Quick start Guide - Catalyst SD-WAN Simplified Configuration and Policies

Contents

Introduction

This document is a Quick start guide for Simplified configuration and policies in Catalyst SD-WAN.

Summary

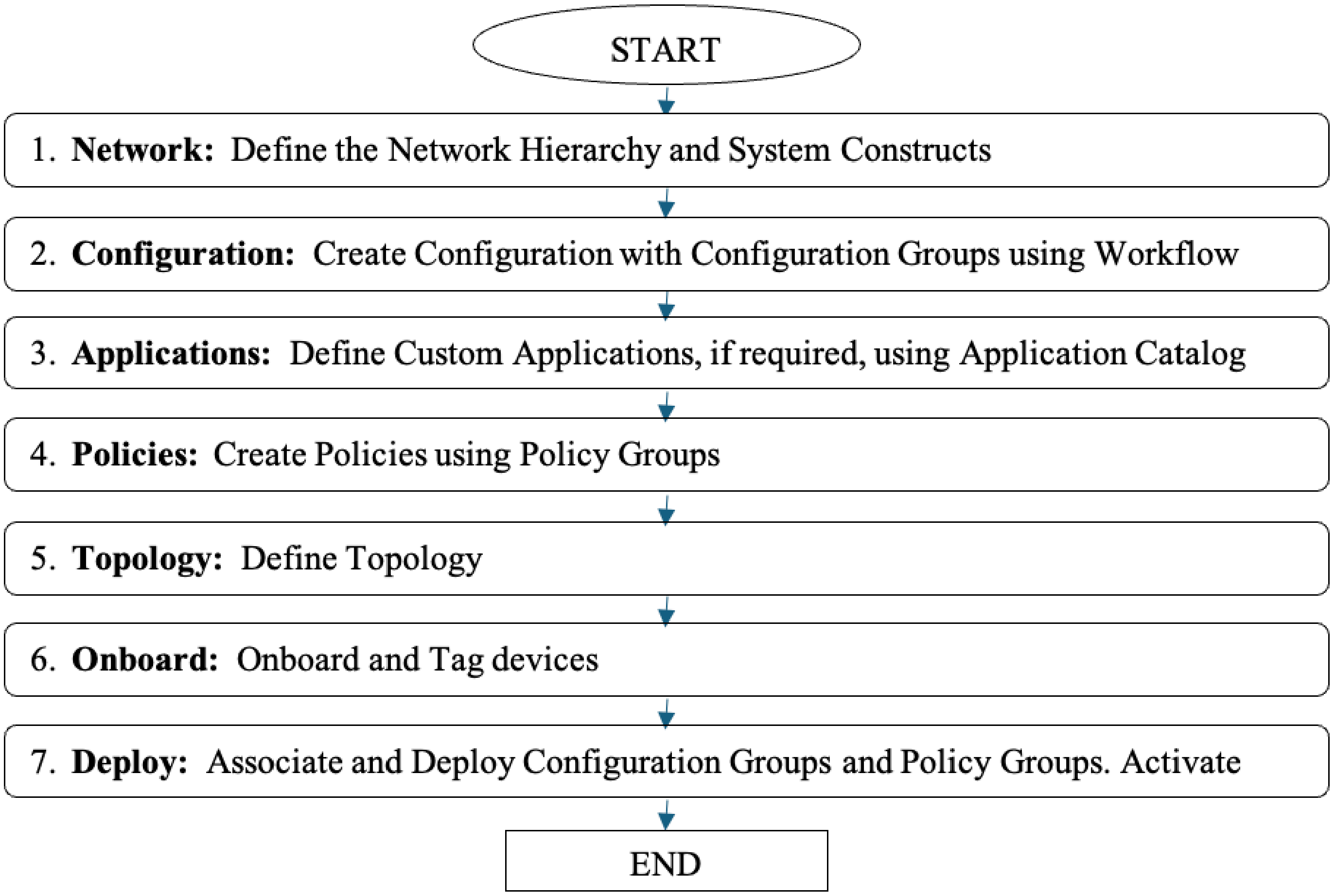
With Cisco Catalyst SD-WAN Software Release 20.12/17.12, it is recommended that users start migration from traditional configuration based on device and feature templates, to the new configuration approach based on Configuration Groups and Policy Groups. In this document, important details for the new configuration approach are described.

The main goal of this document is to serve as a guide for starting with using new constructs for Configuration, Policies and Onboarding, with the 20.12 golden release. The document does not cover explanations of individual features.

New Deployments

To successfully utilize the new configuration approach, you need to execute these steps:

1. Network: Define the Network Hierarchy and System Constructs
2. Configuration: Create Configuration with Configuration Groups using Workflow
3. Applications: Define Custom Applications, if required, using the Application Catalog
4. Policies: Create Policies using Policy Groups
5. Topology: Define Topology
6. Onboard: Onboard and Tag devices
7. Deploy: Associate and Deploy Configuration Groups and Policy Groups. Activate Topology.


START
1. **Network:** Define the Network Hierarchy and System Constructs
2. **Configuration:** Create Configuration with Configuration Groups using Workflow
3. **Applications:** Define Custom Applications, if required, using Application Catalog
4. **Policies:** Create Policies using Policy Groups
5. **Topology:** Define Topology
6. **Onboard:** Onboard and Tag devices
7. **Deploy:** Associate and Deploy Configuration Groups and Policy Groups. Activate
END

Flowchart for New Deployments

Existing Deployments

1. Execute the steps mentioned in the Existing Deployments section
2. Use the Conversion tool to convert existing configuration/policies to new Configuration/Policies

Enhancements to User Experience and Operational Simplification

Cisco Catalyst SD-WAN offers an enhanced User Experience and simplifies Operations.

- Common UI: A new UX framework has been introduced in Catalyst SD-WAN Manager and other Cisco products, to be about consistency in the User eXperience and providing a common look and feel across products.
- Configuration: Simplified configuration and policy creation & deployment with intuitive intent-based workflows and the use of Cisco-recommended smart defaults.
- Monitoring: Rich insights into network and application performance & health with new widgets and customizable & enhanced dashboards.
- Troubleshooting: Dynamic site & network topology views, context-based troubleshooting tools access, Reports on network & application performance on a scheduled basis.

Benefits

Ease of use	Intuitive and Guided workflows

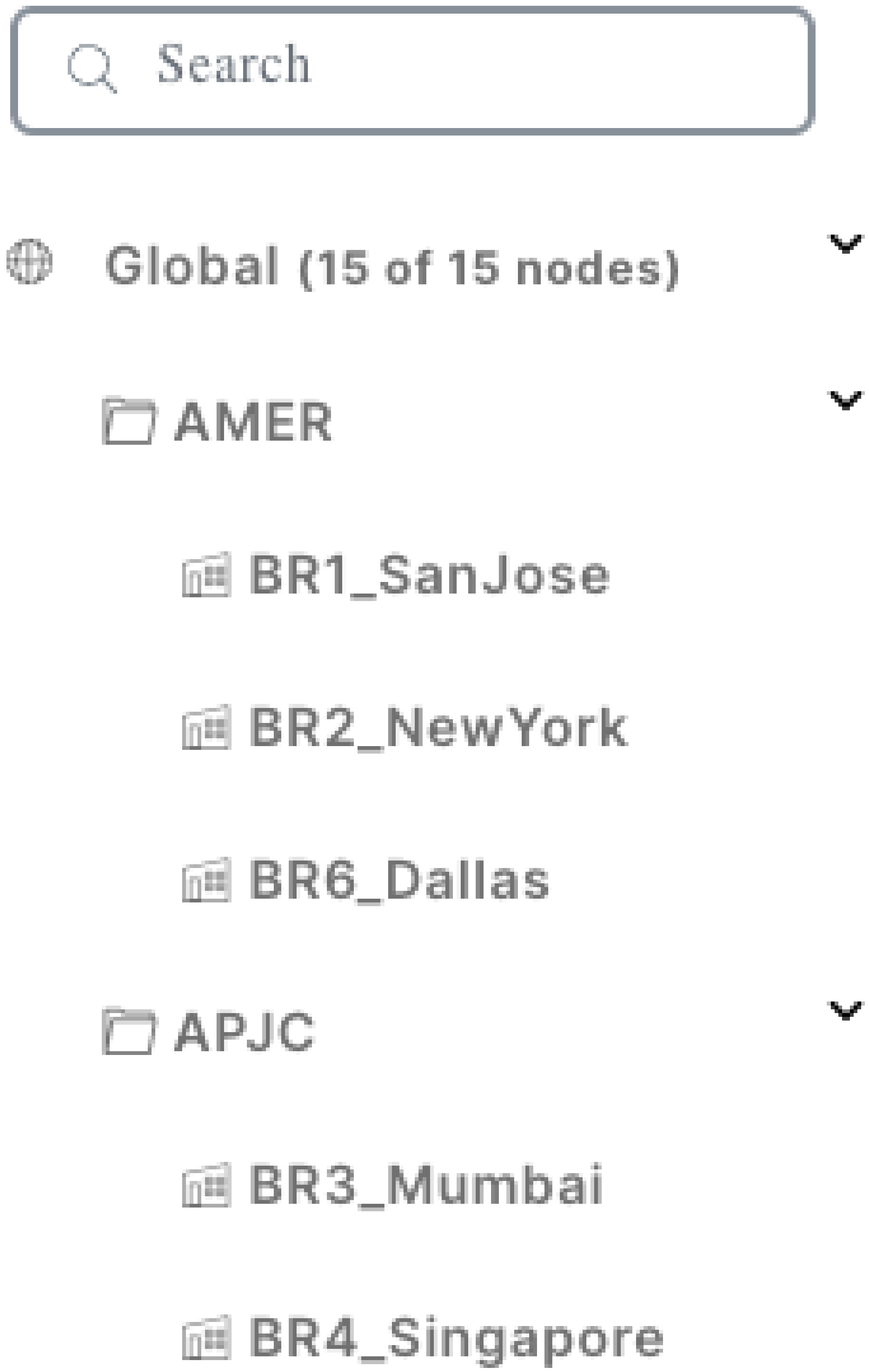
Configuration sprawl	Reduced sprawl (model agnostic, re-use, structure)
Configuration creation	Quicker and easier with smart defaults
Configuration modification	Modify now, deploy selectively later
Visibility	New dashboards, Apps/Sites performance monitoring
Troubleshooting guidance	Site Topology, Troubleshooting tools guidance

Define your Network Hierarchy and System Constructs

Network Hierarchy

Provides a notion of ‘hierarchy’, that is, Sites, Regions and Areas, for the network. You can create this based on your network.

Example:



Global (15 of 15 nodes)

AMER

BR1_SanJose

BR2_NewYork

BR6_Dallas

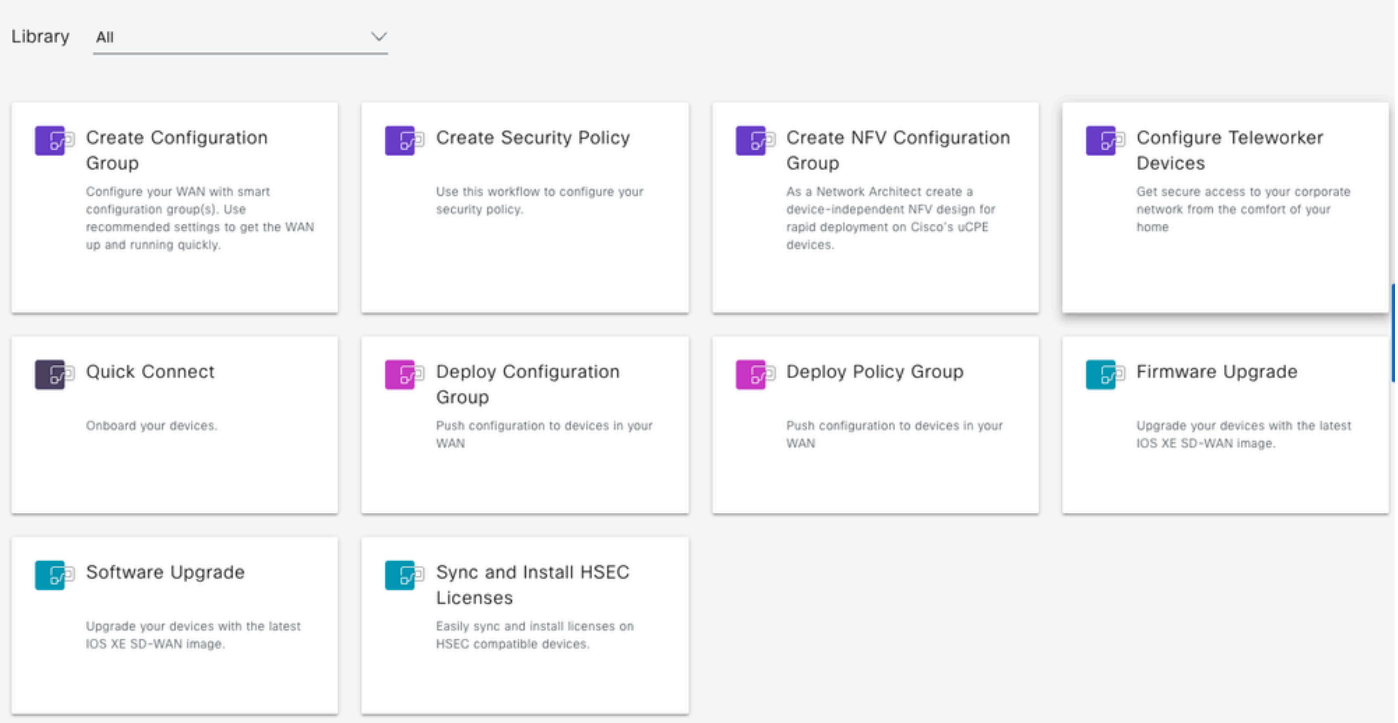
APJC

BR3_Mumbai

BR4_Singapore

- Most of the configuration knobs/settings are set to Cisco-recommended smart defaults.
- Users need to specify a few configurations only.
- Advanced configuration knobs are available outside of the workflow, where the configuration group can be manually edited.

A Workflow Library lists all the available workflows.



Library All

Create Configuration Group
Configure your WAN with smart configuration group(s). Use recommended settings to get the WAN up and running quickly.

Create Security Policy
Use this workflow to configure your security policy.

Create NFV Configuration Group
As a Network Architect create a device-independent NFV design for rapid deployment on Cisco's uCPE devices.

Configure Teleworker Devices
Get secure access to your corporate network from the comfort of your home

Quick Connect
Onboard your devices.

Deploy Configuration Group
Push configuration to devices in your WAN

Deploy Policy Group
Push configuration to devices in your WAN

Firmware Upgrade
Upgrade your devices with the latest IOS XE SD-WAN image.

Software Upgrade
Upgrade your devices with the latest IOS XE SD-WAN image.

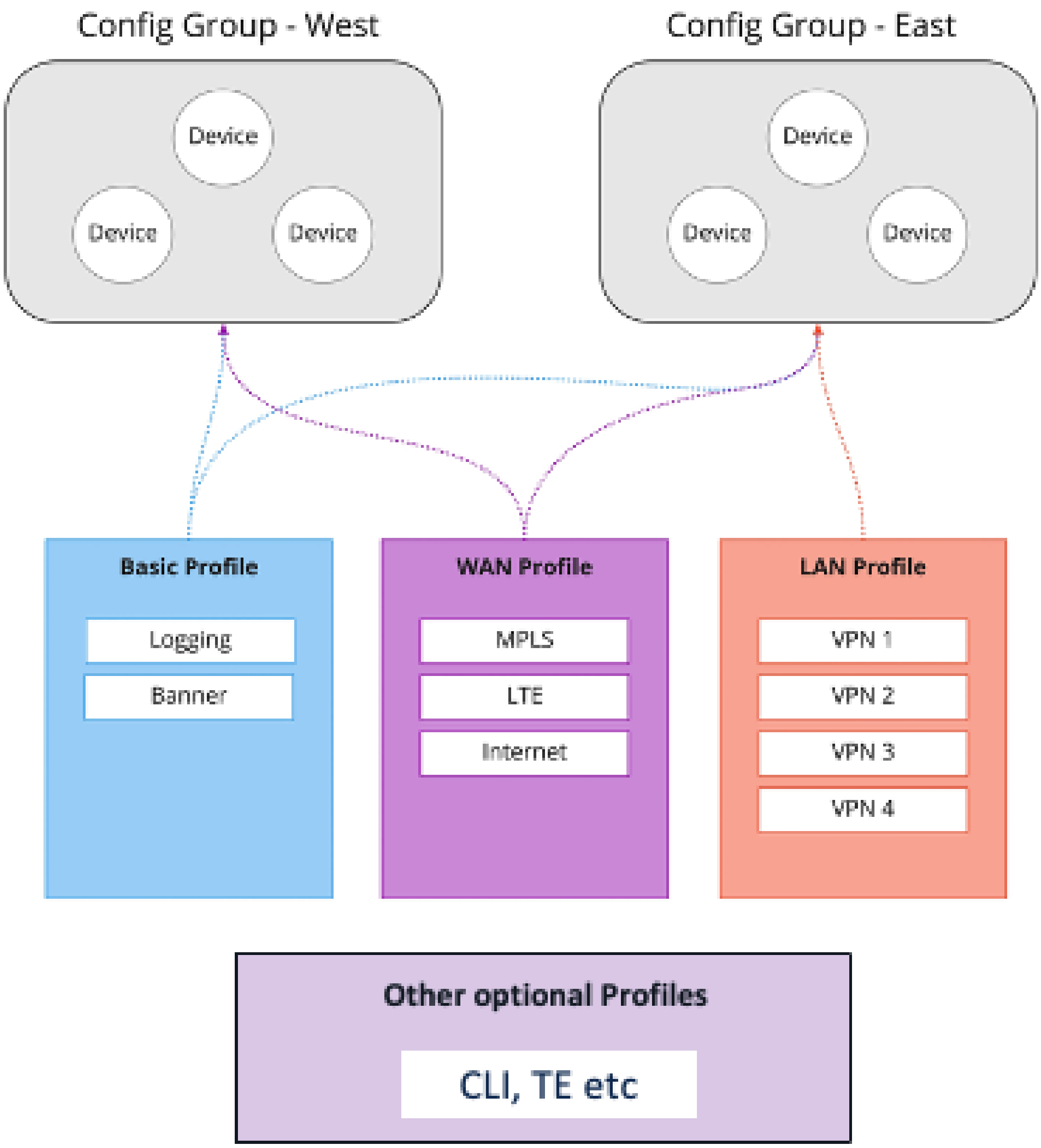
Sync and Install HSEC Licenses
Easily sync and install licenses on HSEC compatible devices.

Workflow Library

Configuration Groups

Configuration Groups is a fresh approach to fabric configuration that is based on principles of simplicity, re-usability and structure.

https://www.cisco.com/c/en/us/td/docs/routers/sdwan/configuration/config-groups/configuration-group-guide/using-config-groups.html



Configuration Groups Structure

Configuration Groups

- Logical grouping of devices that share a common purpose within the WAN.
- The user defines and can customize this grouping based on their business needs.

