



# Let's Talk about Catalyst Center Integrations

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IBOOPS-2882



# Webex App

## Questions?

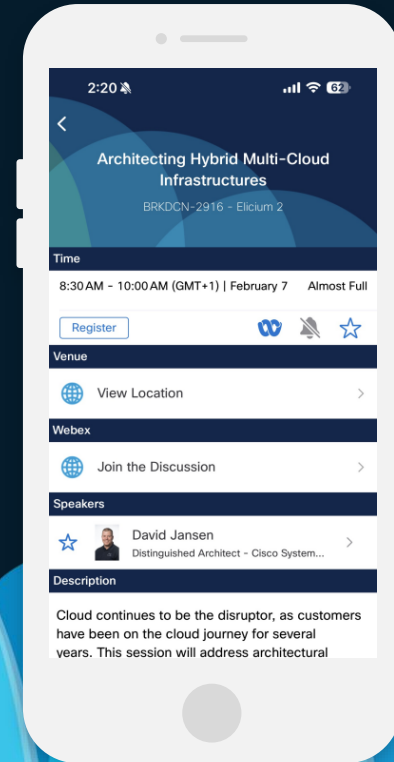
Use the Webex app to chat with the speaker after the session

## How

- 1 Find this session in the Cisco Events 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 February 28, 2025.

**CISCO** *Live!*



# Catalyst Center Integrations

- Let's keep it interactive
- This session is for you
- You decide what we will discuss today
- We will review various Integrations options
- We will whiteboard, present recorded demos, and slides if needed



# What is Interesting for YOU?

servicenow

Python SDK  
Ansible  
Terraform

Webex Notifications

Events

Jenkins

Custom Workflows and  
Integrations

REST APIs

PagerDuty



Catalyst Center Platform

Splunk

GenAI

Integrations Options

Reports

GitHub Integrations

- Catalyst Center Platform

# Catalyst Center Platform

# Catalyst Center Platform Vision



Efficient

Managing infrastructure as code while lowering OPEX



Consistent

Repeatable and precise intent-based outcomes



Scalable

Able to reduce time and effort with large network automation requirements



Secure

Secure APIs and integrations



Sustainable

Integrate sustainable devices and systems



Smart

260+ real time event notifications and AI/ML capabilities

# Cisco Catalyst Center Platform

Healthcare



Education



Hospitality



Workplaces



Retail



Manufacturing



Network Insights

splunk> Managed Services

Infrastructure-as-Code

Infrastructure provisioning, and network management

GenAI



Integrations

ThousandEyes  
part of Cisco



servicenow

PagerDuty

webex  
by Cisco

Cisco Spaces

BLUECAT

Infoblox

Custom Integrations

DevOps Tools

python  
Red Hat Ansible

HashiCorp Terraform

GitHub  
GitLab



Reports

REST APIs

Events

Cisco Catalyst



Center Platform



Cisco Physical and Virtual Infrastructure



# Multi Catalyst Center/Controller Managed Networks

```
1 configuration_templates:
2   - project: Jenkins with variables
3     name: Variables testing
4     file: template_with_variables.j2
5     variables:
6       - parameterName: interface_name
7         dataType: STRING
8         required: True
9         order: 1
10      - parameterName: ip_address
11        dataType: STRING
12        required: True
13        order: 2
14  devices:
15    - name: C9K-Branch-SF0.clus-demo.com
16      variables:
17        interface_name: Loopback 200
18        ip_address: 172.30.200.1
19  product_family:
20    - Routers
21    - Switches and Hubs
22
```



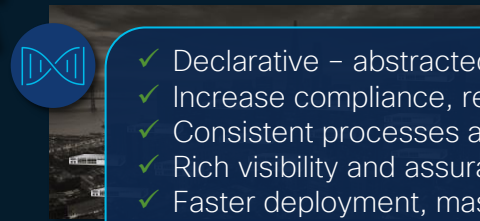
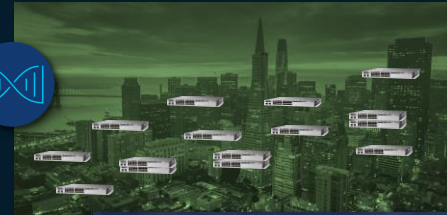
REST  
APIs



Services  
Layer



GitHub



ITSM, Splunk,  
Notifications, IPAM,  
Custom Integrations

Webhooks

- ✓ Declarative – abstracted configuration state
- ✓ Increase compliance, reduce configuration drift
- ✓ Consistent processes and outcomes network wide
- ✓ Rich visibility and assurance data
- ✓ Faster deployment, massive scale, reducing cost
- ✓ Enable GenAI innovation

# Catalyst Center New APIs Release

Accelerating release of new APIs  
version 2.3.5.3 – 476 APIs  
version 2.3.7.5 – 520 APIs  
version 2.3.7.6 – 876 APIs  
New Client, SDA and Assurance APIs in 2.3.7.6

Try 'Retrieves the list of clients, while also offering basic filtering and sorting capabilities.'

Method: **GET** Public URL: <https://10.93.141.45/dna/data/api/v1/clients>

Response Headers Status Code: 200

```
1- {
2-   "response": [
3-     {
4-       "id": "16:23:08:58:7D:AE",
5-       "macAddress": "16:23:08:58:7D:AE",
6-       "type": "Wired",
7-       "name": null,
8-       "userId": null,
9-       "username": null,
10-      "ipv4Address": null,
11-      "ipv6Addresses": [
12-        "fe80::1423:bff:fe58:7dae"
13-      ],
14-      "vendor": null,
15-      "osType": null,
16-      "osVersion": null,
17-      "formFactor": null,
18-      "deviceType": null,
19-      "siteHierarchy": "Global/OR/PDX/Floor-2",
20-      "siteHierarchyId": "/15ab86e1-706e-41df-8400-ee1a974bc1f3/245892a8-",
21-      "siteId": "17d5b2b9-ff29-4320-bdab-fd6c3a7df09d",
22-      "lastUpdateTime": 1727318100000,
23-      "connectionStatus": "disconnected",
24-      "tracked": "No",
25-      "isPrivateMacAddress": true,
26-      "health": {
27-        "overallScore": 1,
```

# Catalyst Center Platform – Developer Toolkit

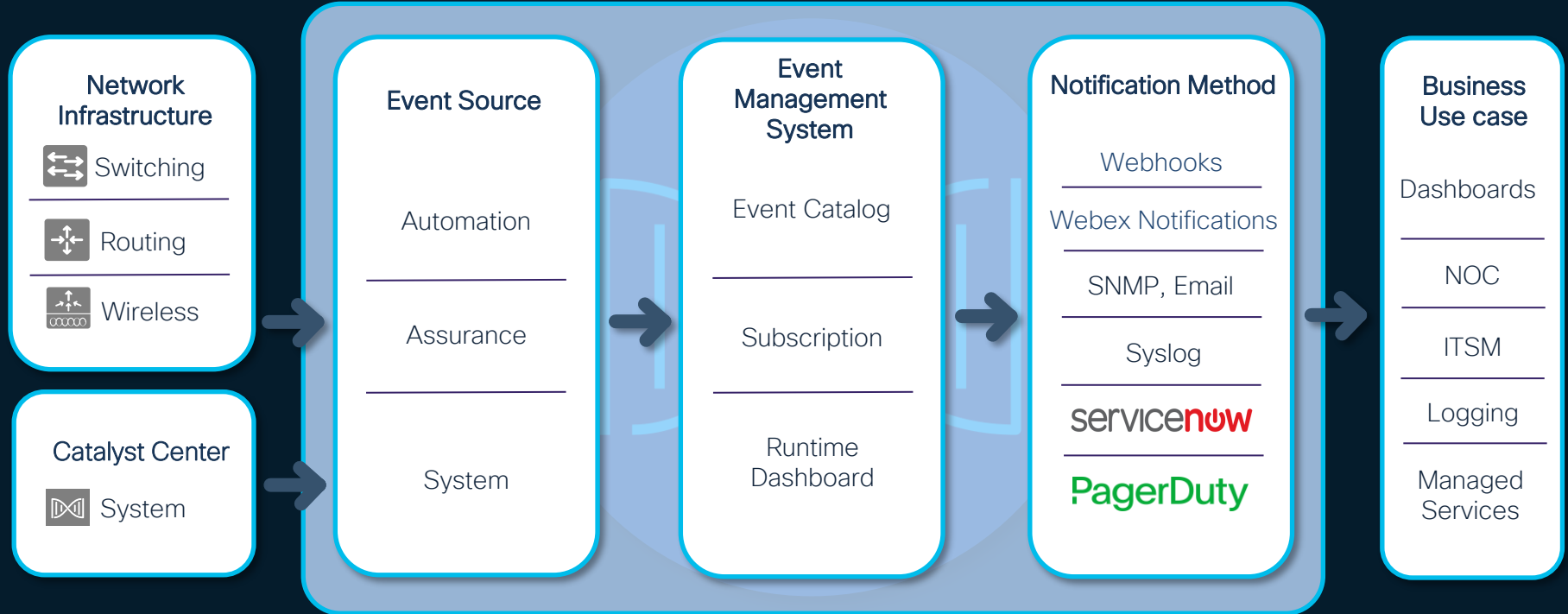
The screenshot shows the Catalyst Center Developer Toolkit interface. The top navigation bar includes the Cisco logo, 'Catalyst Center', and a breadcrumb 'Platform / Developer Toolkit'. Below the navigation, there are tabs for 'APIs', 'Integration Flows', and 'Event Notifications'. A search bar is present on the left. The main content area displays a list of APIs with columns for method (POST, GET, DELETE), description, and endpoint. A 'Try' button is highlighted in the bottom right corner of the interface.

- Review API docs, configure integration workflows and subscribe to events
- API docs for multiple versions of Catalyst Center may be found on [DevNet](#)

Try  
Call an API  
without writing  
any code

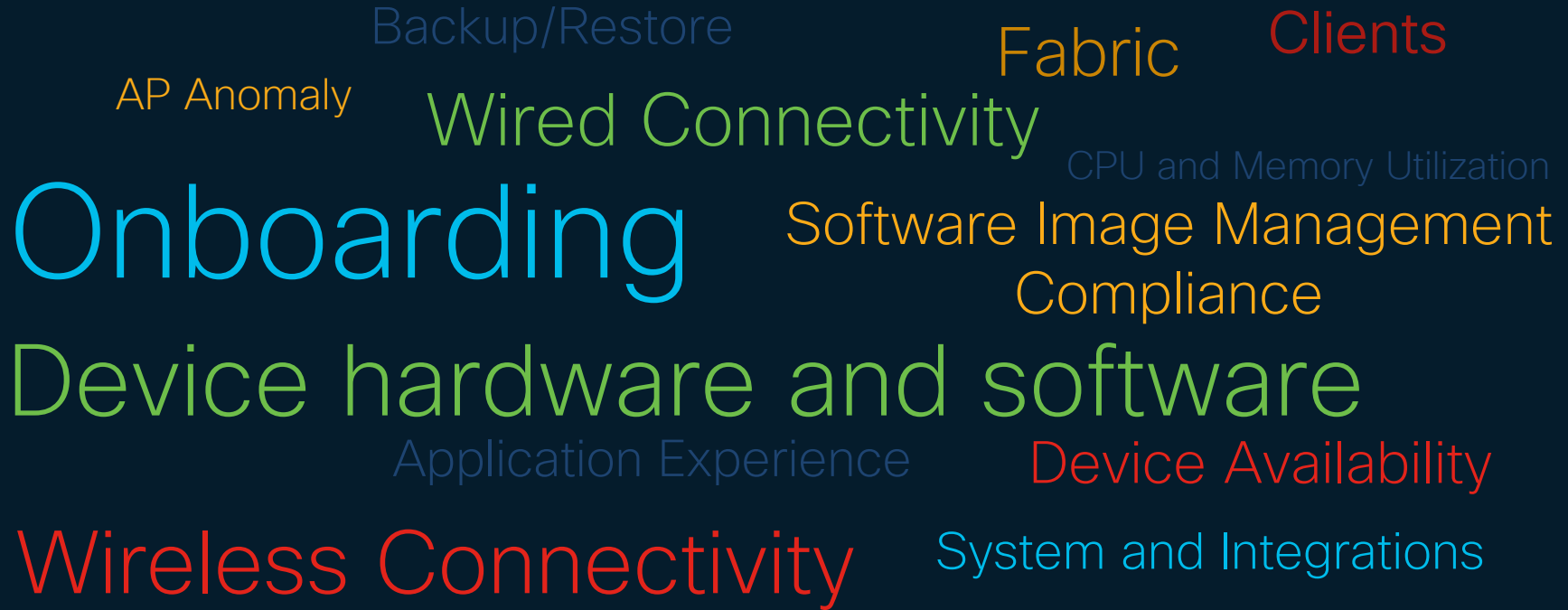
850+ APIs, Version 2.3.7.7  
Download the OpenAPI Specs from [DevNet](#)

# Event Notifications Framework



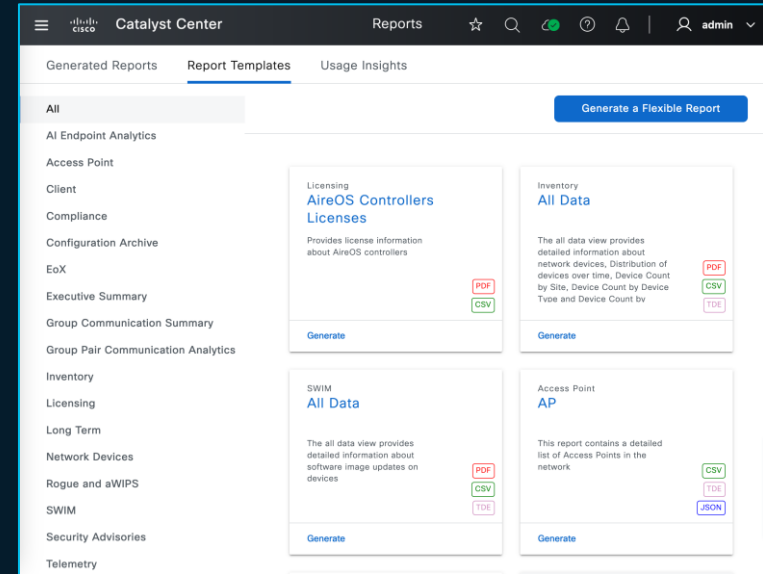
Two steps process, configure destination followed by subscribe to events

# 269 Events in Different Areas ...



# Reports – Bulk Data Extract

- Capacity planning – client, applications and inventory
- Usage pattern for clients, devices, or applications
- Asset reporting for inventory, licensing, software upgrades and EoX
- Wired and wireless reporting for device availability and performance
- Security advisories, rogue and aWIPS



65 reports + Flexible reports  
Report Catalog may be found on [DevNet](#)

# Client Detail Report - UI

The screenshot shows the 'Reports' section of the Cisco Catalyst Center interface. The 'Report Templates' tab is active, displaying a grid of report options: 'Busiest Client', 'Client Detail', 'Client Session', 'Client Summary', 'Client Trend', and 'Top N Sessions'. The 'Client Detail' report is highlighted with a green border. A 'Generate a Flexible Report' button is visible in the top right of the report grid.

The 'Report Name' configuration dialog is shown. The report name is 'Client Report - Client Detail - Jan 26 2024 03:14 pm'. The 'Scope' is set to 'Global'. The 'Device Type' is set to 'All'. The 'Time Range' is set to 'Last 24 Hours'. The 'Location' field is currently empty.

