



The bridge to possible

Cisco Catalyst Center Platform:

APIs, Event Notifications, Integrations, and DevOps Resources

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DEVNET-1087

CISCO *Live!*

#CiscoLive



Agenda

- Catalyst Center Platform Overview
- REST APIs
- Event Notifications
- Integrations
- Developer Resources
- Summary

Cisco Webex App

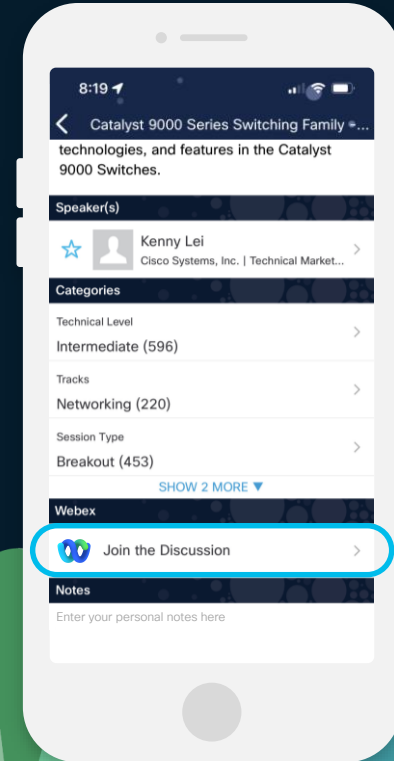
Questions?

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

How

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

Webex spaces will be moderated by the speaker until June 7, 2024.

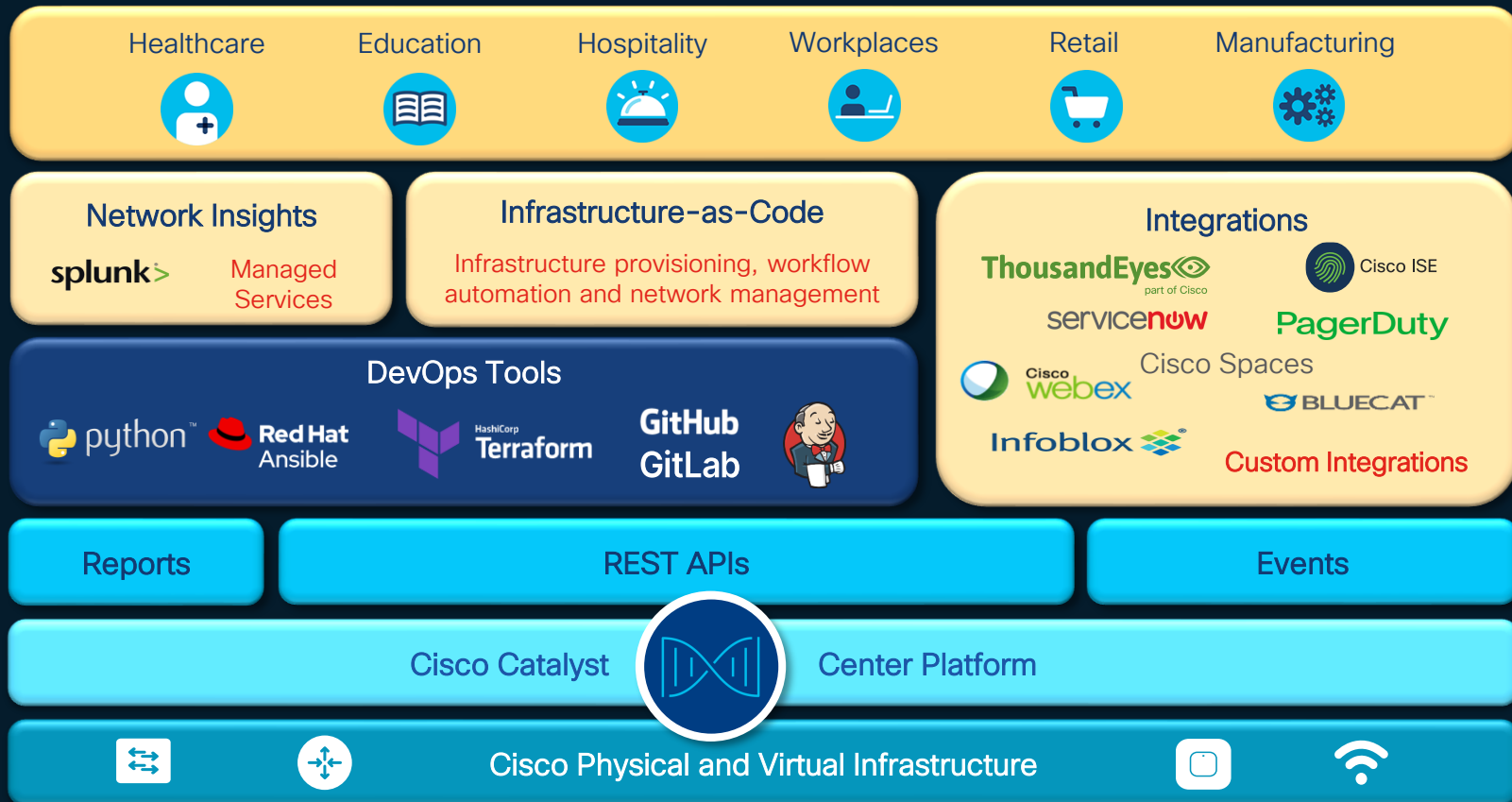




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Cisco Catalyst Center Platform



Catalyst Center Platform

Event Notifications

- Assurance Issues
- AI/ML Insights
- System Health
- Integration Connectivity
- License Management
- Webhooks
- PagerDuty
- Webex
- Syslog
- SNMP

Northbound REST APIs

- Network Inventory
- Network Topology
- Network Design
- Provisioning
- SWIM, PnP
- Path Trace
- Assurance
- SDA
- Templates
- RMA
- Config Archive
- Sensors

IT Ecosystem Integrations

- IT Service Management
- IP Address Management
- Reporting
- Wireless Planning
- Alerting
- Network Insights

Developer Resources

- Sample Code, Videos
- Python SDK, Ansible, Terraform
- Cisco DevNet
 - Sandboxes, Learning Labs
 - Developer Guides
 - Community



Catalyst Center Platform – Overview

Catalyst Center Platform / Overview

Welcome to the Catalyst Center Platform. Programmatically access your network through Intent APIs, integrate with your preferred IT systems to create end-to-end solutions and add support for multi-vendor devices.

Bundles

Bundles are easy to use feature sets for consuming Intent APIs, integrations, events and notifications. View all the available bundles, enable relevant bundles and customize the configuration preferences to consume events as per your application(s) or IT system(s) needs.

Developer Toolkit

Discover APIs to manage your network, configure integration flows and access network data to analyze, export and visualize complex reports.

Runtime Dashboard

Get insights into API usage, view events published to IT systems such as number of API calls, response time(s), events published, bundles activated etc.

Configurations

View and set global or bundle specific settings to manage your integration configurations and modify event specific settings.

Notifications

Find

BUNDLE UPDATE

Catalyst Center Automation events for ITSM (ServiceNow) successfully configured.

Jan 17 2024, 04:13 pm

[View Details](#) | [Dismiss](#)

BUNDLE UPDATE

Basic ITSM (ServiceNow) CMDB synchronization successfully configured.

Jan 17 2024, 04:10 pm

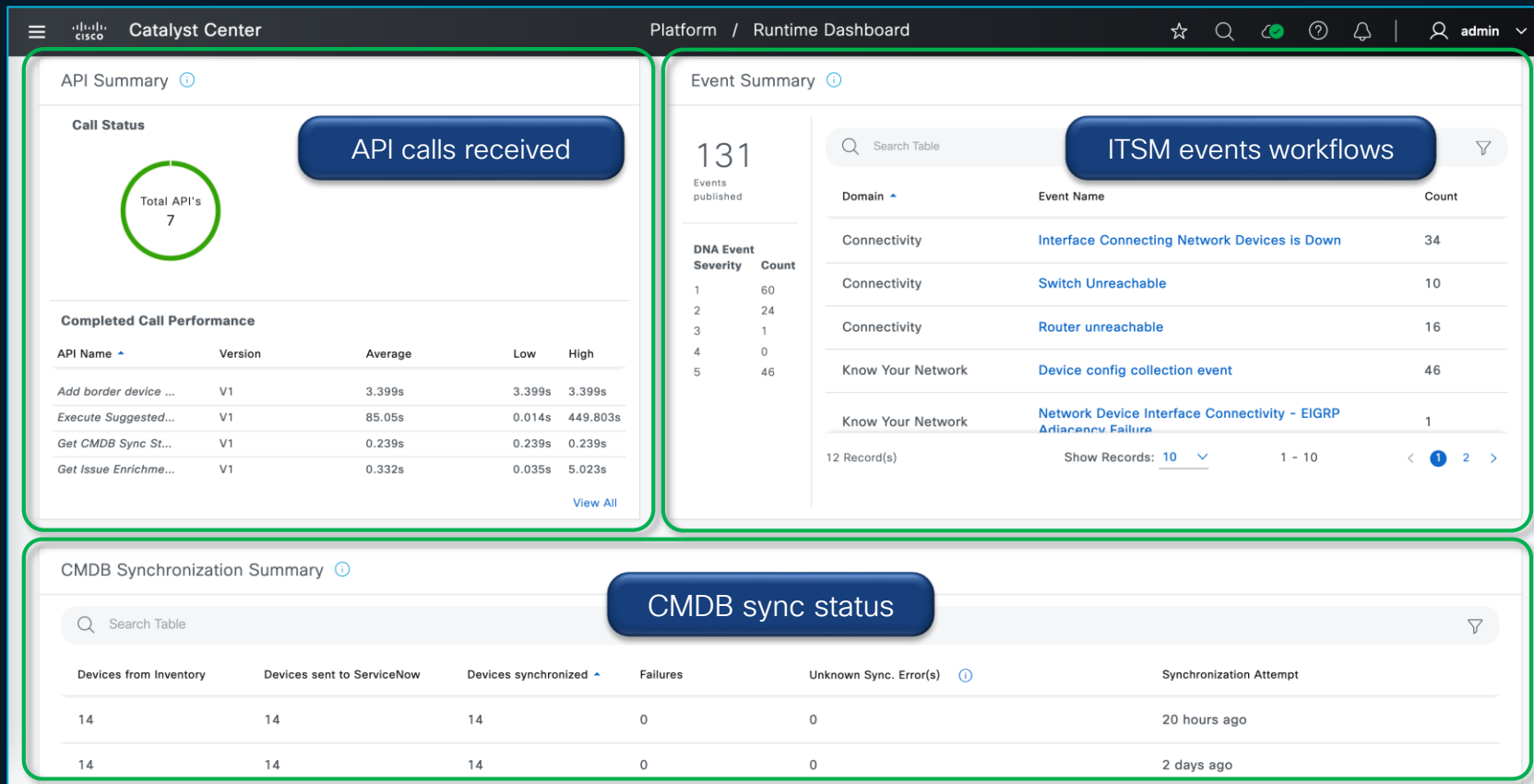
[View Details](#) | [Dismiss](#)

BUNDLE UPDATE

The Basic ITSM (ServiceNow) CMDB synchronization bundle is enabled and ready for configuration.