For example; East/West, Americas/APJC/EMEAR, Retail Store/Distribution Centre

Feature Profiles

- Flexible “buckets” of configuration that can be shared across Configuration Groups.
- Create Feature Profiles based on features that are required
- Put profiles together to complete device configuration, like building blocks
- Build, save, and reuse

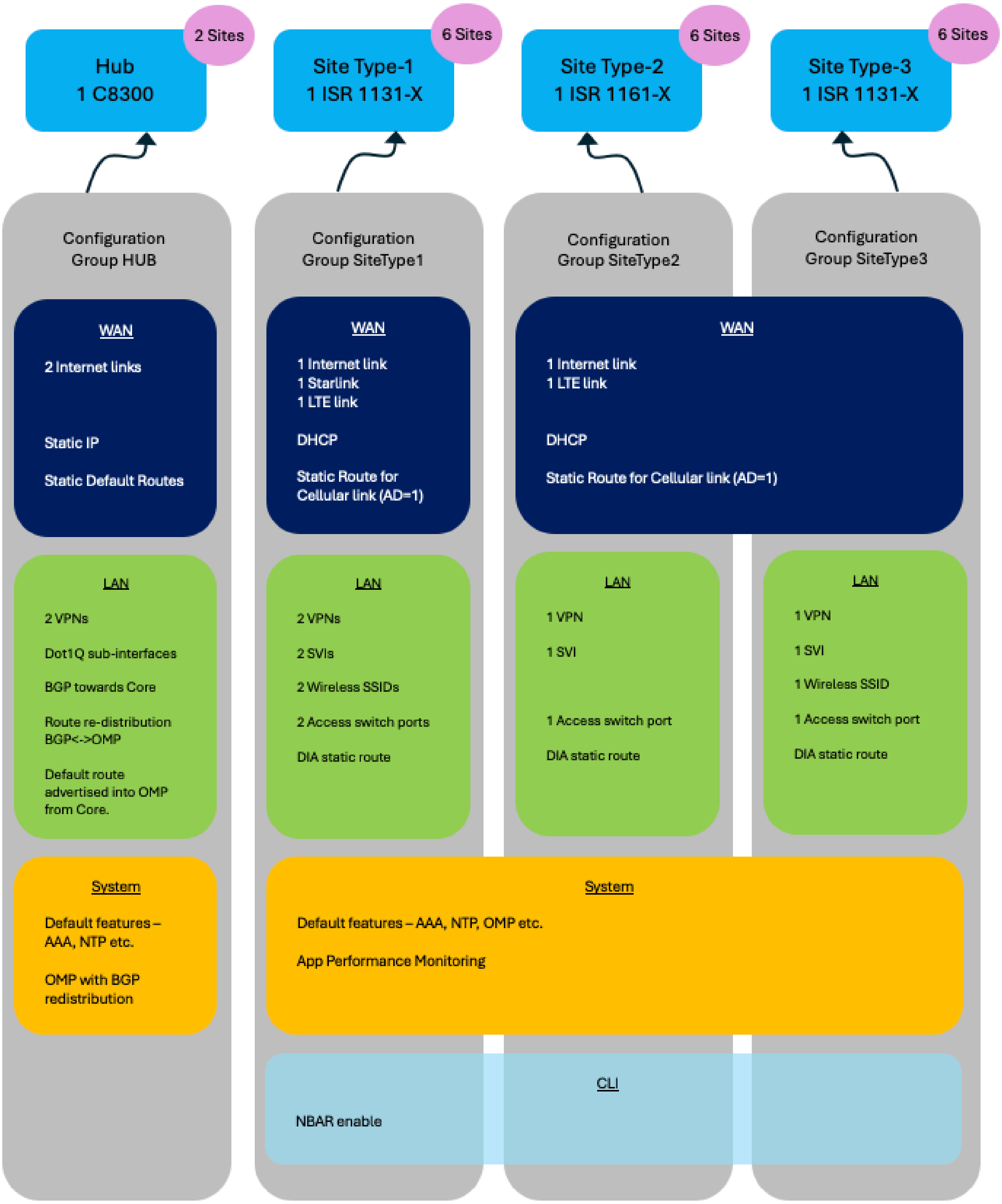
For example; Basic Profile, WAN Profile, LAN Profile

Configuration Group Deployment Examples

Note:

- Configuration Groups are Device Model Agnostic
- Feature Profiles can be shared across Configuration Groups

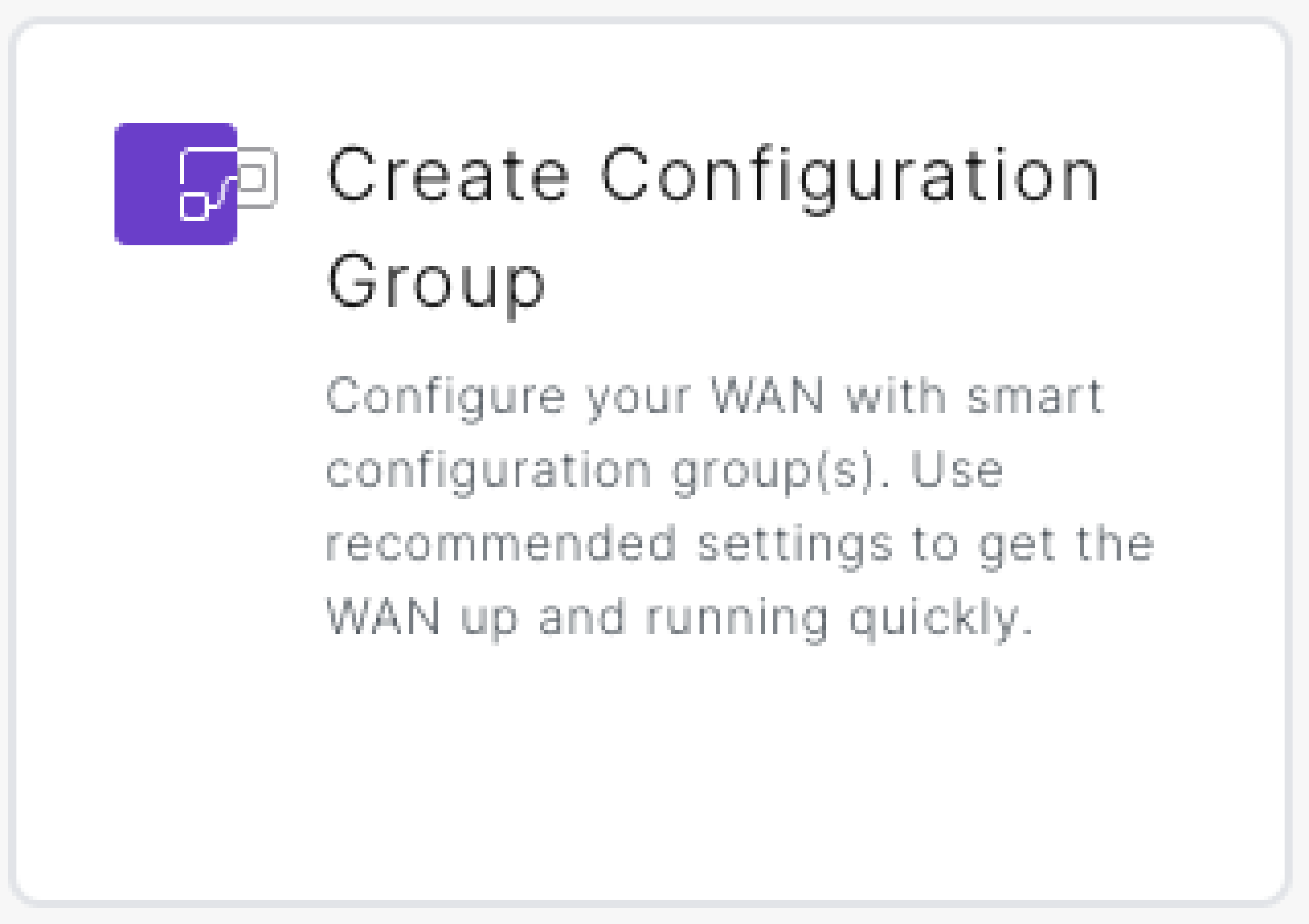
Use-case 1: Government Customer



Example Usecase 1 - Configuration Groups

Configuration Group HUB

Execute the Create Configuration Group Workflow.

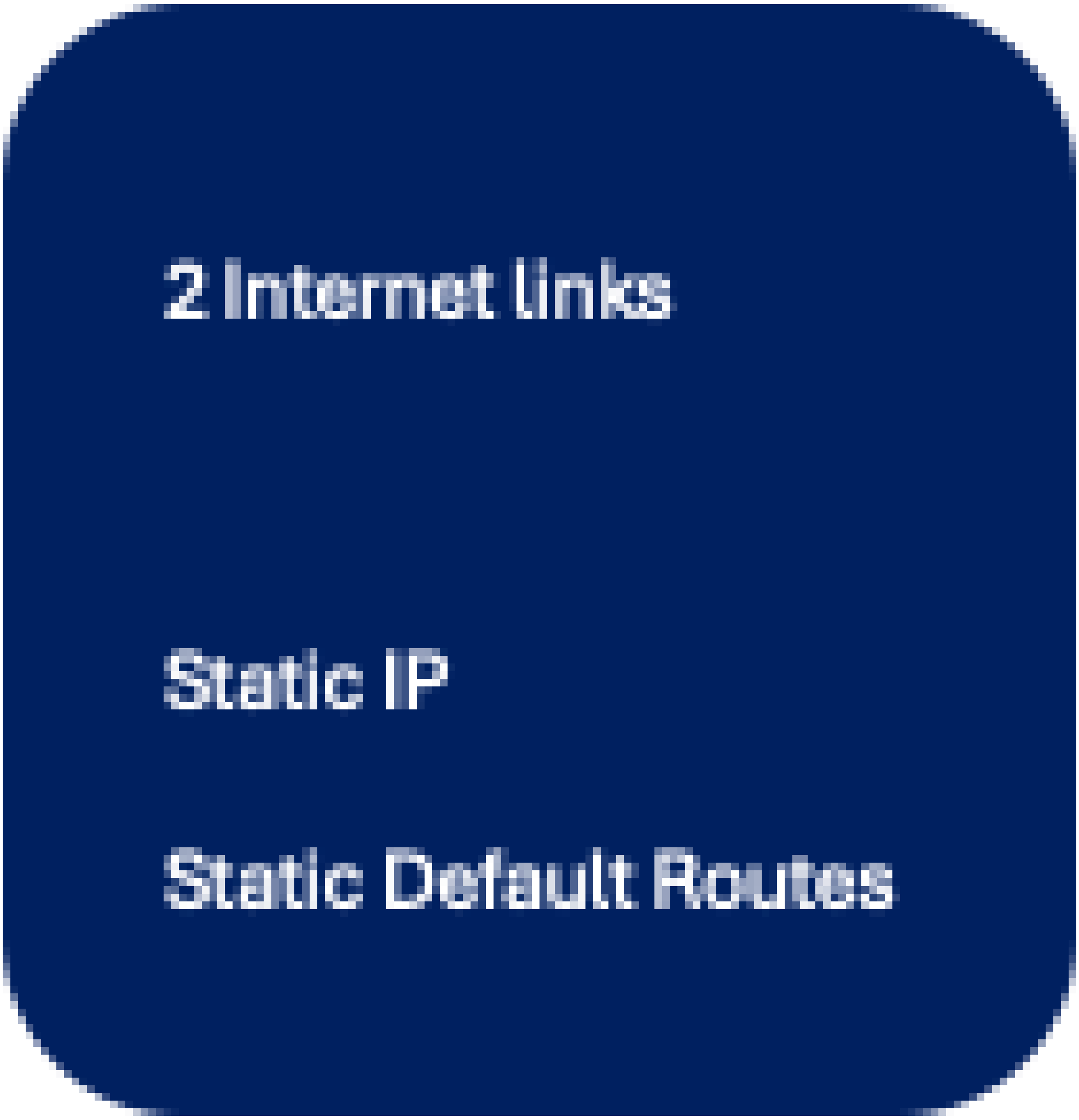


Create Configuration Group

Configure your WAN with smart configuration group(s). Use recommended settings to get the WAN up and running quickly.

Create Configuration Group Workflow Option

WAN profile



2 Internet links

Static IP

Static Default Routes

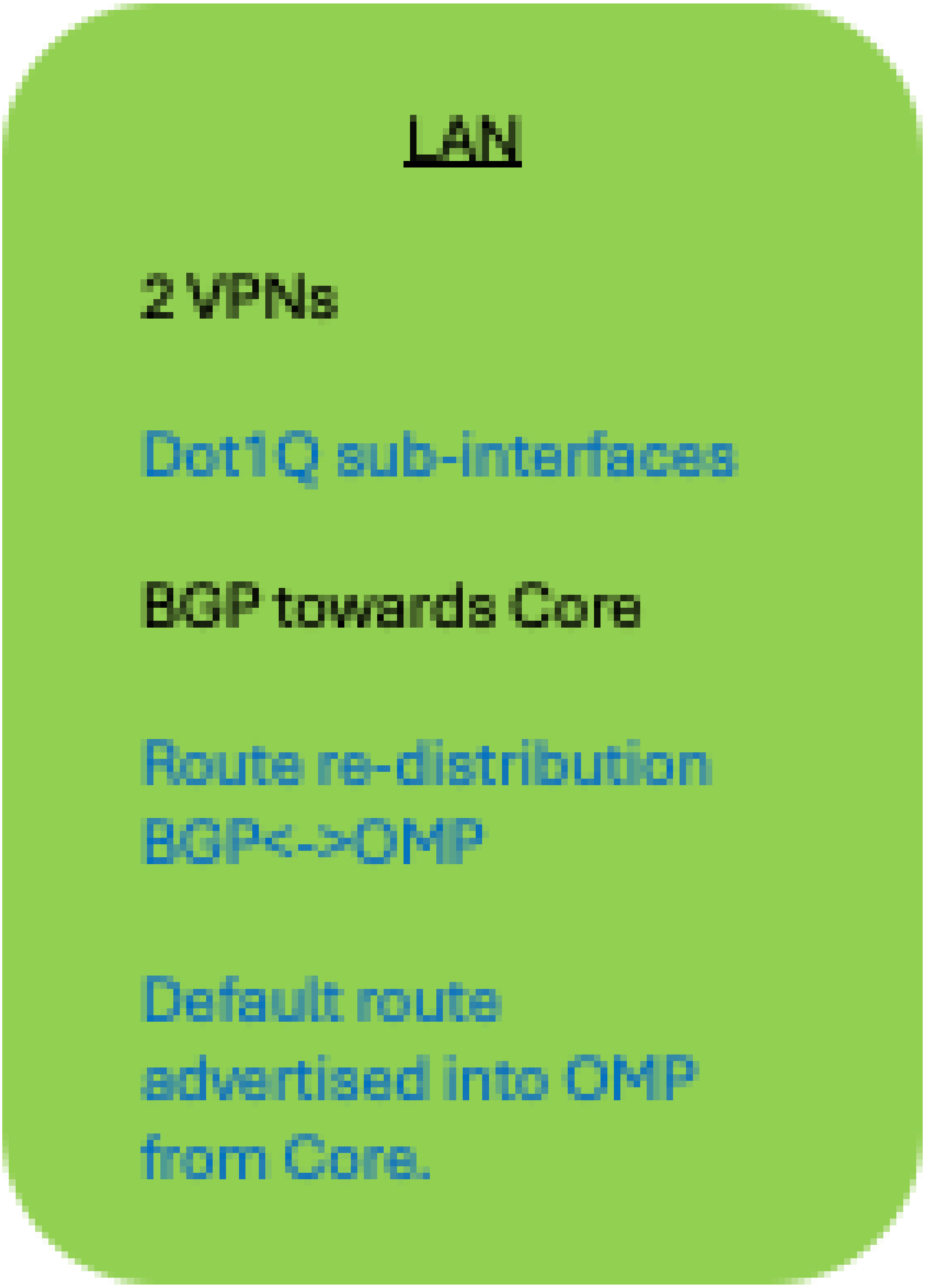
Example Usecase 1 - WAN Profile 1

Using the workflow, the complete WAN profile configuration for this use case, can be generated.

Entities like actual Static IP, Static Default route IP/subnet/Next-Hop and so on, can be specified as Global or Device-specific.

The device-specific option can be specified with actual values during deployment of the Configuration-group to the devices.

LAN profile



LAN

2 VPNs

Dot1Q sub-interfaces

BGP towards Core

Route re-distribution BGP<->OMP

Default route advertised into OMP from Core.

Example Usecase 1 - LAN Profile 1

Using the workflow, most of the LAN profile configuration for this use-case, can be generated.

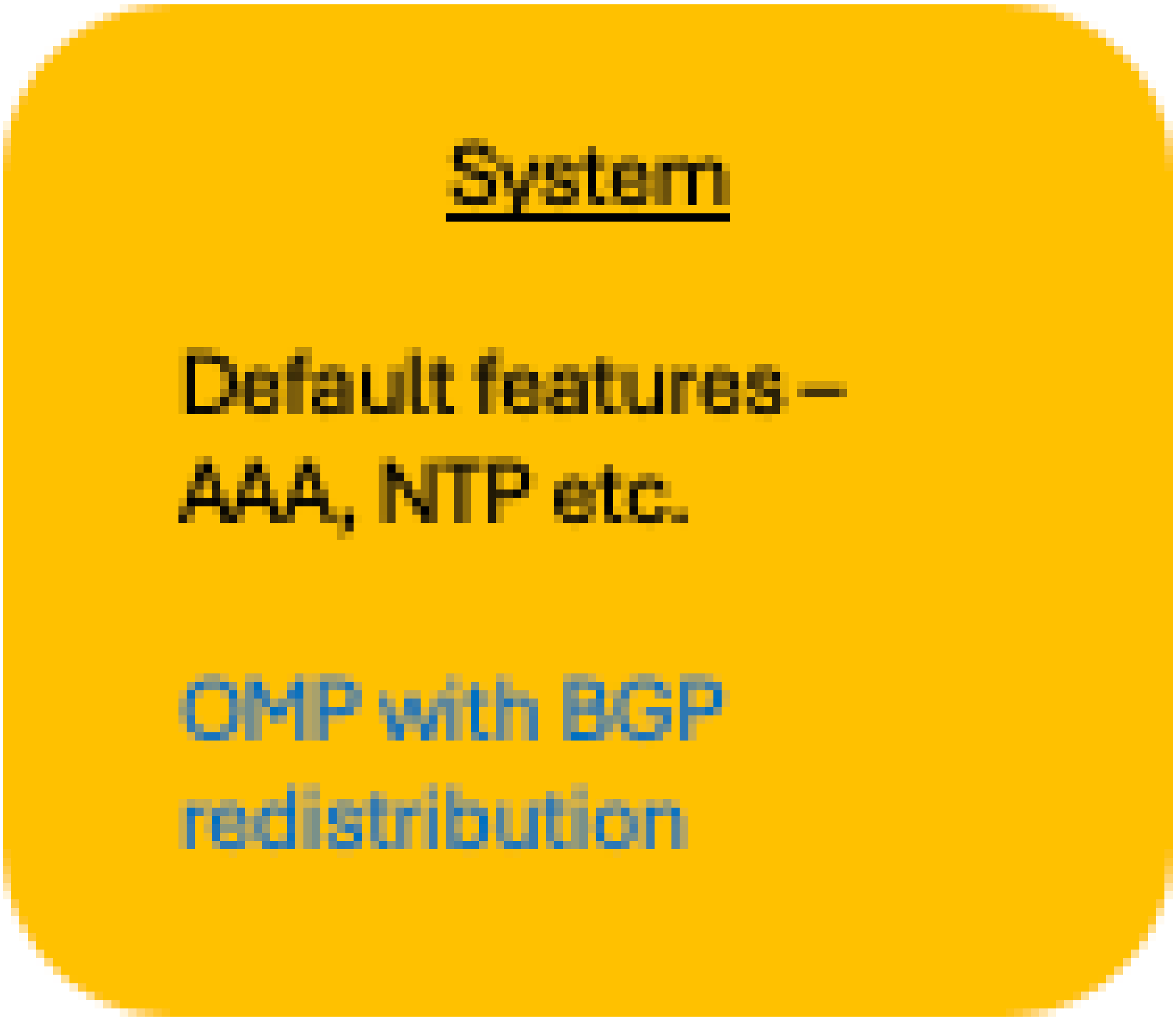
- 2 VPNs
- BGP routing in each of the VPNs (AS number, network prefixes, neighbors)

Entities like actual Dot1Q sub-interfaces and any other entity marked as Device-specific, can be specified with actual values during deployment of the Configuration-group to the devices.

NOTE:

Advanced configuration like Route re-distribution and Default route advertisement must be configured post the workflow, by manually editing the Configuration group, as also the Sub-interfaces if these are going to be used during deploy.

System Profile



System

Default features – AAA, NTP etc.

OMP with BGP redistribution

Example Usecase 1 - System Profile 1

Using the workflow, most of the System profile configuration for this use-case, can be generated – OMP, AAA, NTP, Logging and so on.

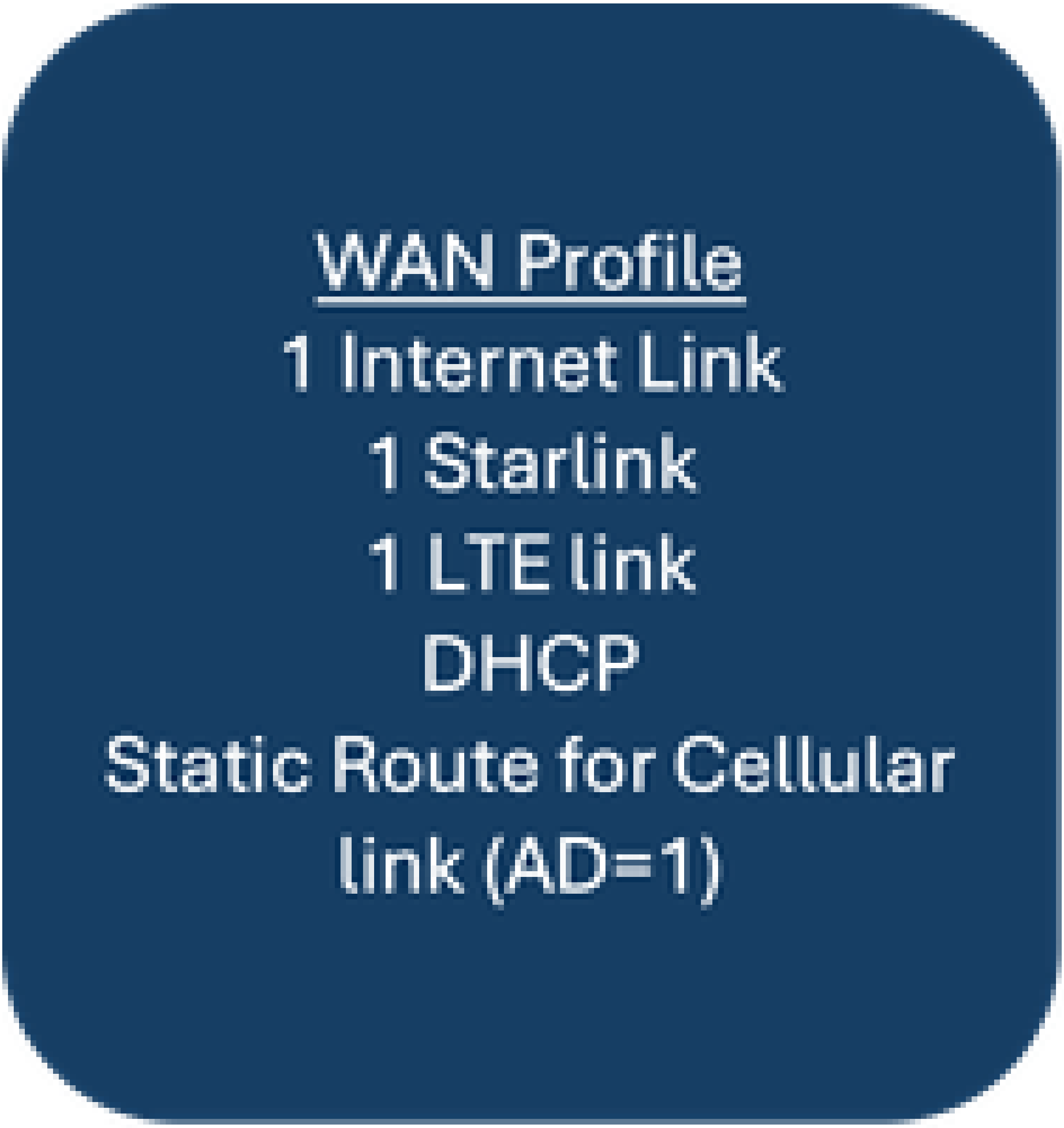
NOTE:

Advanced configuration like OMP-BGP redistribution and any other changes to the System features like OMP, AAA, NTP and so on, must be configured post the workflow, by manually editing the Configuration group.

