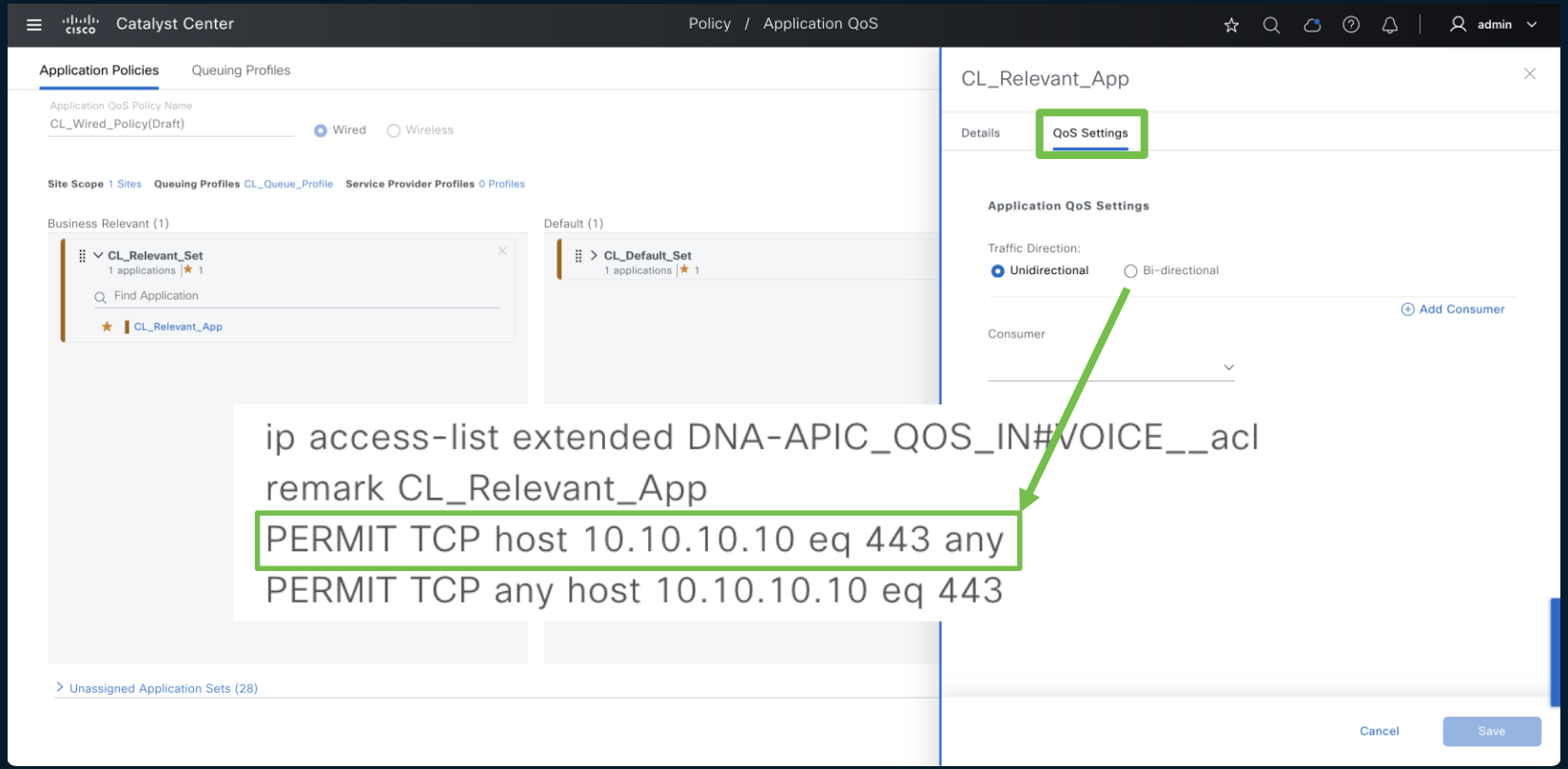
Custom Applications – “Consumer” Settings



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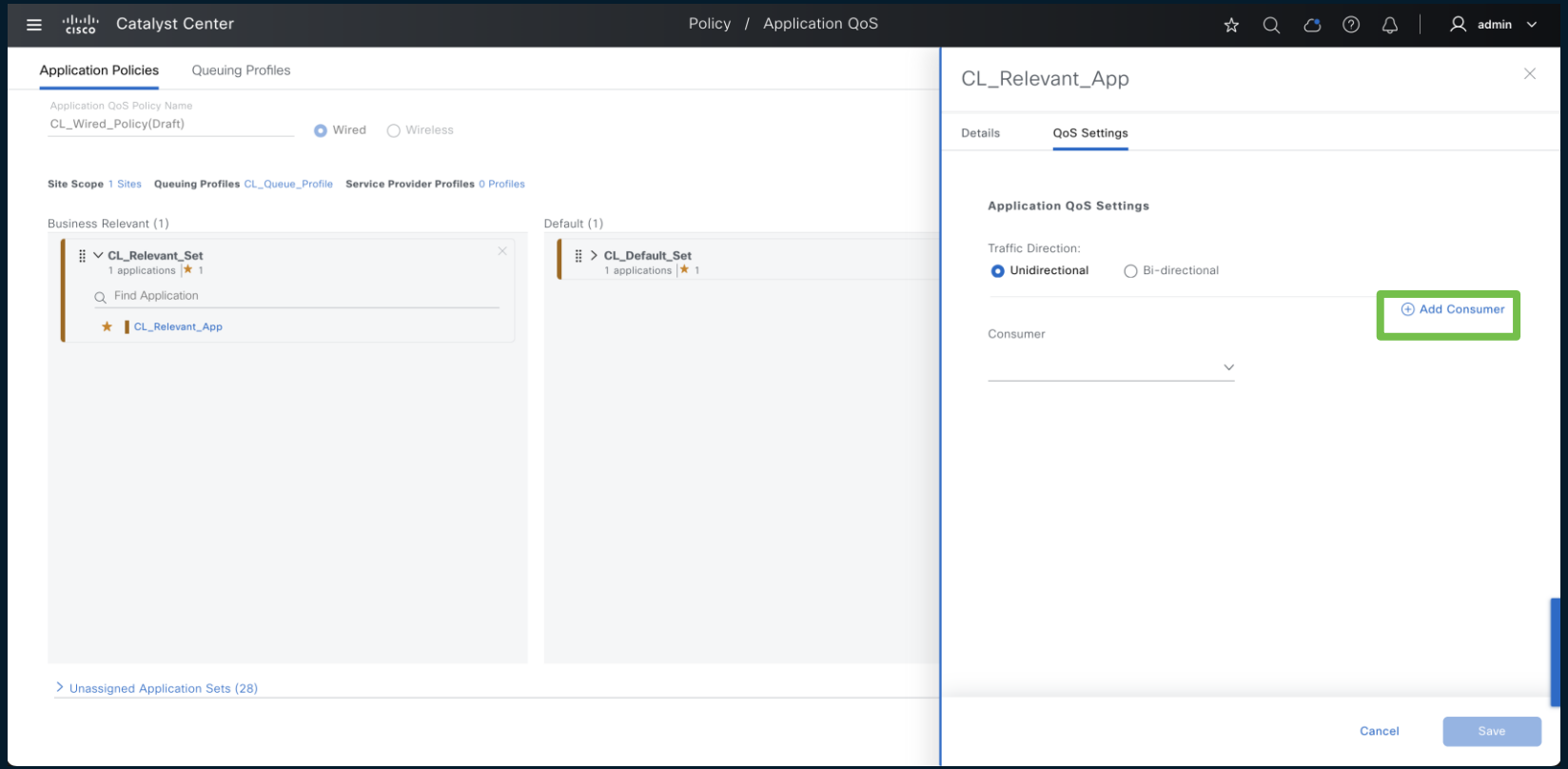
Custom Applications – “Consumer” Settings



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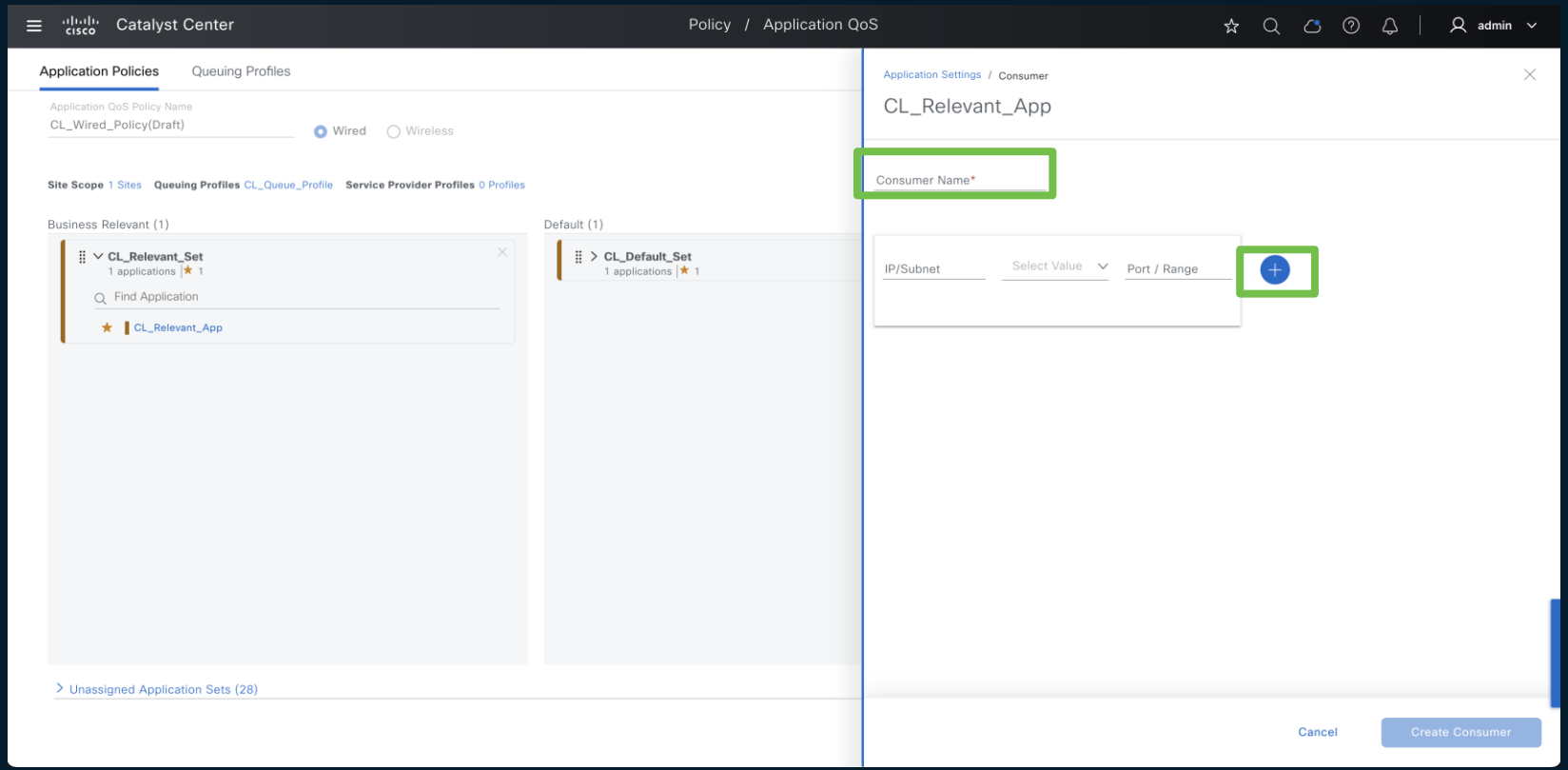
Custom Applications – “Consumer” Settings