Jan 17 2024, 04:09 pm

Platform Runtime Dashboard



Catalyst Center 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



Webhooks



ITSM, SIEM,
Notifications, IPAM,
Custom Integrations

- ✓ Declarative – abstracted configuration state
- ✓ Increase compliance, reduce configuration drift
- ✓ Consistent processes and outcomes
- ✓ Rich visibility and assurance data
- ✓ Faster deployment, while reducing cost



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Catalyst Center Platform – Developer Toolkit

Catalyst Center Platform / Developer Toolkit

APIs Integration Flows Event Notifications

Search

Event Management

Integrations >

Know Your Network >

Applications

Clients

Compliance

Devices

EoX

Issues

Security Advisories

Sensors

Sites

Topology

Users

Operational Tasks >

Policy >

Review API docs, configure integration workflows and subscribe to events

GET	Get All User-Defined-Fields	Gets existing global User Defined Fields. If no input is given, it fetches ALL the Global UDFs. Filter/search is supported by UDF Id(s) or UDF name(s) or both.	/network-device/user-defined-field	...
POST	Create User-Defined-Field	Creates a new global User Defined Field, which can be assigned to devices	/network-device/user-defined-field	...
GET	Get Module Info by Id	Returns Module info by 'module id'	/network-device/module/{id}	...
GET	Get Device list	Returns list of network devices based on filter criteria such as management IP address, mac address, hostname, etc. You can use the .* in any value to conduct...	/network-device	...
GET	Get the Details of Physical Components of the Given Device.	Return all types of equipment details like PowerSupply, Fan, Chassis, Backplane, Module, PROCESSOR, Other and SFP for the Given device.	/network-device/\${deviceUuid}/equipment	...
POST	Clear Mac-Address table	Clear mac-address on an individual port. In request body, operation needs to be specified as 'ClearMacAddress'. In the future more possible operations will be...	/interface/\${interfaceUuid}/operation	...

Try
Call an API without writing any code

Try

Try an API Call

Catalyst Center

Get Device list

Try 'Get Device list'

Method: GET Public URL :https://10.93.141.45/dna/intent/api/v1/network-device

PARAMETERS

QUERY PARAMETERS

☐ Select All

☒ hostname ?

☐ LO-CN

☐ managementIpAddress ?

☐ macAddress ?

☐ locationName ?

☐ serialNumber ?

Reset

Run

Response

Headers

Status Code: 200

```
1- {
2-   "response": [
3-     {
4-       "type": "Cisco Catalyst 9300 Switch",
5-       "lastUpdateTime": "1705537690563",
6-       "macAddress": "30:8b:b2:ba:c2:80",
7-       "deviceSupportLevel": "Supported",
8-       "softwareType": "IOS-XE",
9-       "softwareVersion": "17.9.4a",
10-      "serialNumber": "FJC2325T0PH",
11-      "collectionInterval": "Global Default",
12-      "dnsResolvedManagementAddress": "10.93.141.20",
13-      "inventoryStatusDetail": "<status><general code=\\\"SUCCESS\\\"/></status>",
14-      "managementState": "Managed",
15-      "pendingSyncRequestsCount": "0",
16-      "reasonsForDeviceResync": "Periodic",
17-      "reasonsForPendingSyncRequests": "",
18-      "upTime": "84 days, 2:19:13.13",
19-      "bootDateTime": "2023-10-25 22:09:10",
20-      "lastUpdated": "2024-01-18 00:28:10",
21-      "reachabilityStatus": "Reachable",
22-      "series": "Cisco Catalyst 9300 Series Switches",
23-      "snmpContact": "",
24-      "snmpLocation": "",
25-      "roleSource": "MANUAL",
26-      "apManagerInterfaceIp": "",
27-      "collectionStatus": "Managed",
```


Code Preview

The screenshot displays the Cisco Catalyst Center API interface. On the left is a navigation sidebar with categories like APIs, Integration Flows, and various network management tools. The main panel shows the 'Get Device Count' API endpoint. The 'Code Preview' tab is highlighted with a green box. Below the tab, a language selection dropdown is open, with 'Python' selected and also highlighted with a green box. The Python code preview shows a REST client request for the device count API. A blue callout box on the right contains the text 'Code Preview' and 'Generate code in few programming languages'. At the bottom right of the interface are 'Close' and 'Try' buttons.

Get Device Count

GET `https://10.93.141.45/dna/intent/api/v1/network-device/count`

Returns the count of network devices based on the filter criteria by management IP address, mac address, hostname and location name

[Cisco DevNet API Guide](#)

Parameters Features Responses **Code Preview**

Language **Python**

```
1 //
2 //
3 import requests
4
5 # Create a REST client
6 client = requests.Session()
7 client.headers.update({'Content-Type': 'application/json'})
8
9 # Make a GET request to the API
10 response = client.get('https://10.93.141.45/dna/intent/api/v1/network-device/count?hostname=<hostname>&managementIpAddress=<managementIpAddress>&macAddress=<macAddress>&locationName=<locationName>')
11
12 # Print the response
13 print(response.json())
```

Code Preview
Generate code in few programming languages

Close Try

Catalyst Center REST APIs Variants

- Network based feature level stand alone API's
- Consistent API construct across Catalyst Center

Network
API

GET Device List

- Device details
 - Status, device role, and more
- API calls to read state

- Intent driven high-level API abstraction for network operations
- APIs aligned with business constructs

Business
API

- Provisioning of profiles and fabric devices
- APIs calls to trigger complex workflows, usually Async APIs

500+ APIs
Version 2.3.7.5

Sync and Async APIs

Sync API

Get Site V2

GET <https://10.93.141.45/dna/intent/api/v2/site>

API to get site(s) by site-name-hierarchy or siteld or type. List all sites if these parameters are not given

[Cisco DevNet API Guide](#)

Parameters Responses Code Preview

200

The request was successful. The result is contained in the response body.

Schema Sample

```
root (map, required)
  response (array<map>, required)
    parentId (string, optional): Parent site Instance UUID (e.g. b27181bb-211b-40ec-ba5d-46f-305f475de4c5)
    groupTypeList (array<string>, optional): There are different group types like 'RBAC', 'PC site, so list contains 'SITE' only
    groupHierarchy (string, optional): Site hierarchy by instance UUID (e.g. b27181bb-211b-46f-305f475de4c5)
    additionalInfo (array<map>, optional): Site additional info
      nameSpace (string, optional): Site name space. Default value is 'Location'
```

API request with response including the requested data

Async API

Create Site

POST <https://10.93.141.45/dna/intent/api/v1/site>

Creates site with area/building/floor with specified hierarchy.

[Cisco DevNet API Guide](#)

TAGS

NFV

Parameters Features Request Body Responses Policies Code Preview

200

The request was successful. The result is contained in the response body.

Schema Sample

```
root (map, optional)
  executionId (string, optional)
  executionStatusUrl (string, optional)
  message (string, optional)
```

202

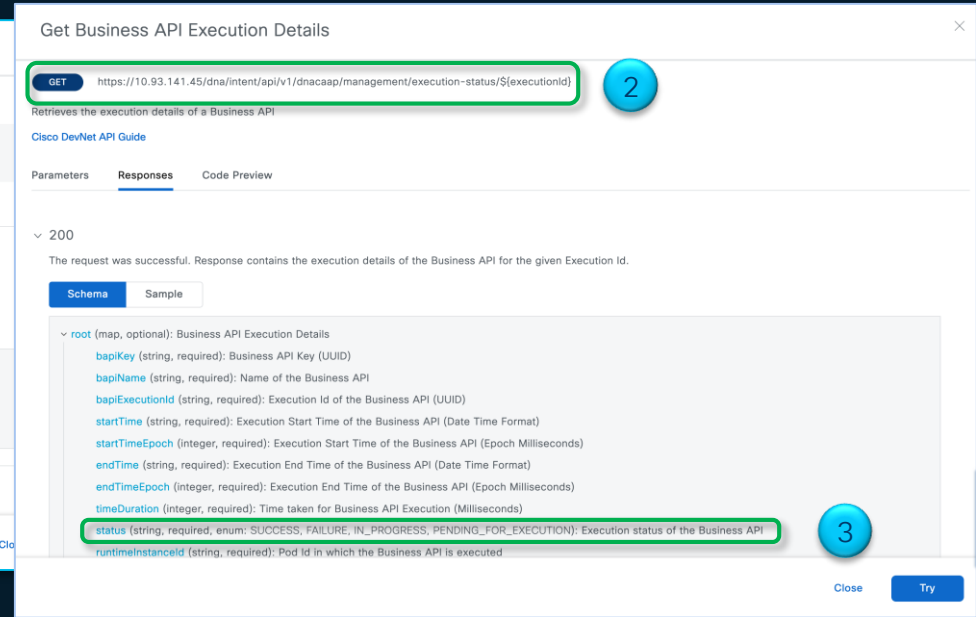
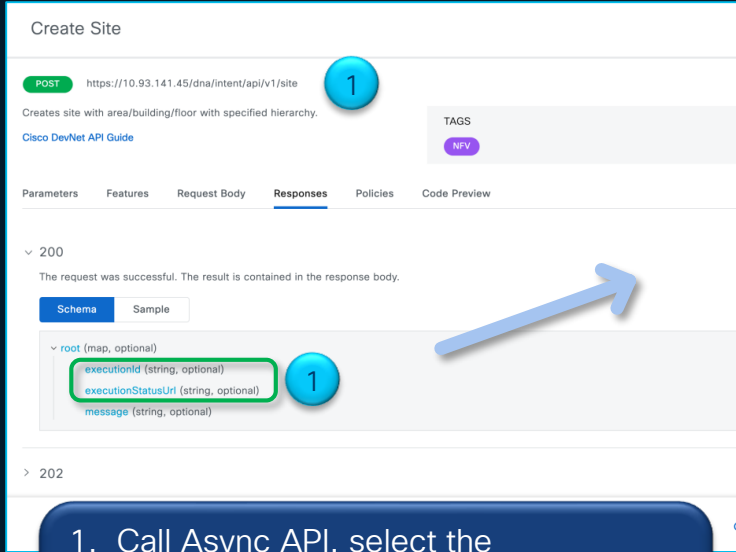
Close Try

The operation in the API request triggers a process being scheduled. The response includes a task or execution unique identifier for the process.