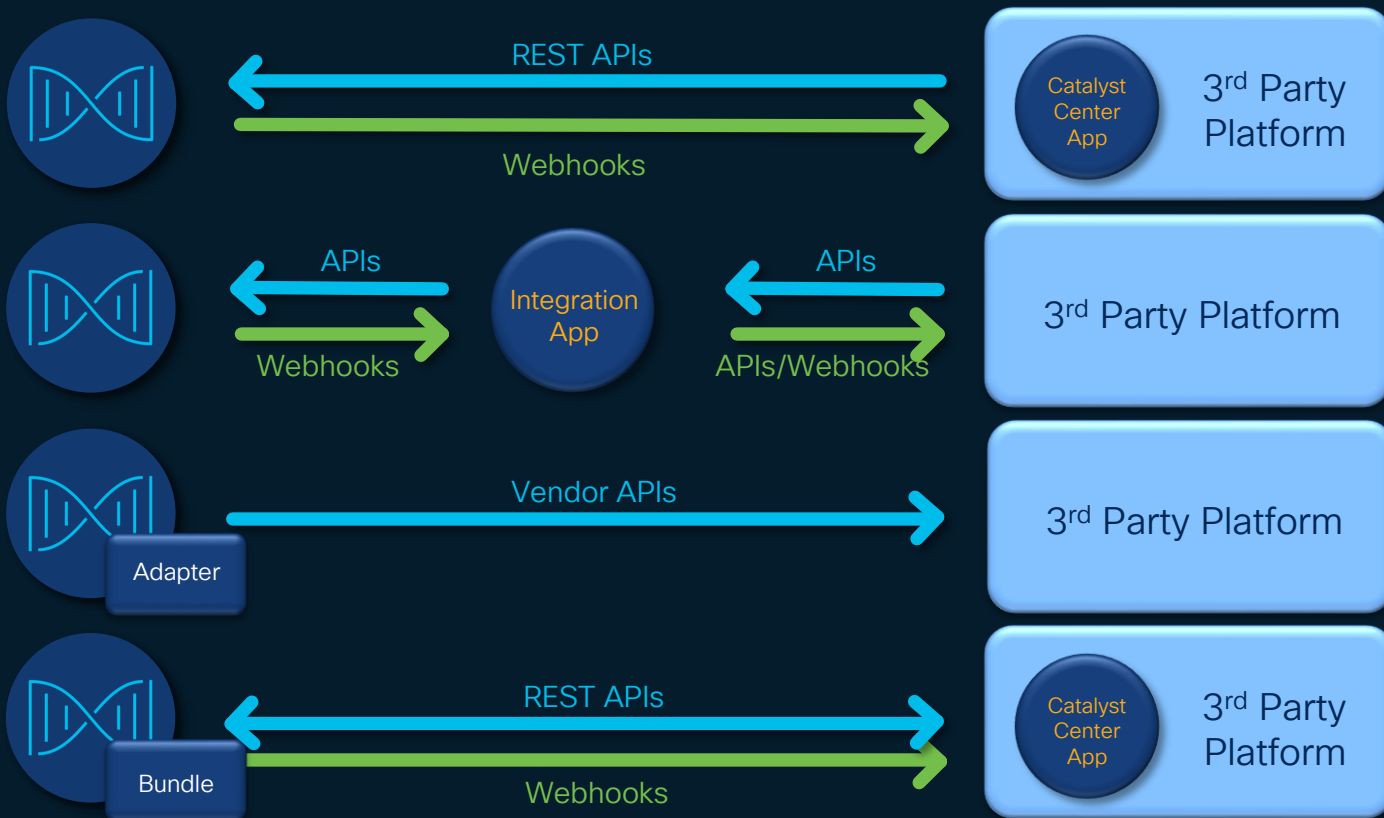
The 'Select File Type' dialog is shown. The 'JSON' option is selected. The 'Fields' section lists the following fields: Host Name, User ID, MAC Address, IPv4 Address, IPv6 Address, Device Type, Device Form, Device Vendor, Duplex, OS, Firmware Version, Current Status, and Min Health Score. All fields are currently checked.

The 'Schedule' dialog is shown. The 'Run Recurring' option is selected. The 'Recurring Type' is set to 'Weekly'. The 'Scheduled Days' are checked for DAILY, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday. The 'Scheduled Time' is set to 8:00 AM.

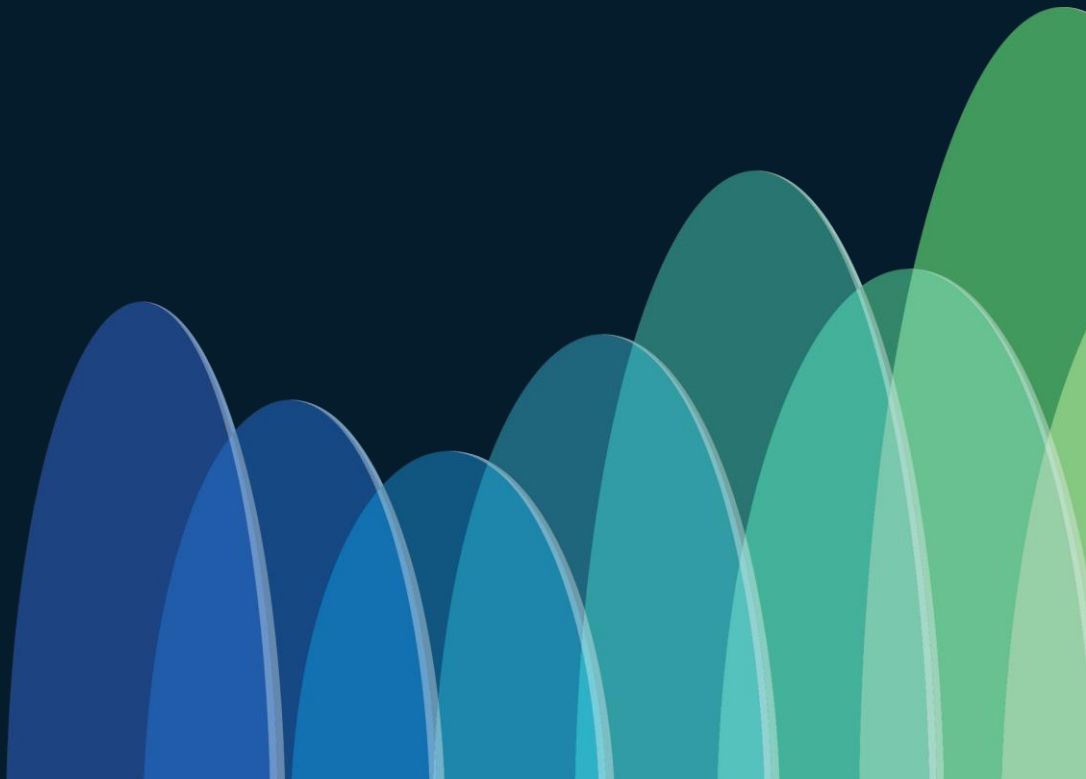
The 'Delivery and Notification' dialog is shown. The 'Webhook Notification' option is selected. The 'Subscription Profile' is set to 'PythonAnywhere'.

- Reports may be created via the UI or API
- Scheduled to run daily
- Output format CSV, Tableau, PDF and JSON
- Notification sent via Webhooks or email

# Catalyst Center Integration Options

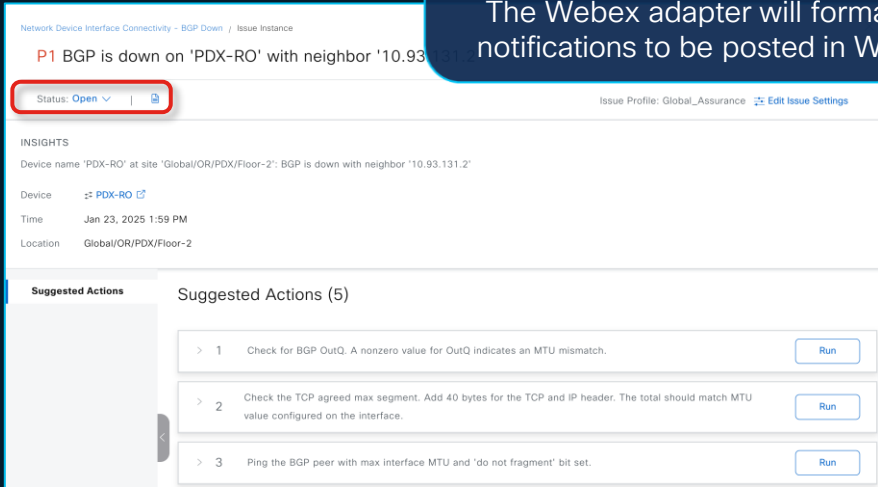


# Webex Notifications



# Events Notifications to Webex

Catalyst Center will use a Webex Bot to post messages to a room.  
The Webex adapter will format the notifications to be posted in Webex.



Network Device Interface Connectivity - BGP Down / Issue Instance

P1 BGP is down on 'PDX-RO' with neighbor '10.93.131.2'

Status: Open | [Share]

Issue Profile: Global\_Assurance | Edit Issue Settings

INSIGHTS

Device name 'PDX-RO' at site 'Global/OR/PDX/Floor-2': BGP is down with neighbor '10.93.131.2'

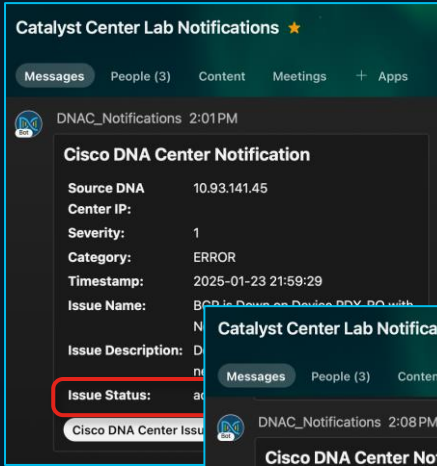
Device: PDX-RO

Time: Jan 23, 2025 1:59 PM

Location: Global/OR/PDX/Floor-2

Suggested Actions (5)

- 1 Check for BGP OutQ. A nonzero value for OutQ indicates an MTU mismatch. [Run]
- 2 Check the TCP agreed max segment. Add 40 bytes for the TCP and IP header. The total should match MTU value configured on the interface. [Run]
- 3 Ping the BGP peer with max interface MTU and 'do not fragment' bit set. [Run]



Catalyst Center Lab Notifications

Messages | People (3) | Content | Meetings | + | Apps

DNAC\_Notifications 2:01PM

**Cisco DNA Center Notification**

Source DNA: 10.93.141.45

Center IP:

Severity: 1

Category: ERROR

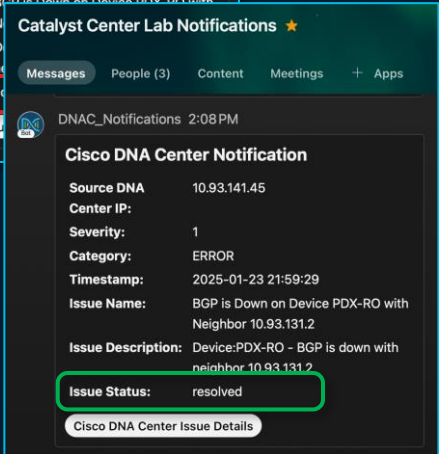
Timestamp: 2025-01-23 21:59:29

Issue Name: BGP is Down on Device PDX-RO with Neighbor 10.93.131.2

Issue Description: Device:PDX-RO - BGP is down with neighbor 10.93.131.2

Issue Status: [Redacted]

Cisco DNA Center Issue Details



Catalyst Center Lab Notifications

Messages | People (3) | Content | Meetings | + | Apps

DNAC\_Notifications 2:08PM

**Cisco DNA Center Notification**

Source DNA: 10.93.141.45

Center IP:

Severity: 1

Category: ERROR

Timestamp: 2025-01-23 21:59:29

Issue Name: BGP is Down on Device PDX-RO with Neighbor 10.93.131.2

Issue Description: Device:PDX-RO - BGP is down with neighbor 10.93.131.2

Issue Status: resolved

Cisco DNA Center Issue Details

# Configure Webex Destination

Catalyst Center Create a New Notification admin

## Step 3 - WEBEX Settings

Configure the WEBEX channel settings for this notification

**1** SERVICE CONFIGURATION

Select Existing Instance  Create New Instance

**2** Instance Name\*  
Webex\_Catalyst\_Center\_Lab

Webex URL\*  
https://webexapis.com/v1/messages

**3** Webex Room Id\*  
Y2lzY29zcGFyazovL3VzL1...

Webex Bot Access Token\* **4** SHOW

**5**

**1.** Create new instance  
**2.** Instance name  
**3.** Webex room id  
**4.** Webex bot token  
**5.** Next

**Note:**  
The integration requires the use of the room id and not room name

Exit Back Next

# Configure Webex Destination – continued

Cisco Catalyst Center Create a New Notification admin

## Step 4 - Name and Description

Provide a name and short description for your notification

Name\*  
Lab\_Notifications\_Webex 1  
Name can have alphanumerics, underscore and hyphen

Description\*  
Lab notifications sent to Webex Room  
Catalyst Center Lab Notifications 2  
Description can have alphanumerics, underscore and hyphen

- 1. Notification name
- 2. Notification description
- 3. Next

Exit Back Next 3

Welcome to Catalyst Center!

Explore

### Assurance Summary

**Health**  ⓘ   
Healthy as of Feb 5, 2025 10:21 AM

<b>54%</b> Network Devices	<b>--%</b> Wireless Clients	<b>89%</b> Wired Clients
<a href="#">View Details</a>		

**Critical Issues**  
Last 24 Hours

<b>6</b> P1	<b>0</b> P2
<a href="#">View Details</a>	

**Trends and Insights**  
Last 30 Days

<b>0</b> AP Performance Advisories	<b>0</b> Trend Deviations
<a href="#">View Details</a>	

### Network Snapshot

**Sites**  
As of Feb 5, 2025 10:21 AM

<b>16</b>	DNS Servers : 1 NTP Servers : 1
<a href="#">Add Sites</a>	

**Network Devices**  
As of Feb 5, 2025 10:21 AM

<b>13</b>	Unclaimed : 3 Unprovisioned : 1 Unreachable : 3
<a href="#">Find New Devices</a>	

**Application QoS Policies**  
As of Feb 5, 2025 10:21 AM

<b>0</b>	Successful Deploys : 0 Errored Deploys : 0 Stale Policies : 0
<a href="#">Add New Policy</a>	

- Webex Notifications

# PagerDuty

# Catalyst Center Integration

<https://www.pagerduty.com/integrations/cisco-dna-center-notifications>

The screenshot shows the PagerDuty website's integration page for Cisco DNA Center. The top navigation bar includes the PagerDuty logo, menu items for Products, Solutions, Pricing, Company, and Resources, a search icon, a globe icon, and links for Contact Us and Log In. A green button labeled 'START FOR FREE' is positioned in the top right corner. The main content area is split into two columns. The left column features the Cisco logo (a stylized signal tower above the word 'CISCO') and a blue badge with the text 'PagerDuty Certified'. The right column has a green background with the heading 'Accelerate Digital Agility with Pager Duty and Cisco DNA Center'. Below the heading is a paragraph of text: 'Cisco DNA Center lets you take charge of your network, optimize your Cisco investment, and lower your IT spending. It provides the digital agility to drive network insights, automation, and security while helping customers connect, secure, and automate their business in a cloud-first world. With Cisco DNA Center and PagerDuty integration customers can identify critical issues quickly, engage the right people, and accelerate the resolution delivering a better user experience.' A white button labeled 'VIEW DOCUMENTATION' is located at the bottom of the right column. A small green cartoon character is visible in the bottom right corner of the page.

# Create a PagerDuty Integration

API docs: <https://developer.pagerduty.com/>

The screenshot shows the PagerDuty website's sign-up page. The header includes the PagerDuty logo, navigation links for Products, Solutions, Pricing, Company, and Resources, a search icon, a globe icon, and links for Contact Us and Log In. A prominent green button labeled 'START FOR FREE' is in the top right. The main content area has a green background with a white box containing the heading 'See how PagerDuty works' and the sub-heading 'No credit card needed'. Below this is a progress indicator with four steps, where the first step is active. A 'Work Email' label is above a text input field with the placeholder 'Enter your email'. A green 'GET STARTED' button is positioned below the input field. A blue callout box on the right side of the page contains the text: 'Create a free developer account Or log in using your account'. The footer is divided into five columns: PLATFORM (Incident Management, AIOps), SOLUTIONS (Incident Management Transformation), RESOURCES (Resources Library, Community Forum), COMPANY (About PagerDuty, Thought Leadership), and SUPPORT (System Status, Help & Support).

Create a free developer account  
Or log in using your account

# Configure PagerDuty Destination

Catalyst Center Create a New Notification admin

## Step 3 - PAGERDUTY Settings

Configure the PAGERDUTY channel settings for this notification

**SERVICE CONFIGURATION**

Select Existing Instance  Create New Instance **1**

**2** Instance Name\*  
PagerDuty Events

PagerDuty Events API URL\*  
https://events.pagerduty.com/v2/enqueue


**3** PagerDuty Integration Key\*  
..... SHOW

PagerDuty Events API Version  
2

**1. Create new instance**  
**2. Instance name**  
**3. PagerDuty Integration Key**  
**4. Next**

Exit Back Next **4**

# Configure PagerDuty Destination – continued

☰  Catalyst Center Create a New Notification ☆ 🔍 🔄 ? 🔔 | 👤 admin ▾

## Step 4 - Name and Description

Provide a name and short description for your notification

Name\* 1

**Lab\_Notifications\_PagerDuty**

Name can have alphanumerics, underscore and hyphen

Description\* 2

**Lab event notifications to PagerDuty**

Description can have alphanumerics, underscore and hyphen

1. Notification name
2. Notification description
3. Next

3

🏠 Exit Back Next

# PagerDuty Notifications

View notifications using the PagerDuty:

- Web UI
- Email
- PagerDuty App
- Text
- Voice

(P1)Interface Connecting Network Devices is Down

Jan 26, 2024 1:30 PM - Jan 27, 2024 1:30 PM | Global

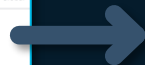
1 Open Issues 1 Area 1 Buildings, 1 Floors 1 BORDER ROUTER

Search Table

0 Selected Actions Export

Issue	Site	Device	Device Type
Interface "GigabitEthernet2" (Interface description: TO_CSR2_GI2) is down on network device "PDX-RO"	OR/PDX/Floor-2	PDX-RO	Cisco Cloud Service

1 Record(s) Show Records: 10 1 - 1



Incidents > Incident #3149

Interface GigabitEthernet2 (Interface description: TO\_CSR2\_GI2) connecting the following two network devices is down: Local Node: PDX-RO, Peer Node: SP

1 alert

Acknowledge Escalate

STATUS Triggered

OPENED 1:29 PM (2 minutes ago)

ASSIGNED TO Alamelu Senthilnathan Gabriel Zapodeanu

ESCALATION POLICY All Engineers Escalation

RESPONDERS 2

PENDING ACTIONS

Resolves automatically (in 12 hours) if left open. If no action is taken, the incident will remain assigned to you.