Configuration Group SiteType1

Execute the *Create Configuration Group* Workflow.

WAN profile



WAN Profile

1 Internet Link

1 Starlink

1 LTE link

DHCP

Static Route for Cellular link (AD=1)

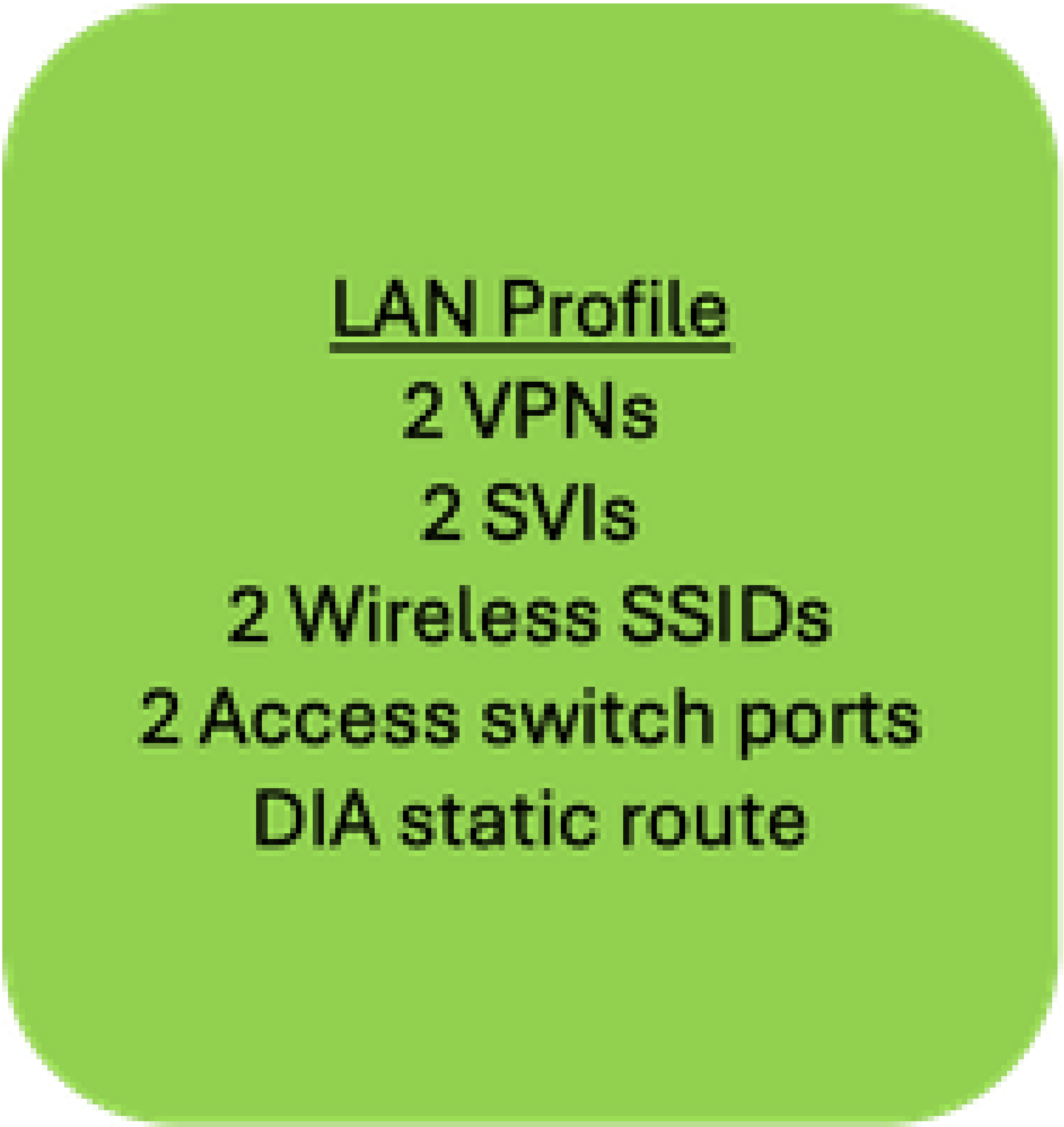
Example Usecase 1 - WAN Profile 2

Using the workflow, most of the WAN profile configuration for this use-case, can be generated. Ethernet interfaces for Internet and Starlink. DHCP.

NOTE:

Cellular Interface for LTE link, including the Static route, must be configured post the workflow, by manually editing the Configuration group.

LAN profile



LAN Profile

2 VPNs

2 SVIs

2 Wireless SSIDs

2 Access switch ports

DIA static route

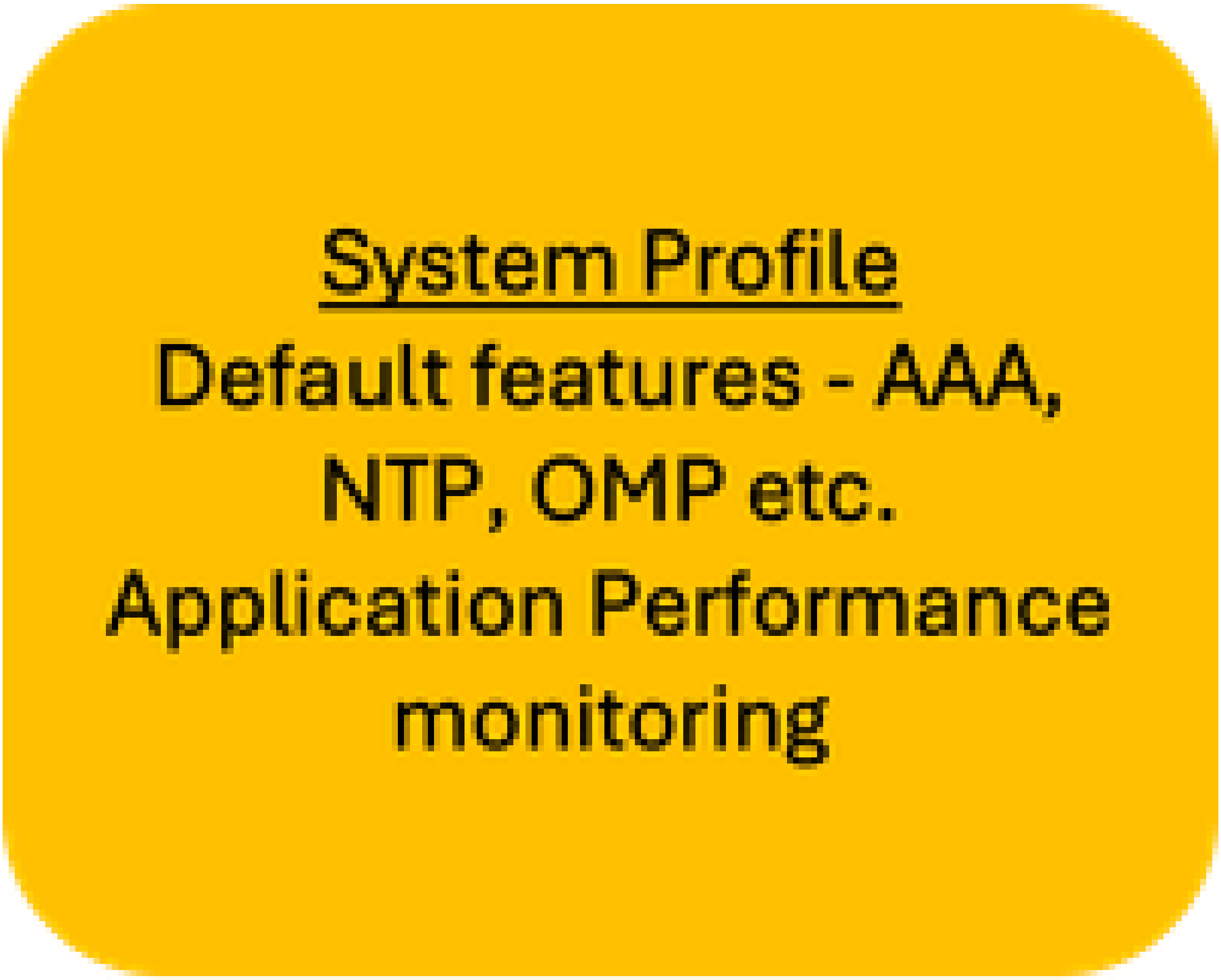
Example Usecase 1 - LAN Profile 2

Using the workflow, some of the LAN profile configuration for this use-case, can be generated. 2 VPNs, DIA static route.

Entities like actual Dot1Q sub-interfaces and any other entity marked as Device-specific, can be specified with actual values during deployment of the Configuration-group to the devices.

> **NOTE:**
>
> SVIs, Wireless SSIDs, Access switch ports and so on, must be configured post the workflow, by manually editing the Configuration group.

System Profile



System Profile

Default features - AAA, NTP, OMP etc.

Application Performance monitoring

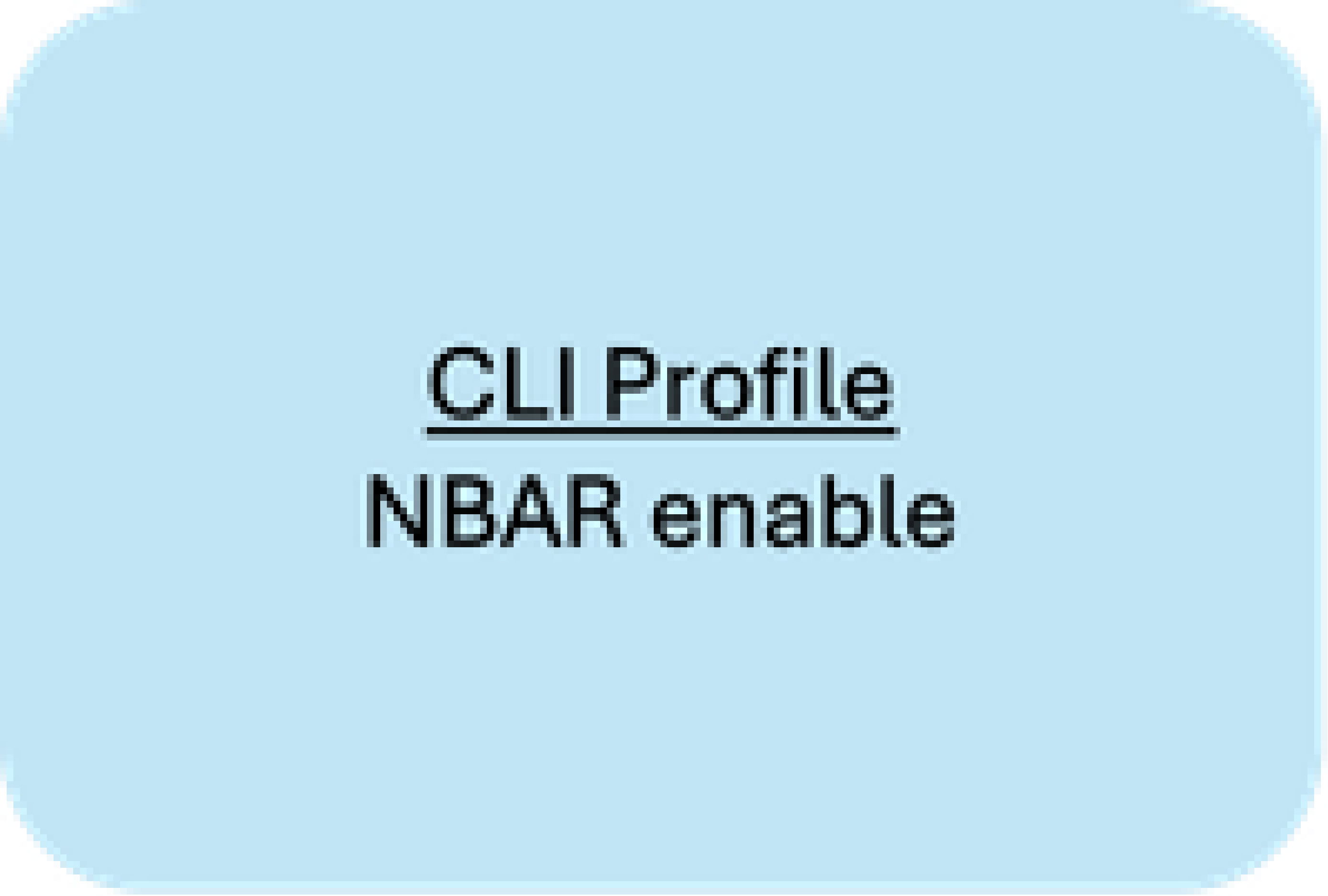
Example Usecase 1 - System Profile 2

Using the workflow, most of the System profile configuration for this use-case, can be generated – OMP, AAA, NTP, Logging and so on.

NOTE:

Advanced configuration like Application Performance Monitoring, must be configured post the workflow, by manually editing the Configuration group.

CLI Profile



Example Usecase 1 - CLI Profile 2

Features not supported via GUI, like App/Flow Visibility (NBAR) enabling, can be configured using a CLI profile.

App/Flow visibility

To enable app-visibility and flow-visibility, use CLI profile/parcel.

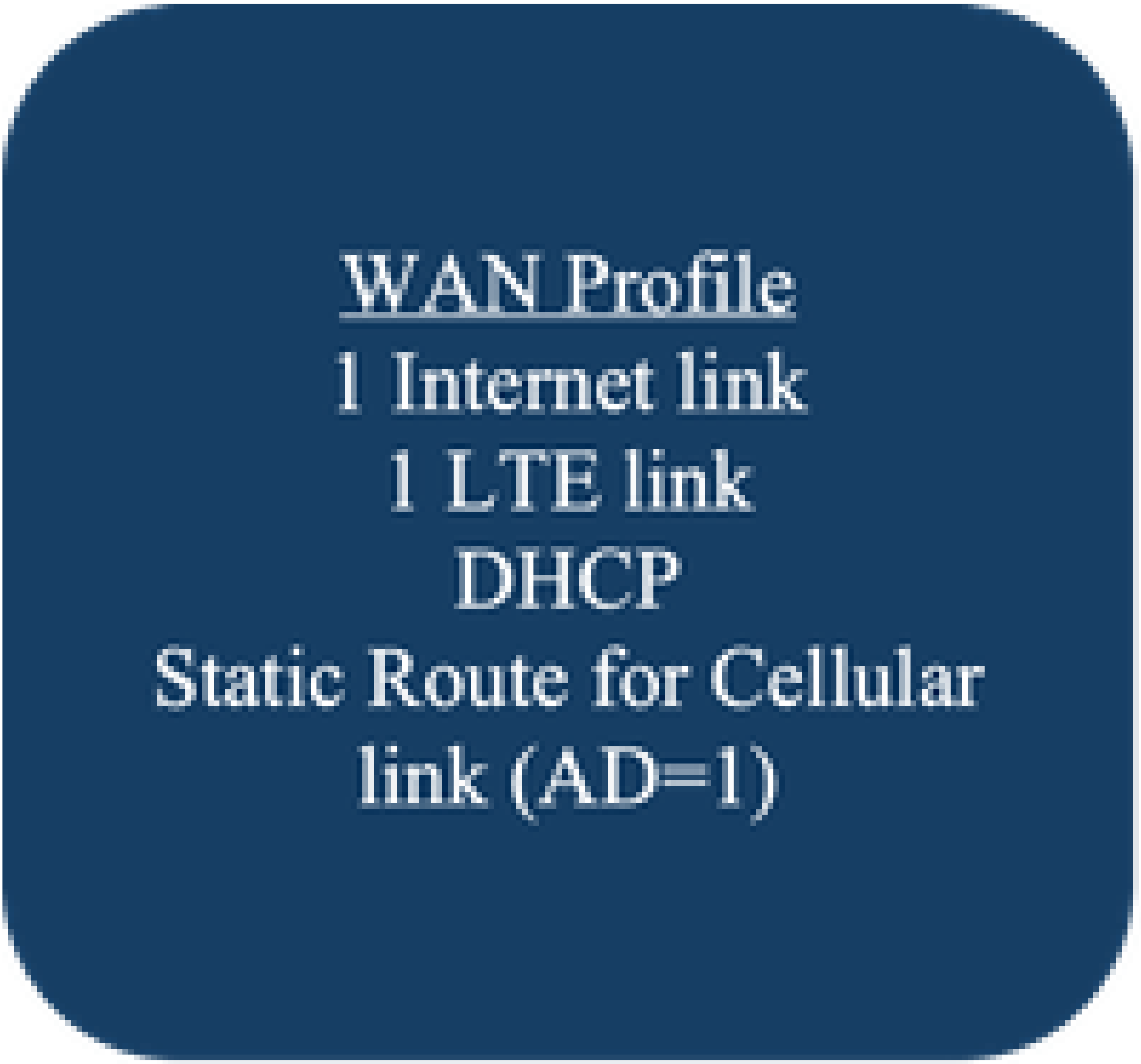
(In 20.13 and later, it is available under *Advanced Settings* in Policy Group)

However, in 20.12, if a AAR policy is configured then, App/Flow Visibility is enabled. And configuring this using CLI profile/parcel, is not required.

Configuration Group SiteType2

Execute the *Create Configuration Group* Workflow.

WAN profile



WAN Profile

1 Internet link

1 LTE link

DHCP

Static Route for Cellular link (AD=1)

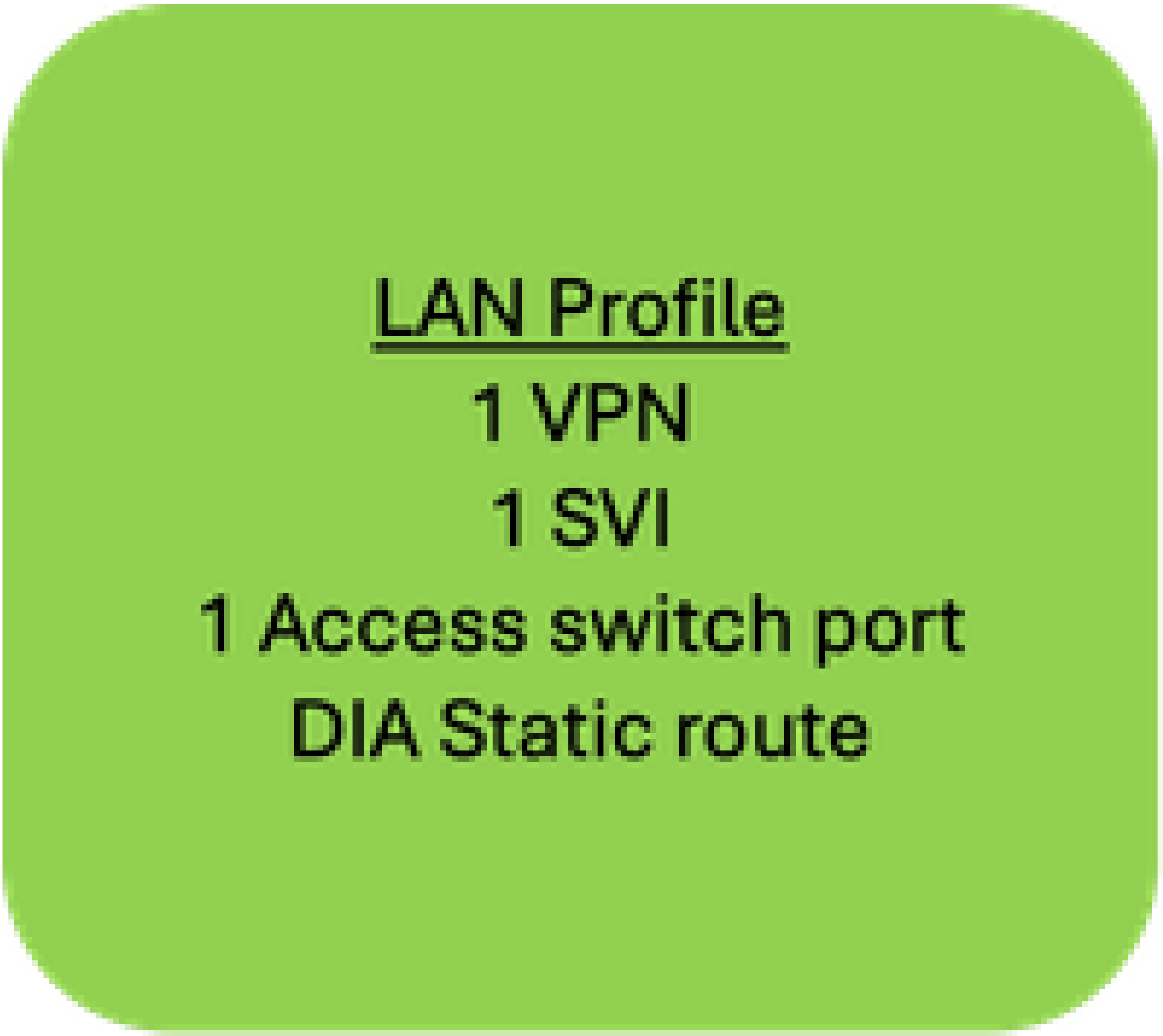
Example Usecase 1 - WAN Profile 3

Using the workflow, most of the WAN profile configuration for this use-case, can be generated. Ethernet interface for Internet. DHCP.

NOTE:

Cellular Interface for LTE link, including the Static route, must be configured post the workflow, by manually editing the Configuration group.

LAN profile



LAN Profile

1 VPN

1 SVI

1 Access switch port

DIA Static route

Example Usecase 1 - LAN Profile 3

Using the workflow, some of the LAN profile configuration for this use-case, can be generated. 1 VPN, DIA static route.

Entities like actual Dot1Q sub-interfaces and any other entity marked as Device-specific, can be specified with actual values during deployment of the Configuration-group to the devices.

NOTE:

SVI, Access switch port and so on, must be configured post the workflow, by manually editing the Configuration group.