Note:

APIs for which we are unable to *ensure* a response in 60 seconds are implemented as Async

Async APIs Workflow

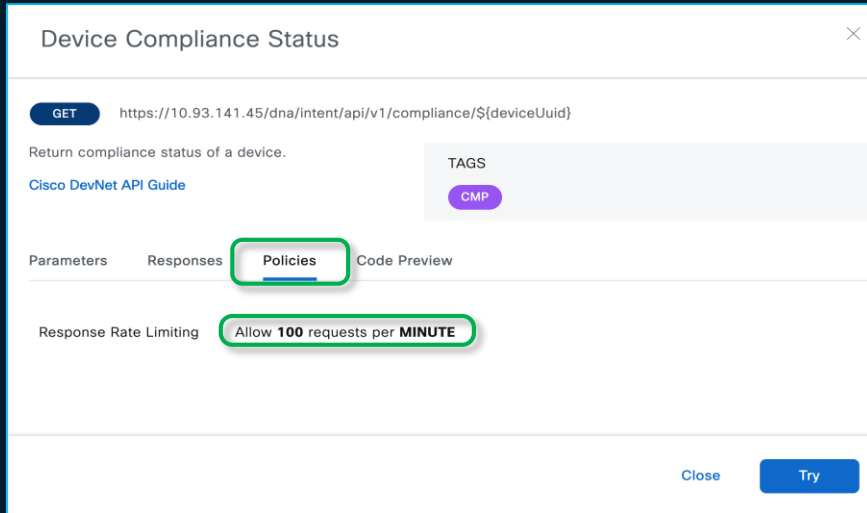


1. Call Async API, select the {executionId} or {executionStatusUri} from response
2. Call the business execution details API using the {executionId}. Repeat this call until execution is completed
3. Select the execution status

Note:

Async APIs execution may complete in few seconds, minutes, or longer.

API Policies – Rate Limit



- Catalyst Center API rate limit is defined at the API level, not at a Platform level
- Default rate limit is 100 API calls/minute
- There are APIs with 20, 50, 100 or 500 calls/minute
- Example:
 - Workflows calling 20 different API endpoints
 - Total number of API calls/minute = 2,000

API Rate Limit Documentation

Issues

GET `https://10.93.141.45/dna/intent/api/v1/issues`

Intent API to get a list of global issues, issues for a specific device, or issue for a specific client device's MAC address.

[Cisco DevNet API Guide](#)

TAGS: Assurance, Know Your Network, API

Parameters Features Responses **Policies** Code Preview

Response Rate Limiting: Allow 20 requests per MINUTE

Close Try

Device Compliance Status

GET `https://10.93.141.45/dna/intent/api/v1/compliance/${deviceUuid}`

Return compliance status of a device.

[Cisco DevNet API Guide](#)

TAGS: CMP

Parameters Responses **Policies** Code Preview

Response Rate Limiting: Allow 100 requests per MINUTE

Get Device Interface Stats Info

POST `https://10.93.141.45/dna/intent/api/v2/networkDevices/${deviceId}/interfaces/query`

This API returns the Interface Stats for the given Device Id. Please refer to the Feature tab for the Request Body usage and the API filtering support.

[Cisco DevNet API Guide](#)

TAGS: InterfaceStats, Stats, interface, Device Interface, Assurance

Parameters Features Request Body Responses **Policies** Code Preview

Response Rate Limiting: Allow 500 requests per MINUTE

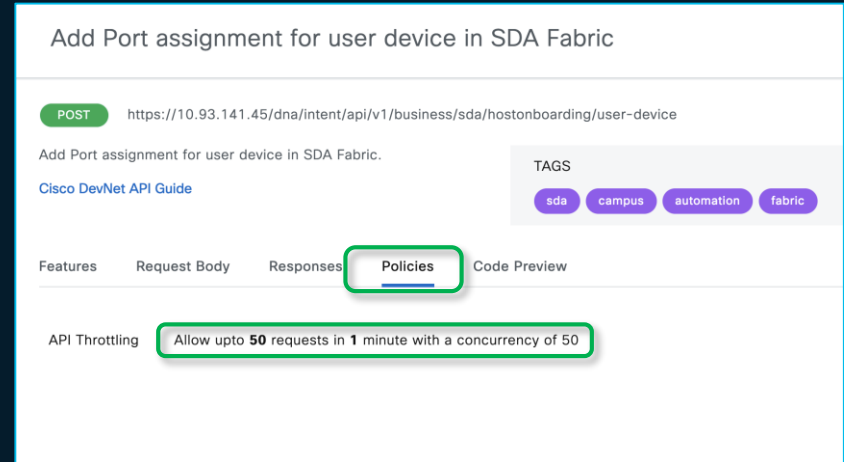
Close Try

Note:

Rate-limited operations may return 429 status code, too many requests, with HTTP headers indicating limit/retry details

API Policies – Concurrency

- Default API concurrency limit is the API rate limit
- There are APIs with a concurrency of 1, 5, 10, 50, 100, 500 calls
- This is very important for Async APIs



The screenshot displays the Cisco DevNet API console interface. At the top, the title is "Add Port assignment for user device in SDA Fabric". Below this, the HTTP method is "POST" and the URL is "https://10.93.141.45/dna/intent/api/v1/business/sda/hostonboarding/user-device". The description is "Add Port assignment for user device in SDA Fabric." and there is a link to the "Cisco DevNet API Guide". On the right, there are tags: "sda", "campus", "automation", and "fabric". Below the tags, there are tabs for "Features", "Request Body", "Responses", "Policies", and "Code Preview". The "Policies" tab is selected and highlighted with a green box. Under the "Policies" tab, there is a section for "API Throttling" which contains a green box with the text: "Allow upto 50 requests in 1 minute with a concurrency of 50".

Parallel Processing

- Ansible default parallel processing is on 5 hosts
- Terraform default is 10 concurrent operations
- Other programming languages or automation platforms may vary
- Results may be unpredictable when grossly exceeding API concurrency and rate limits
- Understand the Catalyst Center resources for various processes

Add border device in SDA Fabric

POST https://10.93.141.45/dna/intent/api/v1/business/sda/border-device

Add border device in SDA Fabric

[Cisco DevNet API Guide](#)

TAGS

sda campus automation fabric

Features Request Body Responses Policies Code Preview

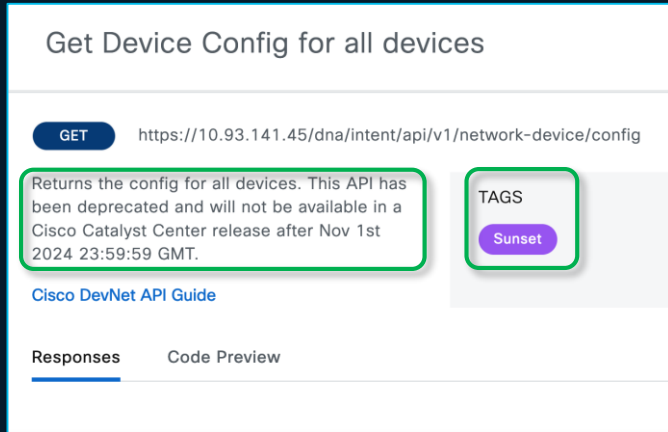
API Throttling Allow upto 50 requests in 1 minute with a concurrency of 1

Close Try

Note:

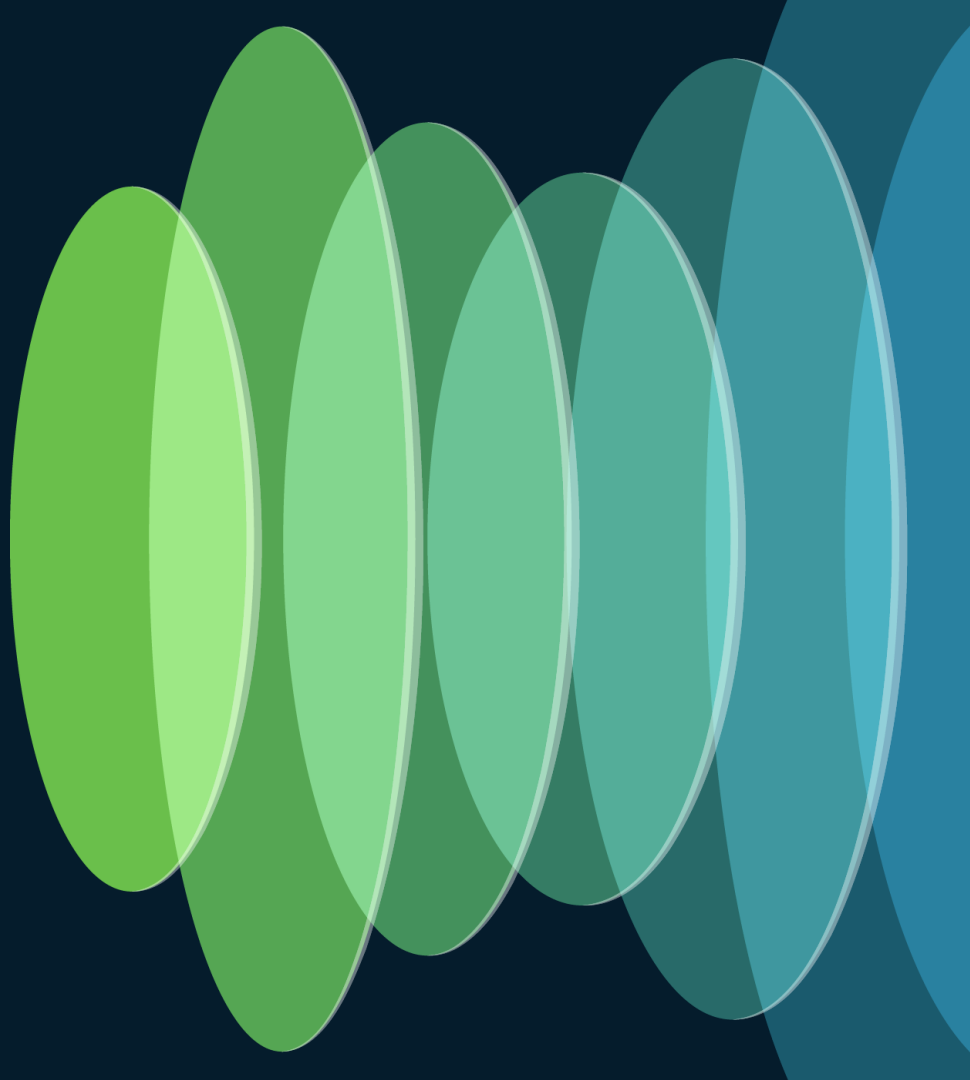
Best practice is to trigger the first operation, check for completion, trigger the next operation, etc.