View Incident

DETAILS

ciscoDnaEventLink: https://10.93.4116-9d89-25cf41265b6-devicel...NON-FABRIC\_WIRED-1-251 issue

STATUS Triggered

PagerDuty

ciscodnac.pagerduty.com

Hello Gabriel Zapodeanu, you have one open incident assigned to you:

INCIDENT #3149

Interface GigabitEthernet2 (Interface description: TO\_CSR2\_GI2) connecting the following two network devices is down: Local Node: PDX-RO, Peer Node: SP

View Incident

DETAILS

ciscoDnaEventLink: https://10.93.4116-9d89-25cf41265b6-devicel...NON-FABRIC\_WIRED-1-251 issue

STATUS Triggered

1:34

Back Incident #3149

Interface GigabitEthernet2 (Interface description: TO\_CSR2\_GI2) connecting the following two network devices is down: Local Node: PDX-RO, Peer Node: SP

DURATION 0 Days 0 Hours 0 Minutes

ASSIGNEES Gabriel Zapodeanu, +1

Triage Overview

Run a Workflow Run a Play Add Note Post Status Update Edit Title

Details

Cisco DNA Center Issue Details

https://10.93.141.45/sha-assurance/ciscoDetails?issueId=6030027-0736-4178-9058-C3824128056

CiscoDnaEventLink

https://10.93.141.45/sha-assurance/ciscoDetails?issueId=6030027-0736-4178-9058-C3824128056

DeviceIdentifier

Show More

Latest Note

Ack Resolve All Actions

Home Incidents My Shifts Services More

To: 43105

Monday 2:33 AM

LOW #3144, #3143, #3142 on Cisco DNA Center Event Notifications.  
Reply 4: Ack all, 6: Resolve all

LOW #3145, #3143, #3142 on Cisco DNA Center Event Notifications.  
Reply 14: Ack all, 16: Resolve all

LOW #3148, #3147, #3146, #3145, #3143, #3142 on Cisco DNA Center Event Notifications.  
Reply 24: Ack all, 26: Resolve all

LOW #3148, #3147, #3146, #3145, #3143, #3142 on Cisco DNA Center Event Notifications.  
Reply 34: Ack all, 36: Resolve all

Today 1:29 PM

LOW #3149 on Cisco DNA Center Event Notifications: Interface GigabitEthernet2 (Interface description: TO\_CSR2\_GI2) connecting the following two network devices is down: Local Node: PDX-RO, Peer Node: SP  
Reply 4: Ack, 6: Resolve

LOW #3150, #3149 on Cisco DNA Center Event Notifications.  
Reply 14: Ack all, 16: Resolve all

Text Message

*Note: When Catalyst Center resolves the issue, notification will be sent to update PagerDuty Incident and resolve it.*

Welcome to Catalyst Center!

Explore

### Assurance Summary

**Health** ⓘ  
Healthy as of Feb 5, 2025 10:33 AM

54%	--%	89%
Network Devices	Wireless Clients	Wired Clients

[View Details](#)

**Critical Issues**  
Last 24 Hours

1	1
P1	P2

[View Details](#)

**Trends and Insights**  
Last 30 Days

0	0
AP Performance Advisories	Trend Deviations

[View Details](#)

### Network Snapshot

**Sites**  
As of Feb 5, 2025 10:34 AM

16

DNS Servers : 1  
NTP Servers : 1

[Add Sites](#)

**Network Devices**  
As of Feb 5, 2025 10:34 AM

13

Unclaimed : 3  
Unprovisioned : 1  
Unreachable : 0

[Find New Devices](#)

**Application QoS Policies**  
As of Feb 5, 2025 10:34 AM

0

Successful Deploys : 0  
Errored Deploys : 0  
Stale Policies : 0

[Add New Policy](#)

# Splunk Integrations

- Webex Notifications

# Splunk Platform – Enterprise or Cloud

## The Splunk Platform

The extensible data platform powers unified security, full-stack observability and limitless custom applications.

Free Trial



Overview Products Use Cases Differentiators Resources Get Started

OVERVIEW

### Unify your data on a flexible platform for the hybrid world

#### Data accessibility

Access and search data from any source and across any device.

#### Business insights

Share data-driven insights across your enterprise.

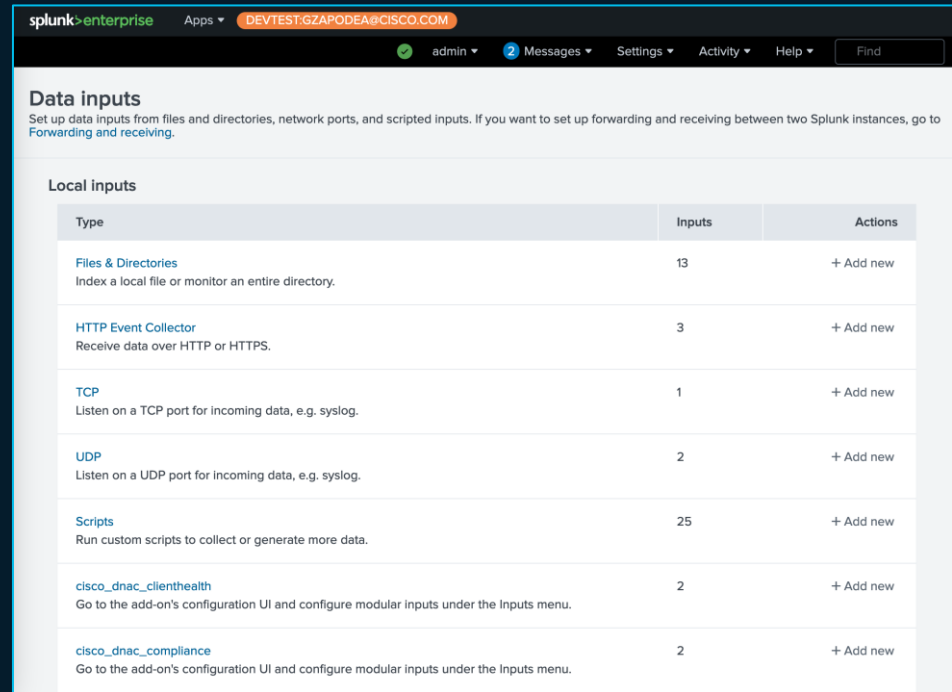
#### Usability and collaboration

Remove data silos in your organization to work smarter across all of your user groups.

**Catalyst Center Integration Value:**  
Executive Dashboards across multiple Cisco platforms  
Historical view of network inventory and assurance data  
Issues trends analysis  
Multi-platform events correlation and logging  
Multi Catalyst Center support  
Rich Splunk ecosystem

# Splunk Integration Options

- Integration using the Cisco Catalyst Apps or the Cisco EN Integration Apps
- Webhook notifications to Splunk HTTP Event Collectors
- Run Python scripts hosted by Splunk – trigger reports runs and import data file
- Syslog notifications



The screenshot shows the Splunk Enterprise web interface. The top navigation bar includes the Splunk logo, 'enterprise' version, 'Apps' dropdown, a user profile for 'DEVTEST.GZAPODEA@CISCO.COM', and utility links for 'admin', 'Messages', 'Settings', 'Activity', 'Help', and a 'Find' search box. The main content area is titled 'Data inputs' and contains a descriptive paragraph. Below this is a section for 'Local inputs' which contains a table listing various input types and their counts.

Type	Inputs	Actions
<a href="#">Files &amp; Directories</a> Index a local file or monitor an entire directory.	13	+ Add new
<a href="#">HTTP Event Collector</a> Receive data over HTTP or HTTPS.	3	+ Add new
<a href="#">TCP</a> Listen on a TCP port for incoming data, e.g. syslog.	1	+ Add new
<a href="#">UDP</a> Listen on a UDP port for incoming data, e.g. syslog.	2	+ Add new
<a href="#">Scripts</a> Run custom scripts to collect or generate more data.	25	+ Add new
<a href="#">cisco_dnac_clienthealth</a> Go to the add-on's configuration UI and configure modular inputs under the Inputs menu.	2	+ Add new
<a href="#">cisco_dnac_compliance</a> Go to the add-on's configuration UI and configure modular inputs under the Inputs menu.	2	+ Add new

# Cisco DNA Center Apps – Splunkbase

<https://splunkbase.splunk.com/>

The screenshot displays the Splunkbase interface. At the top, there is a navigation bar with the Splunkbase logo, links for 'Collections' and 'Apps', a search bar containing 'Find an app', a 'Submit an App' button, and a 'Log In' button. The main heading is 'Discover Apps'. A blue callout box on the right states: 'splunk> Certified Splunk version 8.0 → 9.4 App version 1.0.6'. Below the heading, there are filters for 'PLATFORM' (SPLUNK and SPLUNK SOAR) and 'CATEGORY'. A search filter 'Cisco DNA' is active, showing 'Showing 1-2 of 2 Results for Cisco DNA'. A 'Sort by' dropdown is set to 'Sort By Best Match'. Two app cards are displayed:

- Cisco DNA Center App** by Gabriel Zapodeanu. Description: 'Cisco DNA Center and Splunk have partnered to deliver an advanced security reporting and analysis tool. Th...'. Platform: Splunk Enterprise, Splunk Cloud. Rating: 5 stars (2). Label: DEVELOPER SUPPORTED APP.
- Cisco DNA Center Add-on** by Gabriel Zapodeanu. Description: 'The Cisco DNA Center Add-on for Splunk allows a Splunk® Enterprise administrator to collect data from Cisc...'. Platform: Splunk Enterprise, Splunk Cloud. Rating: 5 stars (3). Label: DEVELOPER SUPPORTED ADDON.

# Catalyst Center Splunk Integration Apps



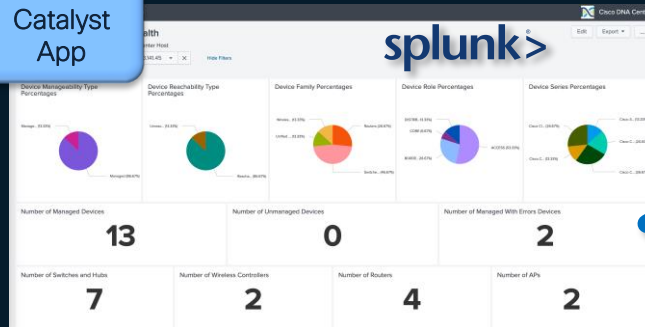
REST APIs

Cisco Catalyst Add-on App

Name	Interval	Index	Status	Actions
advisories_DNAWired	3600	main	Enabled	[Edit] [Delete]
advisories_LO2	3600	main	Enabled	[Edit] [Delete]
client_health_DNAWired	300	main	Enabled	[Edit] [Delete]
client_health_LO2	300	main	Enabled	[Edit] [Delete]
compliance_DNAWired	900	main	Enabled	[Edit] [Delete]
compliance_LO2	900	main	Enabled	[Edit] [Delete]
device_health_DNAWired	300	main	Enabled	[Edit] [Delete]
device_health_LO2	300	main	Enabled	[Edit] [Delete]
issues_DNAWired	900	main	Enabled	[Edit] [Delete]
issues_LO2	900	main	Enabled	[Edit] [Delete]

Save data to index

Cisco Catalyst App



New Search

Index = "main"

Events (85,748)

Format Timeline

Zoom Out

Reports

Top values

Events with this field

More values

Values	Count	%
cisco:dna:compliance	18,287	21.682%
syslog	13,175	26.809%
cisco:dna:devicehealth	11,738	17.853%
cisco:dna:securityadvisory	8,759	11.324%
cisco:dna:clienthealth	8,529	12.995%
network	5,748	4.317%
cisco:dna:issue	1,859	2.51%
cisco:dna:networkhealth	518	0.788%

Query index/input

Multi Catalyst Center clusters integrated with Splunk supported



# Splunk Received Webhook Message

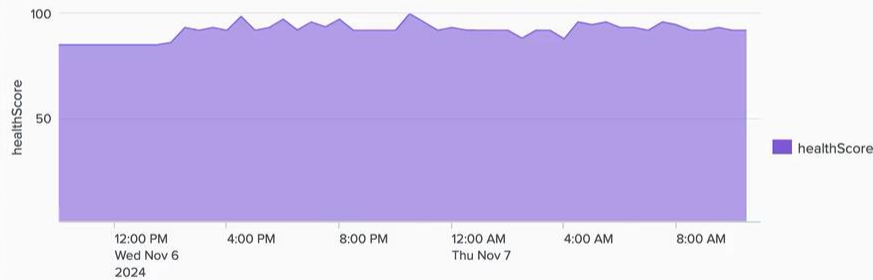
```
> 1/26/24 { [-]
7:19:20.000 PM
  category: ALERT
  ciscoDnaEventLink: https://10.93.141.45/dna/assurance/issueDetails?issueId=0ae9fe6d-ee9b-4614-8708-5df521681836
  context: null
  description: null
  details: { [-]
    Assurance Issue Category: Connectivity
    Assurance Issue Details: Interface GigabitEthernet0/0 (Interface description: connected_to_management network) connecting the following two network devices is down:
    Local Node: PDX-STACK, Peer Node: PDX-M
    Assurance Issue Name: Interface GigabitEthernet0/0 (Interface description: connected_to_management network) is Down on Network Device 10.93.141.21
    Assurance Issue Priority: P1
    Assurance Issue Status: active
    Device: 10.93.141.21
    Type: Network Device
  }
  dnacIP: 10.93.141.45
  domain: Connectivity
  efInstanceId: dad69e6e-acfc-4513-8daf-229564e870e5
  eventHierarchy: null
  eventId: NETWORK-NON-FABRIC_WIRED-1-251
  i18n: null
  instanceId: 0ae9fe6d-ee9b-4614-8708-5df521681836
  message: null
  messageParams: null
  name: null
  namespace: ASSURANCE
  network: { [-]
    deviceId: 0ae9fe6d-ee9b-4614-8708-5df521681836
    siteId: /15ab86e1-706e-41df-8400-ee1a974bc1f3/245892a8-21e9-4d30-9e36-67c44a120d3b/15628823-b52e-4564-a39c-36a9d45dc180/17d5
  }
  note: To programmatically get more info see here - https://<ip-address>/dna/platform/app/consumer-portal/developer-toolkit/ap
  parentInstanceId: null
  severity: 1
  source: ndp
  subDomain: Non-Fabric Wired
  timestamp: 1706325689393
  type: NETWORK
  userId: null
```

Details Included:  
Cisco Assurance Issue Link  
Issue details: name, description,  
device management IP Address,  
priority and status  
Catalyst Center IP Address  
Event Id  
Event unique identifier

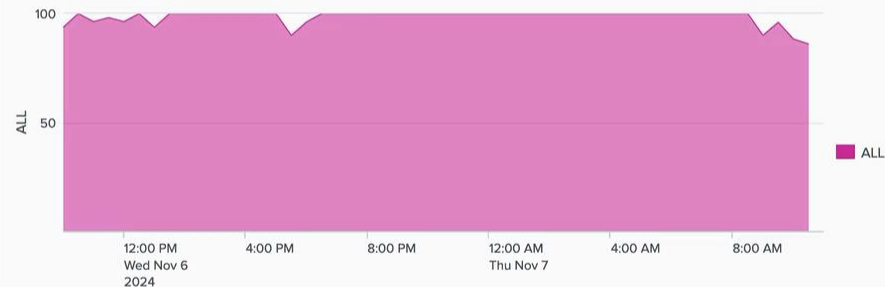
# Cisco Catalyst Center Overview

Time Range: Last 24 hours  
Cisco Catalyst Center Host: https://10.93.141.45  
Hide Filters

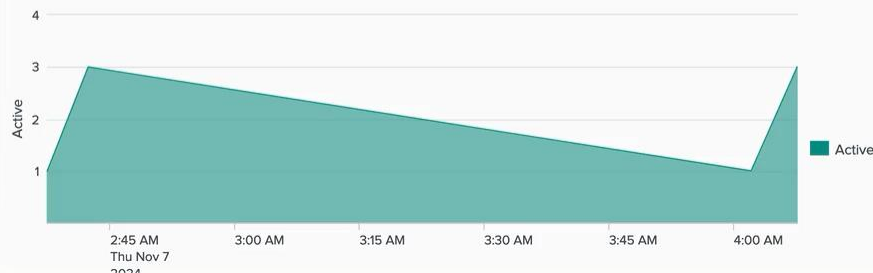
### Average Network Health Score



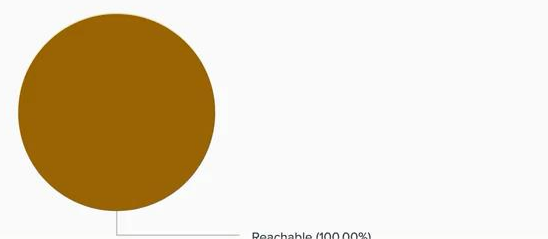
### Average Client Health Score



### Total Number of Active Issues



### Device Reachability Type Percentages



# ServiceNow ITSM Capabilities

## Capabilities that scale with your business

ITSM groups key applications into packages that can grow with you as your needs change.