System Profile

Same as *Configuration Group SiteType1*

CLI Profile

Same as *Configuration Group SiteType1*

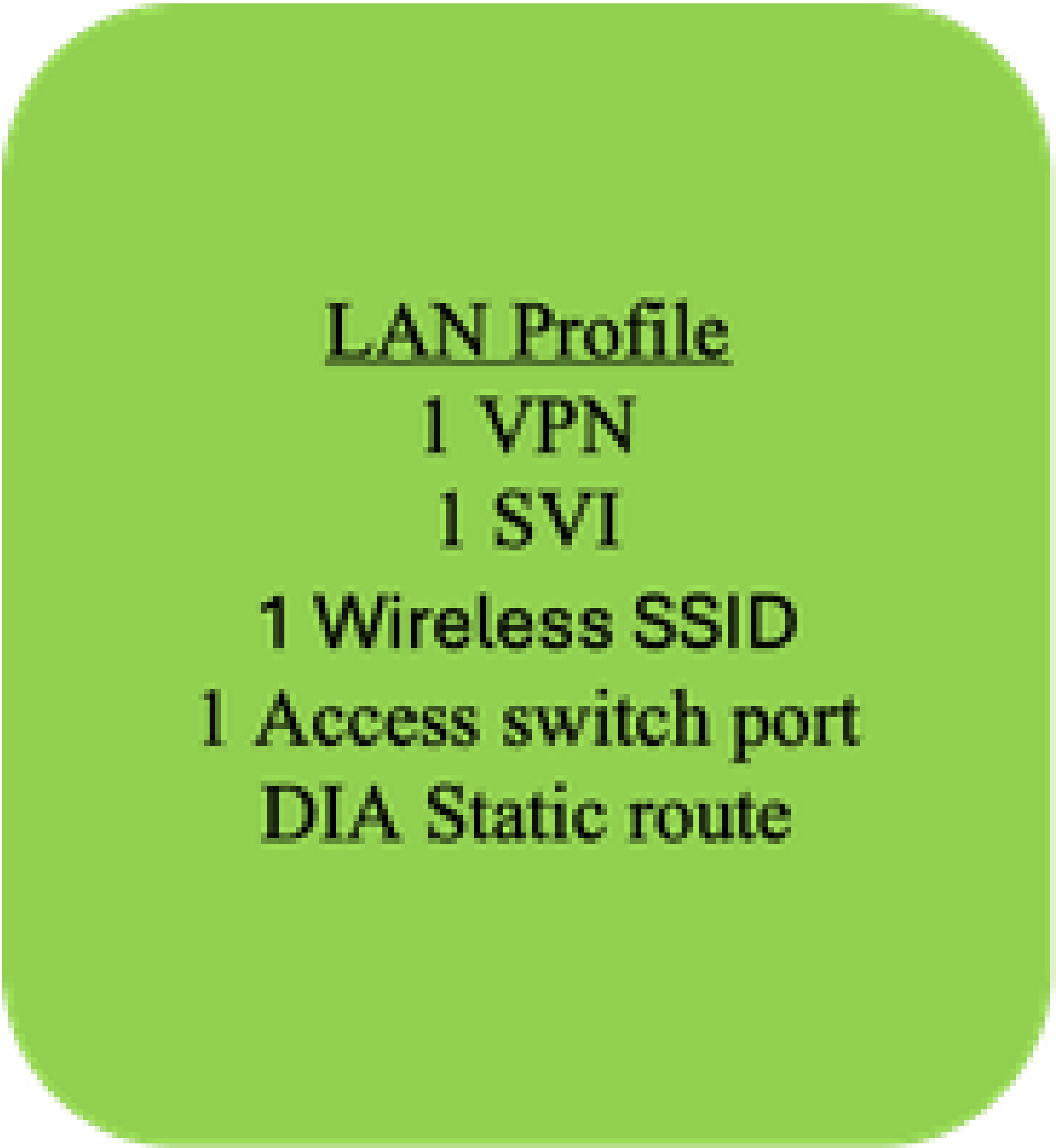
Configuration Group SiteType3

Execute the *Create Configuration Group* Workflow.

WAN Profile

Same as *Configuration Group SiteType2*

LAN Profile



LAN Profile

1 VPN

1 SVI

1 Wireless SSID

1 Access switch port

DIA Static route

Example Usecase 1 - LAN Profile 4

Using the workflow, some of the LAN profile configuration for this use-case, can be generated. 1 VPN, DIA static route.

Entities like actual Dot1Q sub-interfaces and any other entity marked as Device-specific, can be specified with actual values during deployment of the Configuration-group to the devices.

NOTE:

SVI, Wireless SSID, Access switch port and so on, must be configured post the workflow, by manually editing the Configuration group.

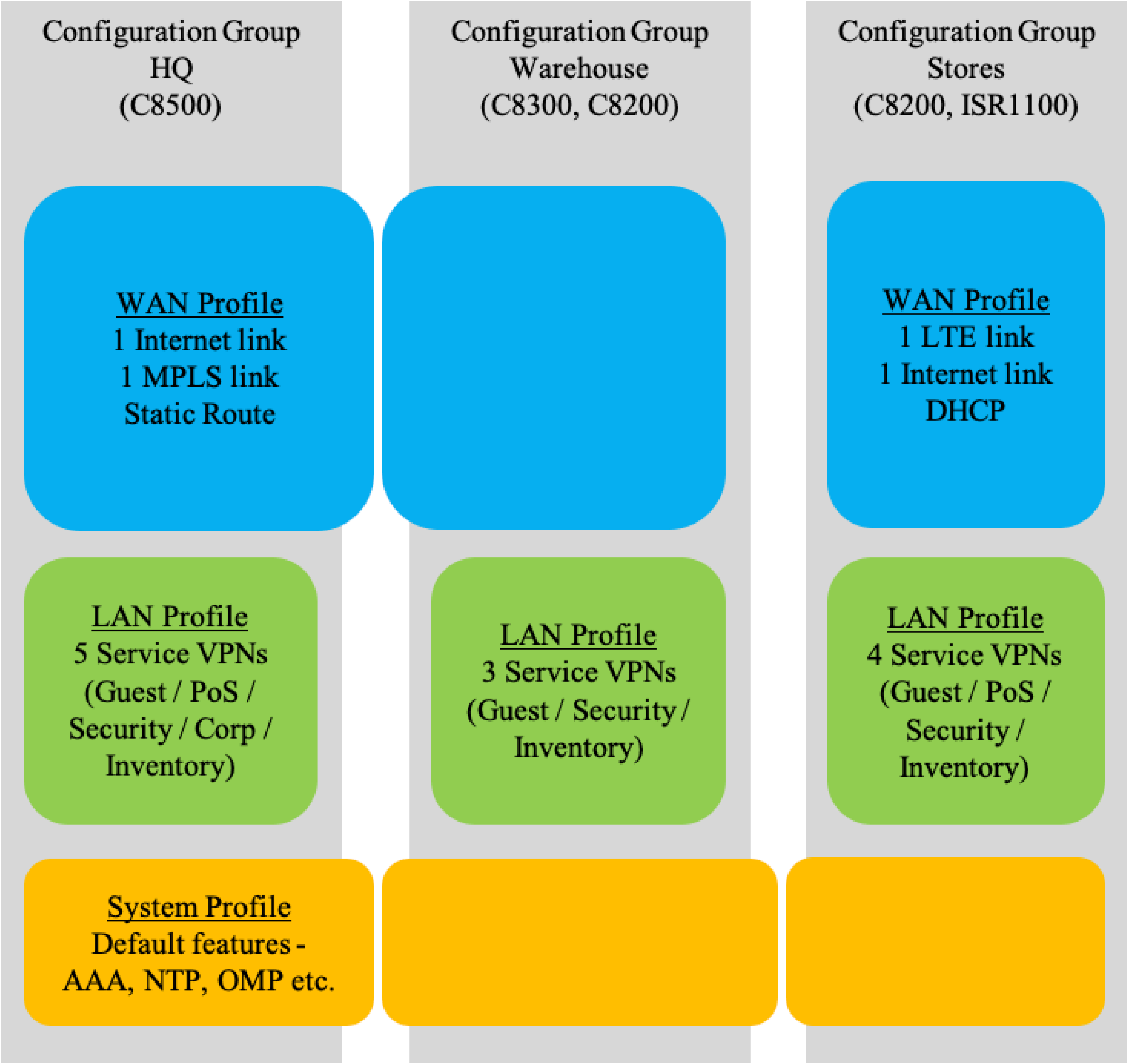
System Profile

Same as *Configuration Group SiteType1*

CLI Profile

Same as *Configuration Group SiteType1*

Use-case 2: Retail Customer



Example Usecase 2 - Configuration Groups

Configuration Group HQ and Warehouse

Execute the *Create Configuration Group* Workflow.

WAN profile

Using the workflow, all of the WAN profile configuration for this use-case, can be generated.

LAN Profile

Using the workflow, all of the LAN profile configuration for this use-case, can be generated.

Entities like actual Dot1Q sub-interfaces and any other entity marked as Device-specific, can be specified with actual values during deployment of the Configuration-group to the devices.

System Profile

Using the workflow, all of the System profile configuration for this use-case, can be generated.

NOTE:

If any changes are required or if Advanced configuration like Application Performance Monitoring is required then, they must be configured post the workflow, by manually editing the Configuration group.

Configuration Group Stores

Execute the *Create Configuration Group* Workflow.

WAN profile

Using the workflow, most of the WAN profile configuration for this use-case, can be generated.

NOTE:

Cellular Interface for LTE link, including routing, must be configured post the workflow, by manually editing the Configuration group.

LAN Profile

Using the workflow, all of the LAN profile configuration for this use-case, can be generated.

Entities like actual Dot1Q sub-interfaces and any other entity marked as Device-specific, can be specified with actual values during deployment of the Configuration-group to the devices.

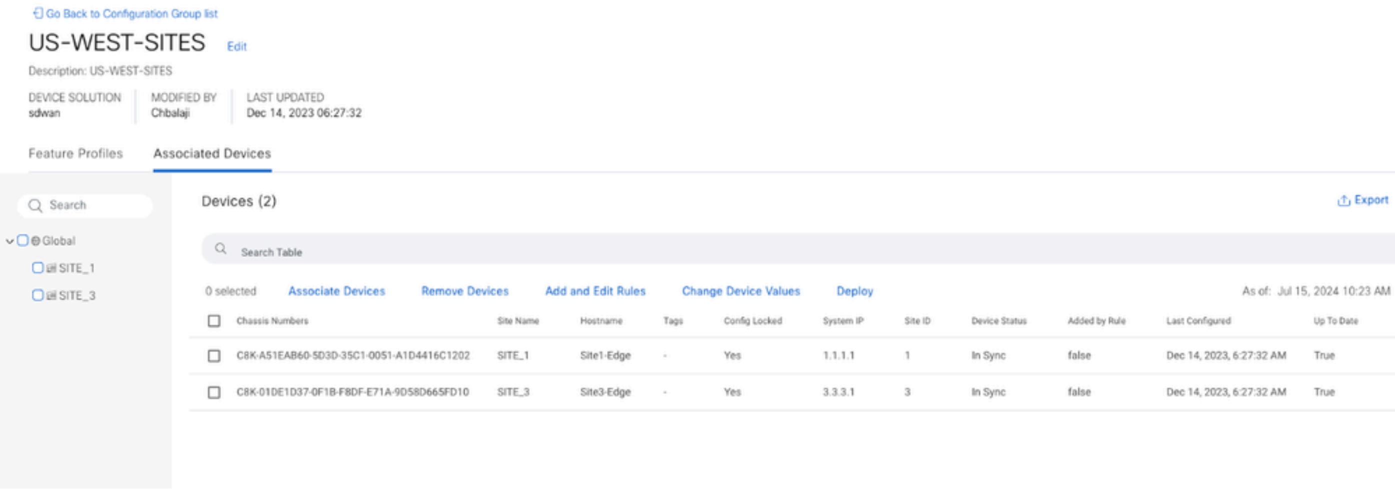
System Profile

Same as *Configuration Group HQ and Warehouse.*

Associate

In the Configuration Group edit page (*Configuration* -> *Configuration Groups*), you can Associate devices with the Configuration Group.

Click on *Associate Devices* and go through the steps in the workflow.



US-WEST-SITES Edit

Description: US-WEST-SITES

DEVICE SOLUTION sdwan | MODIFIED BY Chbalaji | LAST UPDATED Dec 14, 2023 06:27:32

Devices (2)

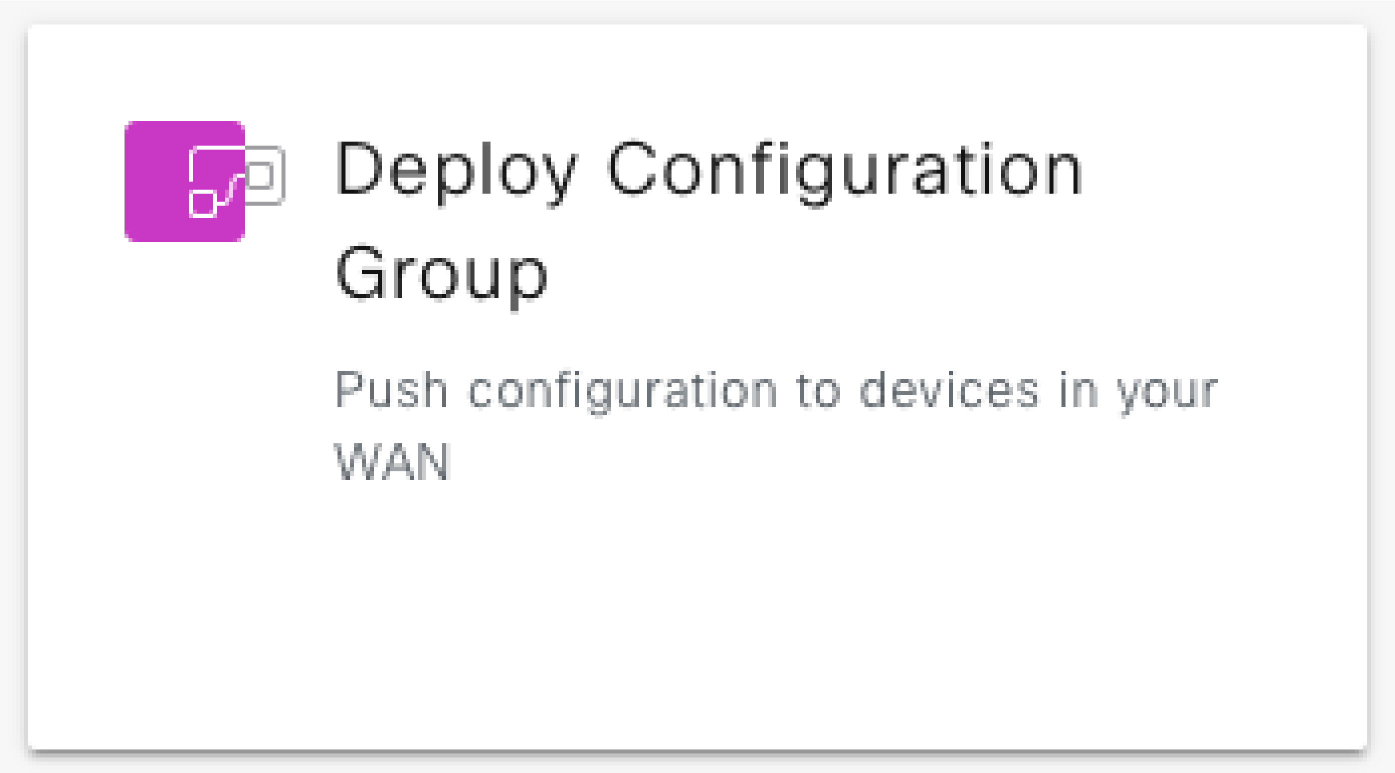
As of: Jul 15, 2024 10:23 AM

□	Chassis Numbers	Site Name	Hostname	Tags	Config Locked	System IP	Site ID	Device Status	Added by Rule	Last Configured	Up To Date
□	C8K-A51EAB60-5D3D-35C1-0051-A1D4416C1202	SITE_1	Site1-Edge	-	Yes	1.1.1.1	1	In Sync	false	Dec 14, 2023, 6:27:32 AM	True
□	C8K-01DE1D37-0F1B-F8DF-E71A-9D58D665FD10	SITE_3	Site3-Edge	-	Yes	3.3.3.1	3	In Sync	false	Dec 14, 2023, 6:27:32 AM	True

Associate Device - Configuration Groups

Deploy

Execute the *Deploy Configuration Group* Workflow.



Deploy Configuration Group

Push configuration to devices in your WAN

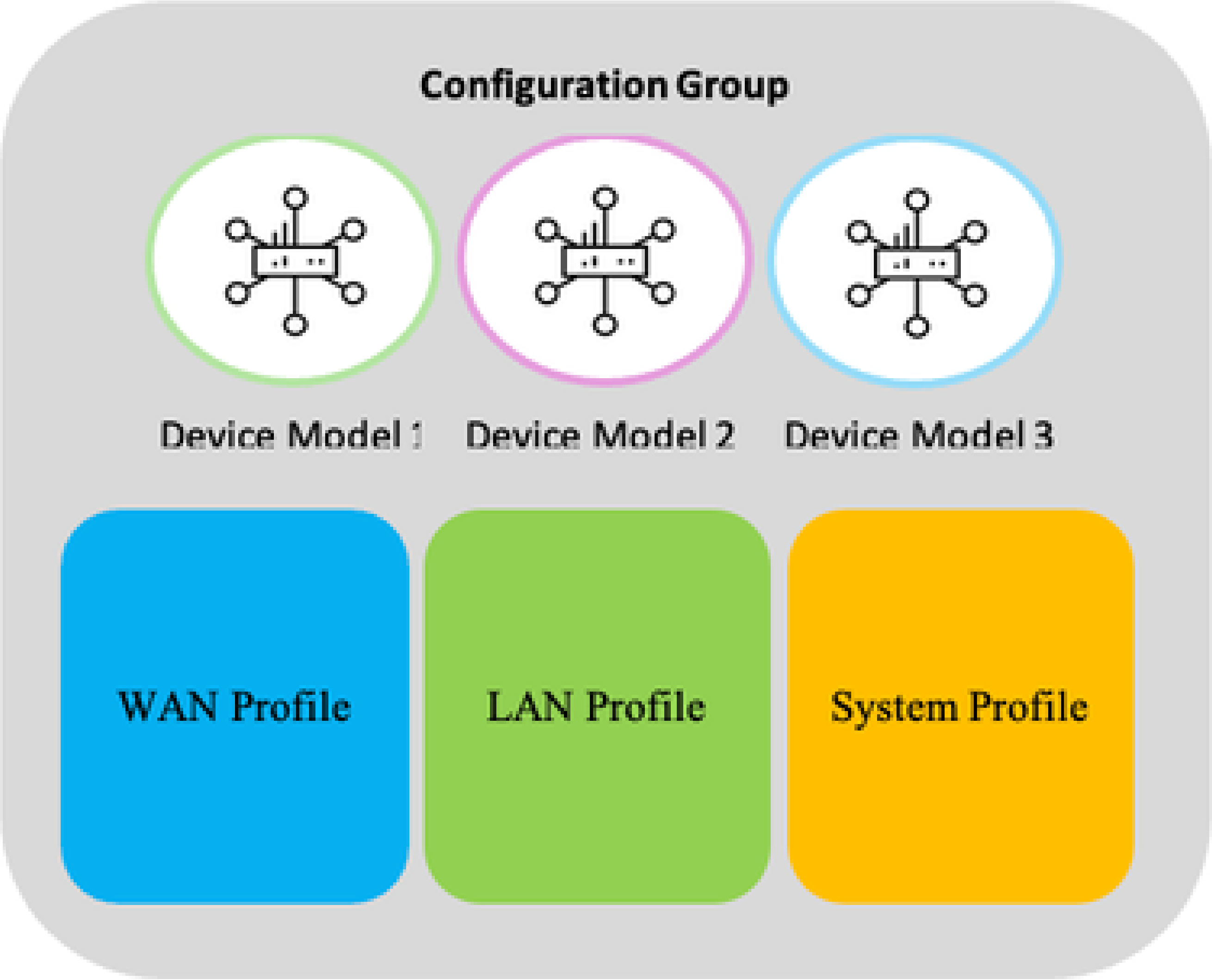
Deploy Configuration Group Workflow

NOTE:

- In the Configuration Group, the ***Change Device Values*** only changes the value in the Manager database, and does NOT push out any changes to a device. If you want the change to take place immediately, then you need to ***Deploy*** the changes.
- Exporting device variable values (as a CSV file) can be done in the Deploy workflow in the ***Add/Review Device Configuration*** step.