API Lifecycle Management



- **Beta** – The API has been released in Beta for feedback and will be supported in the future. However, the API design is not frozen and therefore may include changes in the future: request/response payload, URL change, query/header parameters.
- **Supported** – In production and supported. The design is frozen – breaking changes will require a new API version to be released
- **Deprecated** – Still supported but will soon be sunset. A Sunset header will be used to programmatically communicate when it will be sunset. API endpoint may be removed from the system after two major version releases of Catalyst Center, or 1 year whichever comes later

Demo Device Inventory



Camtasia 2023FileEditModifyTextViewExportWindowHelp

Cisco Catalyst CenterCisco Catalyst Center

https://10.93.141.45/dna/provision/devices/inventory/list120%

Cisco Systems, IncAPIsToolsLAB_AccessCiscoLiveMeraki DashboardSFEH-NAS - Synglo...CDETS, DNACaaPSharePointAPIs and Owners - ...JIRA Engineering SJ...Other Bookmarks

≡CiscoCatalyst Center

Provision / Inventory

☆🔍🔗🔍🔔👤admin

📍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 (13)Focus: Default

Take a tourExport

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

0 SelectedTag⊕ Add DeviceActions ⓘ

As of: Jun 2, 2024 9:35 AM

<input type="checkbox"/>	Tags	Device Name ^	IP Address	Device Family	MAC Address ⓘ
<input type="checkbox"/>	🏷️	AP682C.7B4C.0510	10.93.141.69	Unified AP	68:2c:7b:4e:4f:80
<input type="checkbox"/>	🏷️	AP3800i	10.93.141.70	Unified AP	b0:26:80:e3:50:e0
<input type="checkbox"/>	🏷️	C9800-CL	10.93.141.38	Wireless Controller	00:0c:29:7f:8b:5d
<input type="checkbox"/>	🏷️	LO-BN	10.93.141.28	Switches and Hubs (WLC Capable)	90:77:ee:ac:ab:80

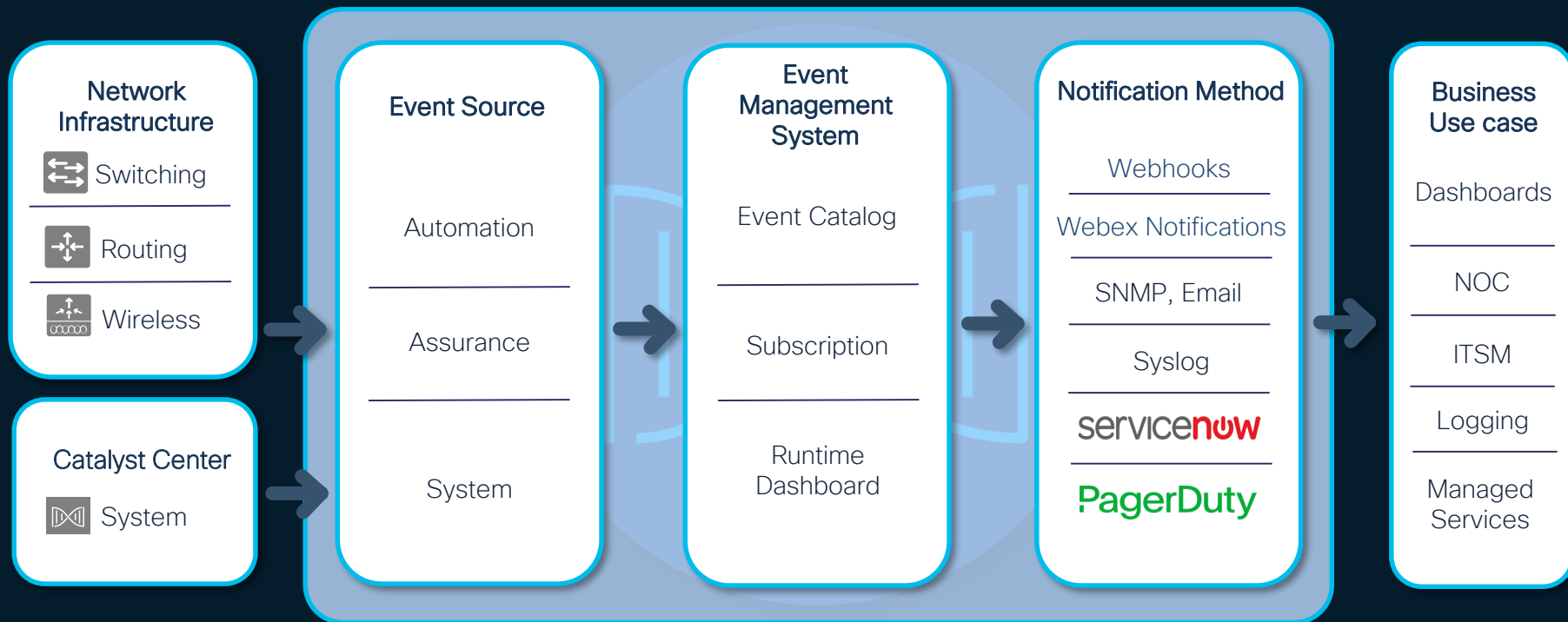
13 Record(s)DEVNET-1087Show Records: 251 - 13



Agenda

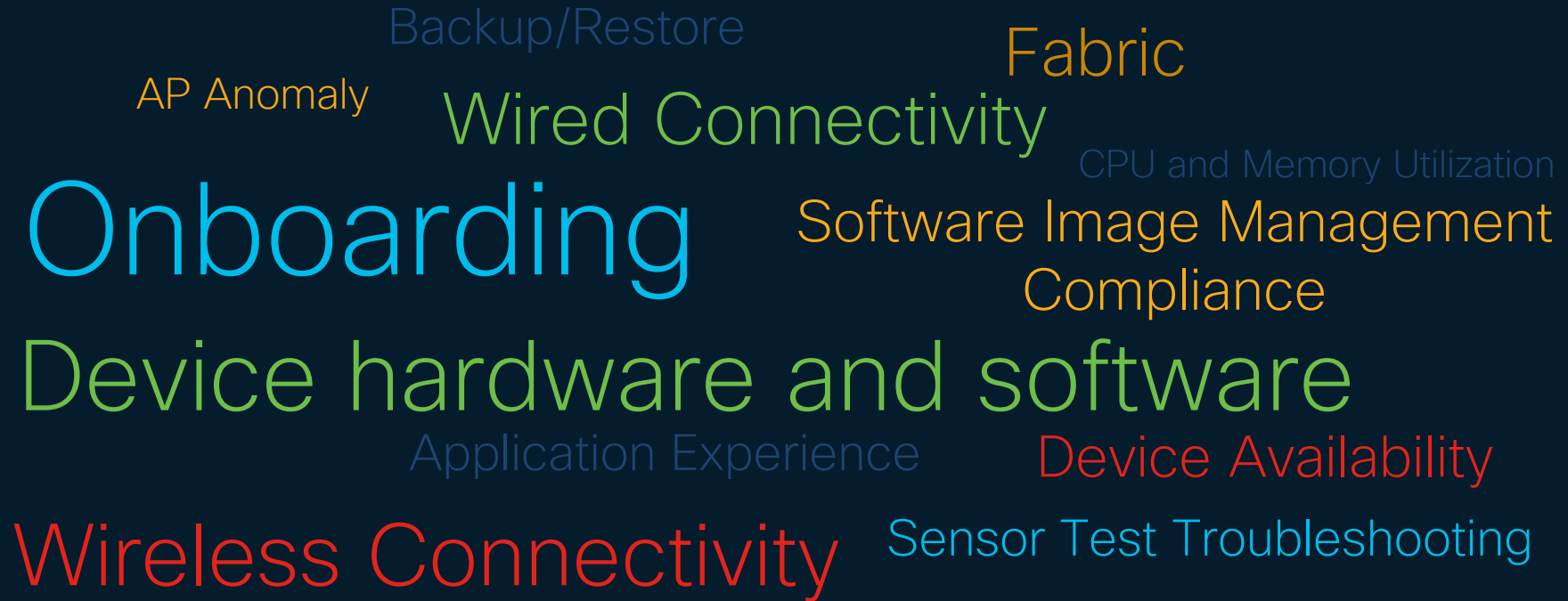
- Catalyst Center Platform Overview
- REST APIs
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Event Notifications Framework



Note: Two steps process, configure destination followed by subscribe to events

250+ Events in Different Areas ...



A word cloud of network management topics. The words are arranged in a circular pattern, with 'Onboarding' and 'Device hardware and software' being the largest. Other prominent words include 'Wireless Connectivity', 'Wired Connectivity', 'Fabric', 'Software Image Management', 'Compliance', 'Sensor Test Troubleshooting', 'Device Availability', 'Application Experience', 'CPU and Memory Utilization', 'Backup/Restore', and 'AP Anomaly'.

Onboarding

Device hardware and software

Wireless Connectivity

Wired Connectivity

Fabric

Software Image Management

Compliance

Sensor Test Troubleshooting

Device Availability

Application Experience

CPU and Memory Utilization

Backup/Restore

AP Anomaly

Webhooks

- Used by servers to publish data, (or event notifications)
- Pre-configured destinations to send data to
- Using POST or PUT methods, typically
- Server sends data when something new
- Push Model

```
{
  "severity": "1", "category": "ALERT", "timestamp": 1701864600273, "Assurance Issue
  Name": "Network Device 10.93.141.24 Is Unreachable From Controller - Notification from
  Cisco DNA Center, PA", "Assurance Issue Details": "This network device SP is unreachable
  from controller. The device role is BORDER ROUTER", "Assurance Issue Status": "resolved",
  "Assurance Issue URL": "https://10.93.141.45/dna/assurance/issueDetails?
  issuelid=c82bf364-ec1b-41a2-9b2b-504da2083fc8"}
{"severity": "1", "category": "ALERT", "timestamp": 1706245321519, "Assurance Issue
  Name": "Interface (Interface description: ) is Down on Network Device - Notification from
  Cisco DNA Center, PA", "Assurance Issue Details": "Interface (Interface description: )
  connecting the following two network devices is down: Local Node: , Peer Node: ",
  "Assurance Issue Status": "", "Assurance Issue URL": "https://10.93.141.45/dna/assurance/
  issueDetails?issuelid=448a421e-1928-45ca-a4da-6c6707a782dc"}
{"severity": "1", "category": "ALERT", "timestamp": 1706245434656, "Assurance Issue
  Name": "Interface (Interface description: ) is Down on Network Device - Notification from
  Cisco DNA Center, PA", "Assurance Issue Details": "Interface (Interface description: )
  connecting the following two network devices is down: Local Node: , Peer Node: ",
  "Assurance Issue Status": "", "Assurance Issue URL": "https://10.93.141.45/dna/assurance/
  issueDetails?issuelid=456a67f0-5743-4808-8989-a85ad3b2db48"}
{"severity": "3", "category": "WARN", "timestamp": 1706245934821, "Assurance Issue
  Name": "Interface (Interface description: ) is Flapping on Network Device - Notification from
  Cisco DNA Center, PA", "Assurance Issue Details": "Switch Interface (Interface description:
  ) is flapping", "Assurance Issue Status": "", "Assurance Issue URL": "https://10.93.141.45/
  dna/assurance/issueDetails?issuelid=b16fd046-4352-46c8-830a-f1b0636f5eb9"}
```