[View Packages](#)

[Get Solution Brief →](#)

ITSM/ITSM PRO

### Incident Management

Restore services faster with intelligent routing and built-in collaboration.

→

ITSM/ITSM PRO

### Problem Management

Identify the root cause of issues and proactively prevent future disruptions.

→

ITSM/ITSM PRO

### Change Management

Accelerate change at DevOps speed by automating approvals while maintaining control.

→

ITSM/ITSM PRO

### Configuration Management Database (CMDB)

Track the dependencies and relationships of supported IT services to maintain continuity.

→

# Why Cisco Catalyst Center and ServiceNow?



Cisco Catalyst Center ServiceNow Integration:

- Increased IT efficiency by streamlining processes
- Automated ServiceNow CMDB inventory with rich asset data
- Enhanced incident management with enriched issue data
- Simplified change management with closed loop functionality
- Endpoint attribute synchronization for client profiling

# ITSM Integration Architecture

Without the Cisco Catalyst App



Platform  
and  
Bundles

REST  
APIs



Staging and  
Event tables,  
Generic REST  
API endpoints

servicenow

The screenshot shows the ServiceNow Incident Management interface. It features a table of incidents with columns for Number, Short description, Priority, State, Class DM Center IP Address, Updated, and Class DM Created Incident. Three incidents are visible, all with a priority of 'Critical' and a state of 'New'. The incidents are related to network device connectivity issues.

Number	Short description	Priority	State	Class DM Center IP Address	Updated	Class DM Created Incident
INC0010001	Interface GigabitEthernet0/5 (Interface Description - ) connecting the following two network devices is down. Local node: 10.0.0.100 (Cisco-ASA-01). GigabitEthernet0_Peer Node: 10.0.0.100 (Cisco-ASA-01). GigabitEthernet0/5	Critical	New	10.0.0.100	2022-06-04 17:10:06	true
INC0010002	Interface GigabitEthernet0/5 (Interface Description - ) connecting the following two network devices is down. Local node: 10.0.0.100 (Cisco-ASA-01). GigabitEthernet0_Peer Node: 10.0.0.100 (Cisco-ASA-01). GigabitEthernet0/5	Critical	New	10.0.0.100	2022-06-04 17:10:06	true
INC0010003	Interface GigabitEthernet0/5 (Interface Description - ) connecting the following two network devices is down. Local node: 10.0.0.100 (Cisco-ASA-01). GigabitEthernet0_Peer Node: 10.0.0.100 (Cisco-ASA-01). GigabitEthernet0/5	Critical	New	10.0.0.100	2022-06-04 17:10:06	true

**Notes:**

No support for closed-loop workflows.  
Code development on ServiceNow required.

Multi Cisco Catalyst Center clusters integrated with one ServiceNow Instance supported

# ITSM Integration Architecture

## With the Cisco Catalyst App



Platform and Bundles

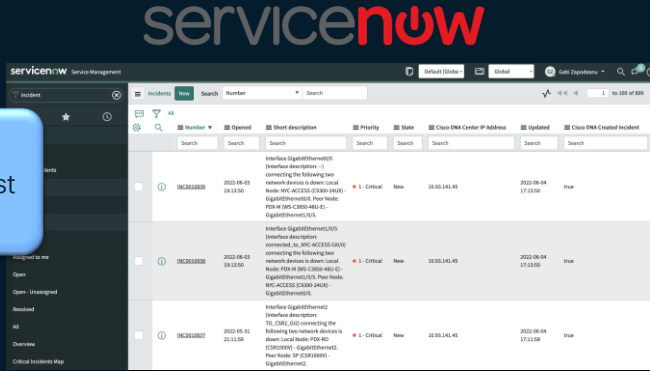
REST APIs

Cisco Catalyst App

REST APIs

REST APIs

Multi Catalyst Center clusters integrated with one ServiceNow Instance supported



**Notes:**  
 Management, Instrumentation, and Discovery (MID) Server is a Java application running on Windows and Linux, managed from the ServiceNow Instance

# Use Cases

MID Server

Cisco Catalyst App

Incident Management

CMDB Sync

required

- ITSM use cases supported
- CMDB sync
  - Incident management
  - SWIM, Group Based Policy, Fabric configuration, Configuration Visibility and Control
  - Endpoint attribute retrieval
  - Incident enrichment

Change Management

Configuration Items

Name	Class	IP Address
NYC-RO	IP Router	10.93.141.25
LO-CN	IP Switch	10.93.141.20
PDX-STACK	IP Switch	10.93.141.21
PDX-RN	IP Router	10.93.141.22
NYC-ACCESS	IP Switch	10.93.141.26
C9800-CL	Wireless Lan Controller	10.93.141.38
PDX-M	IP Switch	10.93.141.17
AP3800i	Wireless Access Point	10.93.141.70

Incidents

Number	Opened	Short description	Priority	State	Cisco DNA Center IP Address	Updated	Cisco DNA Created Incident
INC0010R30	2022-06-03	Interface GigabitEthernet0/0 (Interface description: --) connecting the following two network devices is down: Local			10.93.141.45	2022-06-04 19:13:51	true

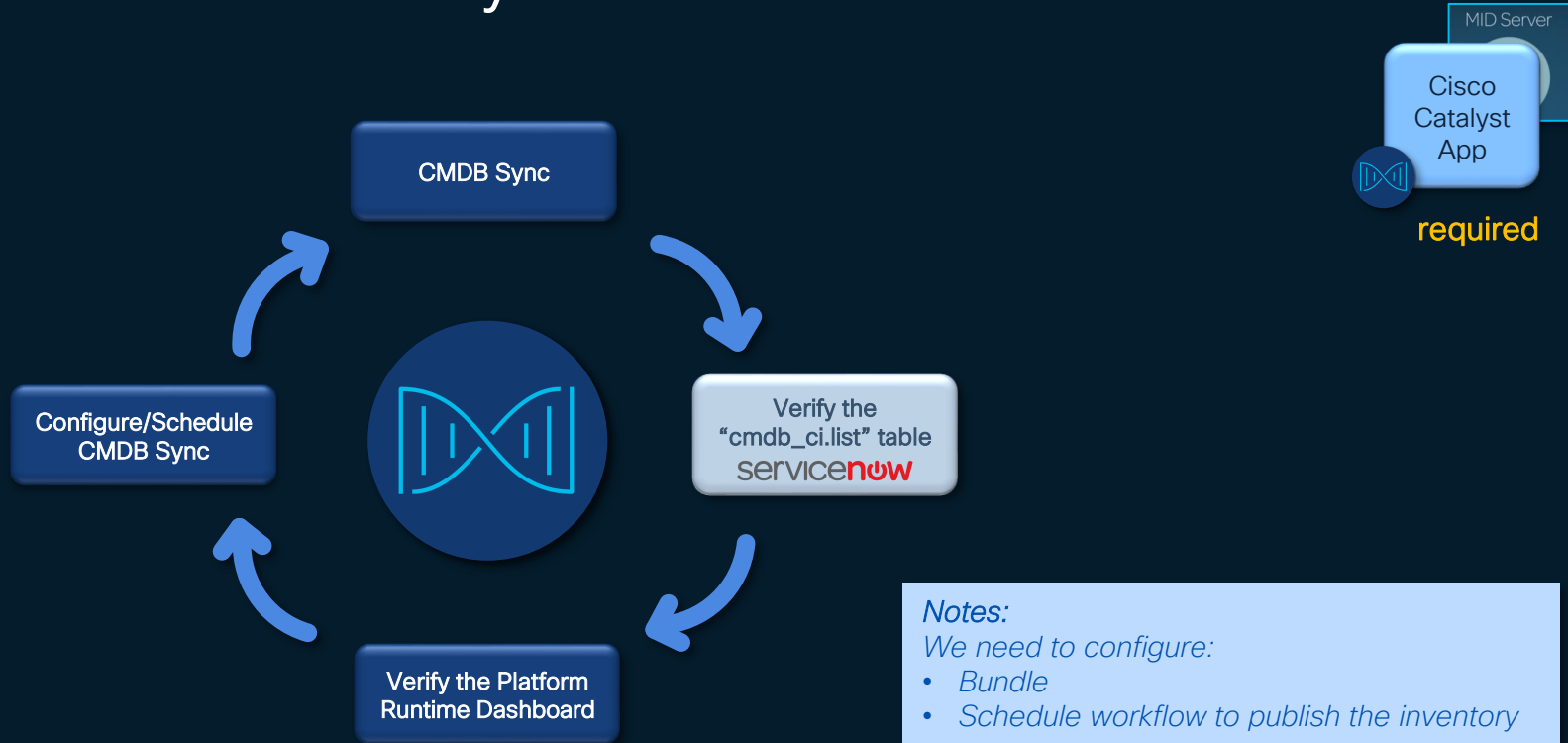
  

Type	State	Planned start date	
SWIM Upgrade Request Creation Image	Standard	Canceled	2022-05-05 23:45:00
SWIM Upgrade Request Creation Image	Standard	Canceled	2022-05-06 08:35:00
SWIM Upgrade Request Creation Image	Standard	Canceled	2022-05-06 08:33:00
SWIM Upgrade Request Creation Image	Standard	Closed	2021-10-05 17:30:00
SWIM Upgrade Request Creation Image	Standard	Review	2021-10-05 17:00:00

- Webex Notifications

# CMDB Sync

# Configuration Management Database (CMDB) Synchronization



# Configuration Items (cmdb\_ci) Table

The screenshot shows the ServiceNow Configuration Items table. The search bar contains 'cmdb\_ci.list' and the filter bar contains 'All > Discovery source = Cisco DNA 10.93.141.45'. The table has columns for Name, Class, IP Address, Discovery source, Location, Serial number, MAC Address, Updated, Updated by, and Updates. The 'PDX-CORE1' row is highlighted with a blue border.

Name	Class	IP Address	Discovery source	Location	Serial number	MAC Address	Updated	Updated by	Updates
SP	IP Router	10.93.141.24	Cisco DNA 10.93.141.45	Global/CO/ENGL/Floor-5	999R1FFKGSU	00:1e:f6:c4:56:00	2025-01-19 20:00:07	AppAdmin-en2	
LO-CN	IP Switch	10.93.141.20	Cisco DNA 10.93.141.45	Global/OR/LO/Floor-3	FJC2325T0PH	30:8b:b2:ba:c2:80	2025-01-19 20:00:06	AppAdmin-en2	
C9800-CL	Wireless Lan Controller	10.93.141.38	Cisco DNA 10.93.141.45	Global/OR/PDX/Floor-2	9L2L5LZBF76	00:0c:29:7f:8b:5d	2025-01-19 20:00:06	AppAdmin-en2	
PDX-STACK	IP Switch	10.93.141.21	Cisco DNA 10.93.141.45	Global/OR/PDX/Floor-2	FCW2426G0QT, FCW2426D0PQ	90:77:ee:06:94:00	2025-01-19 20:00:06	AppAdmin-en2	
NYC-ACCESS	IP Switch	10.93.141.26	Cisco DNA 10.93.141.45	Global/NY/NYC/Floor-8	FJC2325T0SL	30:8b:b2:b5:32:00	2025-01-19 20:00:06	AppAdmin-en2	
PDX-CORE1	IP Switch	10.93.141.18	Cisco DNA 10.93.141.45	Global/OR/PDX/Floor-2	FJC272611CZ	6c:03:b5:66:60:00	2025-01-19 20:00:06	AppAdmin-en2	
PDX-RO	IP Router	10.93.141.23	Cisco DNA 10.93.141.45	Global/OR/PDX/Floor-2	92ML86WCBN	00:1e:e6:06:0d:00	2025-01-19 20:00:06	AppAdmin-en2	
NYC-RO	IP Router	10.93.141.25	Cisco DNA 10.93.141.45	Global/NY/NYC/Floor-8	99YZN3AUH3U	00:1e:49:aa:4c:00	2025-01-19 20:00:06	AppAdmin-en2	
		10.93.141.70	Cisco DNA 10.93.141.45	Global/OR/PDX/Floor-2	FGL2206ABJF	b0:26:80:e3:50:e0	2025-01-19 20:00:06	AppAdmin-en2	
		10.93.141.22	Cisco DNA 10.93.141.45	Global/OR/PDX/Floor-2	9XIF5ZTLXRB	00:1e:e5:d7:ef:00	2025-01-19 20:00:06	AppAdmin-en2	

- Search for the "cmdb\_ci.list" table
- Group/filters using the configured Discovery Source

# Configuration Items Table - Device Details

Device Details:  
Hostname, serial number, model, MAC address, location information, device role, device reachable or not, managed by Cisco Catalyst Center IP address, and more ...

The screenshot displays the ServiceNow Configuration Items table for a device named 'PDX-CORE1'. The form is divided into several sections:

- General Information:** Name (PDX-CORE1), Asset tag, Manufacturer, Asset (C9300-24U), Company, Serial number (FJC272611CZ), Model ID (C9300-24U), and Assigned to.
- Location Information:** Area (OR), City, Building (PDX), Floor (Floor-2), and Address (1600 Northeast Compton Drive, Hillsboro, Oregon 97006, United States).
- Device Information:** MAC Address (6c:03:b5:66:60:00), Model number (C9300-24U), Fabric Role, Number of Users, Prior Upgrade Date, Role (DISTRIBUTION), Code Upgrade Date, Time since Code Upgrade (Days: 00, Hours: 00, 00, 00), Upgrade Failure Reason, and Uptime (Days: 27, Hours: 04, 43, 38).
- Device Status:** Device Id (c09699e3-7eb9-445e-ad81-650ba4a3aa), Device Status (Reachable), and Cisco DNA Center IP Address (10.93.141.45).