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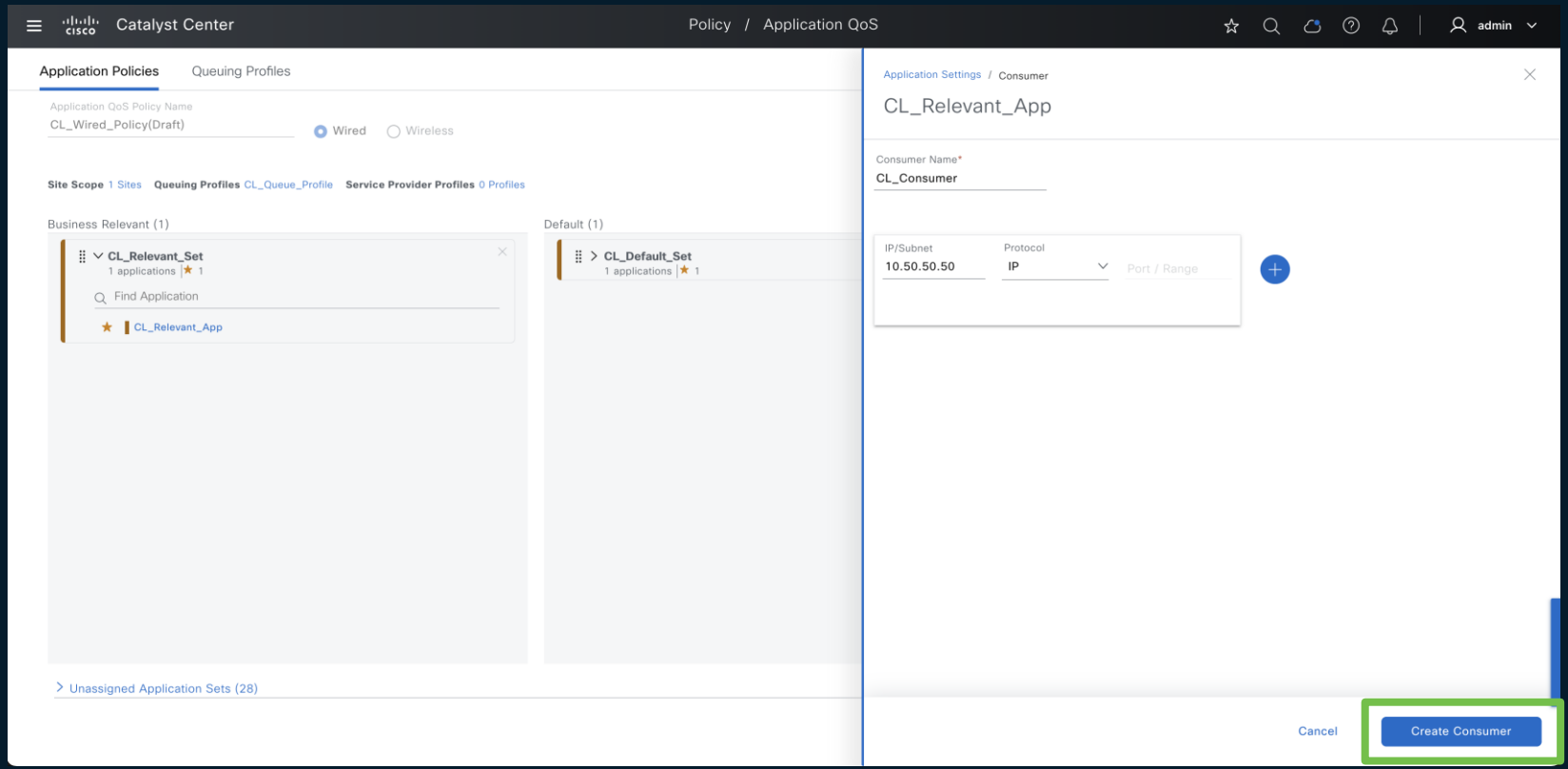
Custom Applications – “Consumer” Settings



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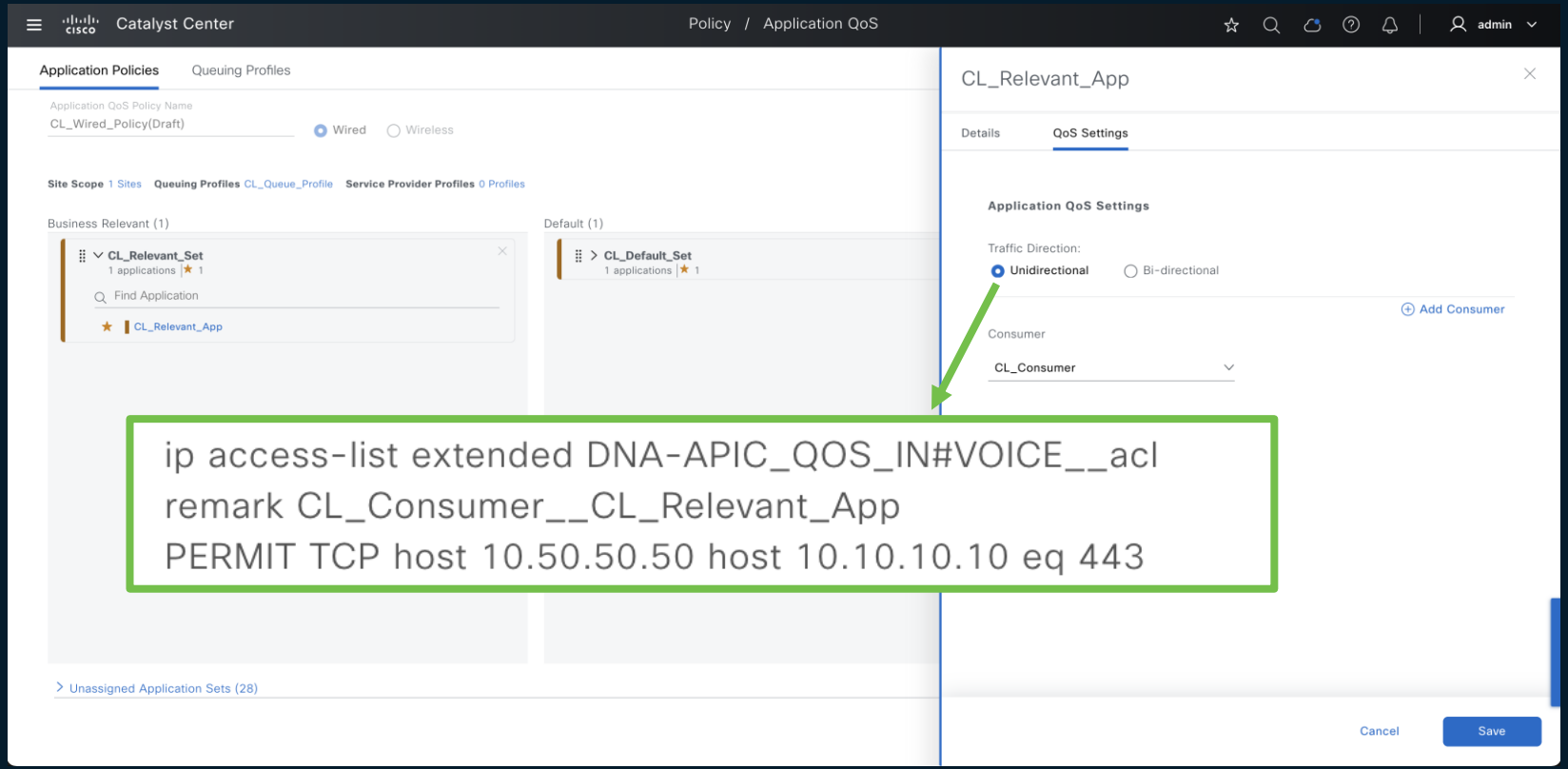
Custom Applications – “Consumer” Settings



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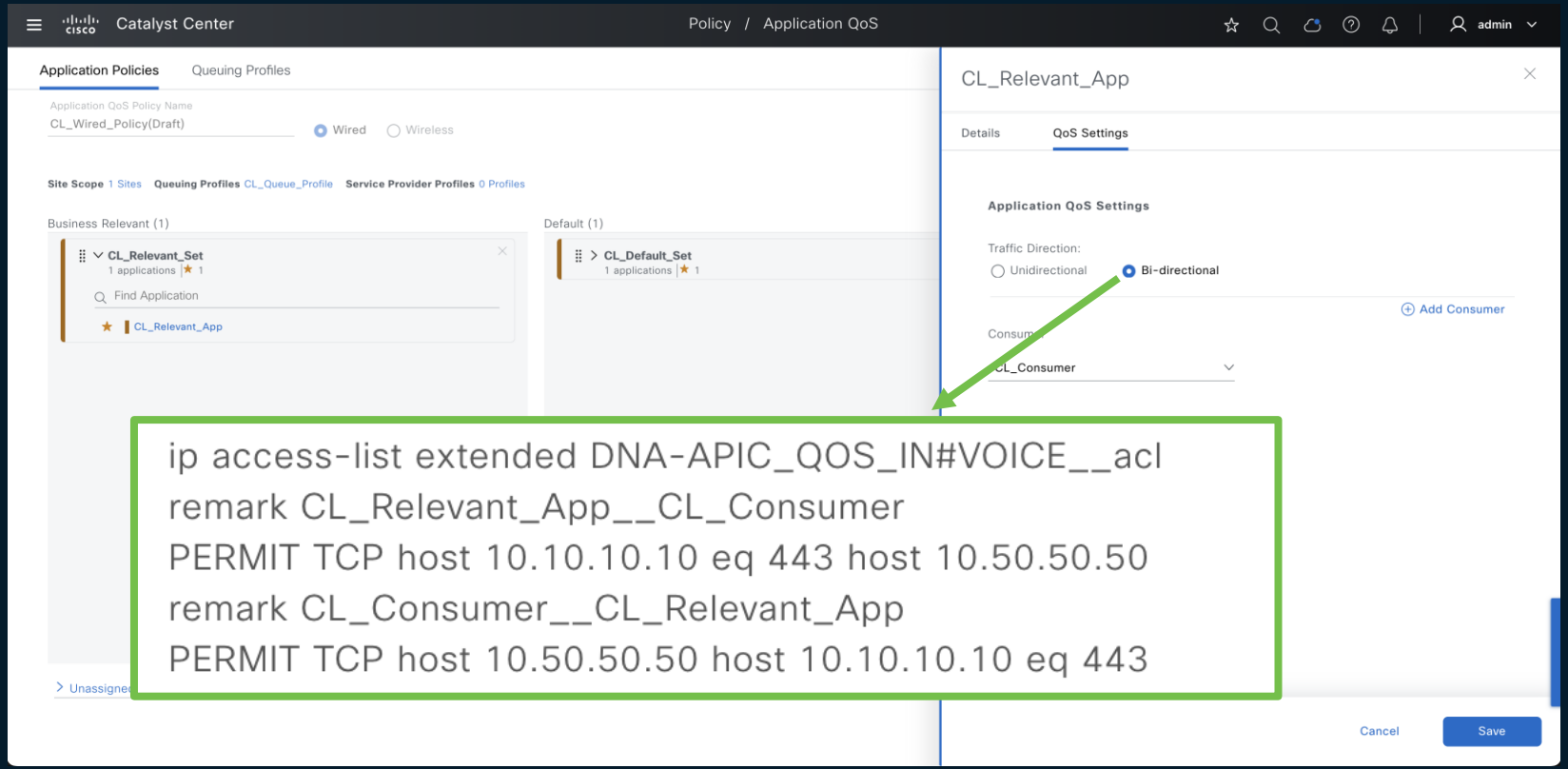
Custom Applications – “Consumer” Settings