Event Catalog

Catalyst Center

Platform / Developer Toolkit

admin

APIsIntegration FlowsEvent Notifications

Event ID	Name	Type	Category	Severity
NETWORK-DEVICES-2-205	Switch Fan Failure	NETWORK	ERROR	2
NETWORK-DEVICES-2-261	SGACL TCAM table is full.	NETWORK	ERROR	2
NETWORK-DEVICES-2-262	SGT access policy download failed on the device	NETWORK	ERROR	2
NETWORK-DEVICES-2-263	Failure to install an access policy for SGT	NETWORK	ERROR	2
NETWORK-DEVICES-2-264	Access Contract (SGACL) access policy installation failed on the device			
NETWORK-DEVICES-2-265	Uninstall of SGT access policy failed on the device			
NETWORK-DEVICES-2-266	Unable to download SGT access policy from the Policy Server			
NETWORK-DEVICES-3-104	AP Memory High Utilization	NETWORK	WARN	3
NETWORK-DEVICES-3-105	AP Reboot Crash	NETWORK	WARN	3
NETWORK-DEVICES-3-107	AP Flap	NETWORK	WARN	3
NETWORK-DEVICES-3-108	Radio High Utilization (2.4GHz)	NETWORK	WARN	3

Showing 100 of 259 Show More

- Platform → Developer Toolkit → Event Notifications
- Version 2.3.7.4 – 259 events

Create a new Webhook Destination

The screenshot displays the Cisco Catalyst Center interface. On the left is a navigation sidebar with sections like 'Umbrella', 'Authentication and Policy Servers', 'Integrity Verification', 'SD-Access Compatibility Matrix', 'IP Address Manager', 'Cloud Access Login', 'Cisco AI Analytics', 'Stealthwatch', 'Talos IP Reputation', 'Destinations', 'Cisco Spaces/CMX Servers', 'Machine Reasoning Engine', 'Cloud Authentication', 'Cisco Catalyst - Cloud', 'Webex Integration', 'ThousandEyes Integration', 'System Configuration', 'Debugging Logs', 'Visibility and Control of Configur...', and 'Geo Map Settings'. The main area shows 'Settings / External Services' with a 'Destinations' section. It includes a description: 'Configure various types of destinations to deliver event notifications from Catalyst Center Platform'. Below this are tabs for 'Webhook', 'Email', 'Syslog', 'SNMP', and 'ITSM'. The 'Webhook' tab is active, showing a description: 'Configure the REST Endpoint to receive Events notifications from Catalyst Center Platform'. A table lists existing destinations: 'Splunk HEC', 'Troubleshooting Webhook Receiver', and 'PythonAnywhere'. A blue callout box lists the fields to be configured: Name, Description, URL, Trust Certificate - yes/no, Method - POST or PUT, Authentication, and Save. On the right, the 'Edit Webhook' modal is open, showing fields for Name (Troubleshooting Webhook Receiver), Description (Webhooks destination for troubleshooting), URL (https://10.93.141.47:5443/troubleshooting), Trust Certificate (No), Method (POST), Authentication (Basic), and Headers (Authorization: Basic YWRta...).

Fields to be configured:

- Name
- Description
- URL
- Trust Certificate - yes/no
- Method - POST or PUT
- Authentication
- Save

Edit Webhook Fields:

- Name*: Troubleshooting Webhook Receiver
- Description: Webhooks destination for troubleshooting
- URL*: https://10.93.141.47:5443/troubleshooting
- Trust Certificate: ☐ Yes ☒ No
- Method*: POST
- Authentication: ☒ Basic ☐ Token ☐ No Auth
- ☐ Proxy
- Headers: Header Name: Authorization, Header Value: Basic YWRta...

Update

Verify Webhook Receiver

The screenshot displays the Cisco Catalyst Center Developer Toolkit interface. The left sidebar shows the navigation menu with 'Event Notifications' selected. The main area is divided into two sections: 'Event Catalog' and 'Event Details'.

Event Catalog: A table listing various events. A blue callout box highlights the 'Try-it' button in the top right corner of the 'Event Details' section, with the following text:

- Try-it will send an event notification to all destinations subscribed to the event
- The payload is not identical with the real event notification payload

Event Details: The right sidebar shows the details for the event 'Network Device Interface Connectivity - BGP Down'. The 'Try-It Now' button is highlighted with a green border. The details include:

- GENERAL INFORMATION**
 - Description: BGP Connectivity is Down with Neighbor
 - Event ID: NETWORK-NETWORKS-2-272 | Version: 1.0.0
 - Namespace: ASSURANCE | Severity: 2
 - Domain: Know Your Network
 - Subdomain: Issues
 - Category: ERROR
 - Note: To programmatically get more info see here - <https://<ip-address>/dna/platform/app/consumer-portal/developer-toolkit/apis?apild=8684-39bb-4e89-a6e4>
 - Event Link: dna/assurance/issueDetails?issueId=\$instanceId\$
- TAGS**
 - ASSURANCE
 - BGP_Down
- CHANNELS**
 - REST
 - SYSLOG
 - EMAIL
 - WEBEX
 - PAGERDUTY

Verify Webhook Receiver – continued

Notification

Event Name
Network Device Interface Connectivity - BGP Down

Event Id
NETWORK-NETWORKS-2-272

Instance Id
b7c8def3-e5c7-49f1-b862-6aa12b621dcf

Name
Network Device Interface Connectivity - BGP Down

Description
BGP Connectivity is Down with Neighbor

Namespace
ASSURANCE

Context
EXTERNAL

Source
EXTERNAL

Type
NETWORK

Category
ERROR

Severity
2

Domain
Know Your Network

Sub Domain
Issues

Cancel Publish

REST SYSLOG EMAIL WEBEX PAGERDUTY

Network Device Interface Connectivity - BGP Down

Try-It Now

activity is Down with Neighbor

NETWORKS-2-272 Version: 1.0.0

Instance/issueDetails?issueId=\$instanceId\$

wn

- This will publish a test event notification, to all your destinations for the event
- The event notification may be customized

Verify Webhook Receiver – continued

The screenshot displays the Cisco Catalyst Center interface. On the left, the 'Event Catalog' is visible with a search for 'bgp'. The main panel shows a 'Notification' modal for the event 'Network Device Interface Connectivity - BGP Down' (Event ID: NETWORK-NETWORKS-2-272). The notification result is 'SUCCESS' and 'Published'. A table lists various notification channels, with 'Network Troubleshooting Events' highlighted in green. A blue callout box states: 'Test event notification: Failed, Published, Success'. In the bottom right, a terminal window titled 'webhook_receiver' shows logs for a successful webhook call, including headers and a POST payload, which is also highlighted in green.

Notification

Event Name
Network Device Interface Connectivity - BGP Down

Event Id
NETWORK-NETWORKS-2-272

Result

Notification	Channel	Status	Message
Interface Events to Splunk Syslog	SYSLOG	● SUCCESS	Published
Lab_Events_PA	REST		
Lab_Notifications_PagerDuty	PAGERDUTY		
Lab_Notifications_Splunk	REST		
Lab_Notifications_Webex	WEBEX		
Network Troubleshooting Events	REST		

Test event notification:
Failed, Published, **Success**

```
Run webhook_receiver
* Debug mode: on
INFO:werkzeug:WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on https://10.93.161.47:5443
INFO:werkzeug:Press CTRL+C to quit
INFO:werkzeug: * Restarting with stat
https://localhost:5443
WARNING:werkzeug: * Debugger is active!
INFO:werkzeug: * Debugger PIN: 771-682-372
INFO:werkzeug:10.93.161.47 - - [27/May/2024 12:24:21] "GET / HTTP/1.1" 401 -
INFO:werkzeug:10.93.161.47 - - [27/May/2024 12:24:29] "GET / HTTP/1.1" 200 -
INFO:werkzeug:10.93.161.47 - - [27/May/2024 12:24:29] "GET /favicon.ico HTTP/1.1" 404 -
INFO:werkzeug:10.24.68.38 - - [27/May/2024 12:24:45] "GET / HTTP/1.1" 401 -
INFO:werkzeug:10.24.68.38 - - [27/May/2024 12:24:51] "GET / HTTP/1.1" 200 -
INFO:werkzeug:10.24.68.38 - - [27/May/2024 12:24:51] "GET /favicon.ico HTTP/1.1" 404 -
INFO:root: Webhook Received
INFO:root:Payload:
INFO:root:{'version': '1.0.0', 'efInstanceId': '51ef677b-1362-4cd0-ad9b-80a1eb351c2d', 'InstanceId': 'ff01f3d5-3153-4d43-a27f-7934bd11389e'}
INFO:werkzeug:10.93.161.45 - - [27/May/2024 12:25:25] "POST /troubleshooting HTTP/1.1" 202 -
```

I have included a simple script to test webhook receiver using Catalyst Center real event payloads.