# Welcome to Catalyst Center!

Explore

## Assurance Summary

### Health ⓘ

Healthy as of Feb 5, 2025 10:43 AM

77%	--%	89%
Network Devices	Wireless Clients	Wired Clients

[View Details](#)

### Critical Issues

Last 24 Hours

1	0
P1	P2

[View Details](#)

### Trends and Insights

Last 30 Days

0	0
AP Performance Advisories	Trend Deviations

[View Details](#)

## Network Snapshot

### Sites

As of Feb 5, 2025 10:43 AM

16	DNS Servers : 1 NTP Servers : 1
----	------------------------------------

[Add Sites](#)

### Network Devices

As of Feb 5, 2025 10:43 AM

13	Unclaimed: 3 Unprovisioned: 1 Unreachable: 0
----	--

[Find New Devices](#)

### Application QoS Policies

As of Feb 5, 2025 10:43 AM

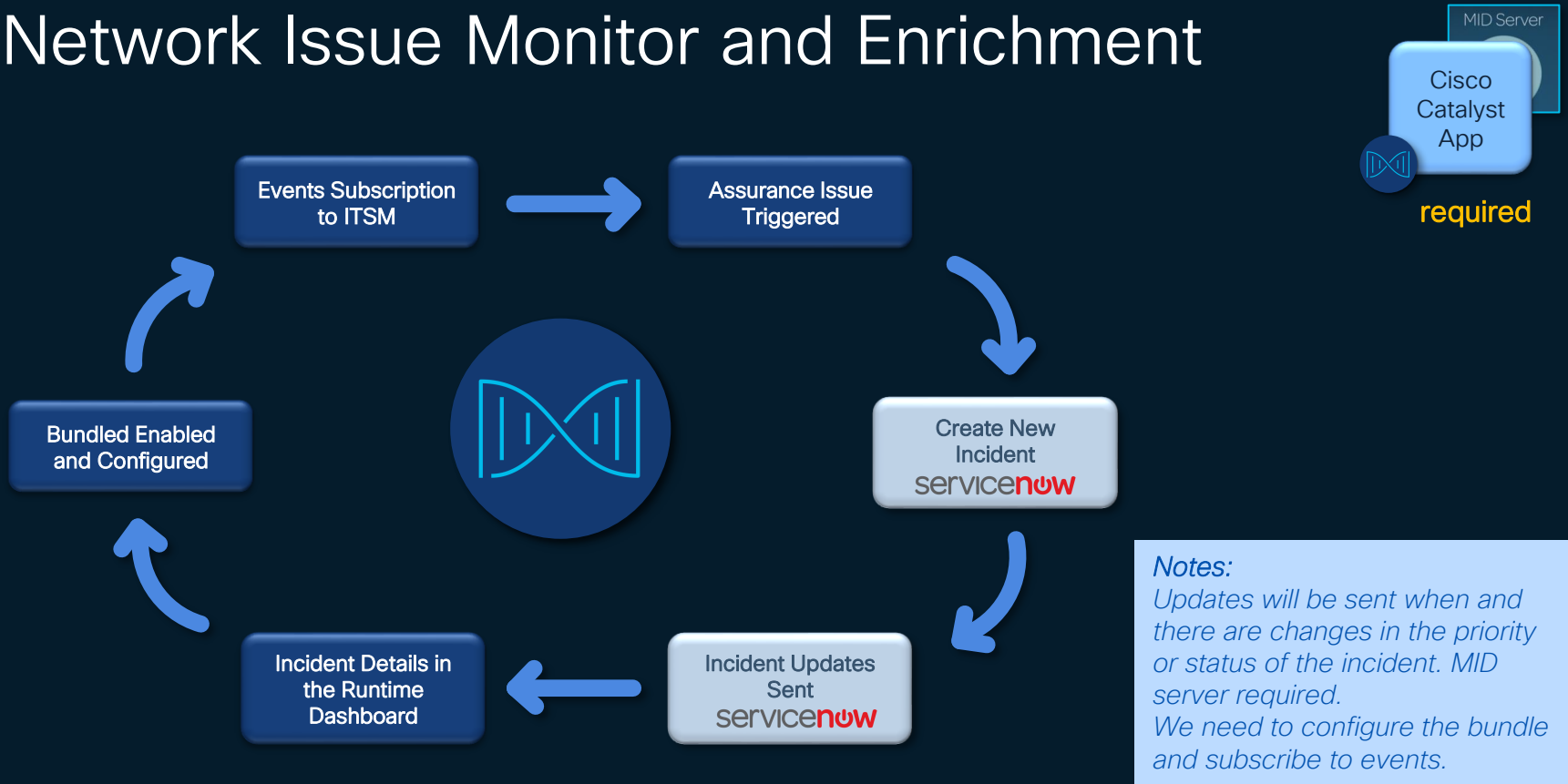
0	Successful Deploys: 0 Errored Deploys: 0 Stale Policies: 0
---	--

[Add New Policy](#)

- Webex Notifications

# Incident Management

# Network Issue Monitor and Enrichment



# Incident Details - ServiceNow

The screenshot displays the ServiceNow interface for an incident. The left sidebar contains navigation options: Home, Incidents, Configuration Items, Change Requests, Problems, and MID Server - Servers. The main content area shows the incident details for INC0025182. The incident number is highlighted with a green box and a blue circle labeled '1'. The short description is highlighted with a green box and a blue circle labeled '2'. The configuration item 'PDX-RO' is highlighted with a green box and a blue circle labeled '3'. The 'Cisco DNA' tab in the 'Resolution Information' section is highlighted with a green box and a blue circle labeled '3'. A blue callout box on the right contains the following list:

1. Incident number
2. Description
3. Device reporting issue
4. Cisco DNA tab

Additional details visible in the screenshot include: Caller (empty), Watch list (lock and share icons), Opened (2025-01-20 19:27:12), Urgency (2 - Medium), Assigned to (empty), Assignment group (empty), State (New), Closed (empty), Short description (Device name 'PDX-RO' at site 'Global/OR/PDX/Floor-2': BGP is down with neighbor '10.93.131.2'), Configuration item (PDX-RO), Notes (Cisco DNA), Related Records (Cisco DNA Center IP Address: 10.93.141.45, Cisco DNA Event Domain: -- None --, Cisco 360 View: <https://10.93.141.45/dna/assurance/device/details?id=01f7cdf2-2298-42c7-bb74-dc68e3c3a051>), and Cisco DNA Network Details (Connected Device:1, Device id: 01f7cdf2-2298-42c7-bb74-dc68e3c3a051).

# Incident Details – DNA Tab Details

The screenshot displays the ServiceNow interface for an incident (INC0025182) with the DNA tab selected. The interface is divided into several sections, each highlighted with a blue circle and a number:

- 5**: Cisco DNA Event Details and Suggested Actions section, showing issue details like ID, Category, and Summary.
- 6**: Cisco DNA Suggested Actions Commands Output section, displaying command output details and a table of neighbor information.
- 4**: Cisco DNA Network Details section, showing device information like DeviceType, PlatformId, Family, Ip, and SoftwareVersion.
- 4**: Filter navigator on the left sidebar.
- 4**: Cisco DNA Center IP Address section in the incident details view.

A legend in the bottom right corner explains the numbers:

1. Cisco Catalyst Center cluster
2. Device details
3. Device 360 view link
4. Topology
5. Suggested actions
6. Commands output (executed when incident is created)

# Incident Updates to Catalyst Center

servicenow Service Management

Default [Globo] Global G2 Gabi Zapodeanu 54

Incident INC0025182

Number: INC0025182

Opened: 2025-01-20 19:27:12

Urgency: 3 - Low

Assigned to: Gabi Zapodeanu

Assignment group: Network

State: In Progress

Closed: [Calendar icon]

\* Short description: Device name 'PDX-RO' at site 'Global/OR/PDX/Floor-2': BGP is down with neighbor '10.93.131.2'

Additional comments (Customer visible)

Configuration item: PDX-RO

Notes | Related Records | Resolution Information | Cisco DNA

Cisco DNA Center IP Address: 10.93.141.45

Cisco DNA Event Domain: -- None --

Cisco 360 View: <https://10.93.141.45/dna/assurance/device/details?id=01f7cdf2-2298-42c7-bb74-dc68e3c3a051>

1. Updates:

- Urgency
- Assigned to
- State

2. Update

# Incident Updates to Catalyst Center – continued

The screenshot displays the Catalyst Center interface for an incident titled "Network Device Interface Connectivity - BGP Down (2)". The interface includes a search bar, a "Retry" button, and a table of incident details. A green circle highlights "Total API's 4" in the left sidebar. A green box highlights a row in the table with status "In Progress". A blue callout box at the bottom states "Updates received from ServiceNow".

ITSM Status	ITSM Id	ITSM Link	ITSM Ticket Assigned To	ITSM Last UpdatedTime	ITSM Entity Severity/Priority	DNA E
Closed	INC0025178	<a href="https://ven03092.service-now.com/nav_to.do?uri=incident.do?sys_id=d2b06f541bd35a5090e64159b04bcb91">https://ven03092.service-now.com/nav_to.do?uri=incident.do?sys_id=d2b06f541bd35a5090e64159b04bcb91</a>	Unassigned	January 20th 2025, 5:06:01 pm	2 - High	2
In Progress	INC0025182	<a href="https://ven03092.service-now.com/nav_to.do?uri=incident.do?sys_id=67a14ce01b975a5090e64159b04bcbf1">https://ven03092.service-now.com/nav_to.do?uri=incident.do?sys_id=67a14ce01b975a5090e64159b04bcbf1</a>	Gabi Zapodeanu	January 20th 2025, 7:46:09 pm	3 - Moderate	2

Updates received from ServiceNow

Welcome to Catalyst Center!

Explore

### Assurance Summary

**Health**  ⓘ   
Healthy as of Feb 5, 2025 10:54 AM

<b>77%</b> Network Devices	<b>--%</b> Wireless Clients	<b>89%</b> Wired Clients
<a href="#">View Details</a>		

**Critical Issues**  
Last 24 Hours

<b>0</b> P1	<b>0</b> P2
<a href="#">View Details</a>	

**Trends and Insights**  
Last 30 Days

<b>0</b> AP Performance Advisories	<b>0</b> Trend Deviations
<a href="#">View Details</a>	

### Network Snapshot

**Sites**  
As of Feb 5, 2025 10:54 AM

<b>16</b>	DNS Servers : 1 NTP Servers : 1
<a href="#">Add Sites</a>	

**Network Devices**  
As of Feb 5, 2025 10:54 AM

<b>13</b>	Unclaimed : 3 Unprovisioned : 1 Unreachable : 0
<a href="#">Find New Devices</a>	

**Application QoS Policies**  
As of Feb 5, 2025 10:54 AM

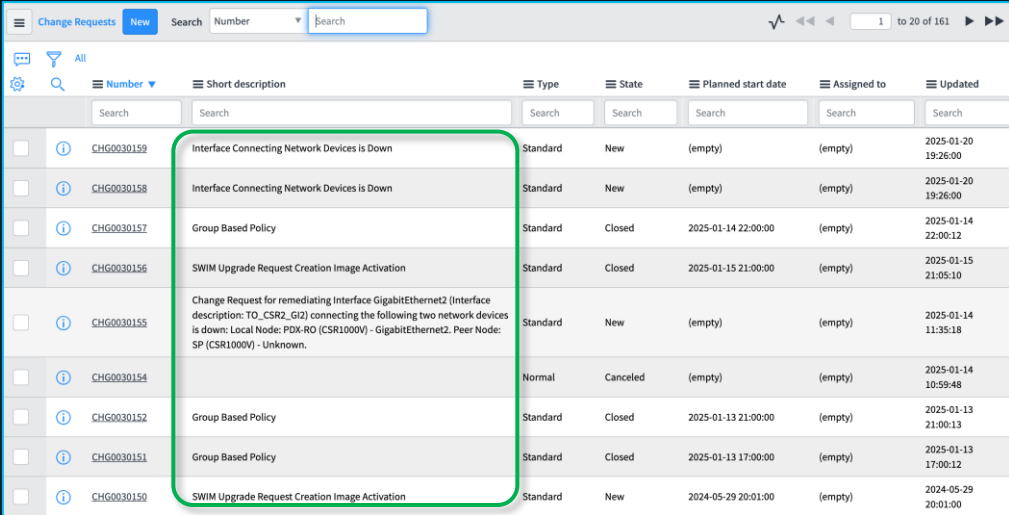
<b>0</b>	Successful Deploys : 0 Errored Deploys : 0 Stale Policies : 0
<a href="#">Add New Policy</a>	

- Webex Notifications

# Change Control

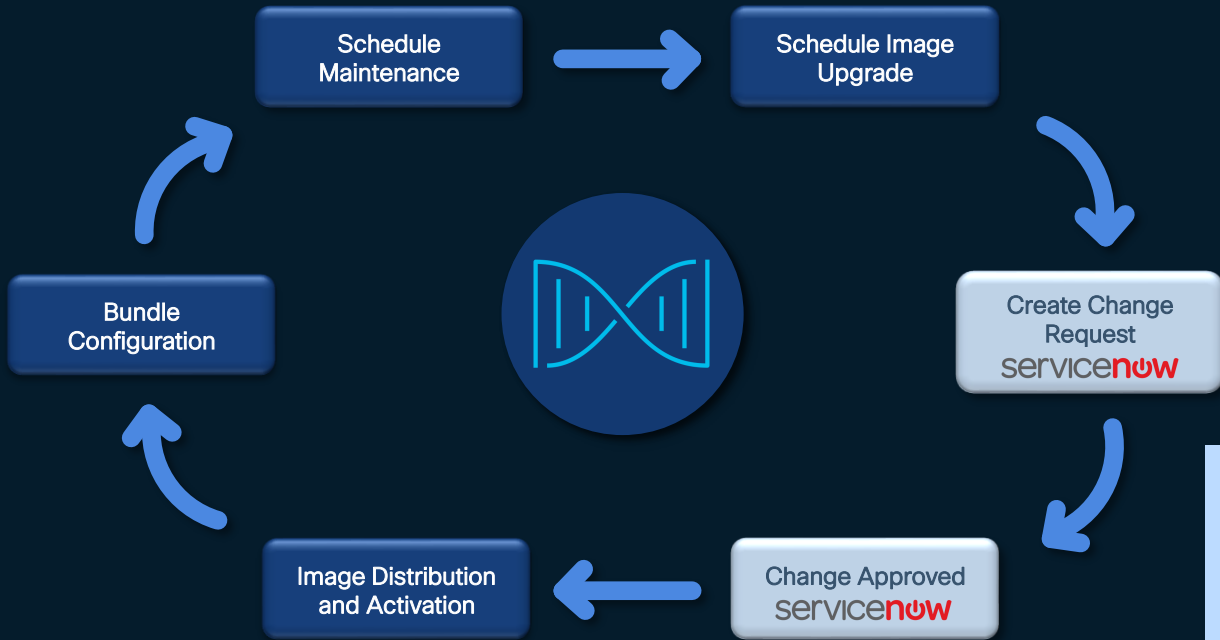
# Cisco Catalyst Center Automation Events for ITSM (ServiceNow)

- This bundle can be used to:
- Monitor and publish events that require software image updates
- Monitor and publish events that require fabric or configuration changes
- Publish events regarding group-based policy changes



Number	Short description	Type	State	Planned start date	Assigned to	Updated
CHG0030159	Interface Connecting Network Devices is Down	Standard	New	(empty)	(empty)	2025-01-20 19:26:00
CHG0030158	Interface Connecting Network Devices is Down	Standard	New	(empty)	(empty)	2025-01-20 19:26:00
CHG0030157	Group Based Policy	Standard	Closed	2025-01-14 22:00:00	(empty)	2025-01-14 22:00:12
CHG0030156	SWIM Upgrade Request Creation Image Activation	Standard	Closed	2025-01-15 21:00:00	(empty)	2025-01-15 21:05:10
CHG0030155	Change Request for remediating Interface GigabitEthernet2 (Interface description: TO_CSR2_Gi2) connecting the following two network devices is down: Local Node: PDX-RO (CSR1000V) - GigabitEthernet2. Peer Node: SP (CSR1000V) - Unknown.	Standard	New	(empty)	(empty)	2025-01-14 11:35:18
CHG0030154		Normal	Canceled	(empty)	(empty)	2025-01-14 10:59:48
CHG0030152	Group Based Policy	Standard	Closed	2025-01-13 21:00:00	(empty)	2025-01-13 21:00:13
CHG0030151	Group Based Policy	Standard	Closed	2025-01-13 17:00:00	(empty)	2025-01-13 17:00:12
CHG0030150	SWIM Upgrade Request Creation Image Activation	Standard	New	2024-05-29 20:01:00	(empty)	2024-05-29 20:01:00

# Software Image Management (SWIM) Closed Loop Workflow



**Notes:**  
*ServiceNow approval will be sent when change request is in implement state.  
Cisco Catalyst Center will close change when upgrade completed.  
MID server required.*

# SWIM Closed Loop End-to-End Automation

The image displays a composite screenshot showing the integration between Cisco Catalyst Center and ServiceNow. The background shows the Catalyst Center interface with a 'Change Request' (CHG0030122) in the 'Closed' state. The foreground shows the ServiceNow interface, where the same change request is visible, and the 'State' dropdown menu is highlighted in green, showing 'Closed'. A dark blue callout box with white text reads: 'Change Request Closed by Catalyst Center'. The ServiceNow interface also shows a 'Filter navigator' on the left with options like 'Home', 'Incidents', 'Configuration Items', 'Change Requests', 'Asset - All Assets', 'MID Server - Dashboard', and 'Problem - All'. The Catalyst Center interface shows a progress bar with steps: New, Assess, Authorize, Scheduled, Implement, Review, Closed, and Canceled. The 'Closed' step is currently selected.

Welcome to Catalyst Center!