Re-usability

1. **Configuration Groups are device model agnostic.**



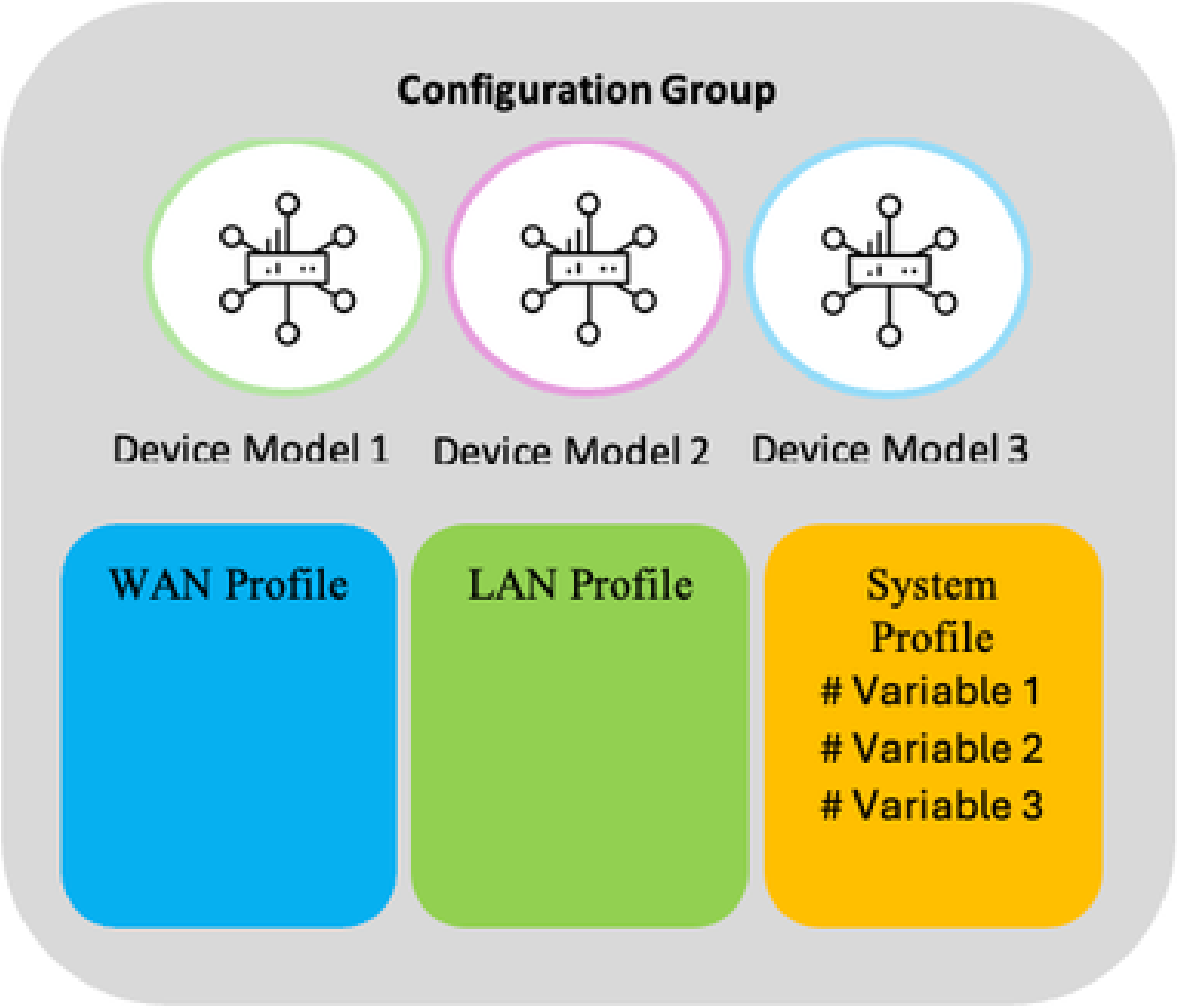
Configuration Group - Device Model Agnostic

NOTE:

If a particular configuration is not supported on a device model then, the corresponding feature parcel push does not occur and an appropriate message is displayed as part of the deploy task.

Example: A device does not support Wi-Fi, but the Configuration Group contains a Wi-Fi parcel. At deploy time, the Wi-Fi parcel configuration is skipped and the deploy task message informs that the Wi-Fi configuration push was skipped.

2. **Use Configuration variables – device-specific values**

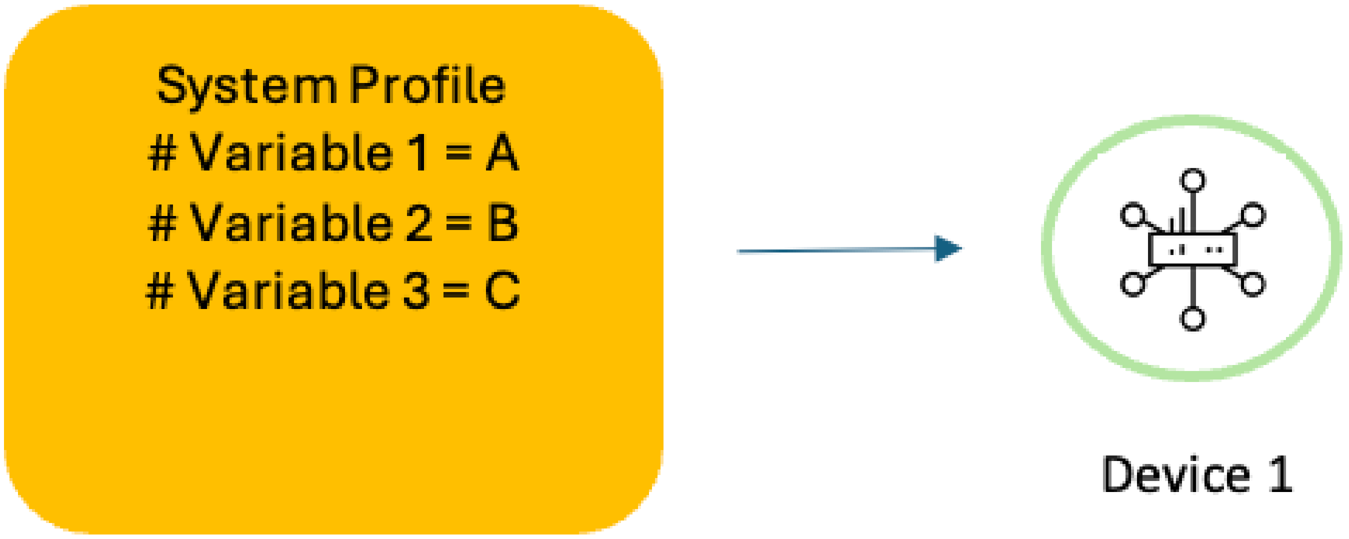


Configuration Group - Device Specific Variables

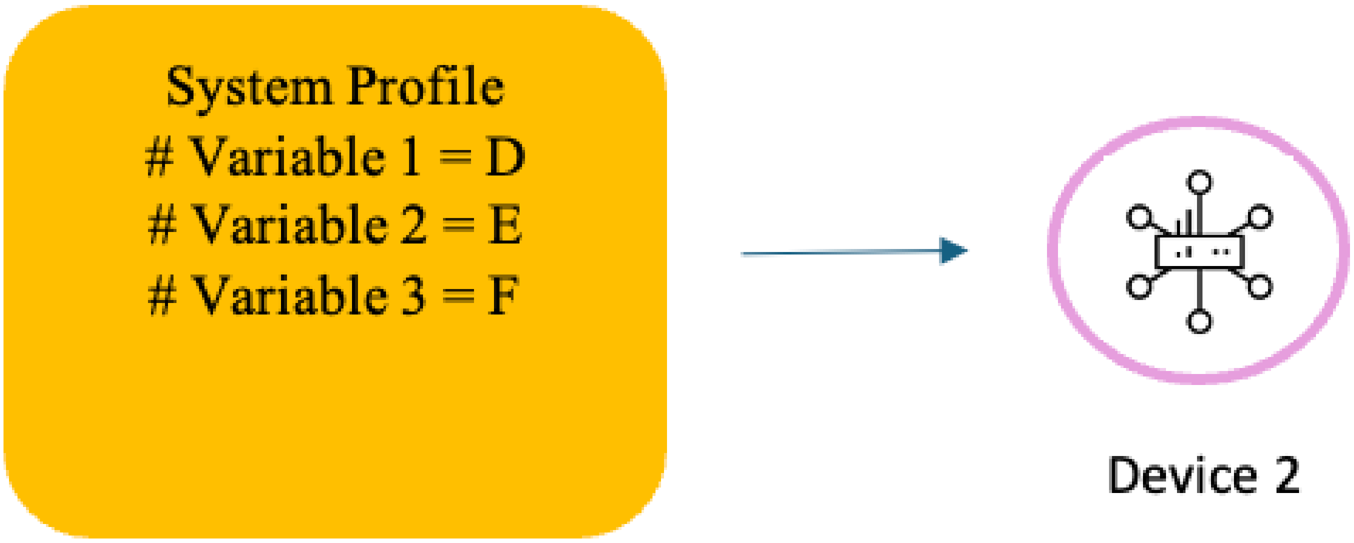
A Feature profile can have some configuration defined as device-specific, similar to template variables.

Example: Interface IP Address, port numbers, Interface name and so on.

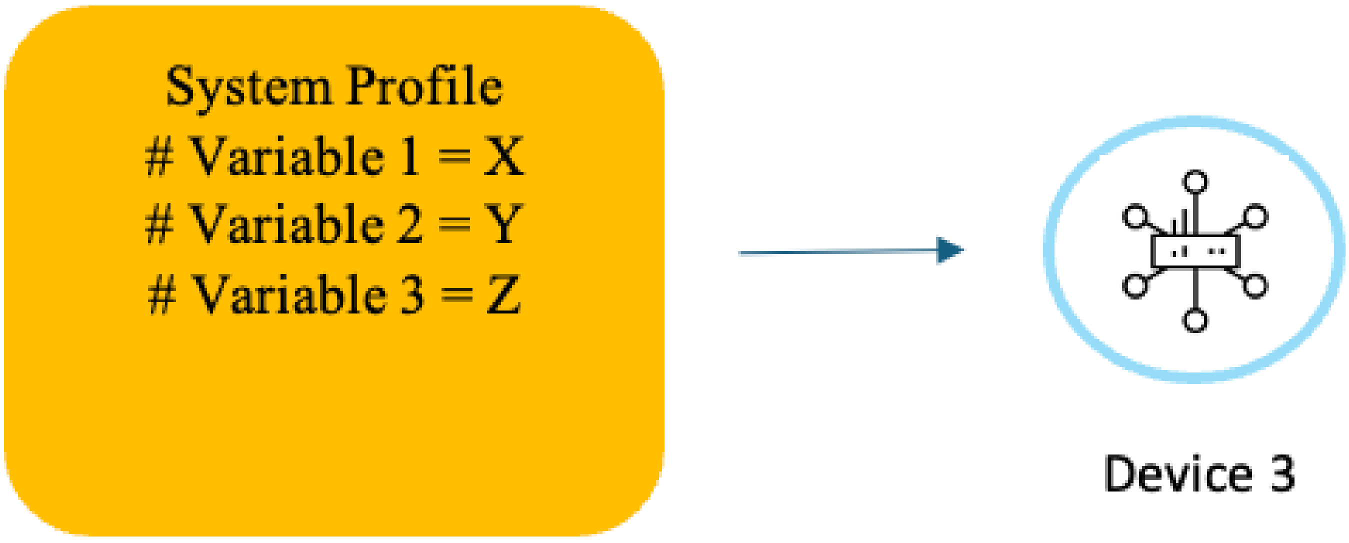
These device-specific values can be supplied at deploy time. And it can be different for different devices.



Configuration Group - Device Specific Variables Example 1



Configuration Group - Device Specific Variables Example 2



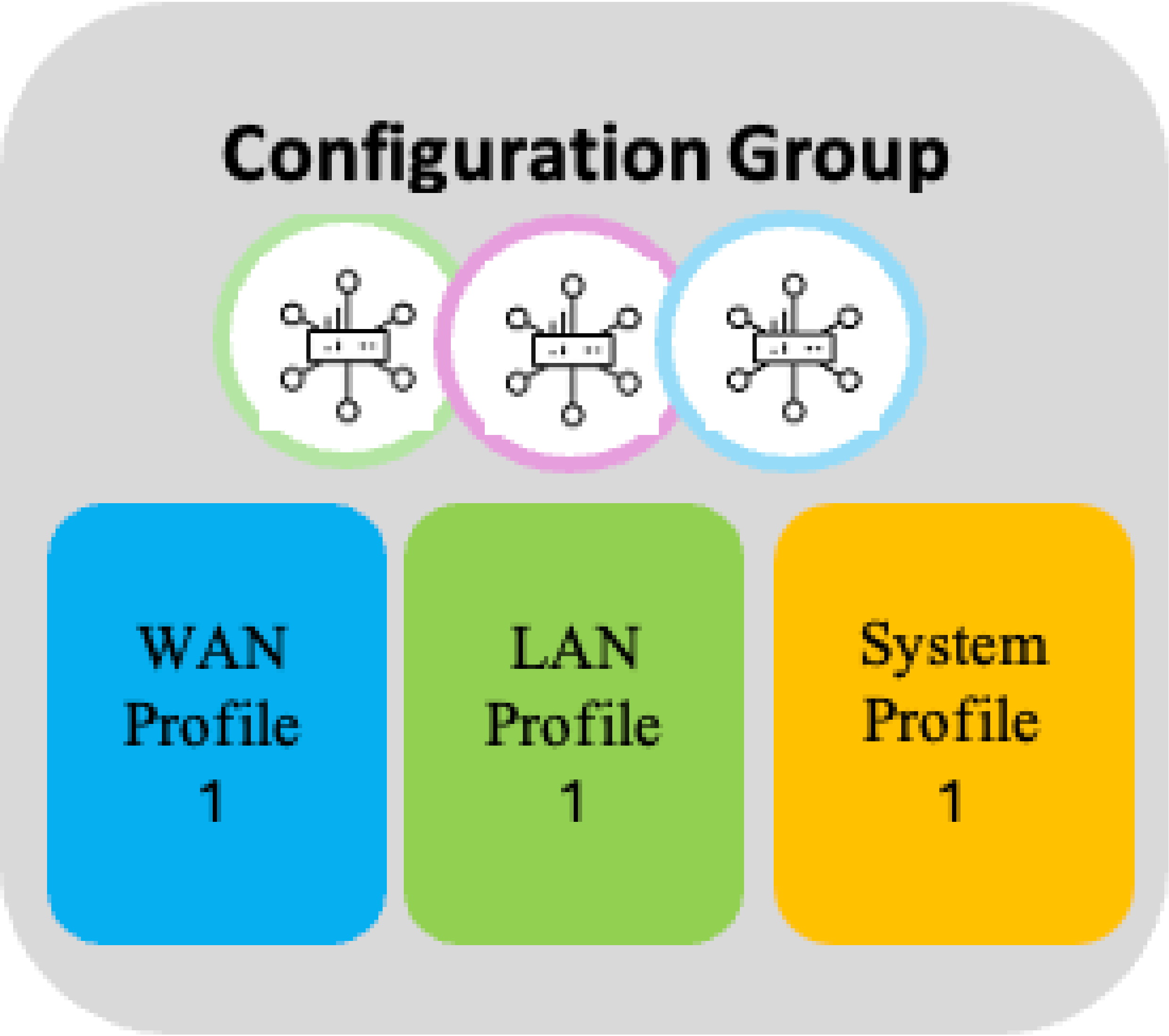
Configuration Group - Device Specific Variables Example 3

3. **Re-use Feature Profiles**

Feature profiles can be re-used across configuration groups.

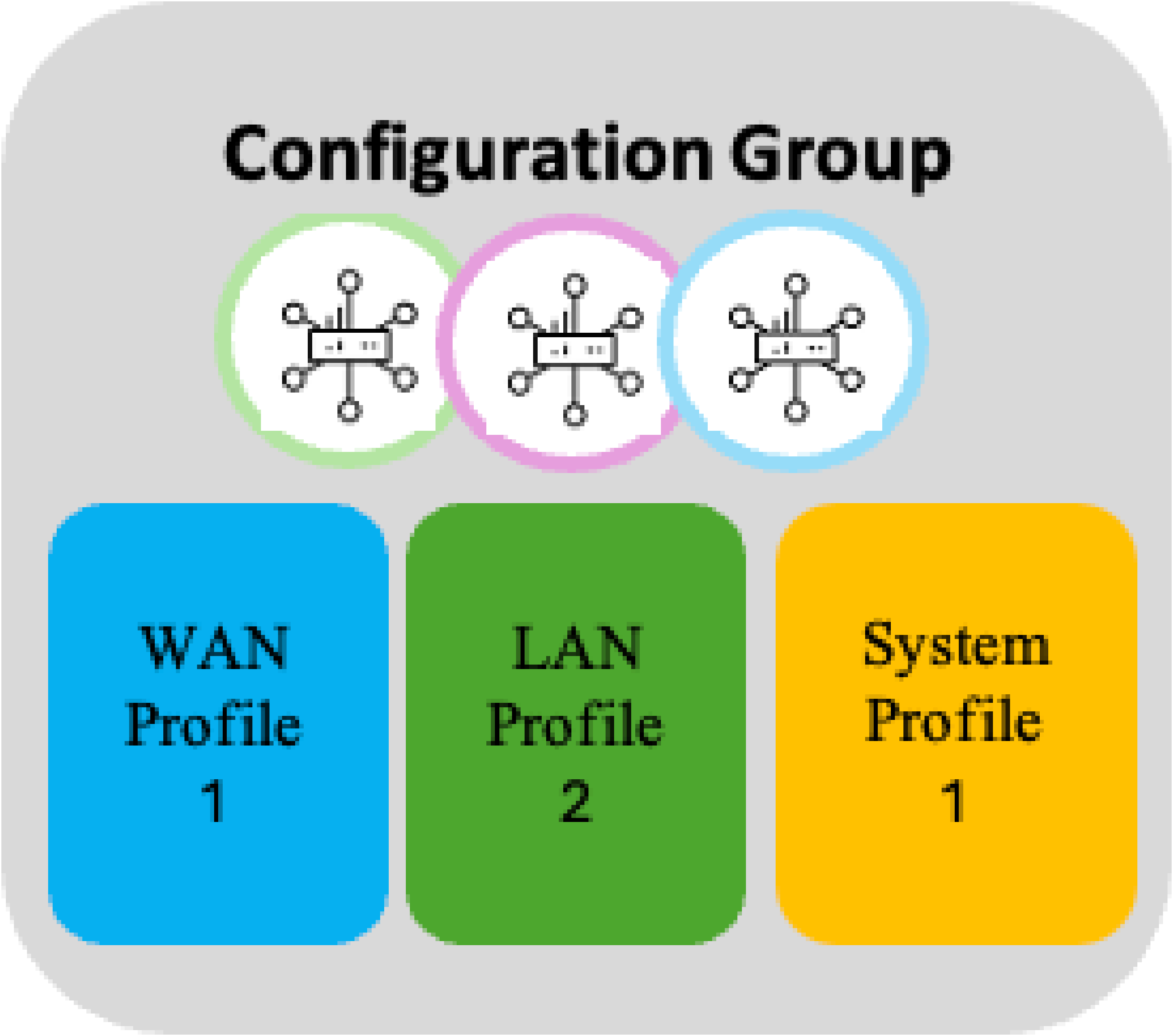
Illustration:

For several devices, if the WAN and System configurations are the same and they differ only in the LAN configuration, for example, then, the WAN and system profiles can be re-used across their Configuration groups while having a different LAN profile in each.



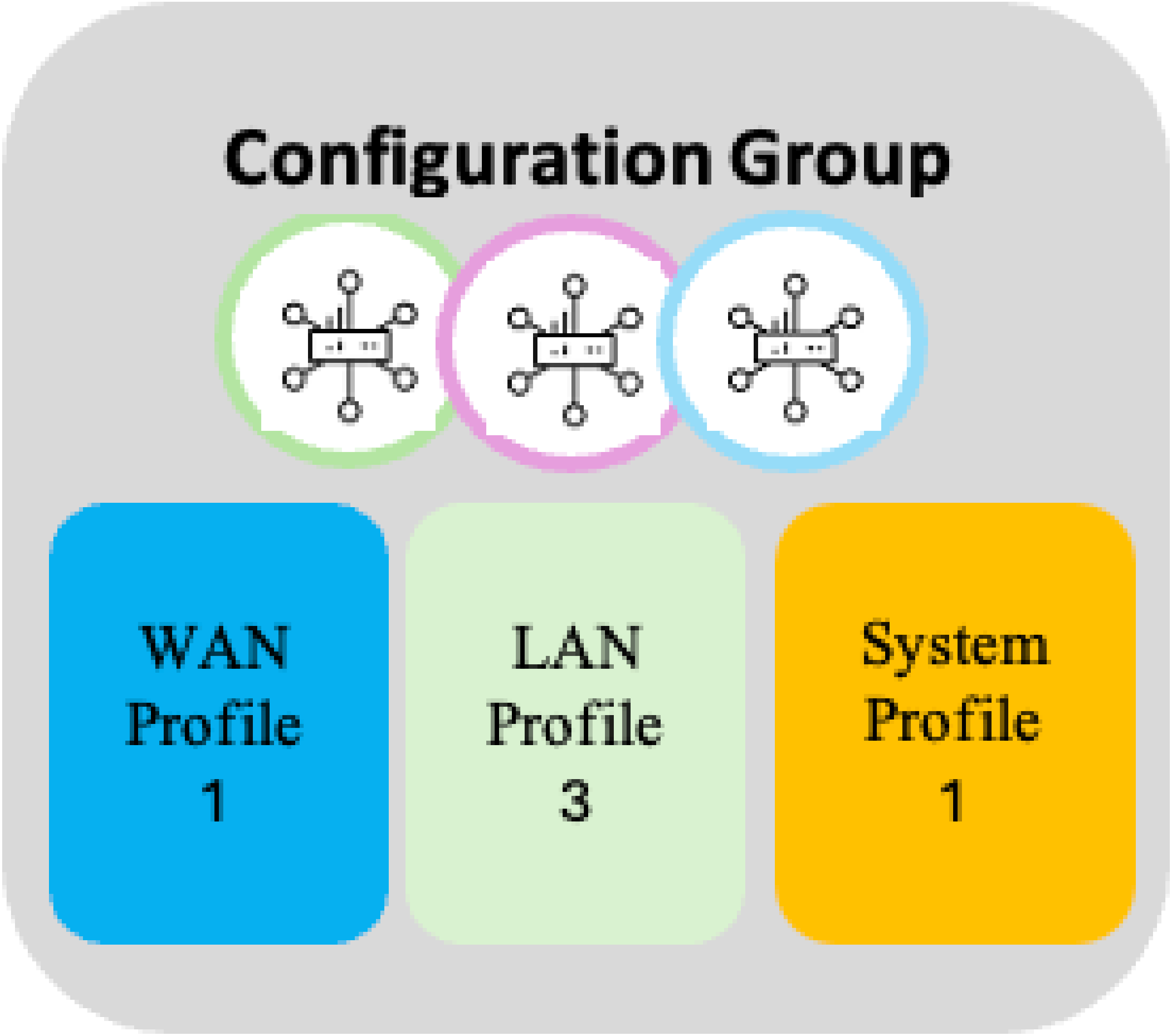
Re-use Feature Profiles - 1

LAN profile 1



Re-use Feature Profiles - 2

LAN profile 2



Re-use Feature Profiles - 3

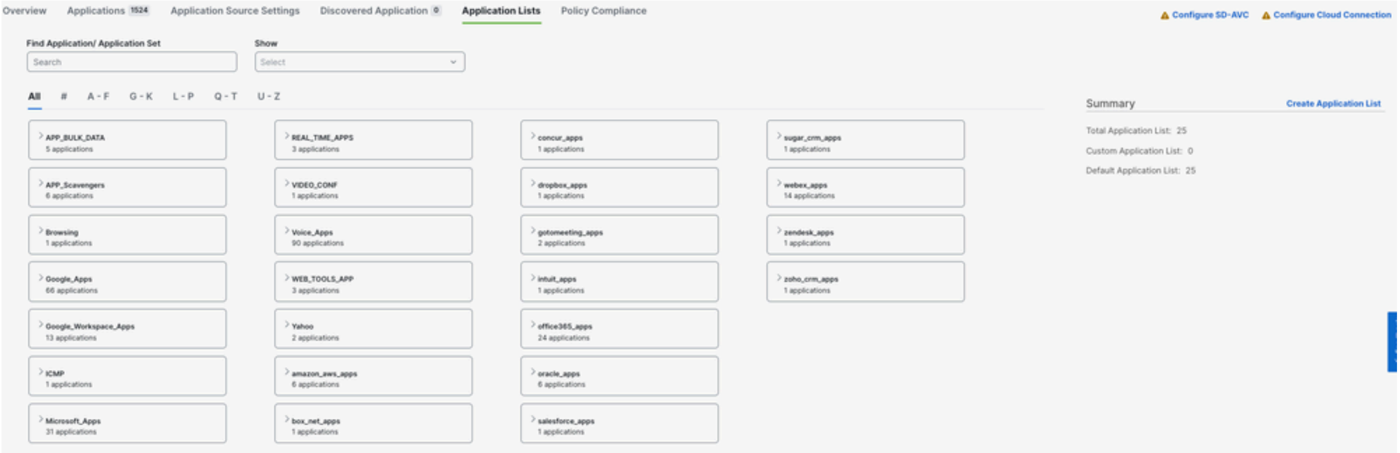
LAN profile 3

Application Catalog

Traditional devices were able to manipulate traffic flows by conditional matching of source and/or destination IP addresses, source/destination ports, and protocols. As more and more applications are dependent upon DNS or embedded in HTTP it is harder to accurately identify network traffic at the application level.