Catalyst Center Webhook Sample Payload

Interface Connecting Network Devices is Down

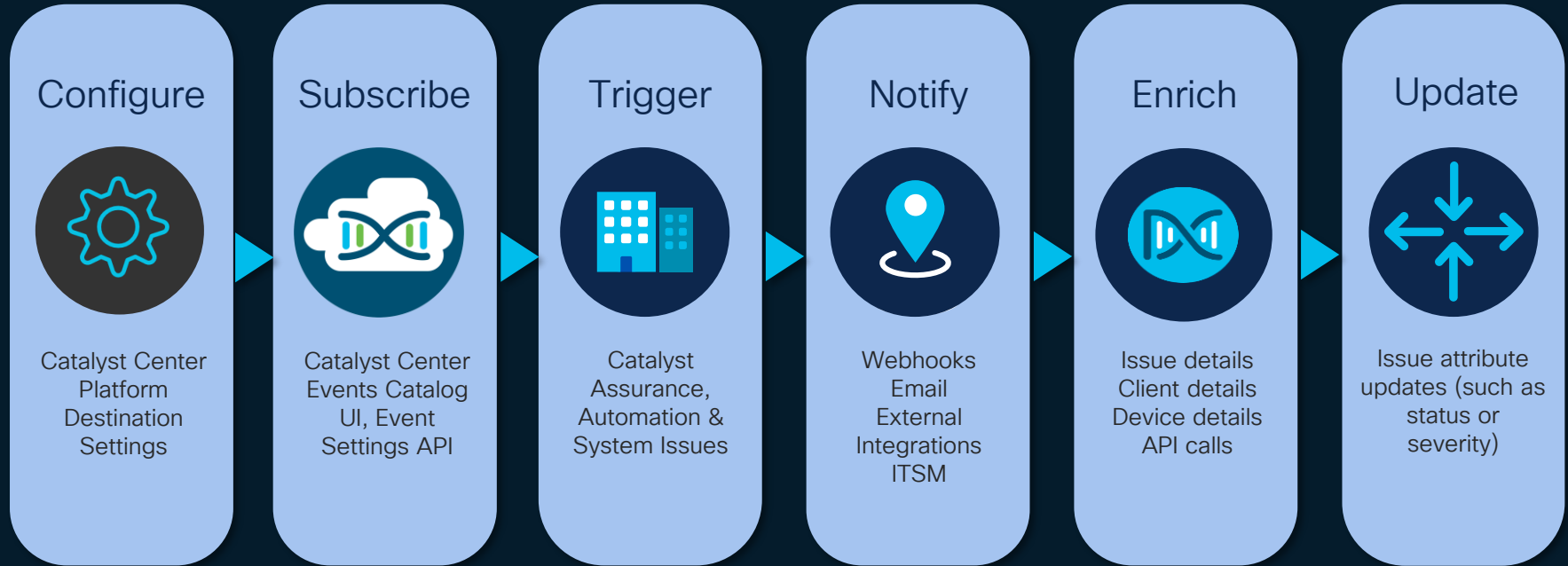
```
> 1/17/24 { [-]
9:32:53.000 AM category: ALERT
ciscoDnaEventLink: https://10.93.141.45/dna/assurance/issueDetails?issueId=5daf6357-0721-4d39-9d27-7ed19dfbc3f7
context: null
description: null
details: { [-]
  Assurance Issue Category: Connectivity
  Assurance Issue Details: Interface GigabitEthernet0/0 (Interface description: connected_to_PDX-M Gi 1/0/4) connecting the following two network devices is down: Local
  Node: L0-CN, Peer Node: PDX-M
  Assurance Issue Name: Interface GigabitEthernet0/0 (Interface description: connected_to_PDX-M Gi 1/0/4) is Down on Network Device 10.93.141.20
  Assurance Issue Priority: P2
  Assurance Issue Status: active
  Device: 10.93.141.20
  Type: Network Device
}
dnacIP: 10.93.141.45
domain: Connectivity
efInstanceId: 2d94bcb5-0a7f-4041-91a9-179cf8bf7ac7
eventHierarchy: null
eventId: NETWORK-NON-FABRIC_WIRED-1-251
i18n: null
instanceId: 5daf6357-0721-4d39-9d27-7ed19dfbc3f7
message: null
messageParams: null
name: null
namespace: ASSURANCE
network: { [-]
  deviceId: 5daf6357-0721-4d39-9d27-7ed19dfbc3f7
  siteId: /15ab86e1-706e-41df-8400-ee1a974bc1f3/245892a8-21e9-4d30-9e36-67c44a120d3b/e7c23ba2-e665-4b9e-aefc-090b28cc8bc6/3ba
}
note: To programmatically get more info see here - https://<ip-address>/dna/platform/app/consumer-portal/developer-toolkit/a
parentInstanceId: null
severity: 1
source: ndp
subDomain: Non-Fabric Wired
timestamp: 1705512902249
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

...

Event Notifications Workflow



Assurance Issue Settings

Catalyst Center

Assurance / Settings / Issue Settings

Global Profile

Custom Profile

System

User Defined

DEVICE TYPE

All Router Core, Distribution & Access Controller Access Point Wired Client Wireless Client Application Sensor Third Party Device

CATEGORY

All Onboarding Connectivity Connected Device Availability Utilization Application Sensor Test AP Anomaly System

Q Search Table

Priority	Issue Name	Issue Resolution	Enabled	Global	Current Setting	Last Modified	Subscription
P3	High input/output utilization on Third Party Device WAN interfaces	Auto	Yes	Yes	Default	--	Subscribed (REST, WEBEX, PAGER_DUTY)
P1	Interface Connecting Network Devices is Down	Auto	Yes	Yes	Default	Jan 18, 2024 5:31 PM	Subscribed (REST, WEBEX, PAGER_DUTY)
P3	Interface is Flapping On Network Device	Auto	Yes	Yes	Default	--	Subscribed (REST, WEBEX, PAGER_DUTY)
P3	Issues based on Syslog events - High Temperature	Manual	Yes	Yes	Default	--	Subscribed (REST)
P3	Issues based on Syslog events - POE	Manual	Yes	Yes	Default	--	Subscribed (REST)
P2	Layer 2 loop symptoms	Manual	Yes	Yes	Default	--	Subscribed (REST)
P2	Map cache limit reached	Manual	Yes	Yes	Default	--	Subscribed (REST)
P3	Network Device HA Switchover	Auto	Yes	Yes	Default	--	Subscribed (REST)
P1	Network Device Interface Connectivity - BGP Down	Auto	Yes	Yes	Custom	Jan 26, 2024 1:38 PM	Subscribed (REST, WEBEX, PAGER_DUTY)

- Provides insights in:
 - Priority
 - Issue auto/manual resolution
 - Enabled and if default config
 - Notification channels
- 84 events are auto resolved in version 2.3.7.4

Changing Assurance Issue Settings

Global Profile Custom Profile

System User Defined

DEVICE TYPE: All Router Core, Distribution & Access Controller Access Point Wired Client Wireless Client Application Sensor

CATEGORY: All Onboarding Connectivity Connected Device Availability Utilization Application Sensor Test AP Anomaly

Q BGP

Priority	Issue Name	Issue Resolution	Enable
P1	Fabric BGP session from Border node to Transit Control Plane node is down	Auto	Yes
P1	Fabric BGP session status is down with Peer Device (per VN)	Auto	Yes
P1	BGP session to Control Plane node down	Auto	Yes
P1	Fabric BGP session status is down with Peer Device	Auto	Yes
P1	BGP Session to Spine Node Down	Auto	Yes
P1	Network Device Interface Connectivity - BGP Down	Auto	Yes
P2	BGP Tunnel Connectivity	Manual	Yes
P2	Network Device Interface Connectivity - BGP Flap		

Network Device Interface Connectivity - BGP Down

This issue configuration is shared on multiple types of network devices, including Router, Core, Distribution and Access

BGP connectivity is down with neighbor.

☒ Enabled Priority: P2

Trigger Condition

Time duration BGP on a Router/S generated > 3 minutes

Last Modified: Jan 26, 2024 12:02 pm

View Default Setting

- Change Priority P2 to P1
- Enable or disable event
- Options to change the KPIs
- The changes will impact all notifications, and the UI

1/26/24 2:45:51.000 PM { [-]

```
{
  "category": "ERROR",
  "ciscoDnaEventLink": "https://10.93.141.45/dna/assurance/issueDetails?issueId=da2ed6b8-8756-4a7c-a849-73b87db9adf6",
  "context": null,
  "description": null,
  "details": {
    "Assurance Issue Category": "connectivity",
    "Assurance Issue Details": "Device:PDX-RO - BGP is down with neighbor 10.93.131.2",
    "Assurance Issue Name": "BGP is Down on Device PDX-RO with Neighbor 10.93.131.2",
    "Assurance Issue Priority": "P1",
    "Assurance Issue Status": "resolved",
    "Device": "10.93.141.23",
    "Type": "Network Device"
  },
  "dnacIP": "10.93.141.45",
  "domain": "Know Your Network",
  "efInstanceId": "551a31ae-db55-4ef2-8f78-8fe341337987",
  "eventHierarchy": null,
  "eventId": "NETWORK-NETWORKS-2-272",
  "i18n": null,
  "instanceId": "da2ed6b8-8756-4a7c-a849-73b87db9adf6",
  "message": null,
  "messageParams": null
}
```


Catalyst Center Webhook Update