Explore

### Assurance Summary

**Health** ⓘ  
Healthy as of Feb 5, 2025 11:24 AM

77%	--%	89%
Network Devices	Wireless Clients	Wired Clients

[View Details](#)

**Critical Issues**  
Last 24 Hours

5	0
P1	P2

[View Details](#)

**Trends and Insights**  
Last 30 Days

0	0
AP Performance Advisories	Trend Deviations

[View Details](#)

### Network Snapshot

**Sites**  
As of Feb 5, 2025 11:24 AM

16

DNS Servers : 1  
NTP Servers : 1

[Add Sites](#)

**Network Devices**  
As of Feb 5, 2025 11:24 AM

13

Unclaimed : 3  
Unprovisioned : 1  
Unreachable : 0

[Find New Devices](#)

**Application QoS Policies**  
As of Feb 5, 2025 11:24 AM

0

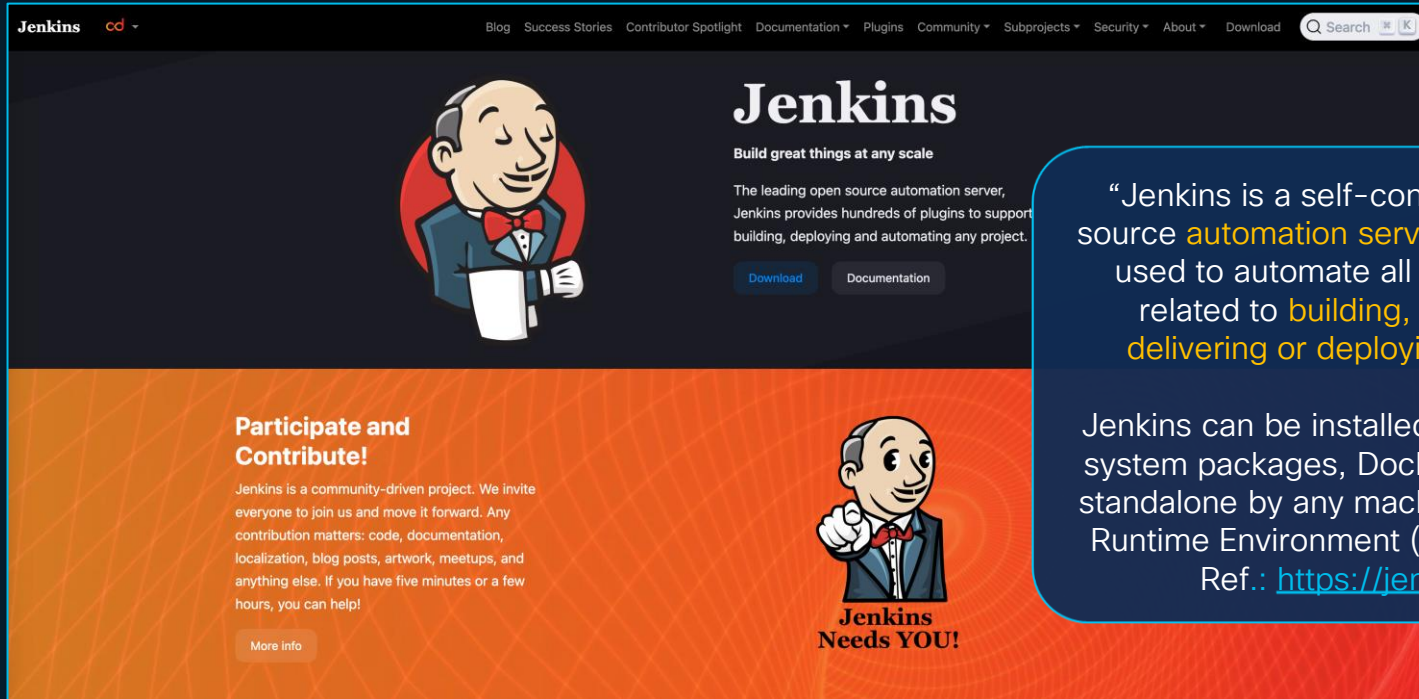
Successful Deploys : 0  
Errored Deploys : 0  
Stale Policies : 0

[Add New Policy](#)

- Webex Notifications

# Jenkins

# What is Jenkins?



The screenshot shows the Jenkins website homepage. At the top, there is a navigation bar with links for Blog, Success Stories, Contributor Spotlight, Documentation, Plugins, Community, Subprojects, Security, About, and Download. A search bar is also present. The main content area features the Jenkins logo (a cartoon man in a tuxedo) and the text "Jenkins" in a large font. Below the logo, it says "Build great things at any scale" and "The leading open source automation server, Jenkins provides hundreds of plugins to support building, deploying and automating any project." There are buttons for "Download" and "Documentation". A section titled "Participate and Contribute!" invites users to join the community-driven project. Another cartoon man in a tuxedo is shown with the text "Jenkins Needs YOU!".

Jenkins cd

Blog Success Stories Contributor Spotlight Documentation Plugins Community Subprojects Security About Download Search

## Jenkins

Build great things at any scale

The leading open source automation server, Jenkins provides hundreds of plugins to support building, deploying and automating any project.

Download Documentation

### Participate and Contribute!

Jenkins is a community-driven project. We invite everyone to join us and move it forward. Any contribution matters: code, documentation, localization, blog posts, artwork, meetups, and anything else. If you have five minutes or a few hours, you can help!

More info

Jenkins Needs YOU!

“Jenkins is a self-contained, open-source **automation server** which can be used to automate all sorts of tasks related to **building, testing, and delivering or deploying software**.”

Jenkins can be installed through native system packages, Docker, or even run standalone by any machine with a Java Runtime Environment (JRE) installed.”

Ref.: <https://jenkins.io/>

# Why Catalyst Center and Jenkins?



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Jenkins is a self-contained, open-source **automation server** which may be used to:

- Support network management as Infrastructure-as-Code
- Integrate with GitHub for validated and approved apps
- Integrate with GitHub for intent configurations, profiles and policies
- Pipelines may include lab testing, approval and production deployment

# Running an Automation Workflow

- Create and activate a new Python virtual environment, or a Docker container
- Clone, or pull, code from Version Control Platforms (GitHub or GitLab)
- Install or upgrade Python Libraries, example: Cisco DNA Center SDK
- Provide the required params
- Run the application

**Note:**

*We do this every time we start development or run the app*



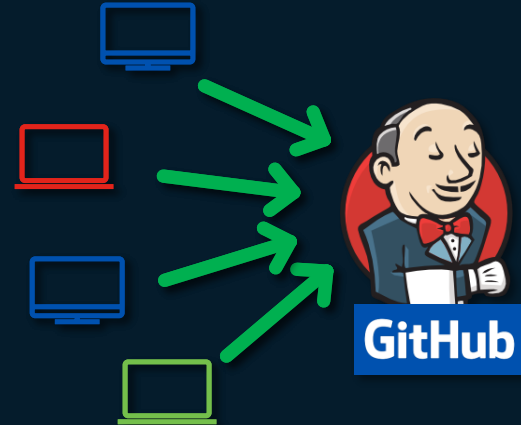
Runbook environments drift between developers, using different libraries and code versions

# Jenkins Pipeline Build

- Create a Docker container
- Clone, or pull, code from Version Control Platforms, GitHub or GitLab
- Install or upgrade to the **configured versions** of Python Libraries – Cisco DNA Center SDK, Ansible, Terraform
- Provide the required params, or pull them from Version Control
- Run the application

**Note:**

*All steps are completely automated*



Runbook environments identical, always using the latest code versions and libraries  
Rich scheduling/triggering options

# Jenkins Dashboard

The screenshot shows the Jenkins Dashboard with a sidebar on the left and a main content area. The sidebar includes links for People, Build History, Project Relationship, Check File Fingerprint, Manage Jenkins, My Views, and Open Blue Ocean. The main content area features a view selector (All, LabView, OpsView) and a table of pipelines. The table columns are S, W, Name, Last Success, and Last Failure. The 'All' view is selected, showing a list of pipelines with their status, last success/failure times, and run counts. The 'Build Queue' section shows no builds in the queue, and the 'Build Executor Status' section shows three idle executors. The 'GitHub Sync' pipeline is highlighted with a yellow box.

S	W	Name ↓	Last Success	Last Failure
✓	☀	Catalyst Center State Sync	22 hr #99	N/A
✓	☀	ChatGPT Plugin	7 mo 1 day #11	N/A
✓	☀	Cisco DNA Center Jenkins Sandbox	9 mo 0 days #1	N/A
✓	☁	CLI Templates Deployment	7 mo 3 days #18	10 mo #13
✓	☀	Dev Ready	4 mo 4 days #61	N/A
✓	☀	Device Inventory	20 hr #1769	5 days 20 hr #1764
✓	☀	GitHub Sync	21 hr #364	N/A
✓	☀	GitLab Sync	21 hr #320	10 days #310
✓	☀	Intent Device Compliance	23 hr #61	N/A
✓	☁	ITSM PnP Workflow	2 days 22 hr #14	2 days 22 hr #12
✓	☁	ITSM Provision Switch	2 days 22 hr #10	2 days 22 hr #7
✓	☀	Jenkins Sandbox	10 mo #8	N/A

- Jenkins preferences
- Group pipelines in views
- Build queue and execution status
- Pipeline stats – health, number of runs, success and failure, ...

# Device Inventory Pipeline

- Runs on a schedule, every 15 minutes
- Will collect the Catalyst Center device inventory
- Push the inventory files to GitHub
- Always up-to-date rich inventory data may be used by other automations tools and platforms
- It includes device and AP inventories, software non-compliant devices list, formatted as JSON and YAML files

The screenshot shows the Jenkins dashboard for the 'OpsView' project. A table lists several jobs, with the 'Device Inventory' job highlighted by a green border. The table columns are: S (Success), W (Warning), Name, Last Success, Last Failure, Last Duration, and Fav (Favorite).

S	W	Name ↓	Last Success	Last Failure	Last Duration	Fav
✓	☀️	Catalyst Center State Sync	23 hr #446	N/A	53 sec	▶️ ☆
✓	☀️	CLI Templates Deployment	6 mo 15 days #19	1 yr 9 mo #13	2 min 55 sec	▶️ ☆
✓	☀️	Device Inventory	21 hr #2170	N/A	1 min 36 sec	▶️ ☆
✓	☀️	GitHub Sync	22 hr #720	N/A	31 sec	▶️ ☆
✗	☁️	GitLab Sync	8 mo 13 days #412	22 hr #665	21 sec	▶️ ☆
✗	☁️	Intent Device Compliance	1 day 0 hr #408	6 min 38 sec #409	37 sec	▶️ ☆

Welcome to Catalyst Center!

Explore

### Assurance Summary

**Health** ⓘ  
Healthy as of Feb 5, 2025 1:31 PM

54%	--%	89%
Network Devices	Wireless Clients	Wired Clients

[View Details](#)

**Critical Issues**  
Last 24 Hours

6	0
P1	P2

[View Details](#)

**Trends and Insights**  
Last 30 Days

0	0
AP Performance Advisories	Trend Deviations

[View Details](#)

### Network Snapshot

**Sites**  
As of Feb 5, 2025 1:31 PM

16

DNS Servers : 1  
NTP Servers : 1

[Add Sites](#)

**Network Devices**  
As of Feb 5, 2025 1:31 PM

12

Unclaimed : 3  
Unprovisioned : 1  
Unreachable : 3

[Find New Devices](#)

**Application QoS Policies**  
As of Feb 5, 2025 1:35 PM

0

Successful Deploys : 0  
Errored Deploys : 0  
Stale Policies : 0

[Add New Policy](#)

# GitHub Integration

- Webex Notifications

# GitHub Integration App Summary

Network Engineer

GitHub  
Integration  
App



GitHub

zapodeanu / dnacenter\_github\_templates

- Verify if repo exists and not empty
- Retrieve the content of each file
- Read the commit details: comments, author, date, diff
- Create, or update, project
- Build a new Cisco Catalyst Center template including the GitHub commit details
- Create CLI template, or update, if changes
- Commit the template
- Create report

```
INFO:root: Template "snmp_ntp" has changed, different template on Cisco DNA Center
INFO:root: Updating existing template "snmp_ntp" id: 27c20fe5-b66b-4884-8d82-94c841805cff
INFO:root: Template "snmp_ntp" committed
```

CLI Templates / csr\_logging (22) Properties

Templates Variables Simulation Provision Conflicts

(x) System Variables Assistant Template History Attach to Network Profile Show Design Conf

Auto saved: 4:05 PM (every 5 mins) Search Clone Export Delete CLI Template Best Practices

```
1 {#
2 This template has been pulled from GitHub.
3 Uploaded to Catalyst Center by GitHub_Sync App
  Author: gzapodea@cisco.com
  Date: 2025-01-22T23:51:27Z
  Commit message: updated logging and snmp/ntp templates
  Commit URL: https://github.com/zapodeanu/dnacenter_github_templates/commit/
  /fb5315a7b5a2192c06d583ef8928cb752583390f
  Commit Diff: @@ -1,8 +1,8 @@

  logging buffered 40960
  logging buffered 8192
  logging host 10.93.141.37 transport udp port 8514
  logging host 10.93.141.68 transport udp port 7514
  logging source-interface Loopback100
  logging host 10.93.141.1 transport udp port 8514

  service timestamps debug datetime localtime
  service timestamps log datetime localtime
```

Discard Changes Save Commit

# Running the Integration App

- Manually, on-demand
- Scheduled – every hour, daily, ...
- GitHub Actions triggered when repo changes
- API calls to run sync
- CI/CD pipelines



```
Run - dnacenter_github_integration
dnacenter_github_sync
/Users/gzapodea/PythonCode/dnacenter_github_integration/dnacenter_github_sync.py
INFO:root: App "dnacenter_github_sync.py" Start, 2023-04-19 15:31:38
INFO:root: Repo "dnacenter_github_templates" found!
INFO:root: Repo "dnacenter_github_templates" files:
INFO:root: File: aaa_config.txt
INFO:root: File: csr_logging.txt
INFO:root: File: snmp_ntp.txt
INFO:root: Collected all commit comments for "dnacenter_github_templates" repo
INFO:root: Project "GitHub_Project" id: bf74f896-b802-49b1-9e8d-9ec7fac84dcb
INFO:root: Template name: aaa_config
INFO:root: Template content:
{#
This template has been pulled from GitHub.
Uploaded to Cisco DNA Center by GitHub_Sync App
Author: gzapodea@cisco.com
Date: 2023-03-24T21:19:42Z
Commit message: updated templates, new template
Commit URL: https://github.com/zapodeanu/dnacenter\_github\_templates/commit/5b72c24f77e6e35bafbd841c19adf648ec41f
Commit Diff: @@ -0,0 +1,5 @@
+!
+aaa new-model
+aaa authentication login default local
+aaa authorization exec default local
+!
\ No newline at end of file
#}
!
!
aaa new-model
aaa authentication login default local
aaa authorization exec default local
!
INFO:root: Template "aaa_config" has not changed, identical template on Cisco DNA Center
INFO:root: Template name: csr_logging
INFO:root: Template content:
```

# GitHub Sync Jenkins Pipeline

**Jenkins** Search (🔍+K) Gabriel Zapodeanu log out

Dashboard > GitHub Sync >

Status ✔ **GitHub Sync**

Open-source integration synchronizing GitHub repos as single source of truth with Cisco Catalyst Center  
[https://github.com/cisco-en-programmability/dnacentr\\_git\\_integrations](https://github.com/cisco-en-programmability/dnacentr_git_integrations)

**Stage View**

	Environment variables	Build Python Environment	Pull or Clone the source code	Install Python libraries
<b>On demand run</b>	77ms	602ms	1s	6s
<b>#722</b> Jan 22 16:00 No Changes	74ms	597ms	1s	6s
<b>#721</b> Jan 21 21:42 No Changes	89ms	606ms	1s	6s
<b>Scheduled runs</b>				
<b>#720</b> Jan 20 21:42 No Changes	81ms	619ms	1s	6s

**Build History** trend

Filter builds... /

- ✔ #722 Jan 22, 2025, 4:00 PM
- ✔ #721 Jan 21, 2025, 9:42 PM
- ✔ #720 Jan 20, 2025, 9:42 PM
- ✔ #719 Jan 19, 2025, 9:42 PM

**GitHub Sync > #722**

```
ntp server 171.68.38.53
no ntp server 171.68.48.80
-ntp source Loopback1
+no ntp source Loopback1
+ntp source Loopback0
!
\ No newline at end of file
#}
!
!
snmp-server host 10.93.135.30 version 2c RO
snmp-server host 10.93.130.50 version 2c RW
!
ntp server 171.68.48.78
ntp server 171.68.38.53
ntp source Loopback0
!
INFO:root: Template "snmp_ntp" has changed, different template on Cisco DNA Center
INFO:root: Updating existing template "snmp_ntp" id: e17a3013-51c5-44a9-8ce5-ae20849be5e3
INFO:root: Template "snmp_ntp" committed

INFO:root:
GitHub Sync Report:
Template "aaa_config" has not changed, identical template on Cisco DNA Center
Template "csr_logging" has changed, updated and committed on Cisco DNA Center
Template "snmp_ntp" has changed, updated and committed on Cisco DNA Center

INFO:root: End of Application "dnacentr_git_hub_sync.py" Run: 2025-01-22 16:01:05
[Pipeline]
```

Welcome to Catalyst Center!