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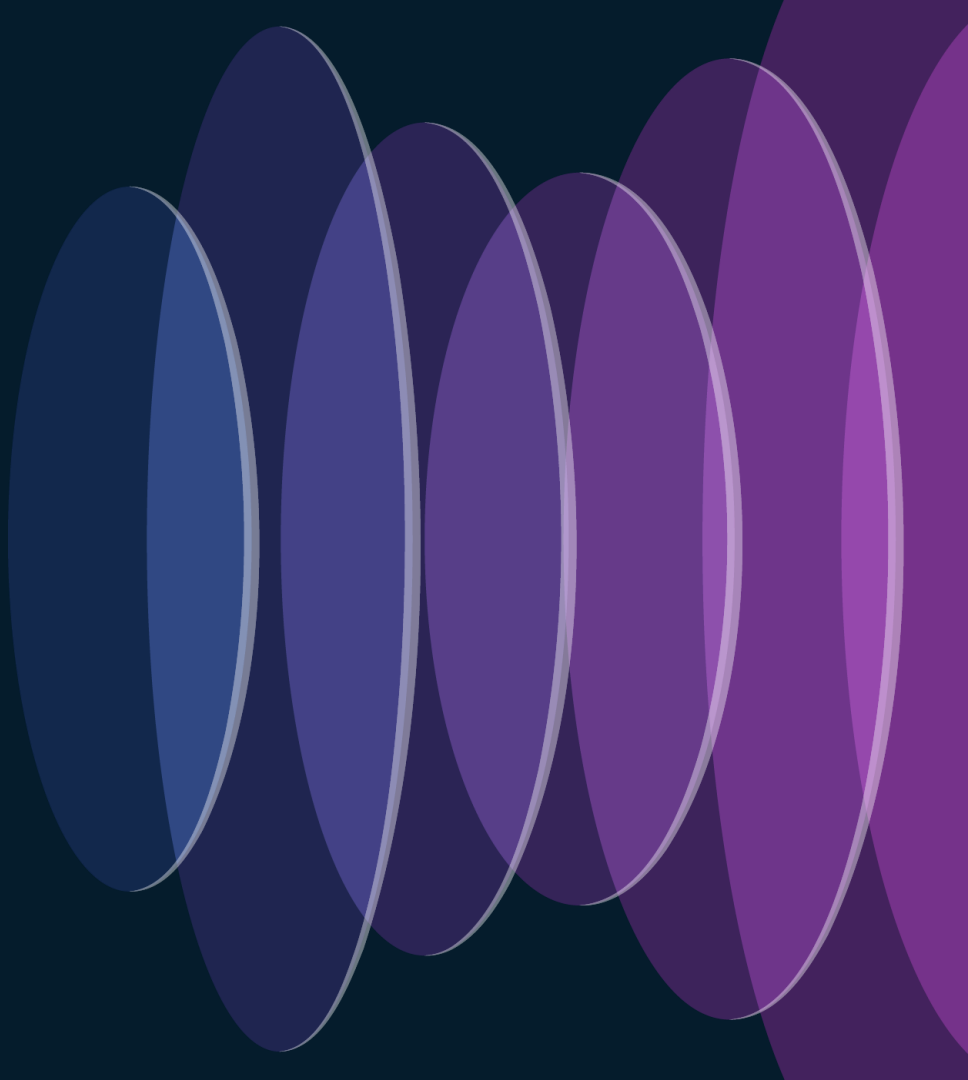
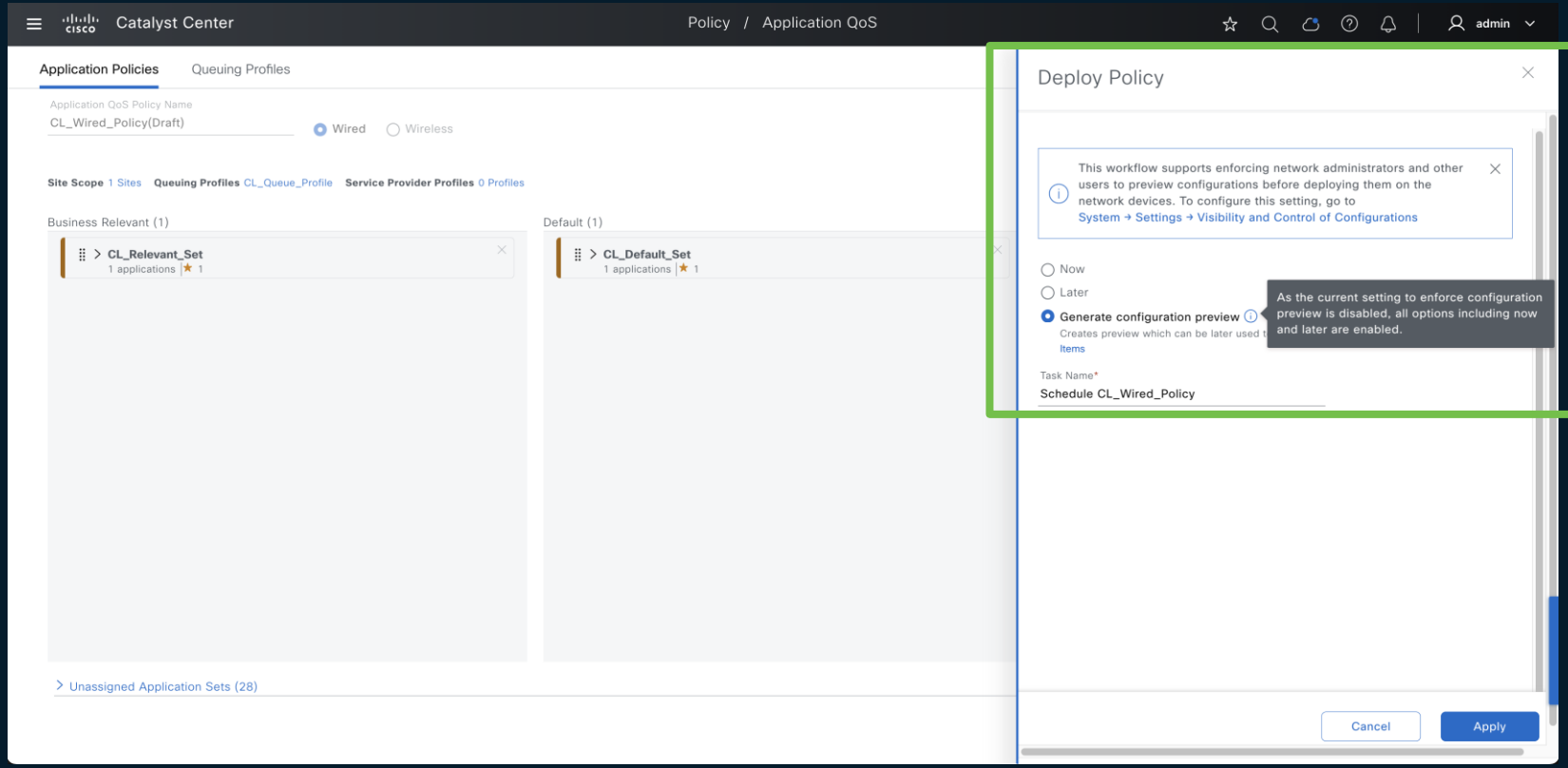
Deploying the Policy



Deploying Policy – Scheduling



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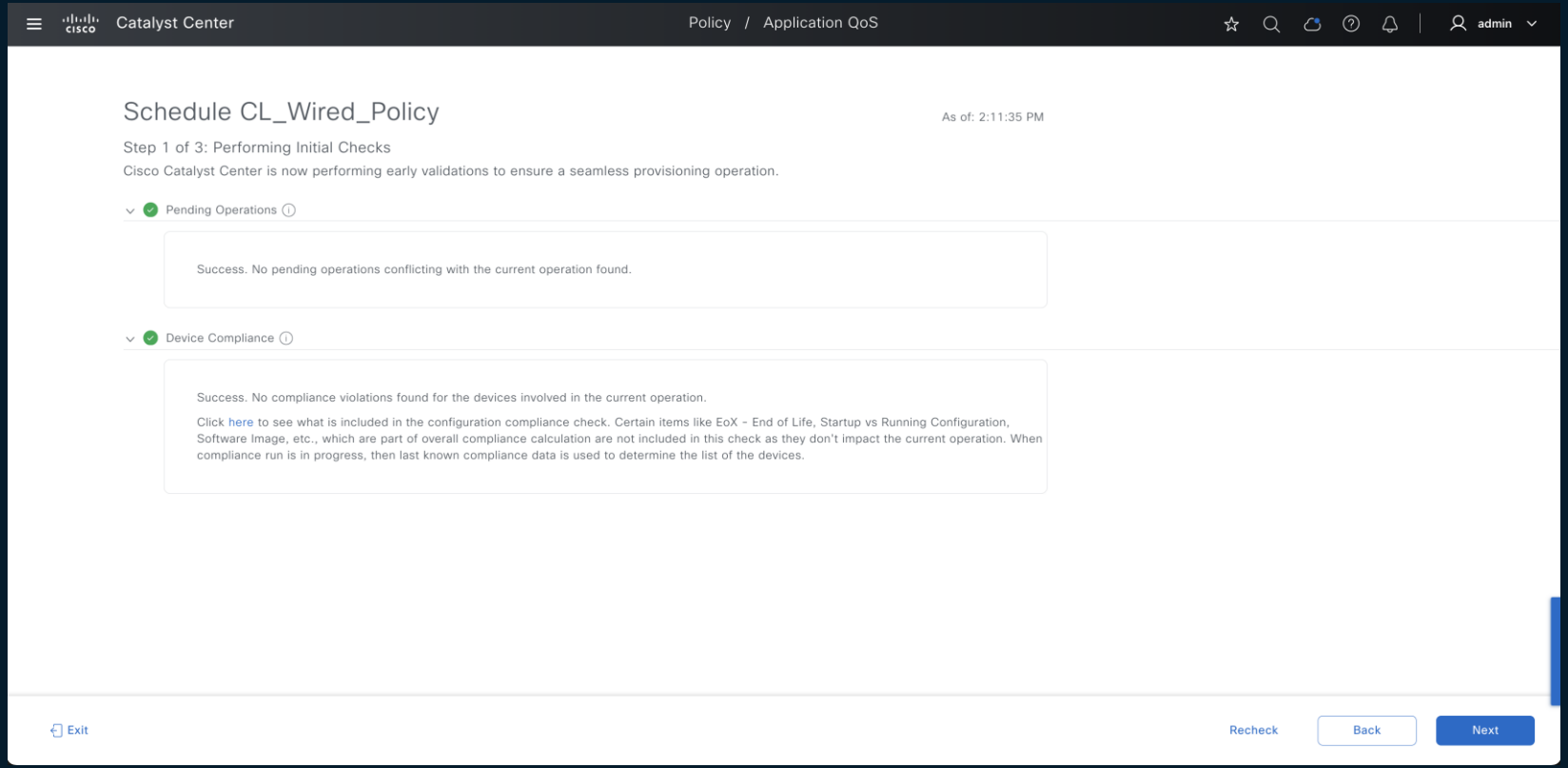
Deploying Policy – Scheduling