```
> 10/11/23 2:28:14.000 PM { [-]
  category: ALERT
  ciscoDnaEventLink: https://10.93.141.45/dna/assurance/issueDetails?issueId=03f56dc7-0c0a-419f-bc22-7f92229bac70
  context: null
  description: null
  details: { [-]
    Assurance Issue Category: Availability
    Assurance Issue Details: This network device SP is unreachable from controller. The device role is BORDER ROUTER
    Assurance Issue Name: Network Device 10.93.141.24 Is Unreachable From Controller
    Assurance Issue Priority: P1
    Assurance Issue Status: active
    Device: 10.93.141.24
    Type: Network Device
  }
  dnacIP: 10.93.130.1
  domain: Connectivity
  eventHierarchy: null
  eventId: NETWORK-NON-FABRIC_WIRED-1-250
  i18n: null
  instanceId: 03f56dc7-0c0a-419f-bc22-7f92229bac70
  message: null
  messageParams: null
  name: null
  namespace: ASSURANCE
  network: { [-]
    dnacIP: 10.93.130.1
    domain: Connectivity
    eventHierarchy: null
    eventId: NETWORK-NON-FABRIC_WIRED-1-250
    i18n: null
    instanceId: 03f56dc7-0c0a-419f-bc22-7f92229bac70
    message: null
    messageParams: null
    name: null
    namespace: null
    network: { [+]
```

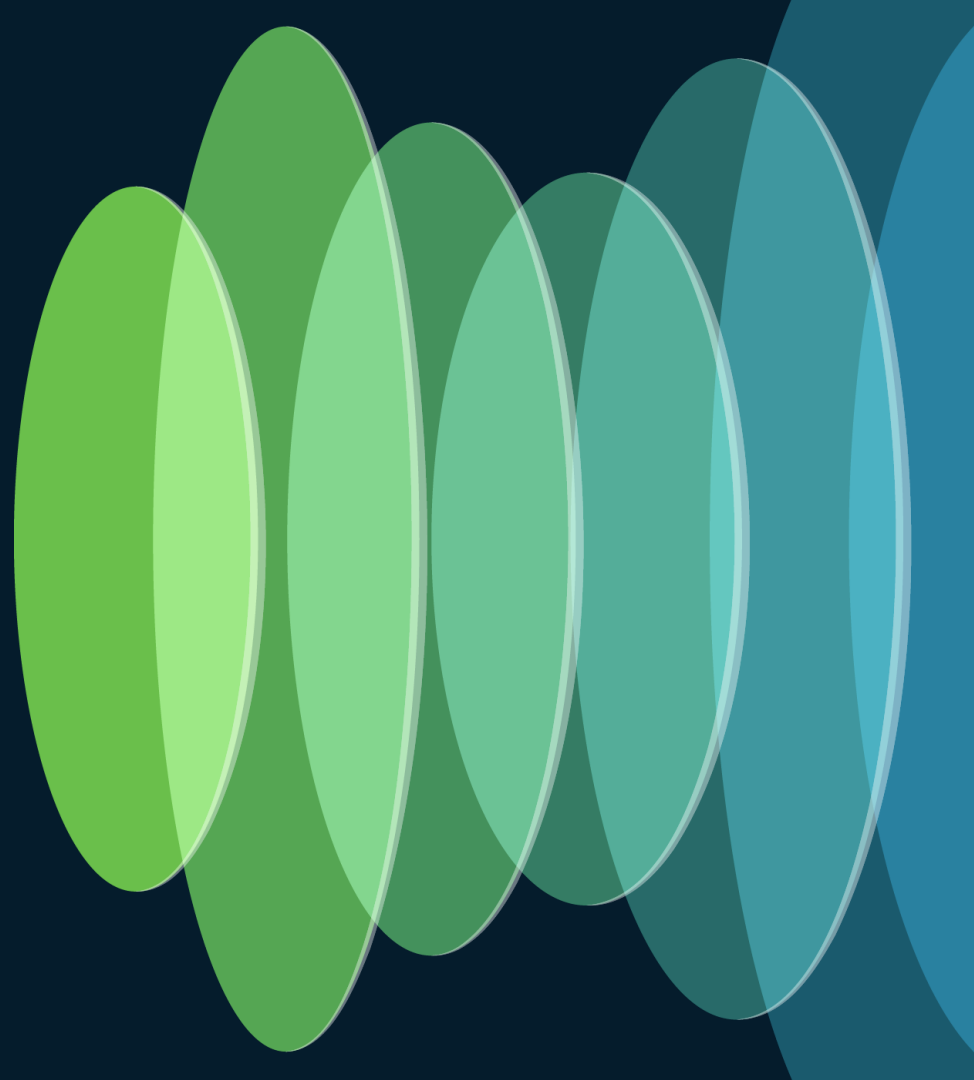
```
> 10/12/23 2:25:36.000 AM { [-]
  category: ALERT
  ciscoDnaEventLink: https://10.93.141.45/dna/assurance/issueDetails?issueId=03f56dc7-0c0a-419f-bc22-7f92229bac70
  context: null
  description: null
  details: { [-]
    Assurance Issue Category: Availability
    Assurance Issue Details: This network device SP is unreachable from controller. The device role is BORDER ROUTER
    Assurance Issue Name: Network Device 10.93.141.24 Is Unreachable From Controller
    Assurance Issue Priority: P1
    Assurance Issue Status: resolved
    Device: 10.93.141.24
    Type: Network Device
  }
  dnacIP: 10.93.130.1
  domain: Connectivity
  eventHierarchy: null
  eventId: NETWORK-NON-FABRIC_WIRED-1-250
  i18n: null
  instanceId: 03f56dc7-0c0a-419f-bc22-7f92229bac70
  message: null
  messageParams: null
  name: null
  namespace: null
  network: { [+]
```

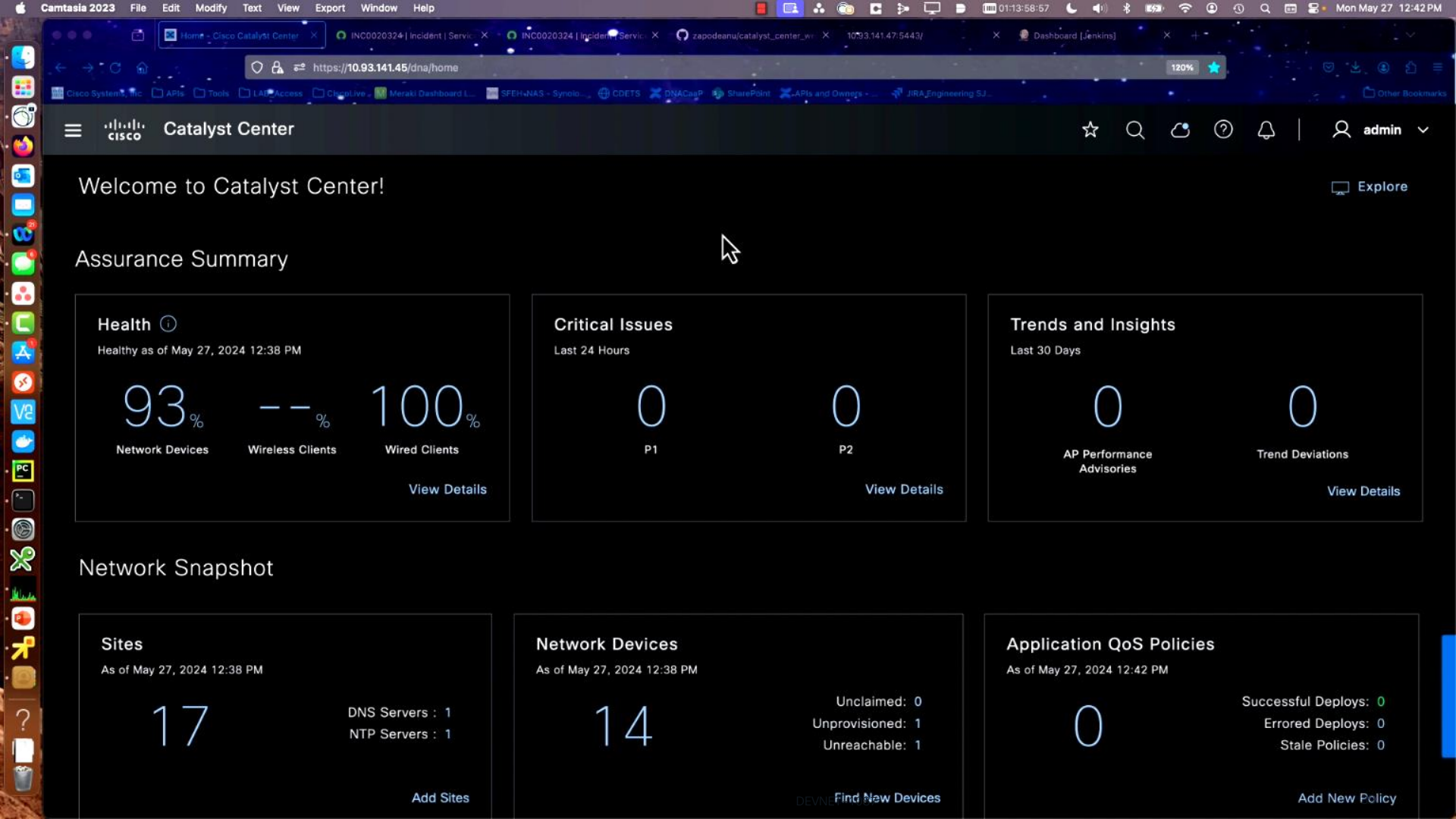
Status Changed from Active to Resolve when:

- Assurance issue auto-resolve
- Resolved by user