Cisco's Network Based Application Recognition (NBAR) engine has the ability to classify over 1500 applications providing network engineers the ability to classify and manipulate traffic flows with more granularity. Cisco's Catalyst SD-WAN Manager contains the ability to connect to a Cisco application repository where signatures for applications can be updated quickly; which has significance for when cloud providers change hosting locations or traffic patterns.

The ***Application catalog*** provides the ability to create custom applications based upon the matching of server name, ip address, ports, or protocol. The application is then defined to a specific Application Family, Application Group, Traffic Class, and Business Relevance.



APP_BULK_DATA 5 applications
APP_Scavengers 6 applications
Browsing 1 applications
Google_Apps 66 applications
Google_Workspace_Apps 13 applications
ICMP 1 applications
Microsoft_Apps 31 applications
REAL_TIME_APPS 3 applications
VIDEO_CONF 1 applications
Voice_Apps 90 applications
WEB_TOOLS_APP 3 applications
Yahoo 2 applications
amazon_aws_apps 6 applications
box_net_apps 1 applications
concur_apps 1 applications
dropbox_apps 1 applications
gotomeeting_apps 2 applications
intuit_apps 1 applications
office365_apps 24 applications
oracle_apps 6 applications
salesforce_apps 1 applications
sugar_crm_apps 1 applications
webex_apps 14 applications
zendesk_apps 1 applications
zoho_crm_apps 1 applications

Total Application List: 25
Custom Application List: 0
Default Application List: 25

Application Catalog

Applications can be dragged and dropped to the appropriate business relevance and/or traffic classification. Upon saving the changes, the definitions are updated in the database.

NOTE: Application classifications are global, and a change in the Application Catalog impacts all device classifications.

Policy Groups

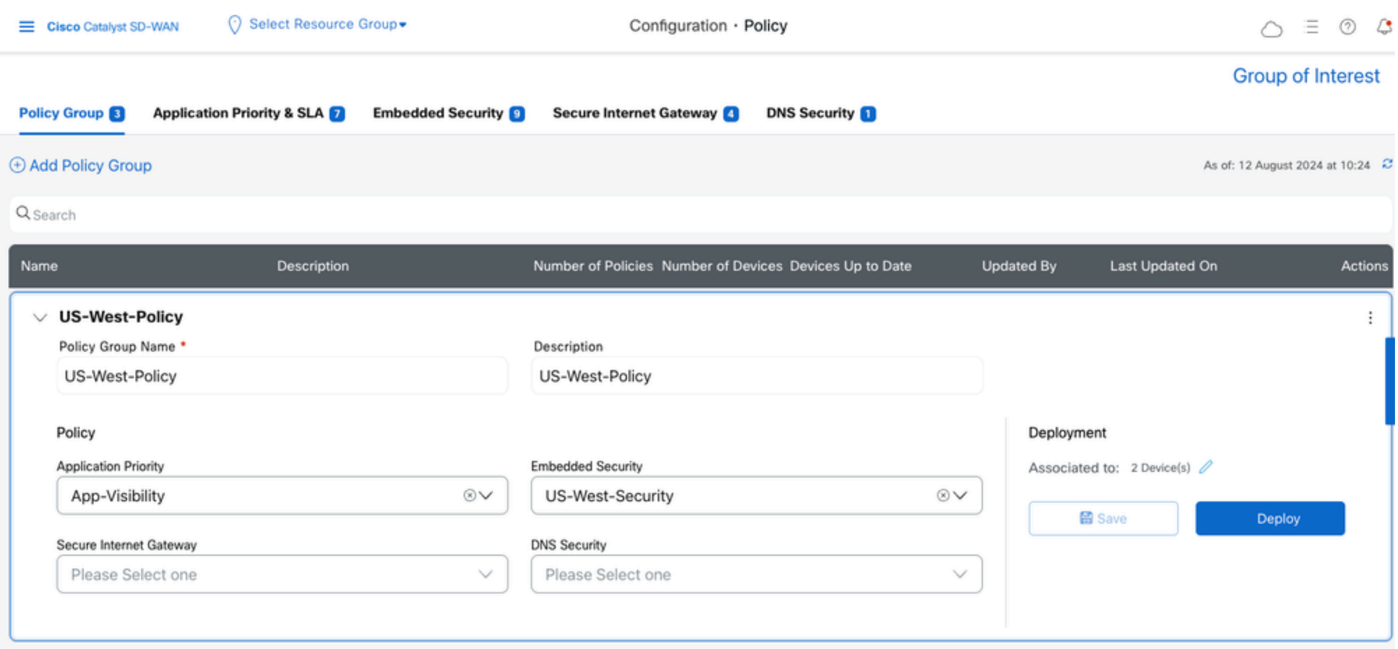
Similar to the Configuration Groups, a Policy Group is a grouping of policies that are deployed to devices associated with the Policy Group.

https://www.cisco.com/c/en/us/td/docs/routers/sdwan/configuration/Policy-Groups/policy-groups/m-policy-groups.html

Policy Group approaches policy creation and deployment based on intent. A simplified UI and workflow makes the creation of a policy, grouping policies and deploying to devices, an easy task.

Pre-requisite:

Configuration Group association and deployment to a device is a pre-requisite for Policy Group deployment to that device.



As of: 12 August 2024 at 10:24

Name	Description	Number of Policies	Number of Devices	Devices Up to Date	Updated By	Last Updated On	Actions
US-West-Policy							

Policy Group Name * US-West-Policy

Description US-West-Policy

Policy

Application Priority: App-Visibility

Embedded Security: US-West-Security

Secure Internet Gateway: Please Select one

DNS Security: Please Select one

Deployment

Associated to: 2 Device(s)

Policy Groups

Application Priority & SLA

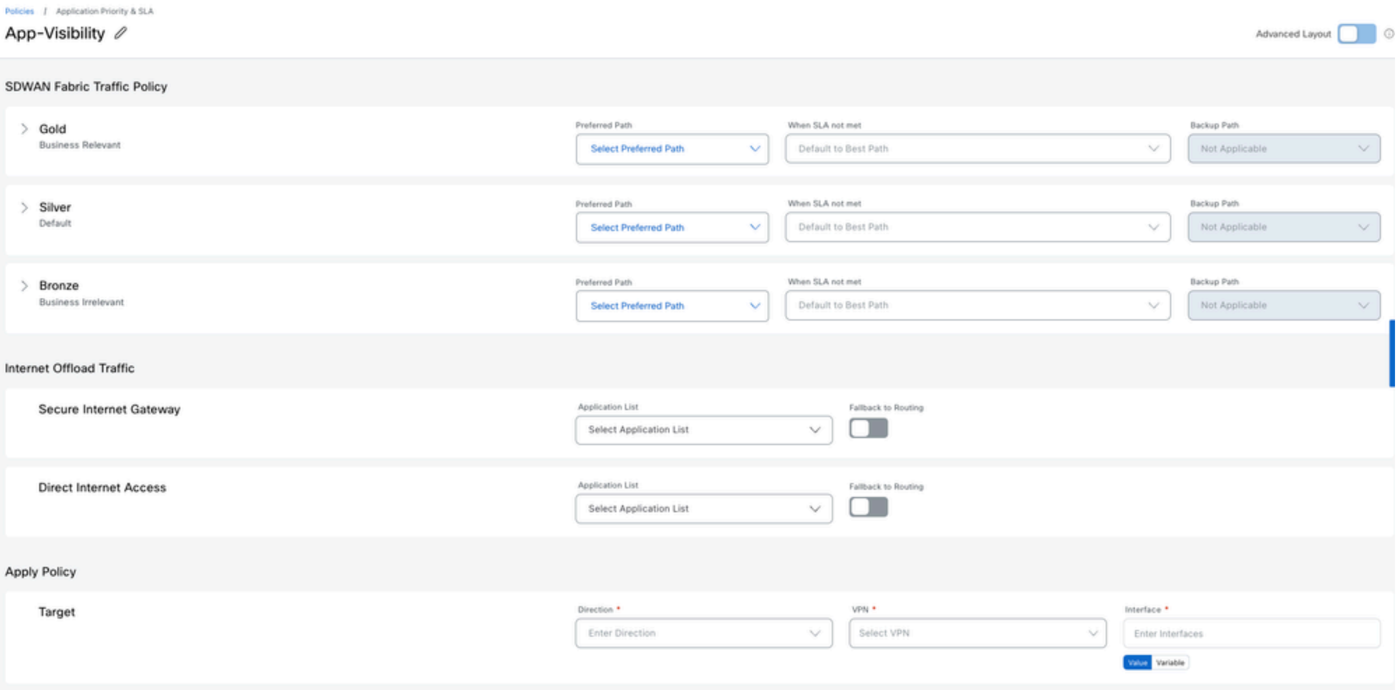
With this policy intent, you can specify:

- Application Aware Routing and SLA policy
- QoS policy
- Traffic Data policy
- DIA policy
- SIG policy

Two modes are provided.

Simple mode

This is the Default mode.



Policies / Application Priority & SLA

App-Visibility

Advanced Layout

SDWAN Fabric Traffic Policy

	Preferred Path	When SLA not met	Backup Path
Gold Business Relevant	Select Preferred Path	Default to Best Path	Not Applicable
Silver Default	Select Preferred Path	Default to Best Path	Not Applicable
Bronze Business Irrelevant	Select Preferred Path	Default to Best Path	Not Applicable

Internet Offload Traffic

	Application List	Fallback to Routing
Secure Internet Gateway	Select Application List	
Direct Internet Access	Select Application List	

Apply Policy

	Direction *	VPN *	Interface *
Target	Enter Direction	Select VPN	Enter Interfaces Value Variable

Simple Mode

This provides a quick and easy way to define the Application priority and SLA for your network.

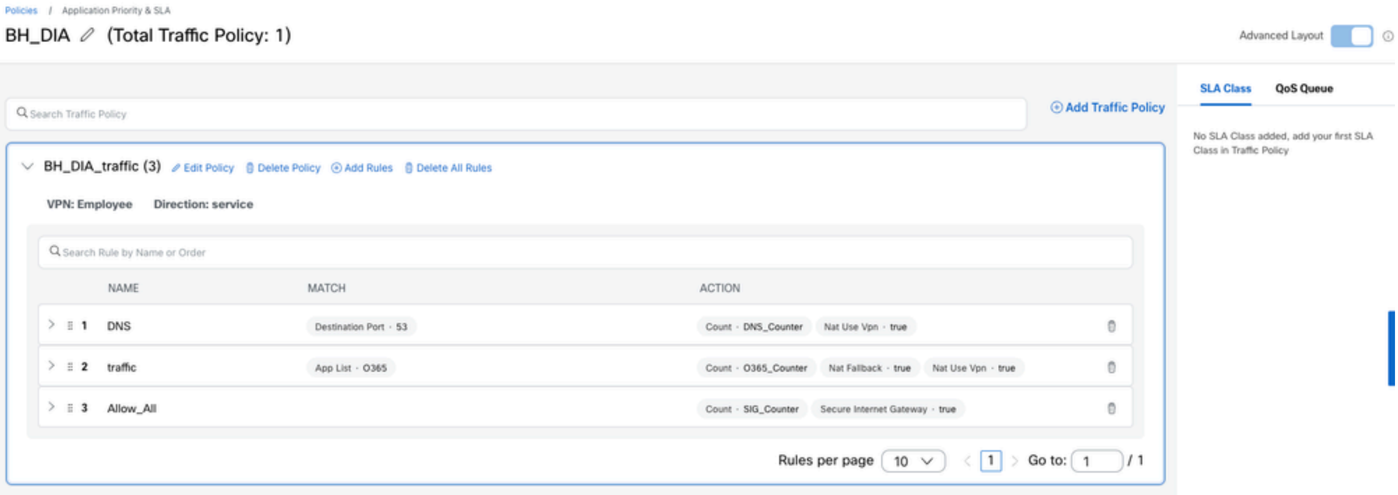
NOTE:

1. Default policy action is DROP

2. Match criteria can be *Applications* only. If you need Prefixes then, use Advanced mode

Advanced mode

This is a full and flexible mode.



Policies / Application Priority & SLA

BH_DIA (Total Traffic Policy: 1)

Advanced Layout

Search Traffic Policy

Add Traffic Policy

SLA Class | QoS Queue

No SLA Class added, add your first SLA Class in Traffic Policy

BH_DIA_traffic (3) Edit Policy Delete Policy Add Rules Delete All Rules

VPN: Employee Direction: service

Search Rule by Name or Order

	NAME	MATCH	ACTION
1	DNS	Destination Port · 53	Count · DNS_Counter Nat Use Vpn · true
2	traffic	App List · O365	Count · O365_Counter Nat Fallback · true Nat Use Vpn · true
3	Allow_All		Count · SIG_Counter Secure Internet Gateway · true

Rules per page 10 | 1 | Go to: 1 / 1

Advanced Mode

NOTE:

1. Default policy action is DROP

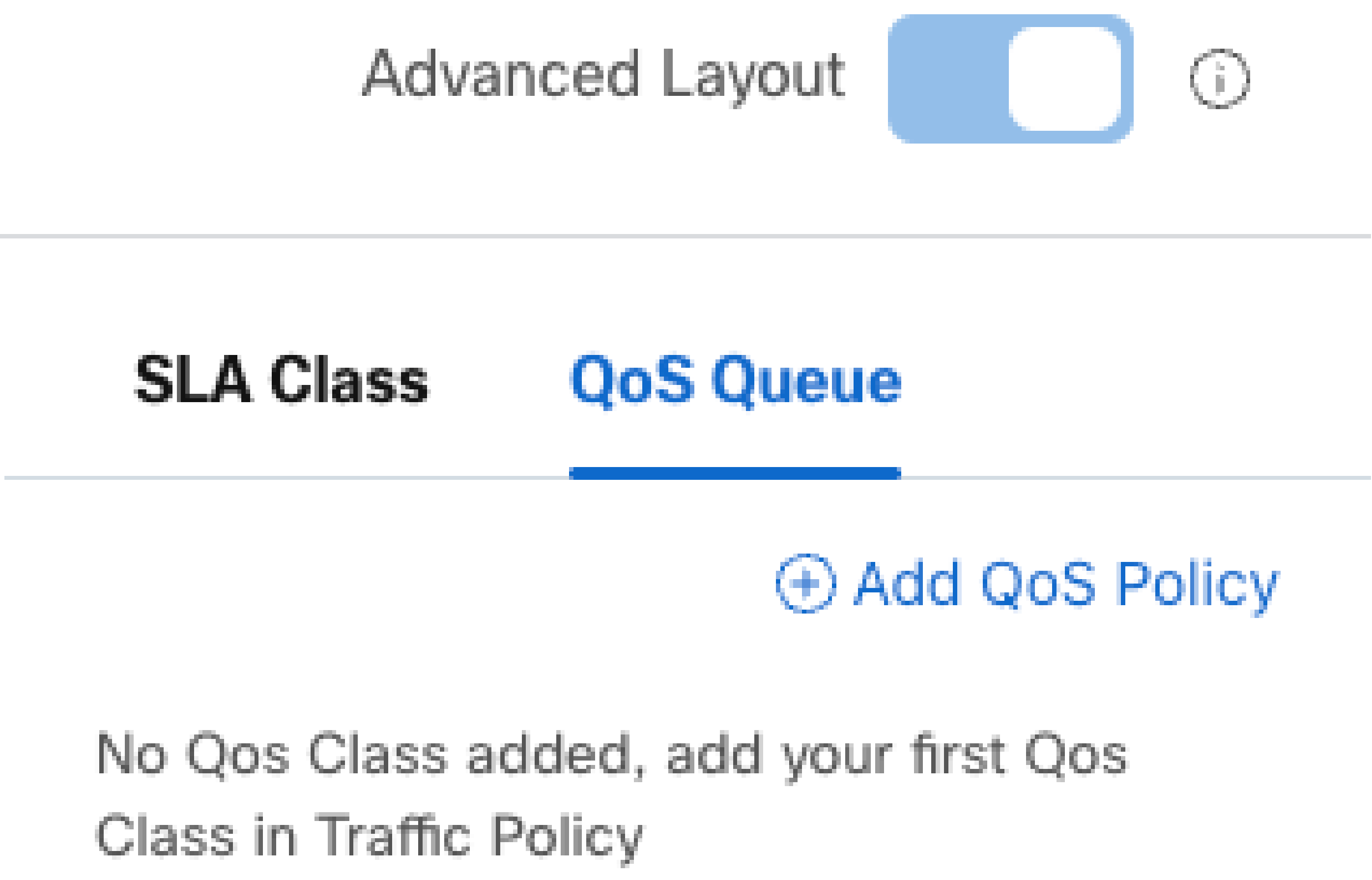
2. Application List and Traffic Class are essentially a list of Applications.

Either one of them can be used for matching a list of Applicaitons. Mapping of Applications to Traffic Class can be done in Application Catalog.

Simple mode generates rules using any or both of these whereas, Advanced mode provides Application List only.