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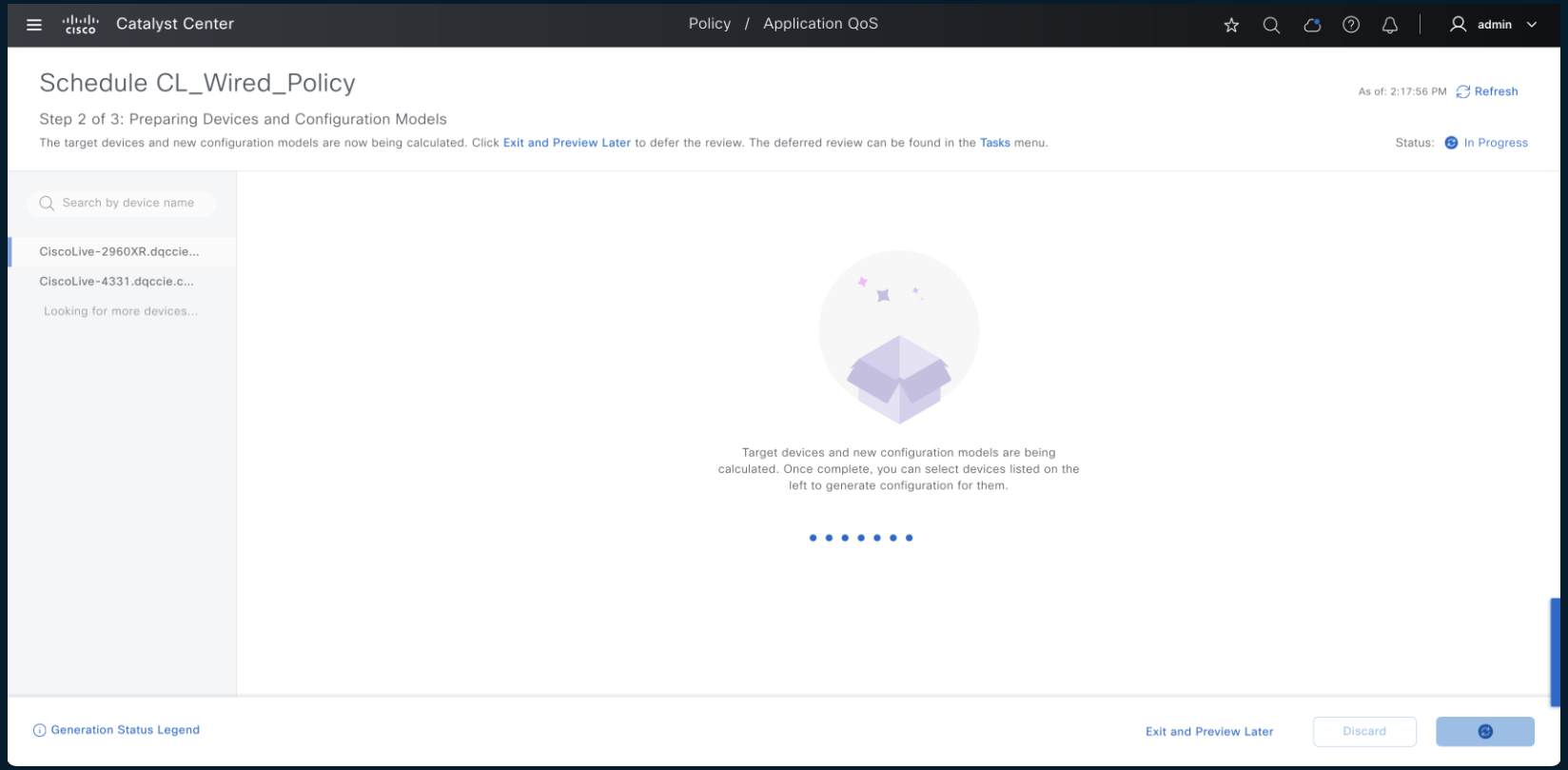
Deploying Policy – Scheduling



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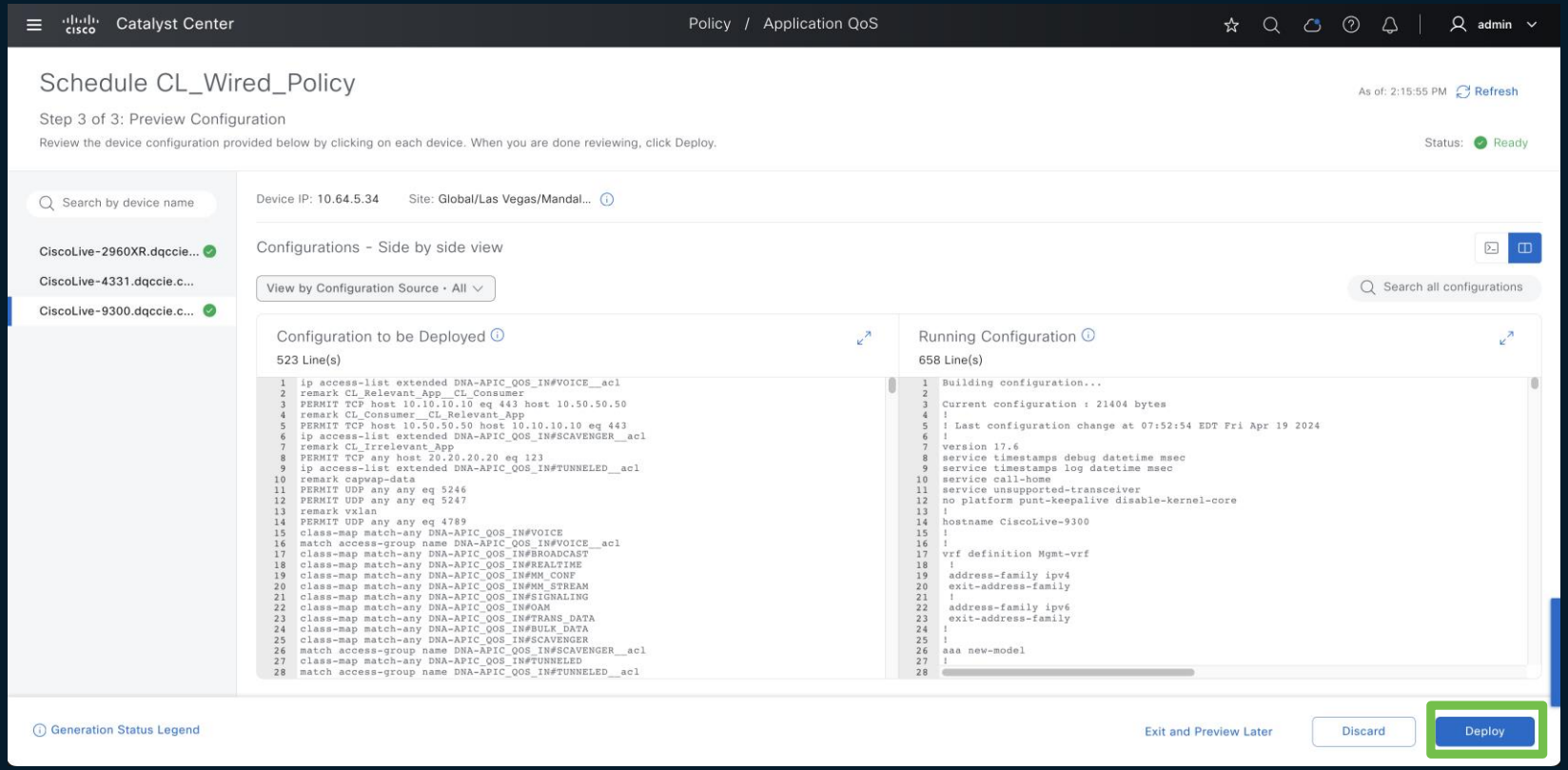
Deploying Policy – Preview Configs



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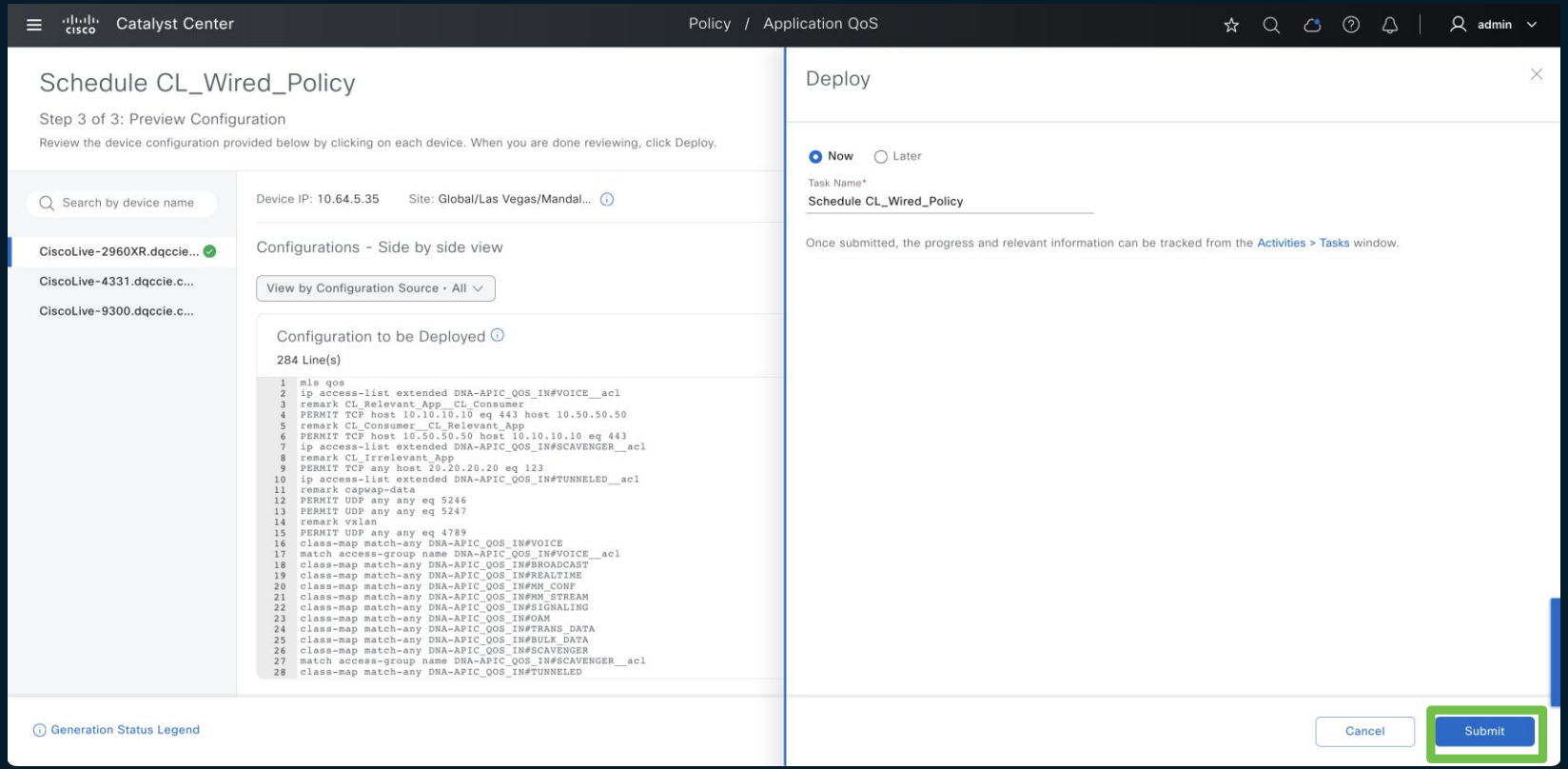
Deploying Policy – Deployment