Explore

### Assurance Summary

**Health**  ⓘ   
Healthy as of Feb 5, 2025 1:22 PM

<b>54%</b> Network Devices	<b>--%</b> Wireless Clients	<b>89%</b> Wired Clients
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[View Details](#)

**Critical Issues**  
Last 24 Hours

<b>6</b> P1	<b>0</b> P2
----------------	----------------

[View Details](#)

**Trends and Insights**  
Last 30 Days

<b>0</b> AP Performance Advisories	<b>0</b> Trend Deviations
---------------------------------------	------------------------------

[View Details](#)

### Network Snapshot

**Sites**  
As of Feb 5, 2025 1:22 PM

**16**

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NTP Servers : 1

[Add Sites](#)

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**13**

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Unprovisioned: 1  
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[Find New Devices](#)

**Application QoS Policies**  
As of Feb 5, 2025 1:22 PM

**0**

Successful Deploys: 0  
Errored Deploys: 0  
Stale Policies: 0

[Add New Policy](#)

- Webex Notifications

# GenAI

# AI, ML, LLM, Function Calling, GenAI, RAG, ... ?

- **Artificial Intelligence (AI)** – use of data and algorithms to allow systems to perform tasks similar with human intelligence
- **Machine Learning (ML)** – AI subset, focused on performing steps without being explicitly programmed. Learn from data patterns and insights to create recommendations
- **Large Language Model (LLM)** – neural network model designed to understand and generate human language
- **Function calling** – Use LLM models to interface with external platforms (usually with API calls), to identify and perform tasks or retrieve data
- **Generative AI (GenAI)** – Use patterns in existing dataset to create new content. This content could be text, numbers or multimedia
- **Retrieval-Augmented Generation (RAG)** – Retrieves matches in provided dataset and uses NLPs to create high-confidence content

# Large Language Model (LLM) – Do I need one?

## LLMs:

- GPT (OpenAI)
- Gemini (Google)
- Llama 3 (Meta)
- Ollama (framework)
- Cohere
- ...

Consider cost and data privacy

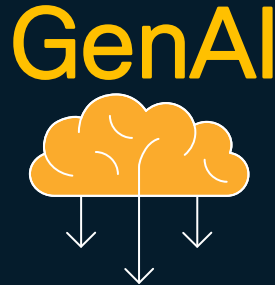
- Large Language Model is an AI Model designed to understand and generate human language
- Will answer queries, using natural language, based on the similarity search results
- Trained on massive data sets (billions of text chunks)
- Understand context and are **general-purpose**
- Provide other features, like function calling
- Support code development of network automation tasks

Troubleshooting Open-source GenAI ChatBot covered in session:  
DEVNET-3000

# Why AI Code Generation for Catalyst Center



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AI may be able to:

- Suggest recommendations and search documentation
- Accelerate code development for your IaC Catalyst Center workflows
- Multi programming language support
- Know or understand available APIs, order of operations, and able to use Swagger files

*Always verify the recommended code, check the order of operations and test the recommendations before using them.*

# Python Code Generation

ChatGPT 4o ▾

Can you write a Python code to create a function that deploys a CLI template to a device using Catalyst Center REST APIs?



Here is an example Python function using `dnacentersdk` to deploy a CLI template to a device using Cisco Catalyst Center (DNA Center) REST APIs:

## Steps the function performs:

1. **Authenticate with Catalyst Center** using `dnacentersdk`.
2. **Find the target device** by its IP or device ID.
3. **Find the CLI template** by its name or ID.
4. **Deploy the CLI template** to the target device using the API call.

Here's the code that does this:

- The ask is to write Python code to deploy templates to devices
- ChatGPT recommendation is using the “dnacentersdk” library
- The suggested code uses the Catalyst Center order of operations, and the APIs required

# Python Code Generation (continued)

Here's the code that does this:

```
python
from dnacentersdk import *
import time

def deploy_cli_template(
    """
    Deploy a CLI template to a device.

    :param api: Authentication API
    :param device_ip: Device IP address
    :param template_name: Template name
    :param params: Dictionary of parameters
    :return: Status of deployment
    """
    # Step 1: Get the device list
    devices = api.device_programmer.get_device_list(device_ip)
    if not devices['result']:
        raise Exception("Device not found")

    device_id = devices['result'][0]['deviceId']
    print(f"Found device ID: {device_id}")
```

```
    # Step 2: Get the templates
    templates = api.template_programmer.get_templates_available()
    template = next((t for t in templates if t['name'] == template_name), None)

    if not template:
        raise Exception("Template not found")

    template_id = template['templateId']
    print(f"Found template ID: {template_id}")

    # Step 3: Deploy the template
    deployment_data = {
        "targetInfo": [
            {
                "id": device_id,
                "type": "device",
                "params": {
                    "interfaceName": template['interfaceName'],
                    "description": template['description']
                }
            }
        ],
        "templateId": template_id
    }
```

```
    # Step 4: Check the deployment status until it completes
    status = "IN_PROGRESS"
    while status == "IN_PROGRESS":
        deployment_status = api.template_programmer.get_template_deployment_status(deployment_id)
        status = deployment_status['status']
        print(f"Deployment status: {status}")
        time.sleep(5)

    return status

# Example usage:
# Define API credentials
api = DNACenterAPI(hostname, username, password)

# Call the function
device_ip = "10.10.10.10"
template_name = "BasicConfig"
params = {
    "interfaceName": "GigabitEthernet0/24",
    "description": "Basic configuration"
}

status = deploy_cli_template(api, device_ip, template_name, params)
print(f"Deployment completed with status: {status}")

deployment_response = api.template_programmer.deploy_template(deployment_data)
deployment_id = deployment_response['deploymentId']
print(f"Deployment started with ID: {deployment_id}")
```

## Key Points:

- **Device Lookup:** It searches for the device using the `get_device_list` API based on the provided IP address.
- **Template Lookup:** It retrieves all templates available using `gets_the_templates_available` and searches for the one by name.
- **Deployment:** The template is deployed to the specified device using the `deploy_template` API.
- **Polling Status:** The function polls the deployment status until it completes or fails.

Ensure the `dnacentersdk` is installed, and the API credentials are correctly set up. This function can be extended with error handling for production use.

Let me know if you need further customization!

ChatGPT knows the order of operations: getting device Id, template Id, the payload if params are required when deploying the template, and polling for status (async API)



Project DEVNET-3419 ~/Gabi\_ALL/

- DEVNET-3419
- .venv
- deploy\_templates\_ai\_ge
- deploy\_templates\_ansib
- requirements.txt
- vars.yml
- External Libraries
- Scratches and Consoles

```
requirements.txt
deploy_templates_ai_generated.py x

1 from dnacentersdk import DNACenterAPI
2 import time
3
4
5 def deploy_cli_template(api, device_ip, template_name, params={}):
6     """
7     Deploy a CLI template to a device using Catalyst Center.
8     :param api: Authenticated DNACenterAPI object.
9     :param device_ip: IP address of the device where the template will be deployed.
10    :param template_name: Name of the CLI template to deploy.
11    :param params: Dictionary of parameters required for the template (if any).
12    :return: Status of the deployment.
13    """
14
15    # Step 1: Get the device by IP address
16    devices = api.devices.get_device_list(management_ip_address=device_ip)
17    if not devices['response']:
18        raise Exception(f"Device with IP {device_ip} not found.")
19
20    device_id = devices['response'][0]['id']
21    print(f"Found device with ID: {device_id}")
22
23    # Step 2: Get the CLI template by name
24    templates = api.configuration_templates.gets_the_templates_available(project_id=None)
25    template = next((tpl for tpl in templates if tpl['name'] == template_name), None)
26
27    if not template:
28        raise Exception(f"Template '{template_name}' not found.")
29
30    template_id = template['templateId']
31    print(f"Found template with ID: {template_id}")
32
33    # Step 3: Deploy the CLI template to the device
34    deployment_data = {
```

1 8 1

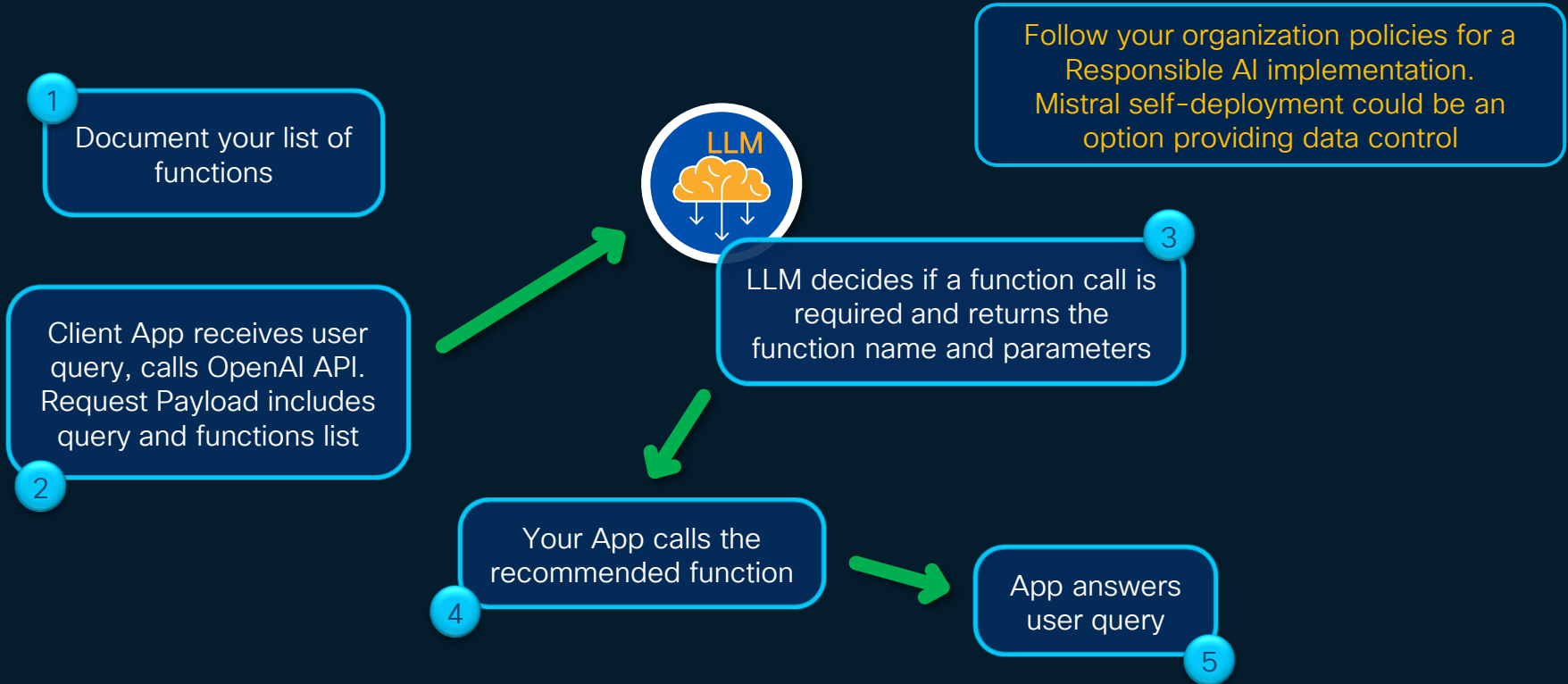
80:1 LF UTF-8 4 spaces Python 3.12 (DEVNET-3419)

# LLM Function Calling

- Connects Large Language Models to other platforms to:
  - Retrieve data with API calls
  - Perform tasks or trigger processes
  - Create new workflows and AI assistants
- The LLM does not call the function, it identifies the function, and it returns:
  - function name
  - required parameters

```
functions = [  
  {  
    "name": "provision_network_device_jenkins",  
    "description": "Provision a device to a site. Call this whenever you need to provision a device, "  
    "or network device, to a location, for example: an user asks "  
    "'Provision a network device to a site'",  
    "parameters": {  
      "type": "object",  
      "properties": {  
        "hostname": {  
          "type": "string",  
          "description": "This is the device name or hostname, or the network device name or hostname"  
        },  
        "siteHierarchy": {  
          "type": "string",  
          "description": "The site hierarchy, or site name, where the device will be provisioned"  
        }  
      },  
      "required": ["hostname", "siteHierarchy"],  
      "additionalProperties": False  
    }  
  },  
]
```

# OpenAI Function Calling Workflow



# NetOps AI Assistant

```
I am a network assistant running network automation workflows. What network configuration task are you interested in? Can you start the software upgrade for the device PDX-ACCESS?

Workflow name: software_distribution
Params identified:
{"hostname": "PDX-ACCESS"}

Do you want to continue or not (y/n)? n

I am a network assistant running network automation workflows. What network configuration task are you interested in? Provision this switch BEAV-CN at this location Global/OR/BEAV/Floor-2

Workflow name: provision_network_device_jenkins
Params identified:
{"hostname": "BEAV-CN", "siteHierarchy": "Global/OR/BEAV/Floor-2"}

Do you want to continue or not (y/n)? y

Network Assistant: Device provisioning started, see status here: https://10.93.141.47:8443/job/Provision%20Device/
```



API call to trigger pipeline run



Pull source-code and intent configs

Pipeline build will configure Catalyst Center and network devices

Pipelines may execute Python, Ansible or Terraform workflows



Multi controllers, lab and production



Single source of truth, version controlled, data validation, compliant

- Multi-channel support
- Webex Bots
- Web Portal
- ITSM – change management
- Voice interface



Global

- All
- Routers**
- Switches
- Wireless Controllers
- Access Points
- Sensors

DEVICE WORK ITEMS

- Unreachable
- Unassigned
- Untagged
- Failed Provision
- Non Compliant
- Outdated Software Image
- No Golden Image
- Failed Image Prechecks
- Under Maintenance
- Security Advisories

Devices (4) Focus: Select

Take a tour Export

Click here to apply basic or advanced filters or view recently applied filters

0 Selected Tag Add Device Actions

As of: Feb 5, 2025 7:17 PM

<input type="checkbox"/>	Tags	Device Name	IP Address	Device Family	Site	Provisioning Status	Serial Number	Device Role
<input type="checkbox"/>		NYC-RO	10.93.141.25	Routers	.../NYC/Floor-8	Success See Details	99YZN3AUH3U	BORDER ROUTER
<input type="checkbox"/>		PDX-RN	10.93.141.22	Routers	Assign	Not Provisioned	9XIF5ZTLXRB	BORDER ROUTER
<input type="checkbox"/>		PDX-RO	10.93.141.23	Routers	.../PDX/Floor-2	Success See Details	92ML86IWCBN	BORDER ROUTER
<input type="checkbox"/>		SP	10.93.141.24	Routers	.../ENGL/Floor-5	Success See Details Out of Sync	999R1FFKGSU	BORDER ROUTER



# Embeddings (Vector Representations)

- Embeddings – encoding data, representing it as a multi-dimensional vector, mapping text to numbers
- They are used to encode both the data and query
- Select the model that is the best fit for your application

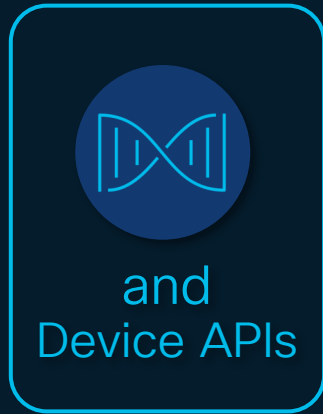
```
interface Loopback0  
ip address 10.93.141.20 255.255.255.255
```



```
[-2.18464285e-02 4.79203351e-02 -5.23540303e-02 -2.06714533e-02  
1.23669589e-02 2.14911737e-02 6.28002435e-02 3.91882733e-02  
-2.81998049e-02 -8.86559635e-02 7.28104562e-02 3.62688117e-02  
9.80289094e-03 -8.77185445e-03 -3.96535993e-02 3.19208466e-02  
-2.86364499e-02 -1.56388357e-02 -8.34894273e-03 -4.92241867e-02  
2.87111066e-02 7.39215463e-02 1.77850178e-03 -4.21317369e-02  
...]
```

Creating embeddings may be costly and there are data privacy requirements.  
Please follow your organization policies for a Responsible AI implementation.