Quality of Service

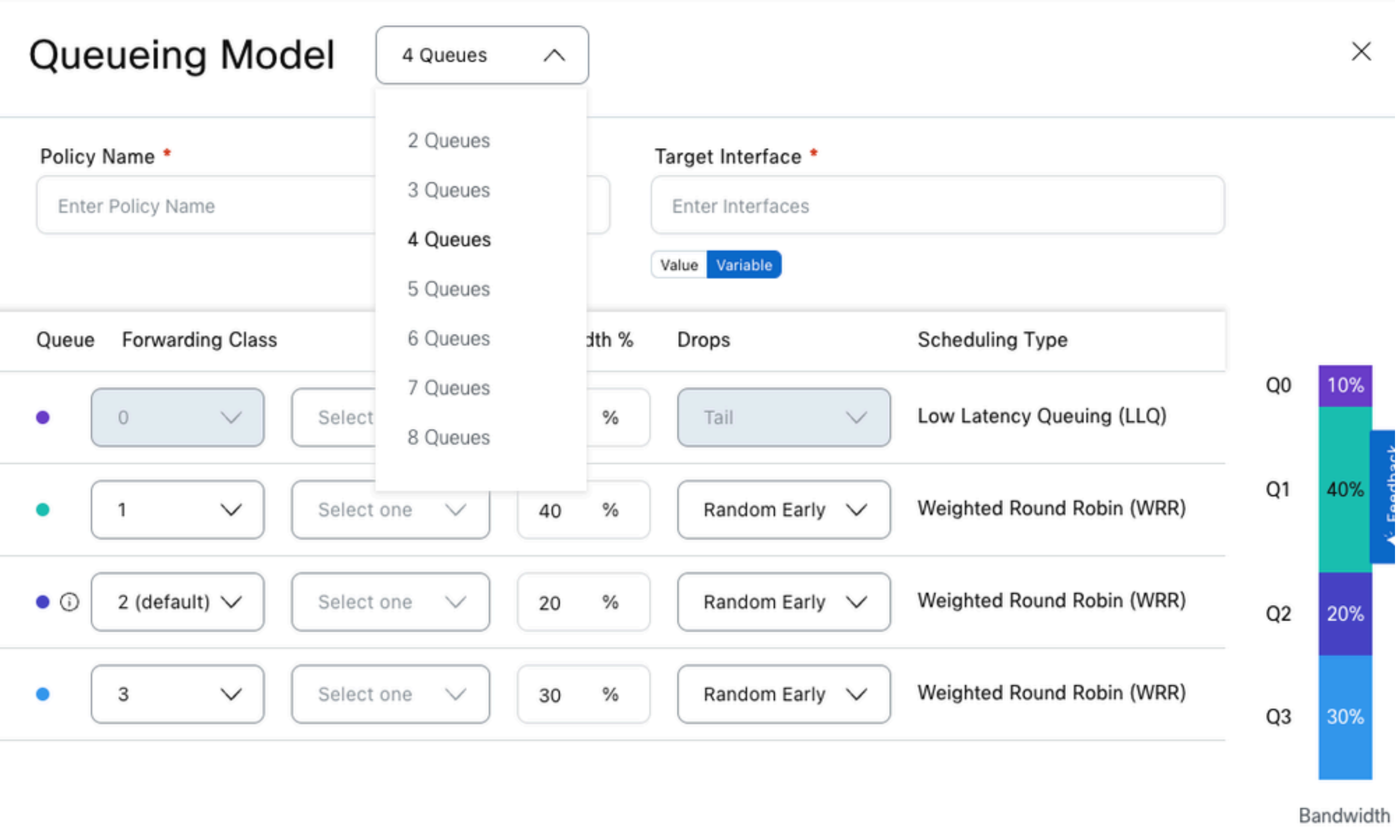
In the *QoS Queue* option, you can add a QoS policy:



Advanced Layout

No Qos Class added, add your first Qos Class in Traffic Policy

Add QoS Policy



Queueing Model

4 Queues

Policy Name *

Enter Policy Name

Target Interface *

Enter Interfaces

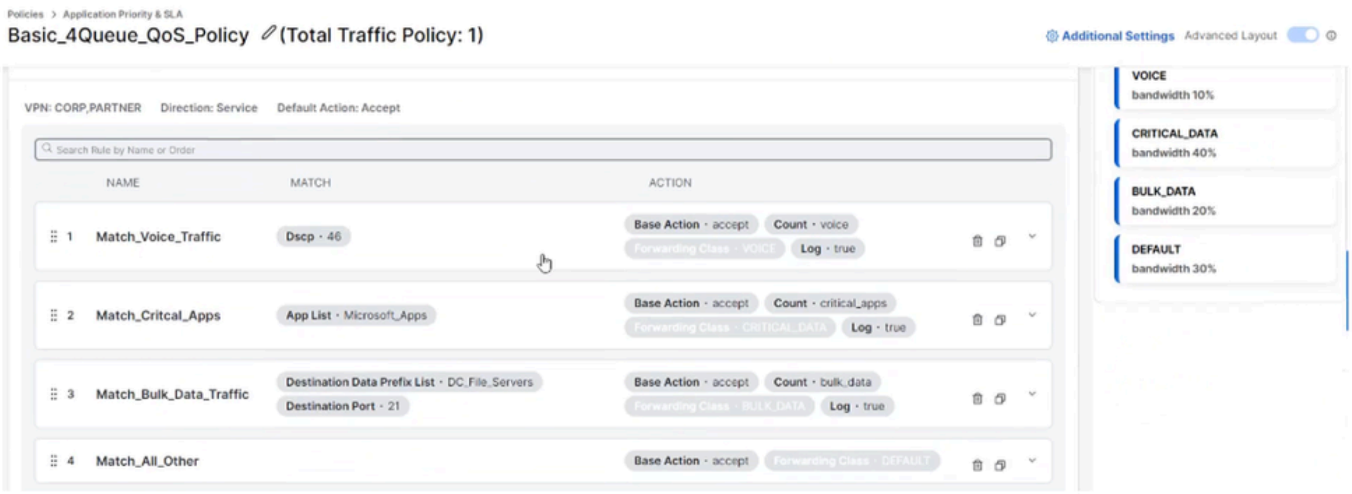
Value Variable

Queue	Forwarding Class		dth %	Drops	Scheduling Type
●	0	Select	%	Tail	Low Latency Queuing (LLQ)
●	1	Select one	40 %	Random Early	Weighted Round Robin (WRR)
● ⓘ	2 (default)	Select one	20 %	Random Early	Weighted Round Robin (WRR)
●	3	Select one	30 %	Random Early	Weighted Round Robin (WRR)

Queuing Models

Next you can define the Traffic data policy (*Add Traffic policy*).

Add rules to match desired traffic and redirect to appropriate Forwarding classes.



Policies > Application Priority & SLA

Basic_4Queue_QoS_Policy (Total Traffic Policy: 1)

VPN: CORP,PARTNER Direction: Service Default Action: Accept

Search Rule by Name or Order

	NAME	MATCH	ACTION
1	Match_Voice_Traffic	Dscp · 46	Base Action · accept Count · voice Forwarding Class · VOICE Log · true
2	Match_Critcal_Apps	App List · Microsoft_Apps	Base Action · accept Count · critical_apps Forwarding Class · CRITICAL_DATA Log · true
3	Match_Bulk_Data_Traffic	Destination Data Prefix List · DC_File_Servers Destination Port · 21	Base Action · accept Count · bulk_data Forwarding Class · BULK_DATA Log · true
4	Match_All_Other		Base Action · accept Forwarding Class · DEFAULT

VOICE
bandwidth 10%

CRITICAL_DATA
bandwidth 40%

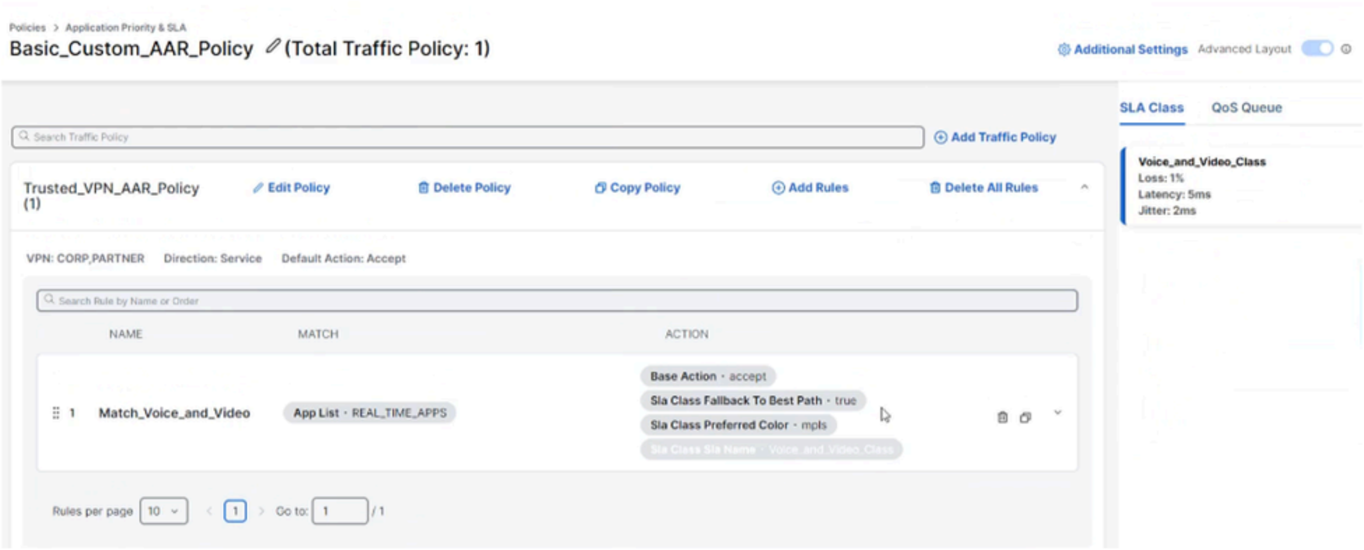
BULK_DATA
bandwidth 20%

DEFAULT
bandwidth 30%

QoS Policy 2

Application Aware Routing

You can define SLA classes and use them in a Traffic policy to realize the intent of an AAR policy.



Policies > Application Priority & SLA

Basic_Custom_AAR_Policy (Total Traffic Policy: 1)

Voice_and_Video_Class
Loss: 1%
Latency: 5ms
Jitter: 2ms

Trusted_VPN_AAR_Policy (1)

VPN: CORP,PARTNER Direction: Service Default Action: Accept

	NAME	MATCH	ACTION
1	Match_Voice_and_Video	App List · REAL_TIME_APPS	Base Action · accept Sla Class Fallback To Best Path · true Sla Class Preferred Color · mpls Sla Class Sla Name · Voice_and_Video_Class

Rules per page 10 · 1 · Go to: 1 / 1

AAR Policy

App/Flow visibility

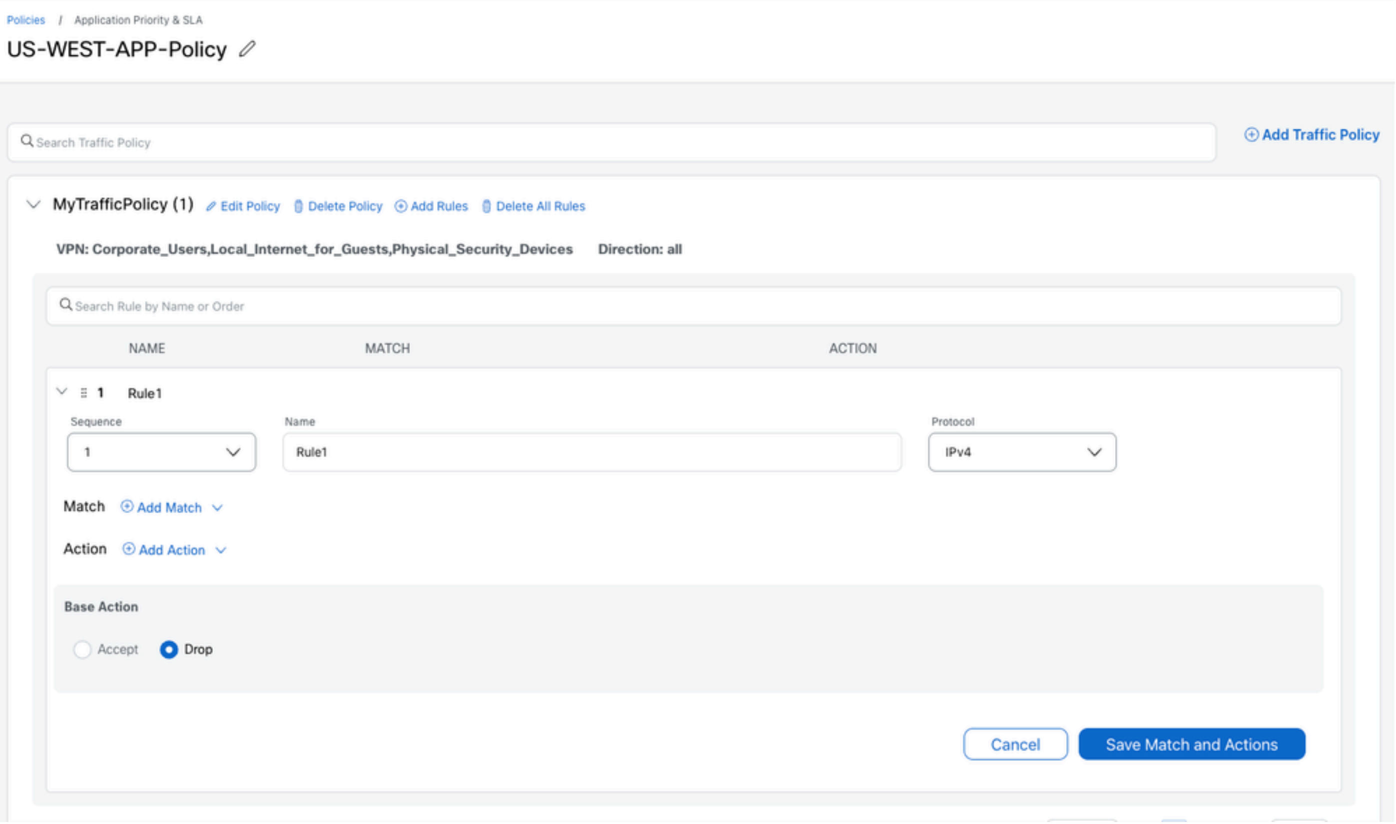
To enable app-visibility and flow-visibility, use CLI profile/parcel in Configuration Group.

(In 20.13 and later, it is available under *Advanced Settings* in Policy Group)

However, in 20.12, if a AAR policy is configured then, App/Flow Visibility is enabled. And configuring this using CLI profile/parcel, is not required.

Traffic policy

Traffic policy can also be used to create a DIA policy, SIG redirection and so on. Add Rules as required.



Policies / Application Priority & SLA

US-WEST-APP-Policy

MyTrafficPolicy (1)

VPN: Corporate_Users,Local_Internet_for_Guests,Physical_Security_Devices Direction: all

1 Rule1

Sequence: 1

Name: Rule1

Protocol: IPv4

Match

Action

Base Action

○ Accept ● Drop

NOTE:

If an Application Priority & SLA policy is created in simple mode, and then switched over to Advanced mode, some Match options are not available for selection. Example: Destination Data Prefix is greyed out.
To make these options available, change the ***Protocol*** from ***BOTH*** to IPv4 or IPv6 as required.

Embedded Security

Defines the security policy for on-box NGFW, IPS, Malware, and content filtering

Secure Internet Gateway/Secure Service Edge

Defines settings required to establish tunnels to cloud based content and security entities, like Cisco Secure Access.

NOTE:

With the legacy configuration approach, this was available as a Feature Template.

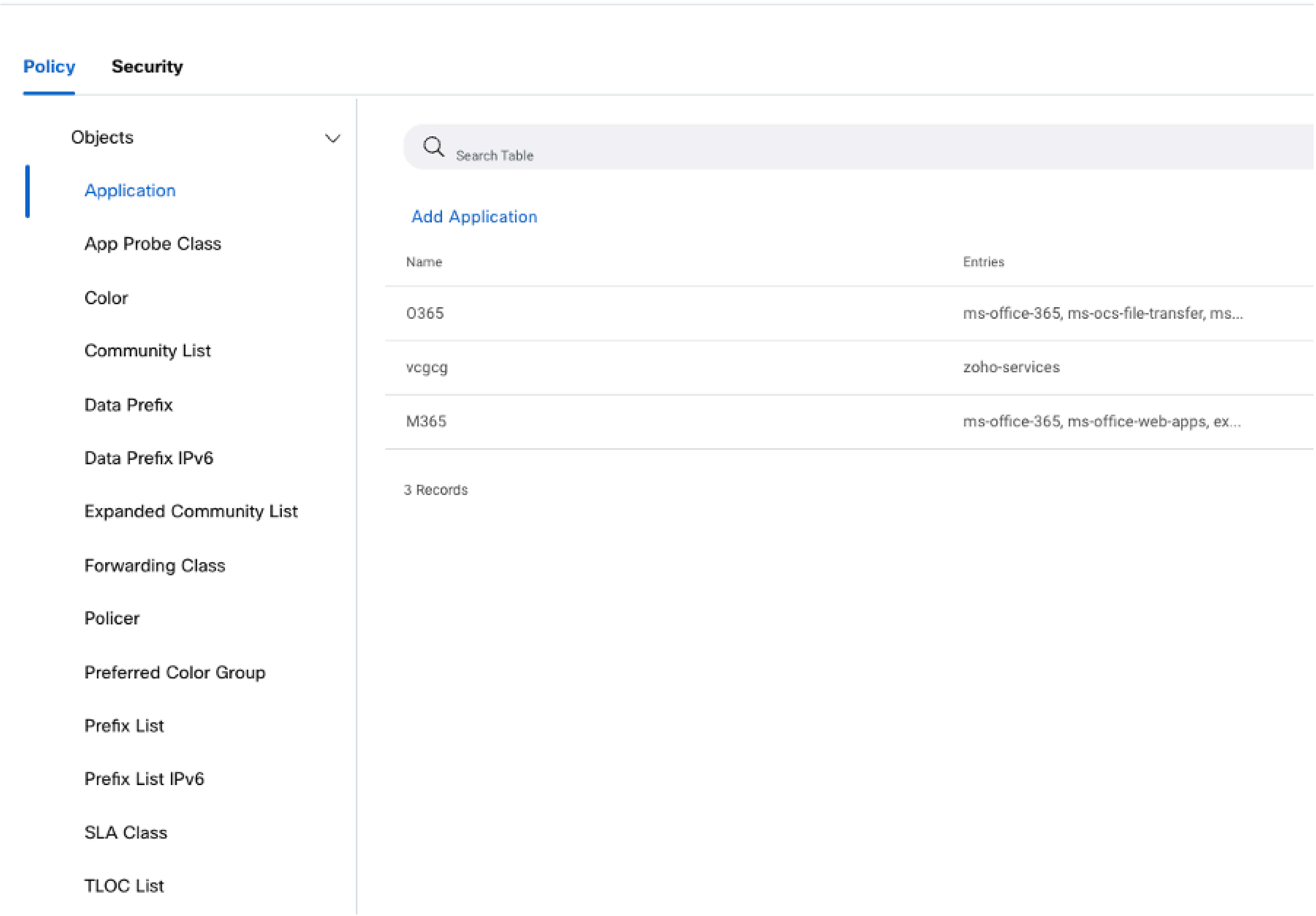
DNS Security

Define settings to allow the usage of cloud-based DNS security services for content filtering.

Groups of Interest

Define the object lists to use in your policies. Example: Application lists, VPN lists, Site lists, Prefixes list and so on.

Additionally, for Security policies, define your profiles like Advanced inspection profiles, SSL decryption policy and so on.



Name	Entries
O365	ms-office-365, ms-ocs-file-transfer, ms...
vcgcg	zoho-services
M365	ms-office-365, ms-office-web-apps, ex...

3 Records

Policy Groups - Groups of Interest

Associate and Deploy

Similar to Configuration Groups, associate devices to Policy Group and deploy.

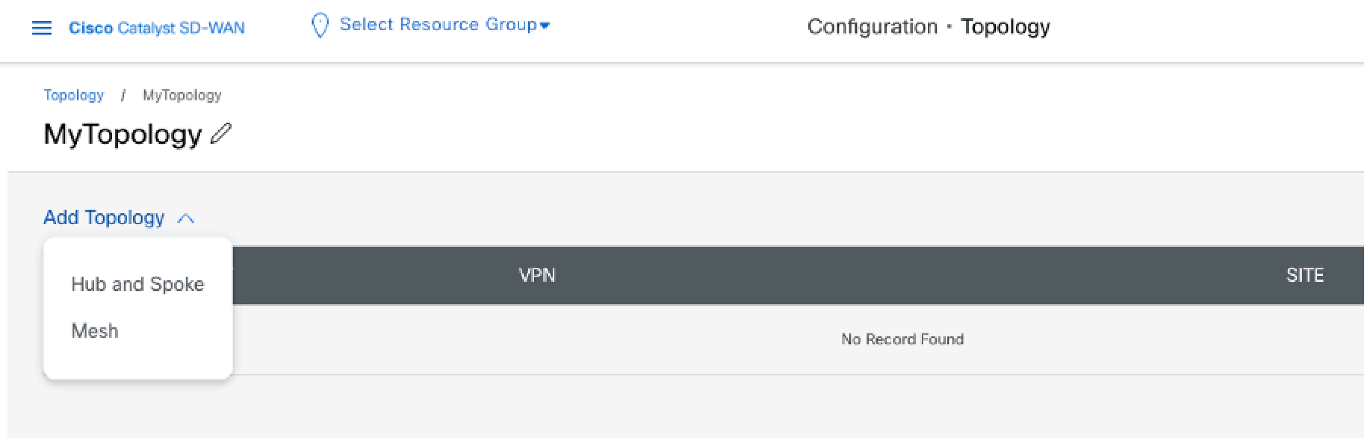
Localized policies

Localized policies like ACL, Route policy, Device access policy and so on, are defined in ***Configuration groups***.

Topology

Define your Network Topology.

Start with a Full mesh or Hub-n-Spoke and customize it if required.



Cisco Catalyst SD-WAN

Select Resource Group

Configuration · Topology

Topology / MyTopology

MyTopology

Add Topology

Hub and Spoke

Mesh

VPN	SITE
No Record Found	

Topology menu

Topology and VPN

Keep in mind these design changes while creating Topology and specifying VPNs.

The new design allows dynamic mapping of VPN name to VPN ID, instead of 1:1 mapping.

A VPN name mapping to multiple VPN IDs

Illustration:
Say there is a VPN with the name *Corporate* in two different Configuration Groups.

One has VPN ID 10 and the other has VPN ID 20.

The Topology workflow VPN list shows one instance of *Corporate* VPN only.

Once you select *Corporate* VPN, the SD-WAN Manager determines the VPN IDs based on the Topology.
Say there are 2 devices in 2 sites:
1. Device1 in site 100 with *Corporate* as VPN 10
2. Device2 in site 200 with *Corporate* as VPN 20

If both site 100 and site 200 are part of the Topology then, SD-WAN Manager creates a VPN list that will have both VPN IDs (10 and 20).
If only site 100 is part of the Topology then, SD-WAN Manager creates a VPN list that will have VPN ID 10 only.
If only site 200 is part of the Topology then, SD-WAN Manager creates a VPN list that will have VPN ID 20 only.

Muliple VPN names mapping to the same VPN ID

You can configure multiple Topology policies with same VPN name that are mapped to different VPN IDs in different sites.

SD-WAN Manager determines the actual mapping based on which Topology is associated to which sites.

Illustration:

Two users can create two different Configuration Groups.

One specifies VPN ID 100 as *Finance* VPN and the other specifies it as *Engineering* VPN.