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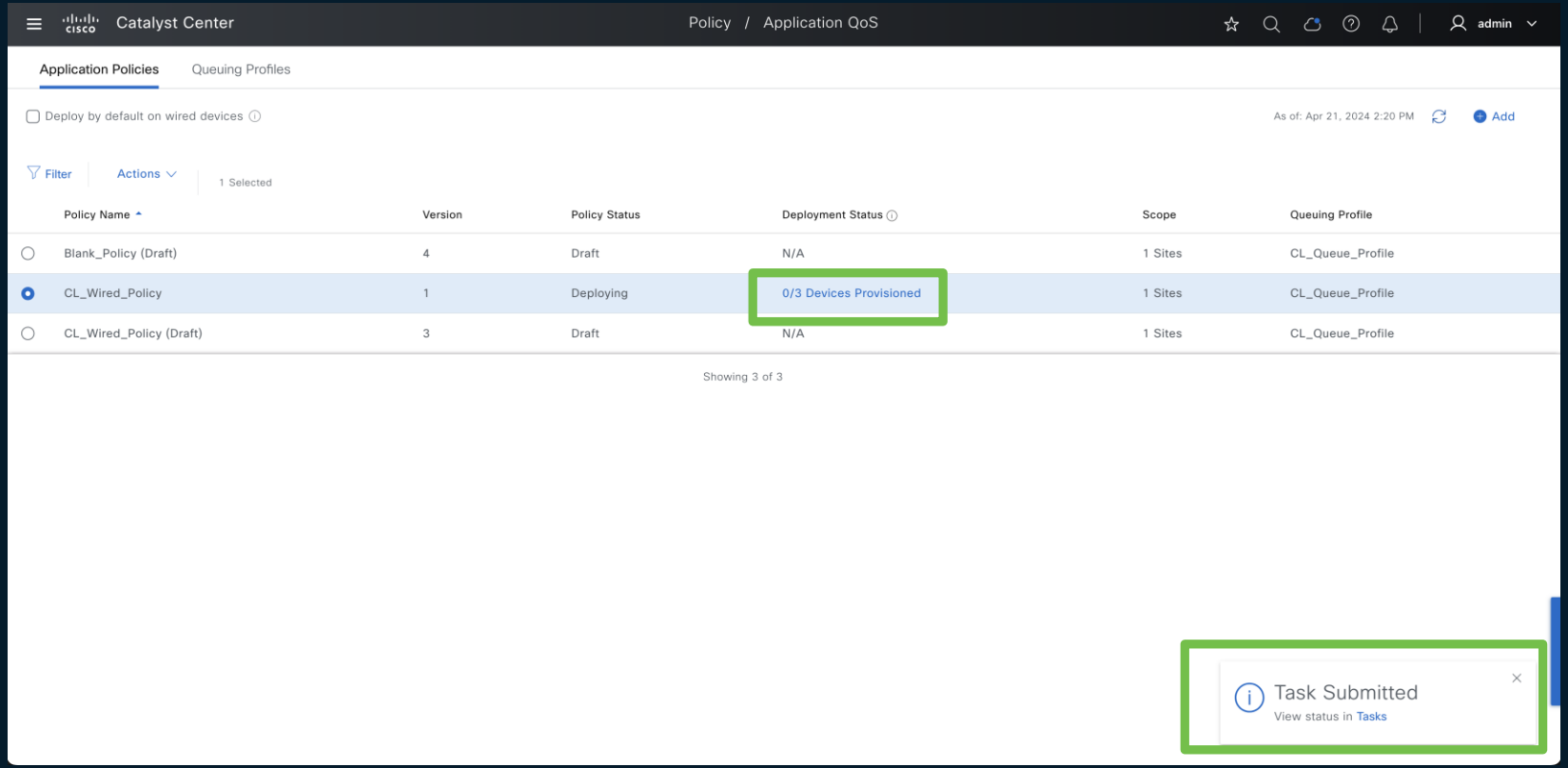
Deploying Policy – Deployment



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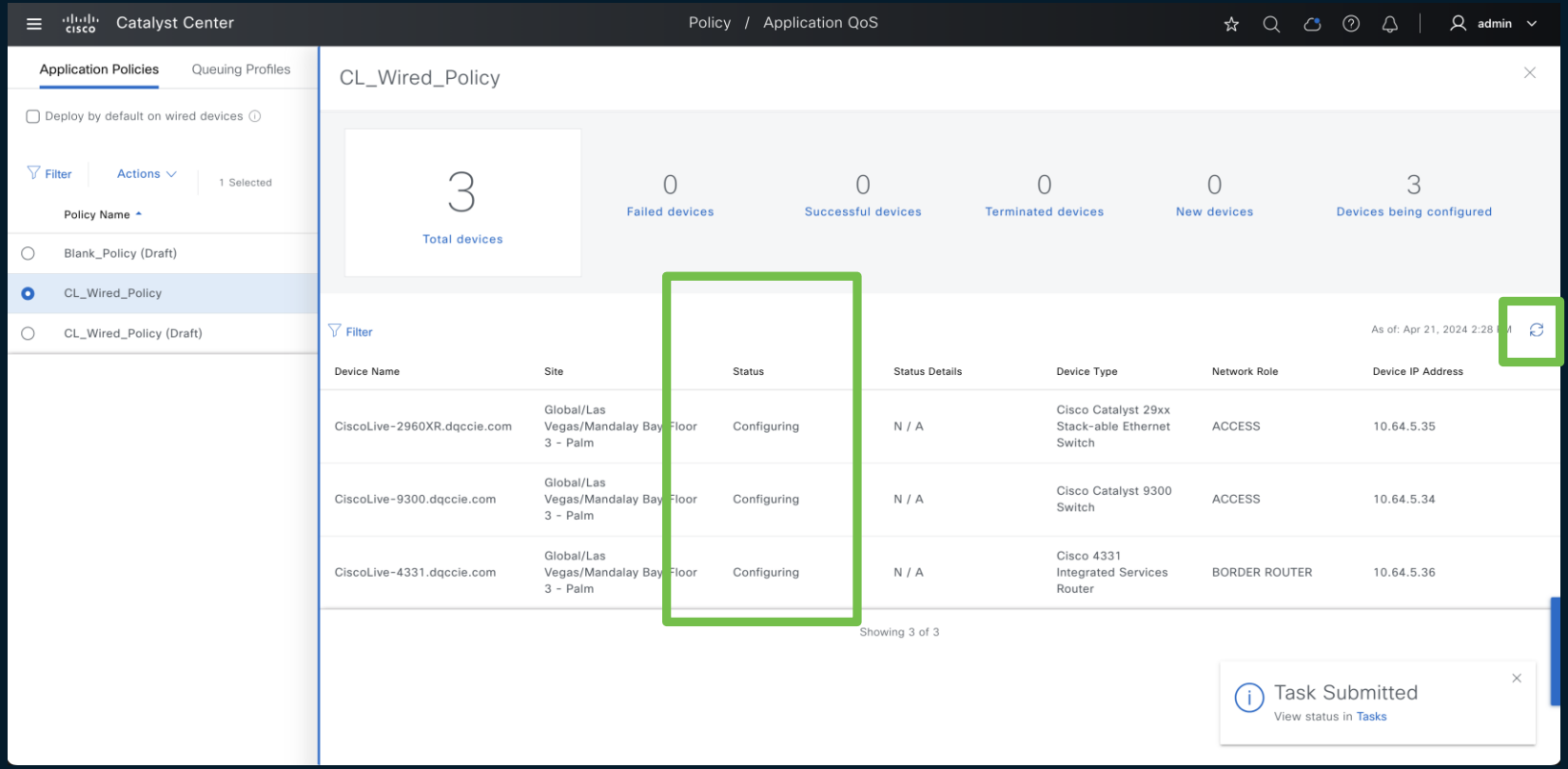
Deploying Policy – Deployment



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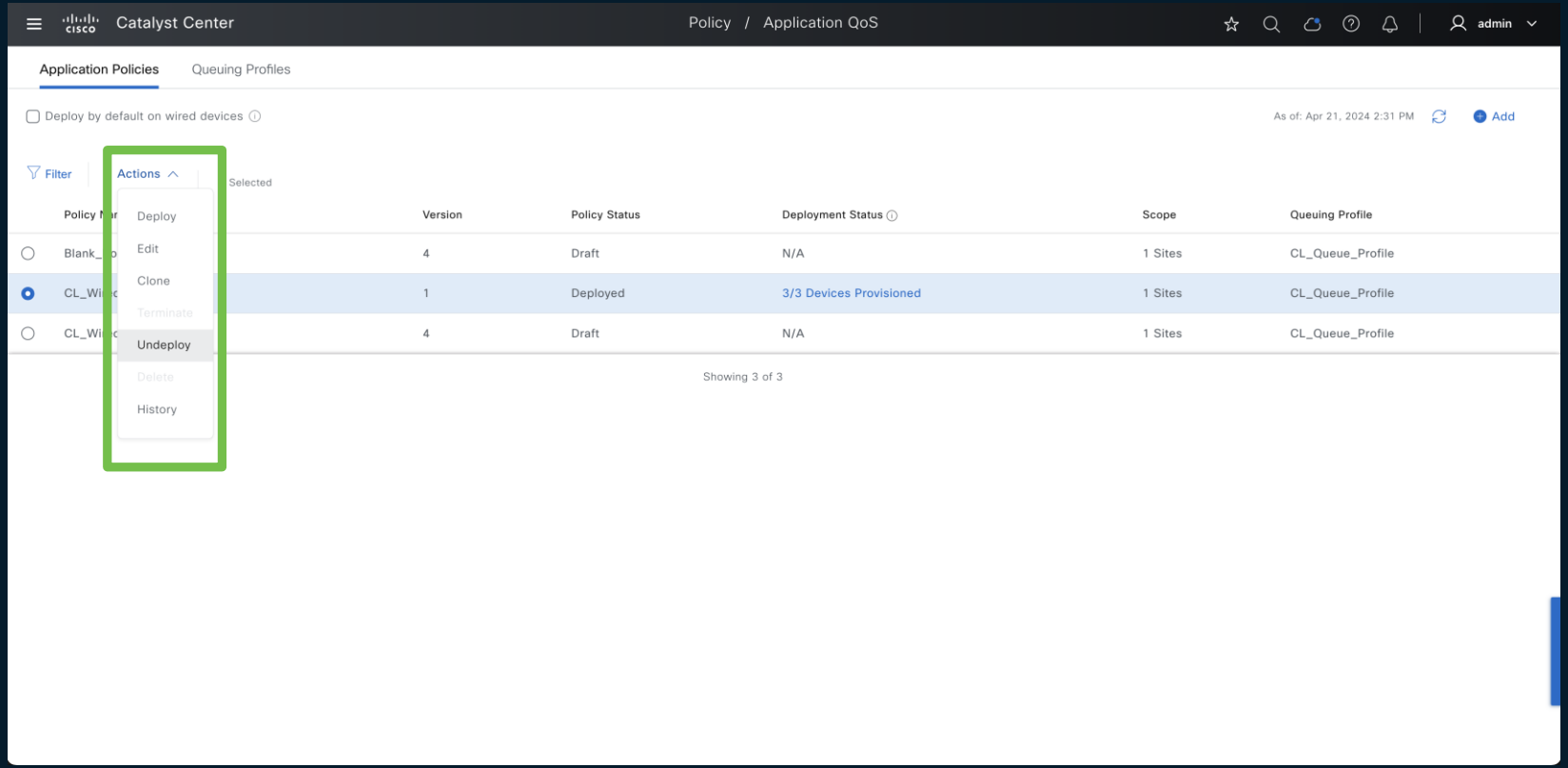
Deploying Policy – Undeploy