# Why Retrieval-Augmented Generation GenAI?



+

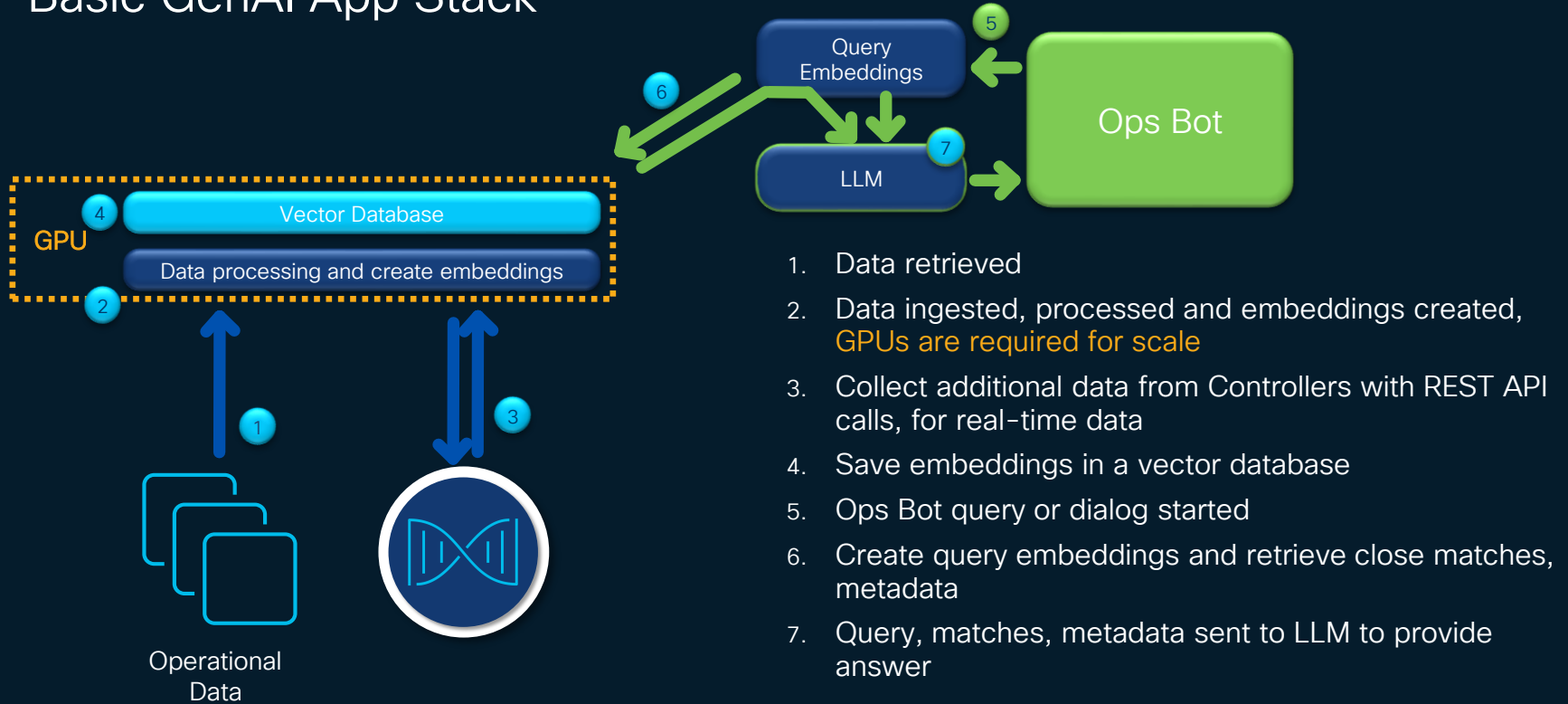
Retrieval-Augmented  
Generation

GenAI LLM

- Config and operational data is collected from Catalyst Center or Device APIs
- **Your data is the dataset (RAG)**
- End-to-end workflow automation: data collection, data transform, vector database updates, query and answer
- Benefit from massive training of the existing LLM models
- **Follow your Corporate policies for Responsible AI, data privacy, and be aware of cost**

# Retrieval-Augmented Generation

## Basic GenAI App Stack



Note: Basic app workflow, other apps and functions are recommended for scale and production

# ChatGPT and Llama3 Answers

## Query

What are the routing protocols configured?

Are there any LISP routes in the routing table?

## ChatGPT 3.5

The routing protocols configured on the device are EIGRP (AS 123), LISP, and BGP (AS 65100).

Based on the provided outputs, there are no LISP routes listed in the routing table.

## Llama3

1. EIGRP (Enhanced Interior Gateway Routing Protocol) with AS number 123.
2. LISP (Locator/Identifier Separation Protocol).
3. BGP (Border Gateway Protocol) with autonomous system number 65100.

Based on the `show ip route` output, I don't see any LISP-specific routes in the routing table. The routing table appears to be primarily populated with EIGRP and BGP routes, as well as some directly connected networks.

If you'd like to verify if there are any LISP-related routes present in the routing table, you can try running a command like `show ip lisp map-cache` or `show ip lisp forwarding-table`.

...

# ChatGPT and Llama3 Answers

## Query

What is the next hop for the route to 0.0.0.0?

What are the CDP neighbors?

## ChatGPT 3.5

The next hop for the route to 0.0.0.0 is 10.93.140.1.

The CDP neighbors are:

1. Device with the ID "LO-BN" with IP address 10.93.140.7, a Cisco C9300-24U platform on interface TenGigabitEthernet1/0/23, connected to GigabitEthernet1/0/23.
2. Device with the ID "PDX-M" with IP address 10.93.141.1, a Cisco WS-C3850-48U platform on interface GigabitEthernet0/0, connected to GigabitEthernet1/0/4.
3. Device with the ID "PDX-M" with IP address 10.93.141.33, a Cisco WS-C3850-48U platform on interface TenGigabitEthernet1/0/24, connected to GigabitEthernet1/0/24.

## Llama3

According to the output of `show ip route`, the next hop for the route to 0.0.0.0 is `10.93.140.1`.

Based on the provided output, the CDP neighbors are:

1. Device ID: LO-BN
  - \* Interface: Ten 1/0/23
  - \* Platform: Cisco C9300-24U
  - \* IP address: 10.93.140.7
2. Device ID: PDX-M (appears twice)
  - \* Interface: Gig 0/0 and Ten 1/0/24
  - \* Platform: Cisco WS-C3850-48U
  - \* IP addresses: 10.93.141.1 and 10.93.141.33

Note that CDP neighbors are devices that have established a CDP (Cisco Discovery Protocol) adjacency with the device running the command, which is LO-CN in this case.

catalyst\_center\_rag\_ops main

embeddings\_toolkit.py query\_chromadb\_gpt4o.py

Run chroma\_db\_server query\_chromadb\_gpt4o

```
/Users/gzapodea/Gabi_All/PythonCode/catalyst_center_rag_ops/.venv/bin/python  
/Users/gzapodea/Gabi_All/PythonCode/catalyst_center_rag_ops/Query/query_chromadb_gpt4o.py
```

```
I am a NetOps bot. How may I help you? What are the details of the EIGRP routing protocol and the EIGRP routes from the routing table?
```



# LLMs Language Support

How may I help you? *What are the routing protocols configured? Answer in Romanian*  
Protocoloalele de rutare configurate sunt:

- \*\*EIGRP\*\*:**
  - AS: 123
  - ID Router: 10.93.141.20
  - Active: Da
- \*\*LISP\*\*:**
  - Maximum caLe: 32
- \*\*BGP\*\*:**
  - AS: 65100
  - Route Reflector pentru familia de adrese VPNv4 Unicast, 1 client
  - Vecin: 10.93.141.28

Ask question in English,  
answer in another language,  
(dataset is in English)

How may I help you? *Care sint rutele EIGRP?*  
Rutele EIGRP sunt notate cu codul "D" in tabela de rutare. In urma iesirii comenzii  
`show ip route`, rutele EIGRP sunt urmatoarele:

- 10.93.131.0/30 [90/3328] via 10.93.140.1, 16:24:00, Vlan140
- 10.93.131.4/30 [90/3584] via 10.93.140.1, 16:23:53, Vlan140
- 10.93.131.8/29 [90/3840] via 10.93.140.1, 16:23:53, Vlan140
- 10.93.141.0/28 [90/3072] via 10.93.140.1, 1w3d, Vlan140
- 10.93.141.17/32 [90/130816] via 10.93.140.1, 1w3d, Vlan140
- 10.93.141.18/32 [90/130816] via 10.93.140.2, 1w3d, Vlan140
- 10.93.141.21/32 [90/130816] via 10.93.140.6, 1w3d, Vlan140
- 10.93.141.22/32 [90/131072] via 10.93.140.1, 1w3d, Vlan140
- 10.93.141.25/32 [90/131584] via 10.93.140.1, 16:23:53, Vlan140
- 10.93.141.26/32 [90/131840] via 10.93.140.1, 16:23:53, Vlan140
- 10.93.141.28/32 [90/130816] via 10.93.140.7, 1w3d, Vlan140
- 10.93.141.32/27 [90/3072] via 10.93.140.1, 1w3d, Vlan140
- 10.93.141.64/29 [90/3072] via 10.93.140.1, 1w3d, Vlan140

Ask question in another  
language, answer in another  
language, (dataset is in English)

# Catalyst Center API Journey



Cisco API platform launch



Python SDK



Ansible collection



Ansible RedHat certified  
Terraform provider  
Jenkins open-source



Ansible community certification  
Intent Ansible modules introduced



Python SDK, Ansible, Terraform  
Support for Catalyst Center 2.3.5.3



AI enabled use cases  
Support for Catalyst Center 2.3.7.6

2018

2019

2020

2021

2022

2023

2024/2025

## API adoption



2 billion API calls per year, 45% customers



850+ APIs available (300+ new APIs in 2.3.7.6)



269 events and 65 reports

## DevOps resources



Python SDK - 16,000 downloads/month



Ansible collection - 84,000 downloads

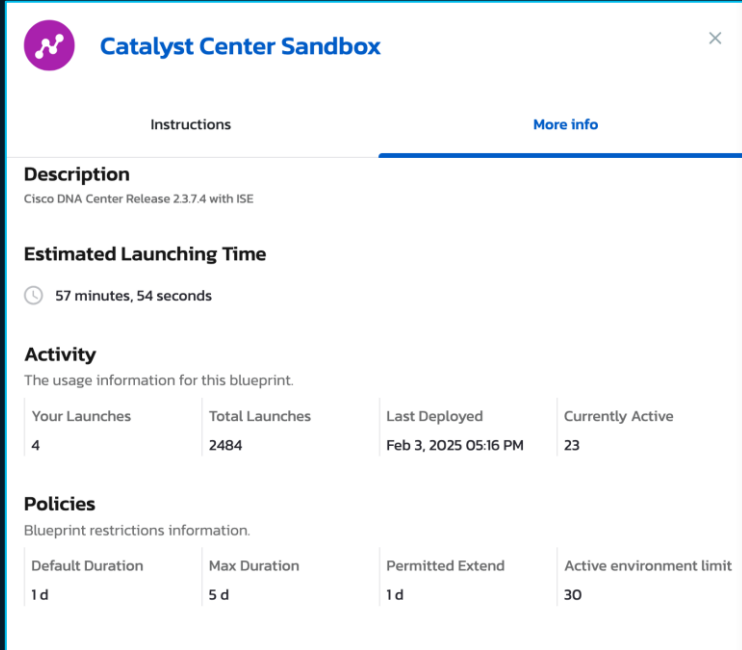


Terraform provider - 47,000 downloads

30 Catalyst Center DevNet sandboxes

[https://devnetsandbox.cisco.com/DevNet/catalog/catalyst-center-sandbox\\_catalyst-center](https://devnetsandbox.cisco.com/DevNet/catalog/catalyst-center-sandbox_catalyst-center)

# DevNet Catalyst Center Sandboxes



**Catalyst Center Sandbox**

Instructions [More info](#)

**Description**  
Cisco DNA Center Release 2.3.7.4 with ISE

**Estimated Launching Time**  
57 minutes, 54 seconds

**Activity**  
The usage information for this blueprint.

Your Launches	Total Launches	Last Deployed	Currently Active
4	2484	Feb 3, 2025 05:16 PM	23

**Policies**  
Blueprint restrictions information.


Default Duration	Max Duration	Permitted Extend	Active environment limit
1 d	5 d	1 d	30

- 30 Catalyst Center DevNet sandboxes
- Include virtual Catalyst Center 2.3.7.4, ISE, CML, and 4 Cat9kV switches
- Unrestricted access to all Catalyst Center APIs
- Build and test your IaC workflows
- Develop your custom integrations
- **Free**

[https://devnetsandbox.cisco.com/DevNet/catalog/catalyst-center-sandbox\\_catalyst-center](https://devnetsandbox.cisco.com/DevNet/catalog/catalyst-center-sandbox_catalyst-center)

# Cisco Developed; TAC/Engineering Supported

Namespaces > cisco > catalystcenter > Content

 **cisco.catalystcenter**

Version  Last updated 23 days ago 📄 160 Downloads

Install Documentation Contents Import log Dependencies [Docs site](#) [Website](#) [Issue tracker](#) [Repo](#)

✕

Showing: All (37) Playbook (13) Module (23) Module\_utils (0) Action (0) Doc\_fragments (1)

Name	Type	Description
<a href="#">sda_fabric_sites_zones_workflow_manager</a>	module	Manage fabric site(s)/zone(s) and update the authentication profile template in Cisco Catalyst Center
<a href="#">pnp_workflow_manager</a>	module	Resource module for Site and PnP related functions
<a href="#">swim_workflow_manager</a>	module	Module to manage SWIM (Software Image Management) operations in Cisco Catalyst Center
<a href="#">network_settings_workflow_manager</a>	module	Resource module for IP Address pools and network functions
<a href="#">sda_fabric_virtual_networks_workflow_manager</a>	module	Configure fabric VLANs, Virtual Networks, and Anycast Gateways in Cisco Catalyst Center.
<a href="#">site_workflow_manager</a>	module	Resource module for Site operations
<a href="#">sda_fabric_devices_workflow_manager</a>	module	Manage SDA fabric devices in Cisco Catalyst Center.
<a href="#">device_credential_workflow_manager</a>	module	Resource module for Global Device Credentials and Assigning Credentials to sites.
<a href="#">discovery_workflow_manager</a>	module	A resource module for handling device discovery tasks.

- Support starting with Cisco Catalyst Center version 2.3.7.6
- Identified with the module name including “workflow\_manager”
- Ansible playbooks for common operations for sites, PnP, SWIM, compliance, templates, network settings, ...

# Cisco EN Programmability GitHub Org

Overview Repositories 59 Projects Packages Teams 7 People 28 Insights Settings

**Cisco EN Programmability**  
Cisco ENB Programmability Technical Marketing Engineering sample code for Cisco DNA Center REST APIs and Integrations  
75 followers cisco-en-programmability@cisco.c...

**Pinned** Order updated. Customize pins

- catalystcentersdk** (Public) Python
- terraform-provider-catalystcenter** (Public) Go 1  
Terraform Provider for Catalyst Center
- splunk-apps** (Public) Python 3 5  
Splunk Add-On App for Cisco DNA Center
- catalystwan-sdk** (Public) Python 2  
Python SDK for Cisco Catalyst SDWAN
- dnacenter\_day\_n** (Public) Python 6 5  
Applications that will automate Day N operations using Cisco DNA Center APIs and these libraries: Cisco DNA Center Python SDK, Cisco DNA Center Ansible Collection, Cisco DNA Center Terraform Provider
- dnacenter\_webhook\_receiver** (Public) Python 14 12  
Sample code for a Cisco DNA Center Webhook Receiver

Repositories

Find a repository... Type Language Sort New

<https://github.com/cisco-en-programmability>

- Cisco EN DevOps Resources for Catalyst Center, Catalyst SD-WAN
- DevOps Catalyst Center use cases
- Python SDK (support up to 2.3.7.6)
- Ansible modules (support up to 2.3.7.6)
- Go SDK and Terraform provider (support up to 2.3.7.6)
- Splunk Integration Apps
- GenAI use case
- SDA-as-Code
- Report Operations
- Day N use cases – Python SDK, Ansible, Terraform
- Jenkins open-source Integration and pipelines
- GitHub/GitLab open-source Integrations
- Compliance
- Custom Integration App (Jira Service Desk)
- Webhook Receiver
- Other sample code

# Fill Out Your Session Surveys



Participants who fill out a minimum of 4 session surveys and the overall event survey will get a unique Cisco Live t-shirt.

(from 11:30 on Thursday, while supplies last)



All surveys can be taken in the Cisco Events mobile app or by logging in to the Session Catalog and clicking the 'Participant Dashboard'



Content Catalog

# Catalyst Center Platform Sessions

Session	Title	Room	Date
TECOPS-2158	Cisco Catalyst Center Out-of-the-Box and Custom Integrations	Lab 9 - G107	February 09 1:30 PM
DEVNET-3000	Open-Source GenAI Bot for Catalyst Center	DevNet Theater 1	February 11 3:00 PM
DEVNET-1087	Cisco Catalyst Center Platform: APIs, Event Notifications, Integrations, and DevOps Resources	DevNet Theatre 2	February 12 9:30 AM
IBOOPS-2882	Let's Talk about Cisco Catalyst Center Integrations	Session Room D508	February 12 4:00 PM
BRKOPS-3429	Simplify Network Management using GenAI and Cisco Catalyst Center APIs	Session Room A6	February 13 10:30 AM
DEVNET-3419	Transform your Network Automation Apps with GenAI	DevNet Theater 1	February 12 2:30 PM

# Continue your education

- Visit the Cisco Showcase for related demos
- Book your one-on-one Meet the Engineer meeting
- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs
- Visit the On-Demand Library for more sessions at [ciscolive.com/on-demand](https://ciscolive.com/on-demand). Sessions from this event will be available from March 3.

Contact me at: [gabi@cisco.com](mailto:gabi@cisco.com)



Thank you

CISCO *Live!*

CISCO *Live!*

GO BEYOND

A series of overlapping, rounded, teardrop-shaped abstract forms in various shades of blue, ranging from light to dark, positioned on the right side of the image.