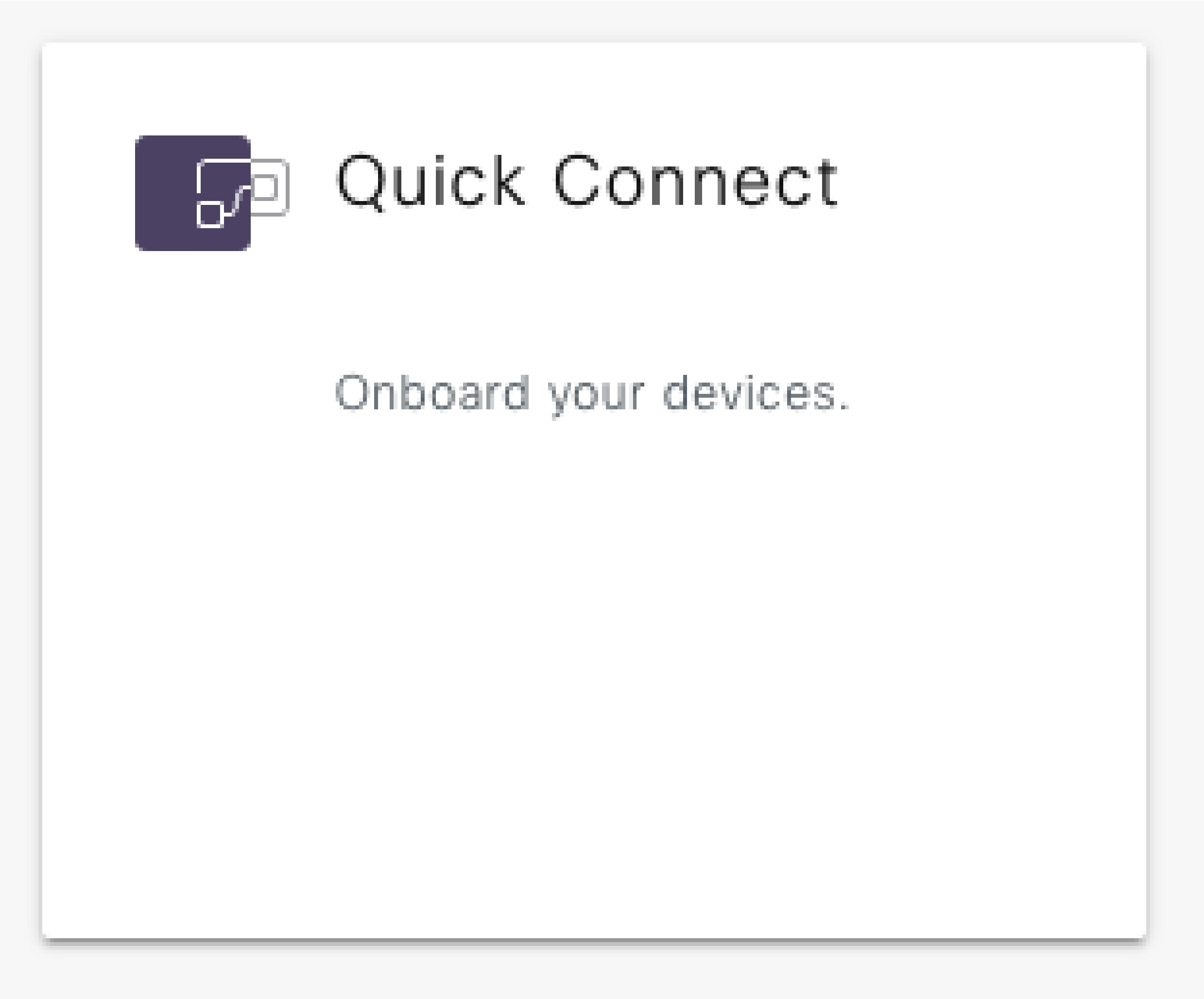
Then they can create Topology using their respective VPN names.

Onboarding

For onboarding your physical routers, use the *Quick Connect Workflow*.

Using this workflow, pre-define the Hostname, System-IP, and Site-name/ID for the devices to be onboarded. Manager auto-generates these but you can modify them if you wish to do so. You can also tag the devices which can then be used to auto-associate the devices to Configuration Groups.

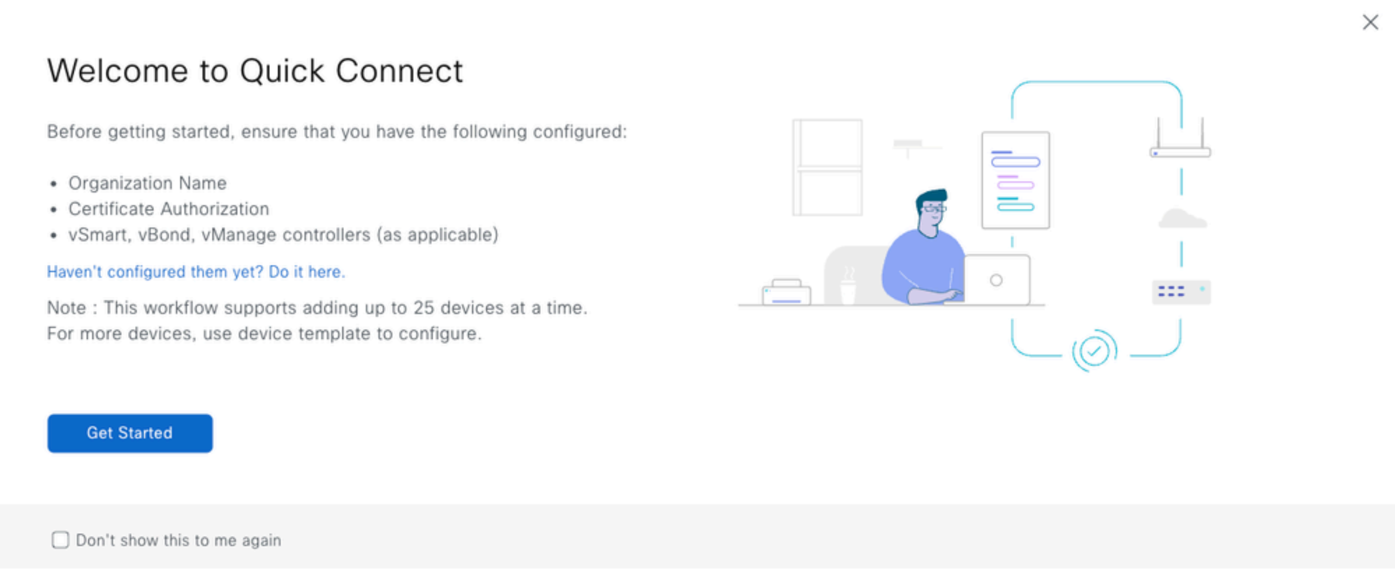
During the PnP ZTP onboarding process, the devices establish the control plane tunnel connections to the SD-WAN Manager. SD-WAN Manager now pushes the pre-defined fabric configuration to the devices and the devices join the SD-WAN fabric.



Quick Connect

Onboard your devices.

Quick Connect Workflow



Welcome to Quick Connect

Before getting started, ensure that you have the following configured:

- Organization Name
- Certificate Authorization
- vSmart, vBond, vManage controllers (as applicable)

Haven't configured them yet? Do it here.

Note : This workflow supports adding up to 25 devices at a time.
For more devices, use device template to configure.

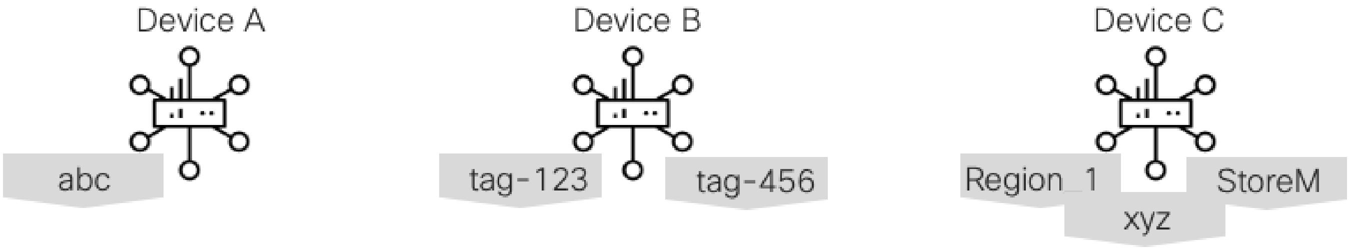
Quick Connect Workflow Description

Tagging

Devices can be associated with user-defined Tags.

Tags can be used for grouping, describing, finding, or managing devices.

Tags enables grouping of devices which can then be used in other features.



Tagging Examples

Example: Association of Configuration Groups to devices.

Configuration Group rules can be set to enable devices with specific Tags to be automatically associated with that Configuration Group.

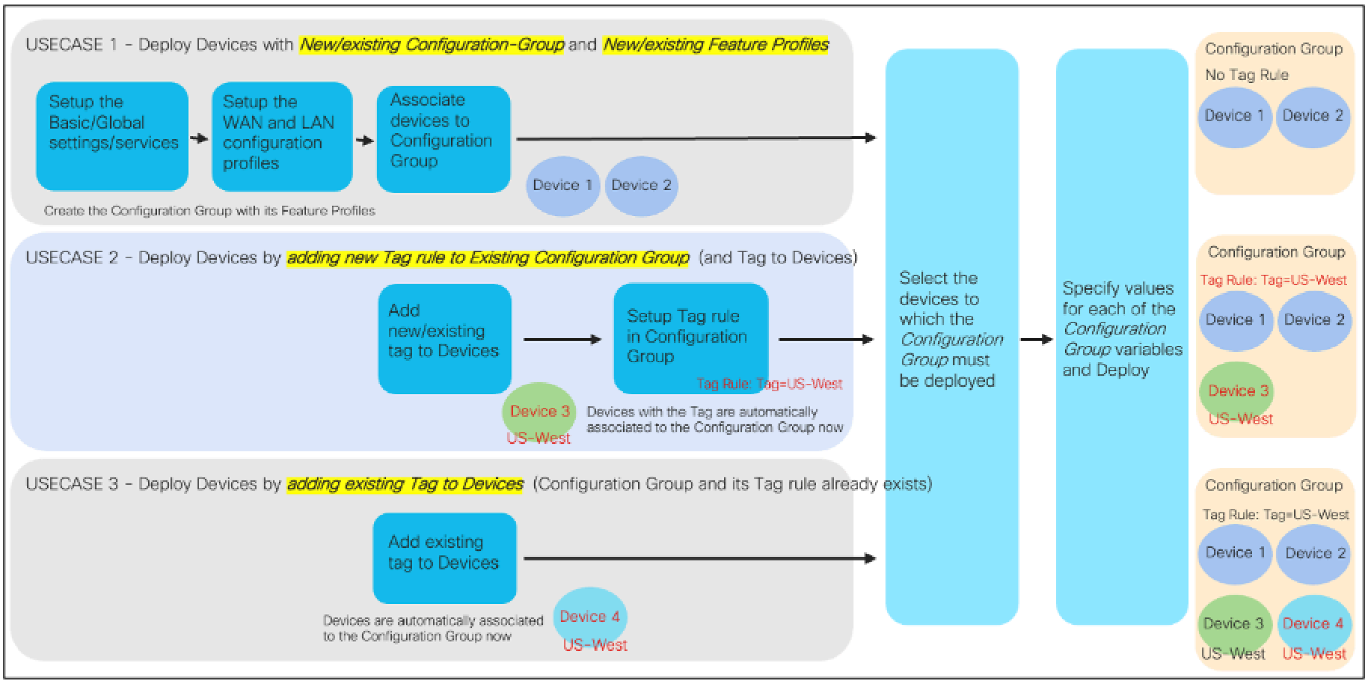
Add Tag

In Configuration->Devices, Tags can be created / added to / removed from the devices.

Tag Rules in Configuration Group

In the Configuration Group -> Associated Devices page, Tag rules can be added/edited.

Illustration



USECASE 1 - Deploy Devices with New/existing Configuration-Group and New/existing Feature Profiles
Setup the Basic/Global settings/services
Setup the WAN and LAN configuration profiles
Associate devices to Configuration Group
Device 1
Device 2
Create the Configuration Group with its Feature Profiles
USECASE 2 - Deploy Devices by adding new Tag rule to Existing Configuration Group (and Tag to Devices)
Add new/existing tag to Devices
Setup Tag rule in Configuration Group
Tag Rule: Tag=US-West
Device 3
US-West
Devices with the Tag are automatically associated to the Configuration Group now
USECASE 3 - Deploy Devices by adding existing Tag to Devices (Configuration Group and its Tag rule already exists)
Add existing tag to Devices
Devices are automatically associated to the Configuration Group now
Device 4
US-West
Select the devices to which the Configuration Group must be deployed
Specify values for each of the Configuration Group variables and Deploy
Configuration Group
No Tag Rule
Device 1
Device 2
Configuration Group
Tag Rule: Tag=US-West
Device 1
Device 2
Device 3
US-West
Configuration Group
Tag Rule: Tag=US-West
Device 1
Device 2
Device 3
Device 4
US-West
US-West

Tagging Illustration

Existing Deployments

In the SD-WAN network, devices which use the Legacy Configuration and Policies can co-exist with devices using the Simplified Configuration and Policies.

This section offers some recommendations for customers who want to take advantage of the Simplified Configuration and Policies, this section offers some recommendations.

The first step is that devices need to be migrated from Device Templates to Configuration Groups. Once that is done, policy groups and/or topology can be deployed.

Configuration Groups

Device templates and configuration groups provide the edge device configuration. So it is easy for co-existence to occur. The steps for migrating from a device template to a configuration group are:

Step 1	Extract a copy of the device values from the device templates. This is accomplished from the Configuration à Templates, click on the Ellipses (…) to the right of the device group and select 'Export CSV".
Step 2	Create a Configuration Group (manually or with the conversion tool).
Step 3	Detach the device template from the device. At this time, the device maintains the configuration at the point of attachment; but does not receive any future changes made to the device template (or any component feature templates).
Step 4	Associate the device(s) to the new configuration group.

Step 5	Deploy the devices associated to the configuration group. To make this process easier, open the Exported CSV file, and change the CSV column headers to match the new variables from the configuration group.
Step 6	After the device variable input screen, you can preview the device configuration. This gives you a preview on what portions of the configuration group do not match to the previous instance; or what variables have changed from the Device Template.

Maintaining a consistent naming scheme for variables simplifies device-specific settings. If all the device values are in a single CSV then you only have to rename the column headers once..

NOTE: A python script exists that works with CSV files for Device Templates or Configuration Groups to consolidate and alphabetize the column headers. The script is available here:

https://github.com/BradEdgeworth/CSVMerger

Policy Groups

Devices that are configured via configuration groups can use a Centralized Policy, or migrate towards a Policy Group; but not both at the same time for the same application. In essence, the goal is to keep the same underlying policy for the edge devices. Policy Groups combine the original AAR and Data policies into a single Application Priority & SLA PG component. In essence, we are just changing how the configuration for policies is built (but not sent to the SD-WAN Manager).

It's important to note that you cannot have a Data Policy or AAR policy reference a site list with a site that has the Application Priority & SLA component as they both configure the same setting.

It is possible to have Centralized Policy with only a Control Policy reference a site that uses a Policy Group with Application Priority & SLA) as they configure different components of a centralized policy.

The steps to migrate a device from a Centralized Policy to a Policy Group involves these steps:

Step 1	Create the necessary policy group components (Application Priority & SLA, Embedded Security, Secure Internet gateway/Secure Service Edge, DNS Security.
Step 2	Create the policy group and associate necessary components.
Step 3	Disassociate the site id from any SiteLists that are references in AAR or Data Policies. At this time, the SD-WAN Manager sends updated configuration to the Controllers which then remove any active data policy instructions from the edge device(s). Note that this could cause un-intended traffic flows at this time.

Step 4	Associate the device(s) to the policy group and save the policy group.
Step 5	Deploy the policy group to the selected devices. At this time, the SD-WAN Manager sends updated configurations to the Edge devices (for QoS/SIG) and the controllers; so that the controllers can send updated data policies to the edge devices.

Note: While Policy Groups can co-exist with a Centralized Policy, it is recommended to stay with a Centralized Policy (for AAR and Data Policies) while converting edge devices to Configuration Groups. Then at that point, start the migration from Centralized Policy to Policy Groups for functionality within the Application Priority & SLA component.

This is done for pure simplicity and to reduce confusion amongst operational staff.

NOTE:
The Policy Group Engine stores things in a different format. So, a Prefix list used in a Centralized Policy must be recreated in the Policy Group. This could happen for other things like Site Lists, and so on.

Topology

Devices that are configured via configuration groups can use a Centralized Policy, or migrate towards a Topology. In essence, the goal is to keep the same underlying control policy for the SD-WAN controllers. Topology is the latest iteration of Control Policies.

It’s important to note that you cannot have a Control Policy policy reference a site list with a site that has a Topology associated with it, as they both configure the same setting.

It is possible to have a Centralized Policy with only a Data Policy and/or AAR policy, and a topology policy as they configure different components.

Steps to migrate a device from a Centralized Policy to a Policy Group:

Step 1	Create the necessary Topology components
Step 2	Disassociate sides from the older Topology List in the Centralized Policy.
Step 3	Disassociate the site ID from any Site Lists that are referenced in AAR or Data Policies. At this time, the SD-WAN Manager sends updated configuration to the Controllers which then remove any active topology configuration for the sites that are being migrated. Note that this could cause unintended traffic flows at this time.

Step 4	Activate the Topology. At this time, the SD-WAN Manager sends updated configurations to the Controllers and modifies any routes being transmitted to edge devices.

Note: While Topology can co-exist with a Centralized Policy, it is recommended to stay with a Centralized Policy (for Topology and Route Manipulation) while converting edge devices to Configuration Groups. Then at that point, start the migration from Centralized Policy to Topology for functionality of modifying topologies and routing manipulation.

This is done for pure simplicity and to reduce confusion amongst operational staff.

Conversion Tool

Scope

The Conversion Tool does a 1-to-1 conversion of templates to configuration groups. The tool collects the templates from an SD-WAN Manager instance, converts them to configuration groups (including feature profiles and feature parcels), and uploads the newly converted constructs to the SD-WAN Manager.

* Conversion of policies to policy groups is tentatively expected to be available in the Conversion Tool in October 2024.

Access Details

A beta version of the tool is available. Please reach out to sdwan-ux-conversion-tool@cisco.com for more information.

How to Use

Prerequisite

Before using the tool, ensure that your SD-WAN Manager is running 20.12.x. If not, upgrade to 20.12 before proceeding.

Conversion Tool Workflow

Step 1	Sign in to the tool using credentials provided by Cisco. (Note: These are not CCO credentials. Reach out to sdwan-ux-conversion-tool@cisco.com for more details).
Step 2	Select the ‘Conversion Tool’ workflow from the homepage. · If you have previously performed this workflow and have the JSON file with the converted configurations, you must select the ‘Upload from a file’ workflow.
Step 3	Login: Provide your SD-WAN Manager IP or URL along with user credentials.

	· User must have read/write access. · Port and subdomain fields are optional.
Step 4.	Import: Click the ‘Collect’ button to retrieve all legacy constructs (device templates, feature templates, policies, and their associated constructs) from SD-WAN Manager. · Once collected, you must download the JSON file containing all of the configurations. This file must be used during this step at a later time instead of collecting from the SD-WAN Manager again.
Step 5.	Select: Select the templates and policies that you like to convert to their new equivalents. Click ‘Migrate’ to convert the selected constructs.
Step 6.	Transform: This page shows all of the newly converted constructs. Once ready, click ‘Upload’ to push these configurations to the SD-WAN Manager. · In the case that you’re not ready to push to SD-WAN Manager yet, you can download these converted configurations as a JSON file and use the ‘Upload from a file’ workflow at a later time.
Step 7.	Summary: At this time the configurations are being pushed and created in SD-WAN Manager. As the configurations are being pushed, you can see the progress bar. Once the upload is complete, you can see the summary of the uploaded configurations. · You can use the ‘Configuration Groups’, ‘Feature Profiles’, and ‘Policy Groups’ quick links to view the new constructs in your SD-WAN Manager. · In the case of an error or mistake, rollback is also available at this step. Performing a rollback removes all of the constructs pushed to the SD-WAN Manager during this workflow/session.

Post-Conversion

Your new constructs are now ready to use. Execute the steps in the ‘Existing Deployments’ section to migrate your devices to the newly converted configuration groups.

Considerations

- The conversions provided by the tool are meant to serve as guidance. Please analyze and test before deploying in a production environment.

- The tool does not consider the device-agnostic capability of configuration groups. Users can analyze their templates before selecting which to convert or analyze the converted configuration groups and associate devices accordingly to benefit from the device-agnostic capability.
- Variable names and global values from legacy constructs are copied over to the newly converted constructs.
- The tool does not push configuration to devices. After performing the conversions, the user is responsible for detaching devices from templates and associating them to the new configuration groups.

20.12 Considerations

No.	**Item Description**
1	DNS config needs to be pushed via CLI Add-on Profile when deploying Configuration Group on Edge running version lower than 17.12.
2	The creation of Topology requires the selection of sites instead of choosing an area defined in NHM.
3	The Create Configuration Group workflow does not create a VPN512 and an interface in this VPN, in the WAN profile. If you need this, you can create this manually by editing the Configuration group.
4	Ability to copy/duplicate Feature profiles, policy not supported. A set of Python scripts can accomplish this task, and is located: https://github.com/dbrown92700/configGroups/
5	A Policy Object profile must be associated with the Configuration Group before creating any Feature parcel related to Policy Configuration (Localized Policies). Example: ACL
6	Import CSV for interface variables inserts semi-colons into the string and fails
7	AppQoE Optimization (TCP Opt and DRE) and Loss Correction (FEC and Pkt Dup) configuration continue to use legacy templates/policies. Configurable via CLI Profile in Configuration/Policy Groups as well. (20.14 in UI Parcel)
8	Cloud OnRamp for SaaS continues to use the legacy Templates/Policies.
9	TrustSec / SGT supported with CLI Profile only
10	UC Voice / DSP Farm / SRST supported with CLI Profile only (20.13 onwards in UI

	Parcel)

Related Information

- Cisco SD-WAN and Cloud Networking YouTube Channel: https://www.youtube.com/@CiscoSDWANandCloudNetworking
- UX2.0 - Operational Simplification: 1. Configure a Single Router Site: https://www.youtube.com/watch?v=98z-d3knd
- **Cisco Technical Support & Downloads**