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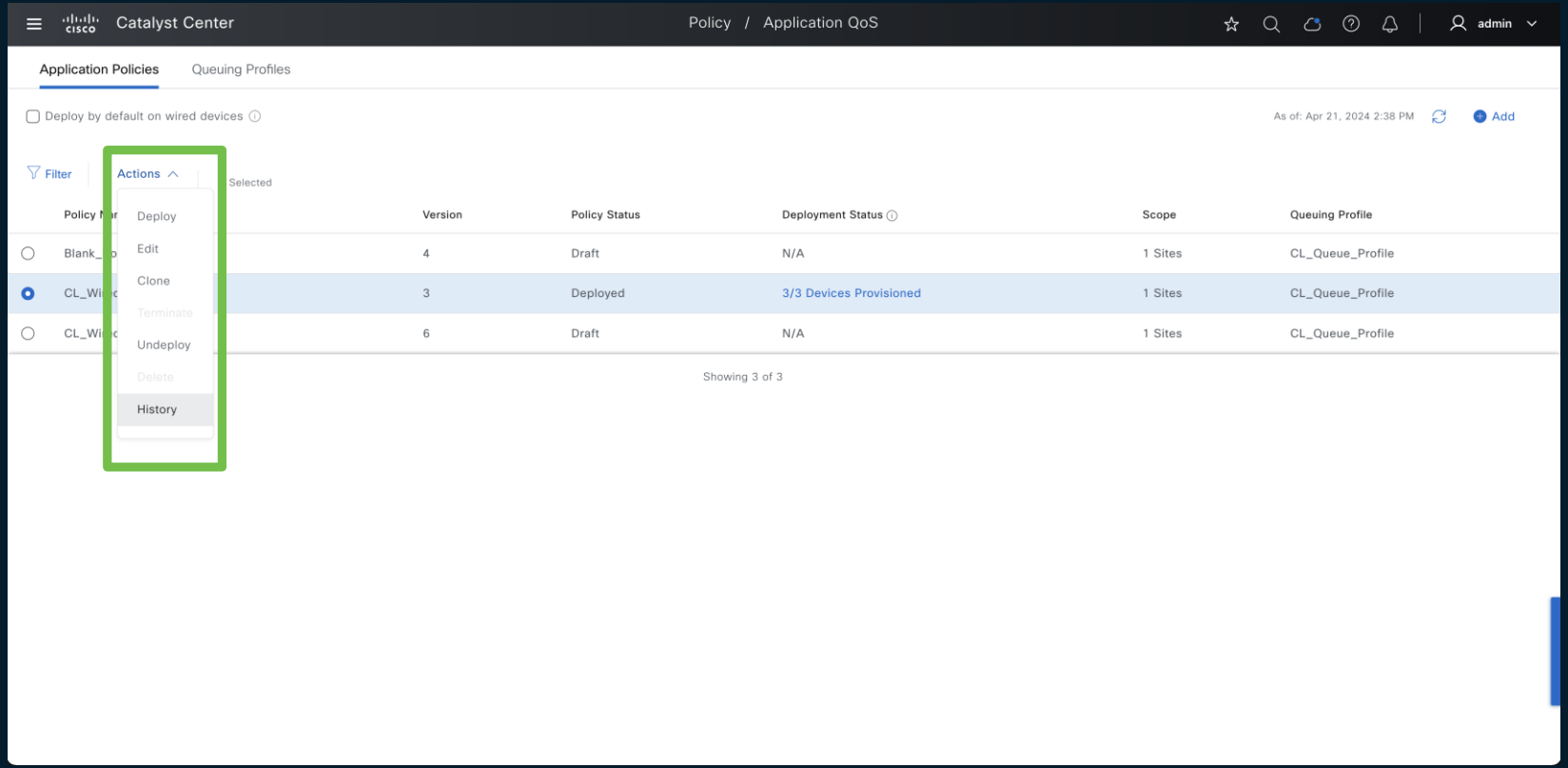
Deploying Policy – History



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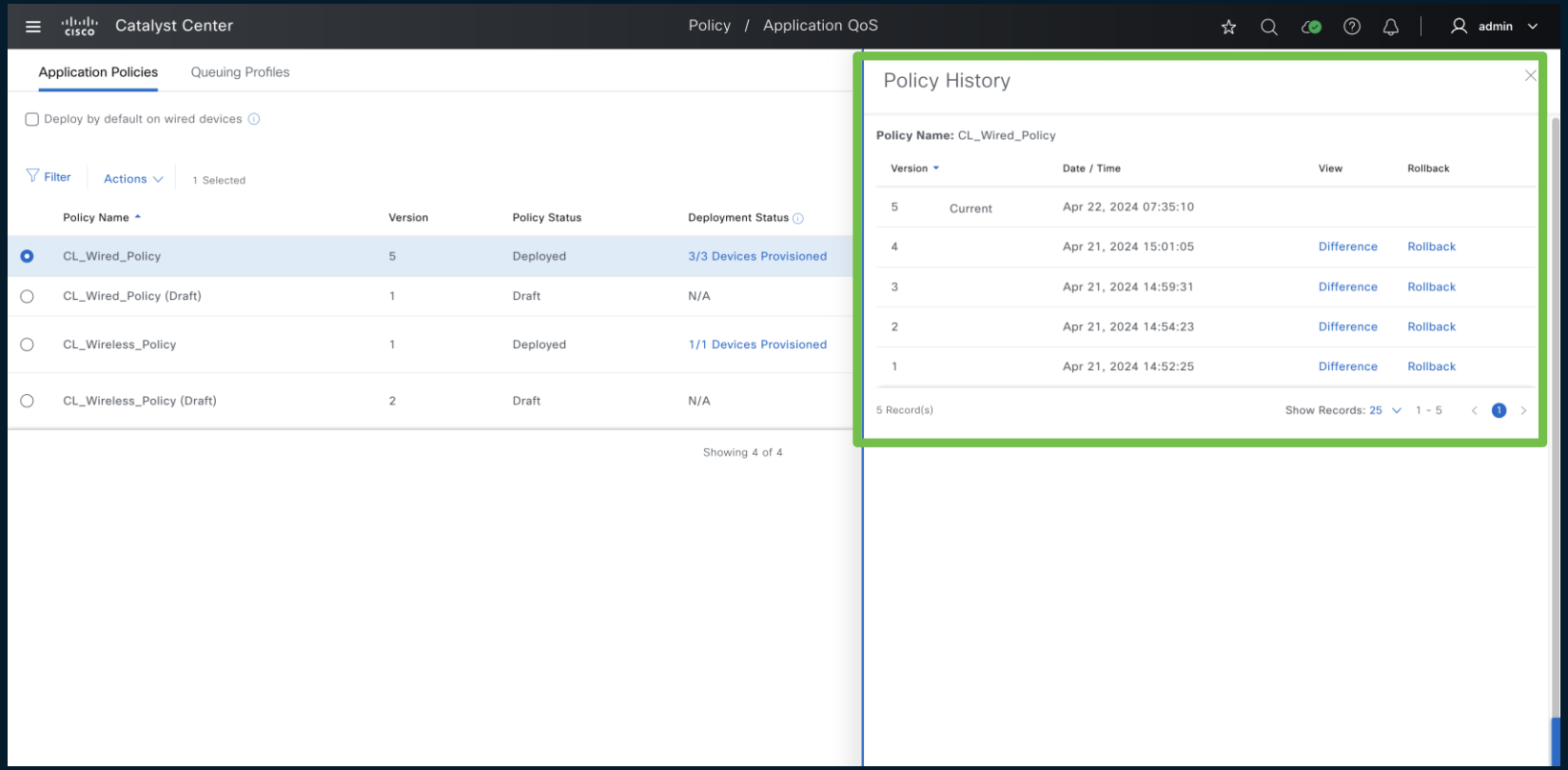
Deploying Policy – History



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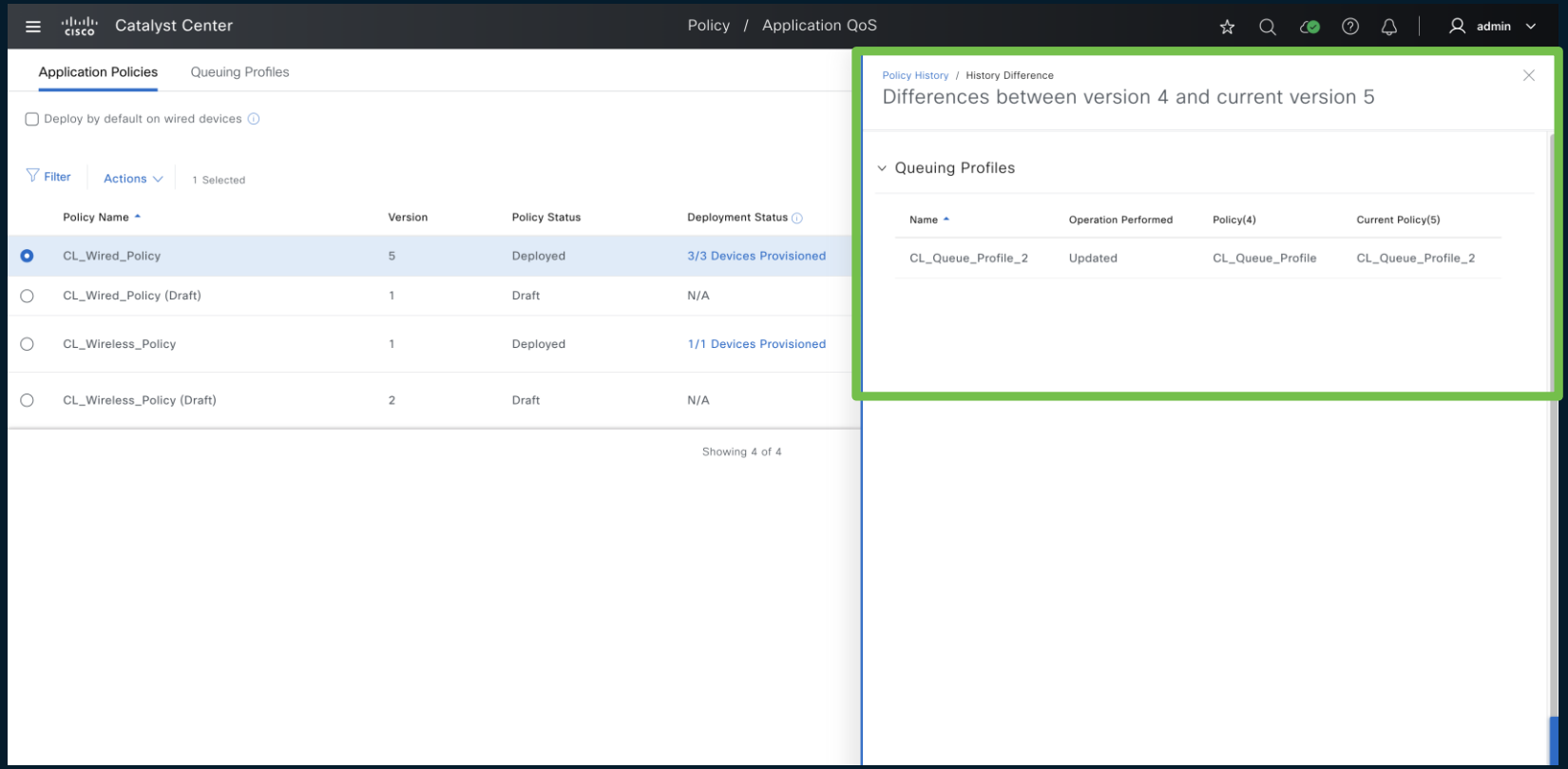
Deploying Policy – History



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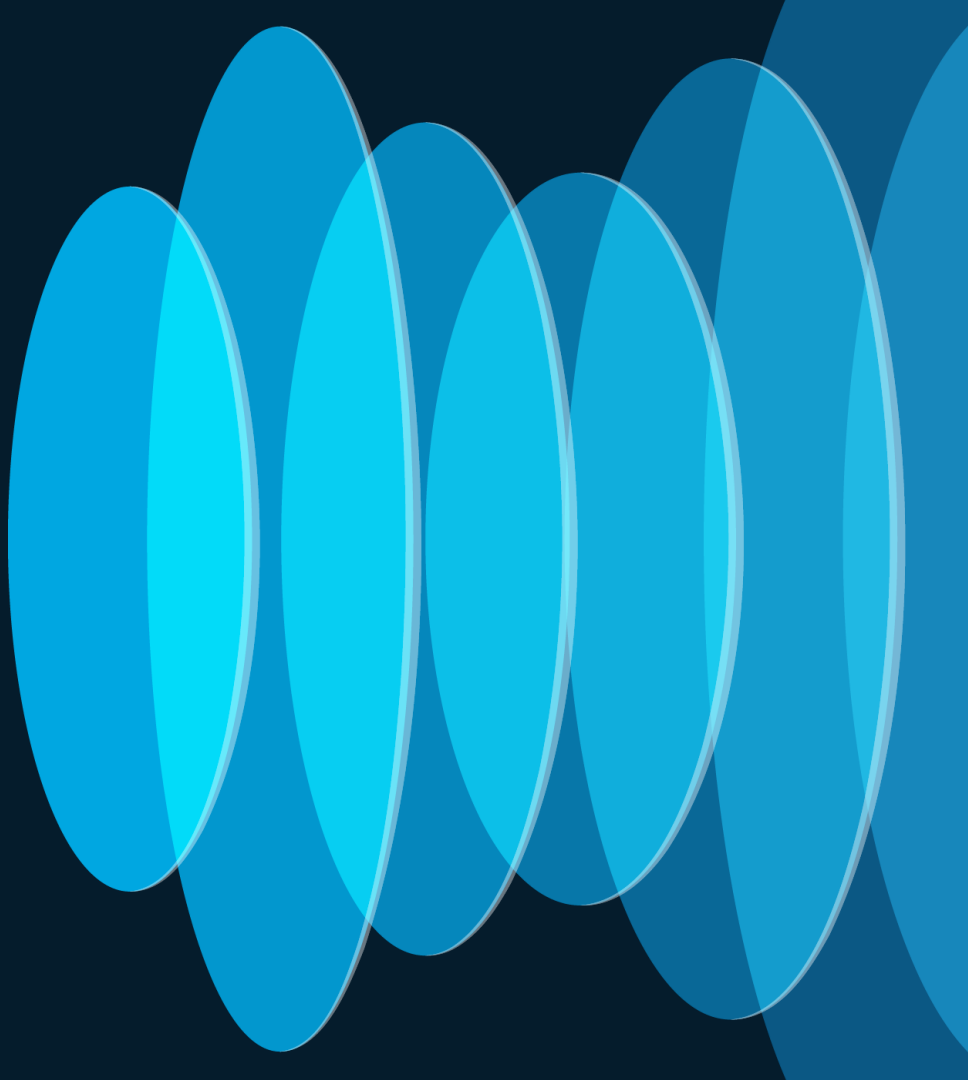
Maintaining the Policy



Maintaining the Policy – Policy Drift

```
CiscoLive-9300#
CiscoLive-9300#
CiscoLive-9300#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
CiscoLive-9300(config)#ip access-list extended DNA-APIC_QOS_IN#VOICE__acl
CiscoLive-9300(config-ext-nacl)#no PERMIT TCP host 10.50.50.50 host 10.10.10.10 eq 443
CiscoLive-9300(config-ext-nacl)#exit
CiscoLive-9300(config)#exit
CiscoLive-9300#wr
Building configuration...
[OK]
CiscoLive-9300#
```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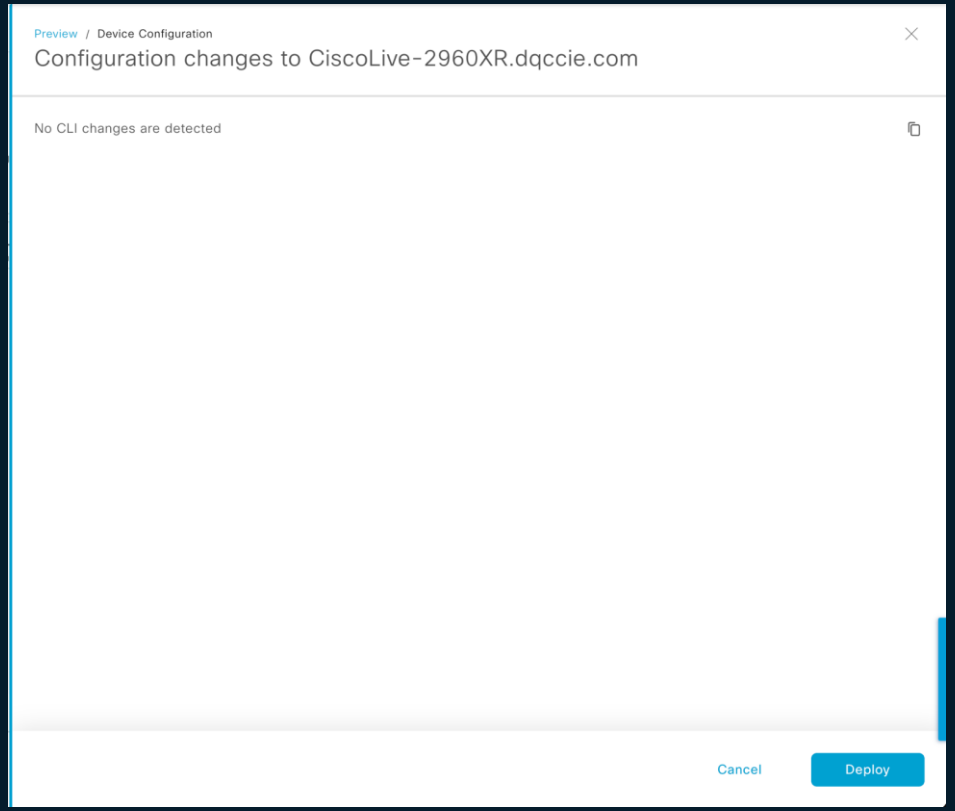
Maintaining the Policy – Policy Drift



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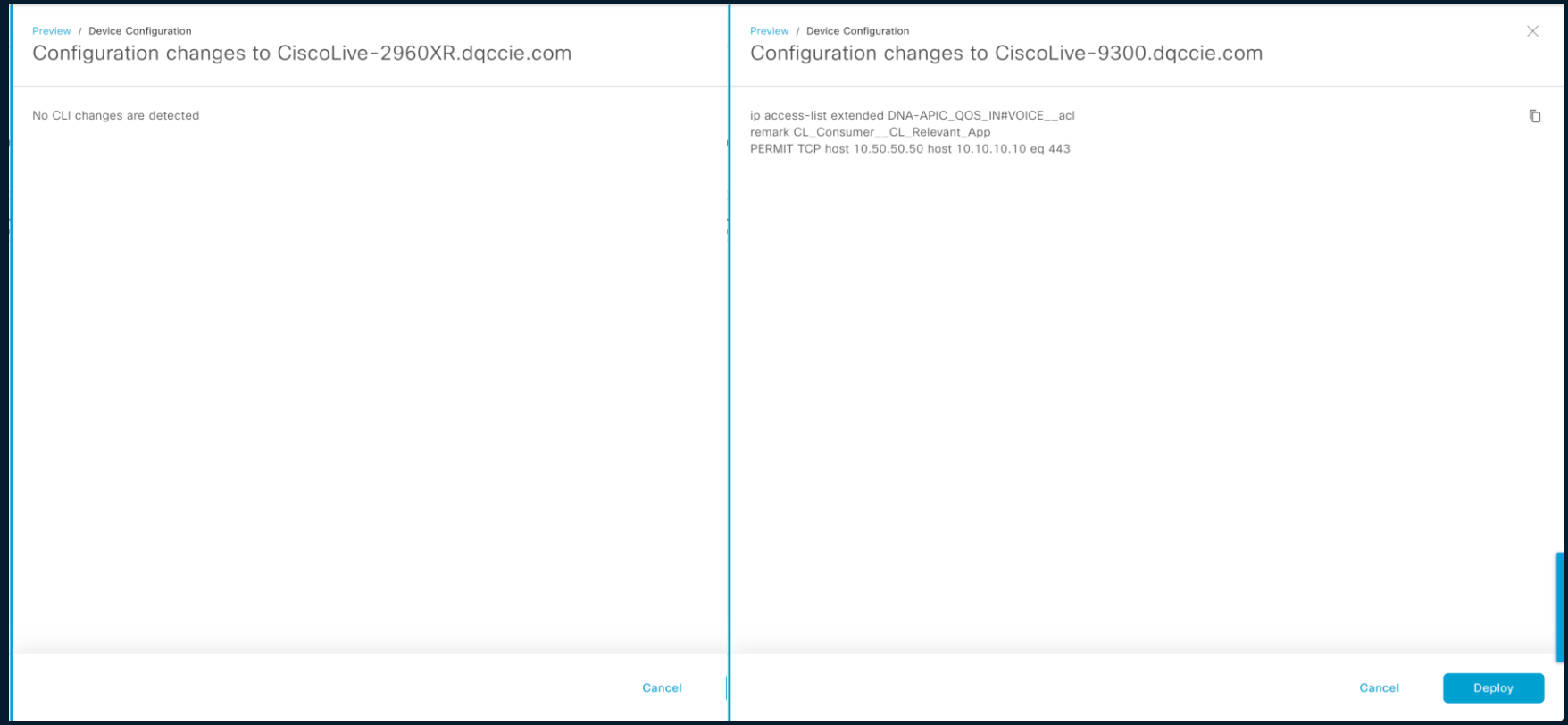
Maintaining the Policy – Policy Drift



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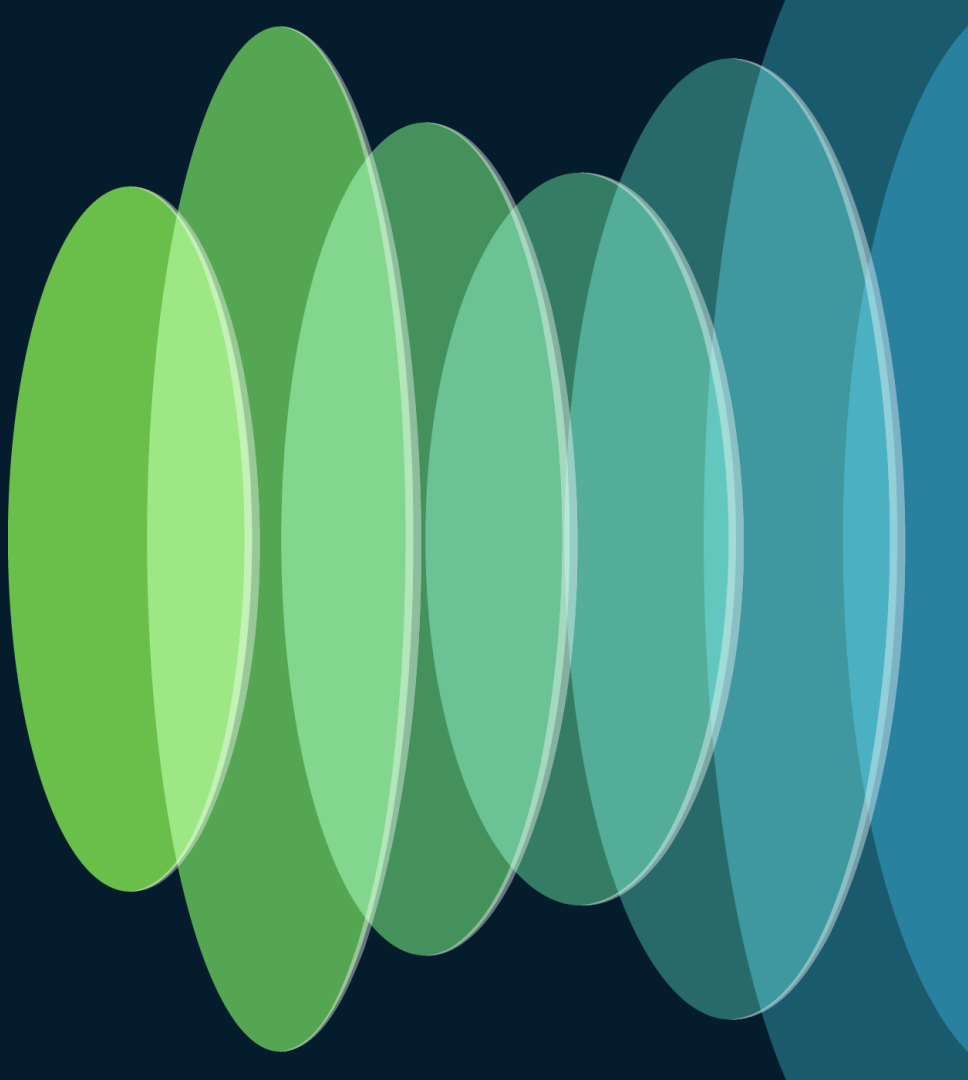
Now what?



Now what?

- Join the Webex room
  https://ciscolive.ciscoevents.com/ciscolivebot/#BRKOPS-2137

- Review your current QoS policy!

- Get some Cisco Catalyst Center Application Policy hands-on
  - Devnet Sandboxes: https://developer.cisco.com
  - Talk to your local Cisco Account Team
  - Lab system, Roadshows, Cisco dCloud

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Reference Material

- Cisco Catalyst Center Compatibility Tool
  - https://www.cisco.com/c/dam/en/us/td/docs/Website/enterprise/catalyst_center_compatibility_matrix/index.html

- Configure Application Policies chapter in Cisco Catalyst Center User Guide (2.3.7 link below)
  - https://www.cisco.com/c/en/us/td/docs/cloud-systems-management/network-automation-and-management/catalyst-center/2-3-7/user_guide/b_cisco_catalyst_center_user_guide_237/m_configure-application-policies.html

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Contact me at:
daquinla@cisco.com or dq@cisco.com

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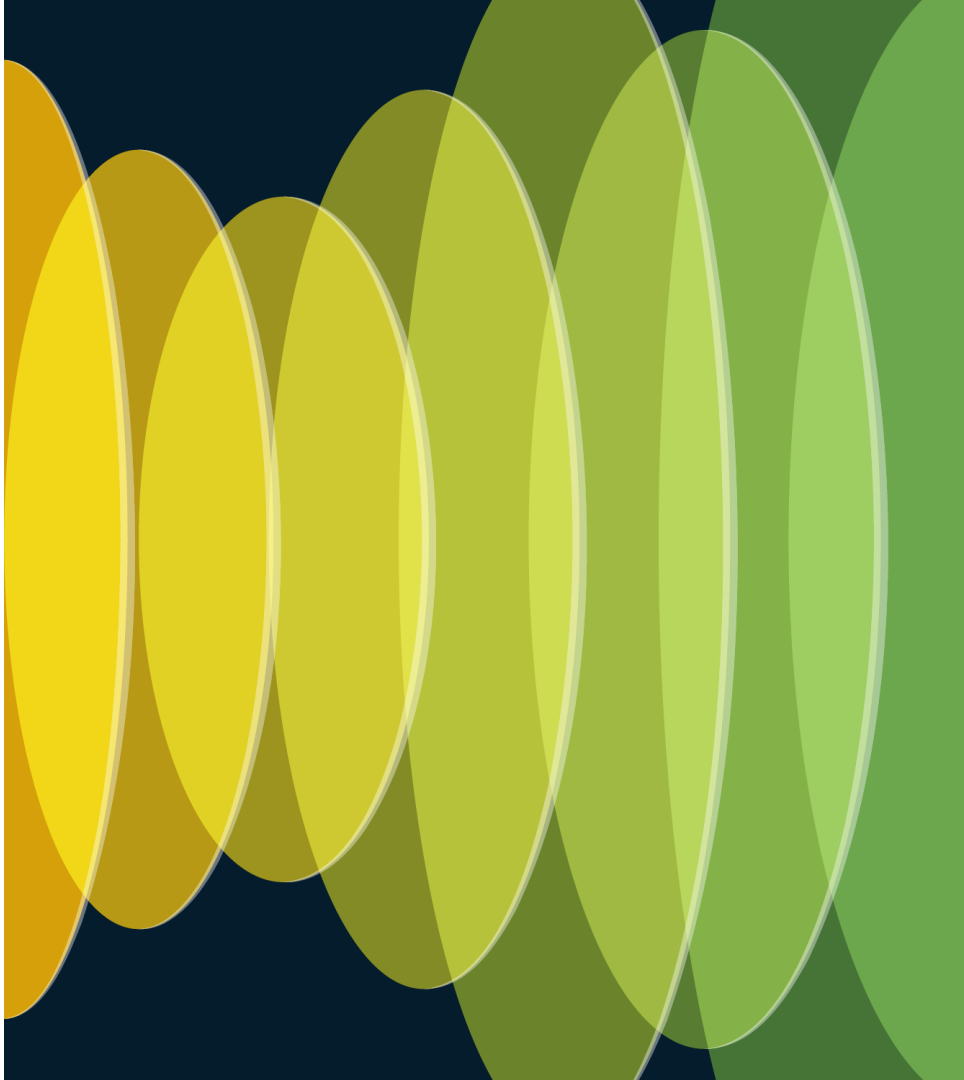
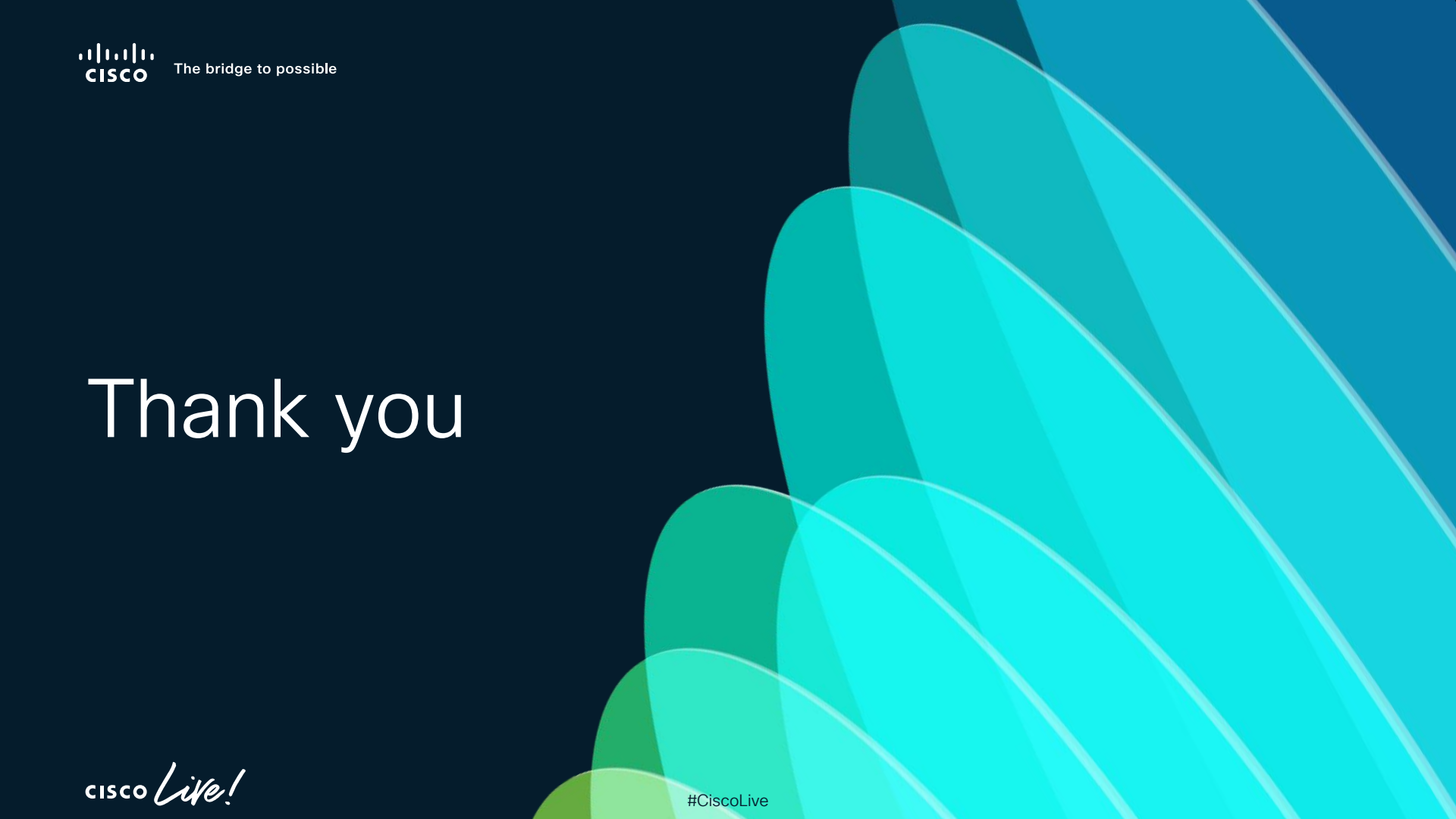
Questions




The bridge to possible
Thank you
cisco Live!
#CiscoLive