```
  note: To programmatically get more info see here - https://<ip-address>/dna/platform/app/consumer-portal/developer-toolkit/apis?apiId=8684-39bb-4e89-a6e4
  parentInstanceId: null
  severity: 1
  source: Cisco DNA Assurance
  subDomain: Non-Fabric Wired
  timestamp: 1697103720470
  type: NETWORK
  userId: null
  version: 1.0.0
}
```

Demo Webhook Receiver





Welcome to Catalyst Center!

Explore

Assurance Summary

Health

Healthy as of May 27, 2024 12:38 PM

93%

Network Devices

--%

Wireless Clients

100%

Wired Clients

View Details

Critical Issues

Last 24 Hours

0

P1

0

P2

View Details

Trends and Insights

Last 30 Days

0

AP Performance
Advisories

0

Trend Deviations

View Details

Network Snapshot

Sites

As of May 27, 2024 12:38 PM

17

DNS Servers : 1
NTP Servers : 1

Add Sites

Network Devices

As of May 27, 2024 12:38 PM

14

Unclaimed: 0
Unprovisioned: 1
Unreachable: 1

Find New Devices

Application QoS Policies

As of May 27, 2024 12:42 PM

0

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

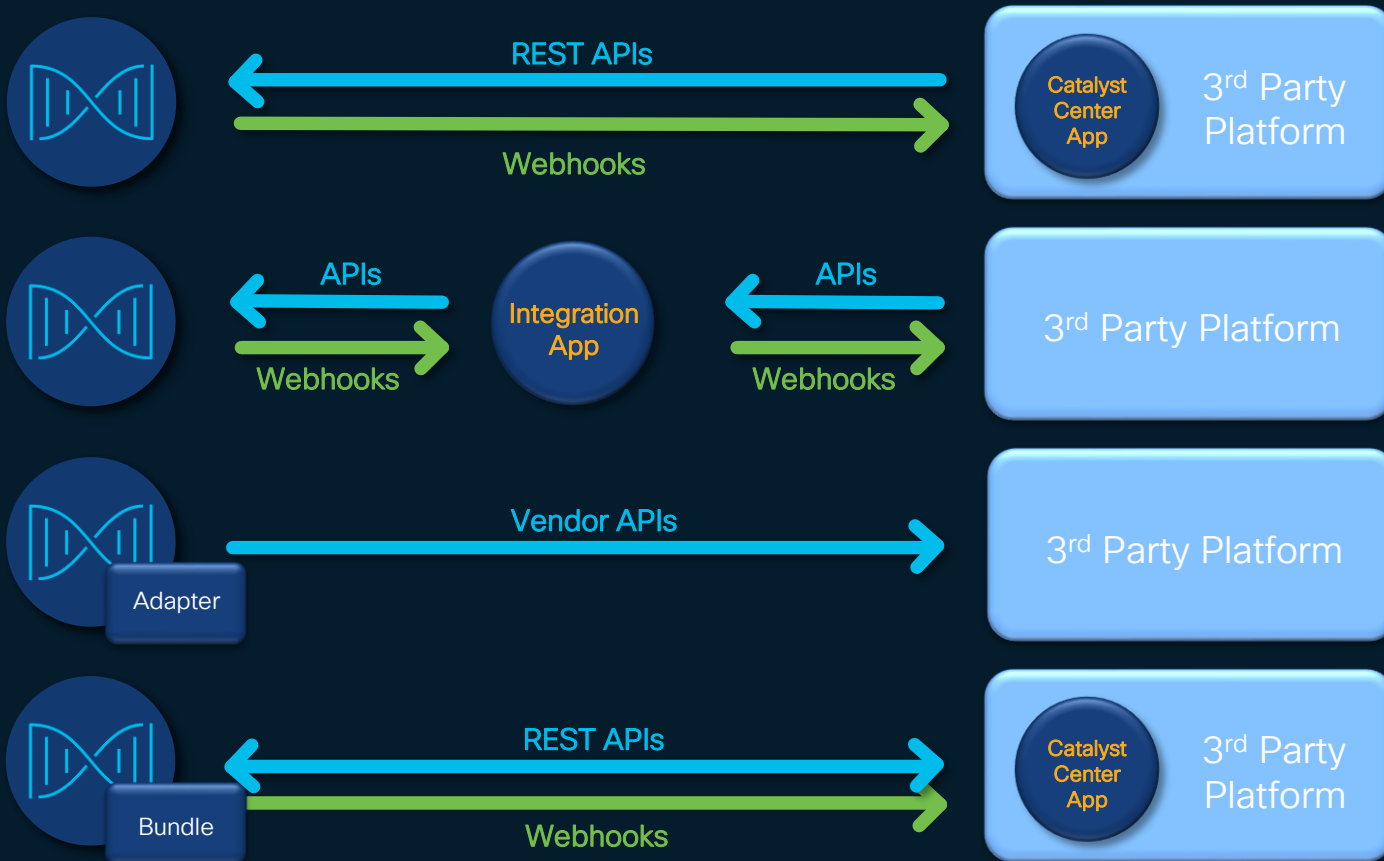
Add New Policy



Agenda

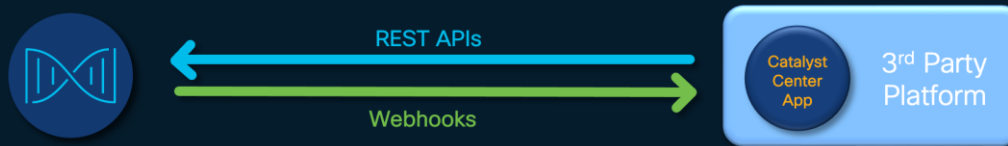
- Catalyst Center Platform Overview
- REST APIs
- Event Notifications
- Integrations
- Developer Resources
- Summary

Catalyst Center Integration Options



Direct Integrations

- Catalyst Center Notifications sent using Webhooks
- App may call Catalyst Center REST APIs to:
 - Enrich the issue, client, device
 - Collect additional information: health, compliance, ...
 - Run other automations workflows
- Forward the collected data, store for long term
- Log events, correlate with other platforms
- Build dashboards



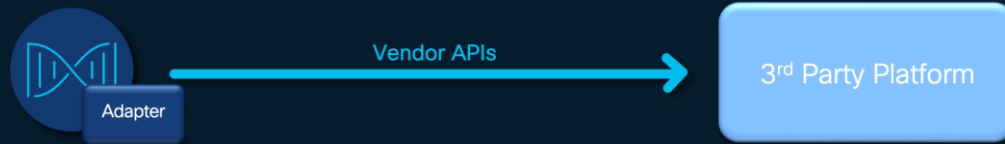
Integration Apps

- Rich features, innovation and maximum extensibility
- Enable GenAI use cases
- Supports non-matching API architectures, auth options, data encoding and data structures
- Ability to build custom integrations with any platforms
- May be required as a proxy between Catalyst Center and cloud platforms



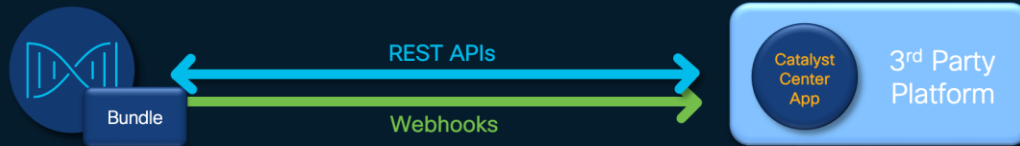
Adapter Integrations

- Catalyst Center software adapters developed for interoperability with other platforms
- The adapter will transform the event notification auth, header, data format and payload structure to match the destination
- Simple Catalyst Center workflows to integrate with 3rd Party Platforms
- Ready to use out-of-the-box

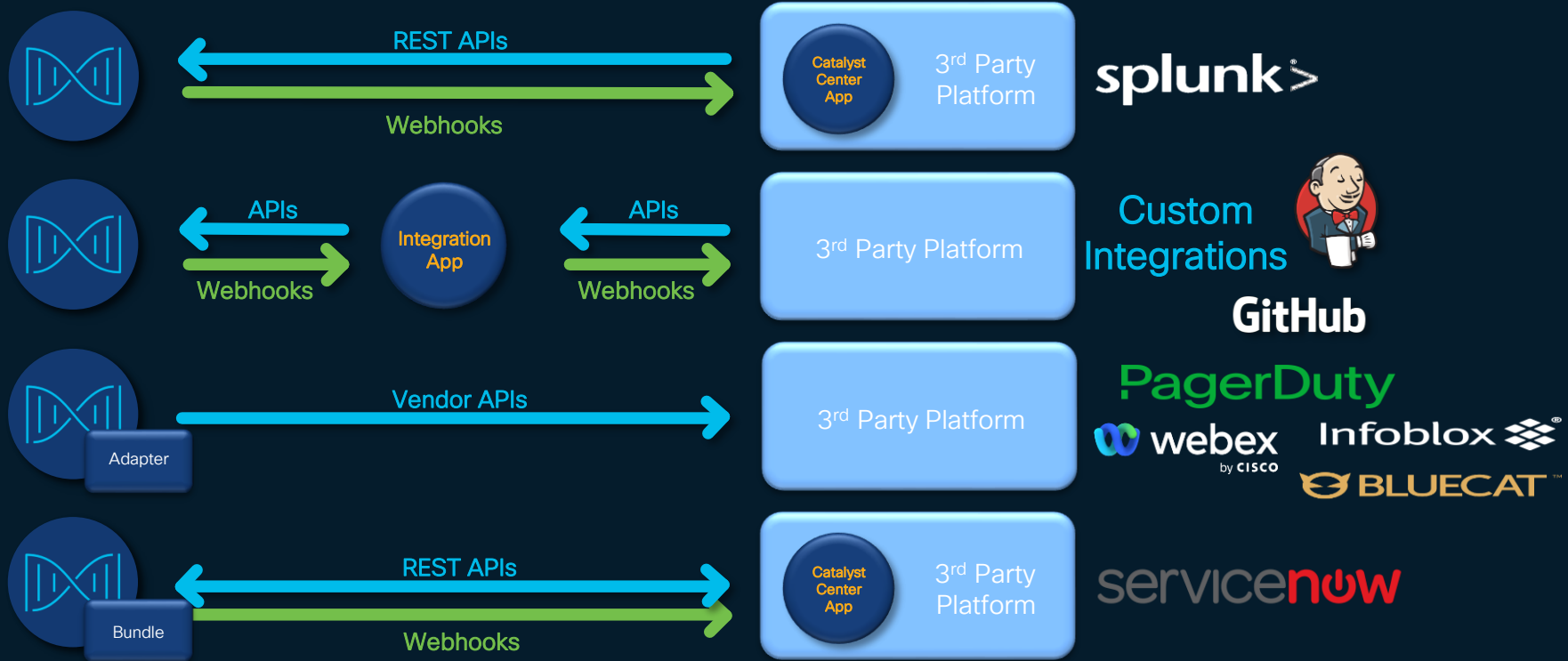


Bundle Integrations

- High value bi-directional, closed-loop integrations between Catalyst Center and 3rd Party Platforms
- Catalyst Center bundles and Integration Apps developed for interoperability between platforms
- Complex Catalyst Center workflows, processes and automations
- Integration App and bundle compatibility and certifications required
- Ready to use out-of-the-box, and customizable

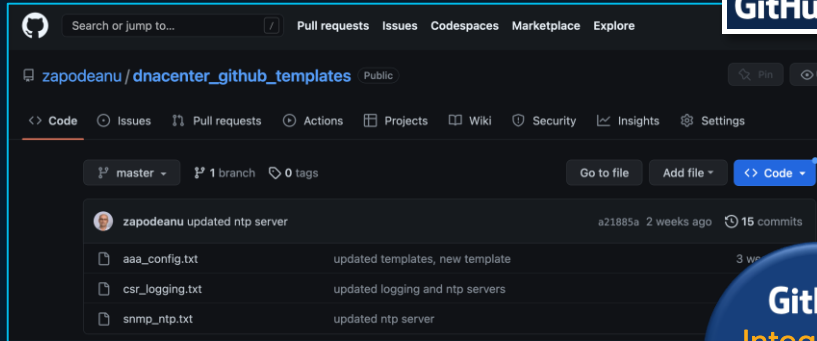


Catalyst Center Integration Options

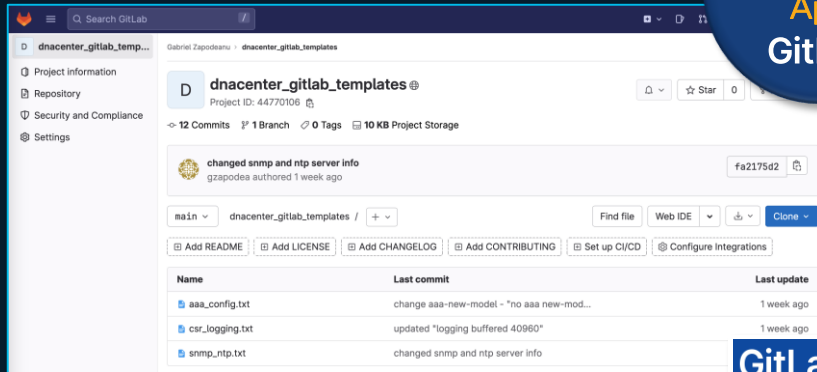


Version Control Tools Integration App

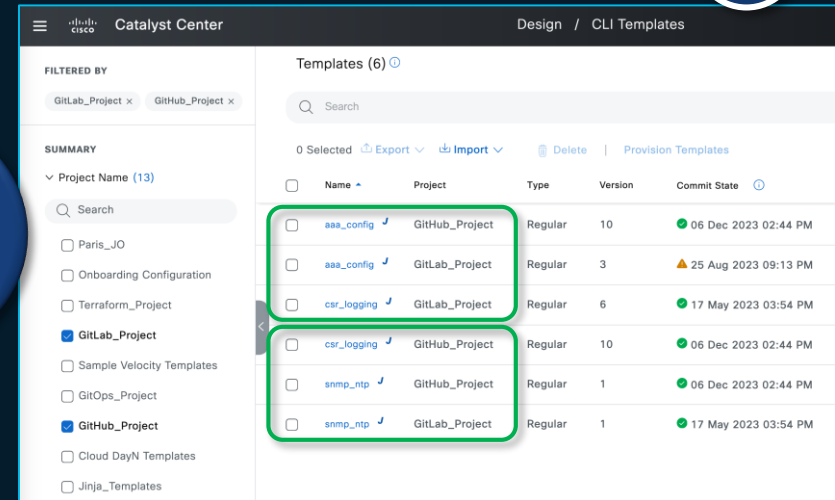
GitHub



GitHub
Integration
App
GitLab



GitLab



GitHub Integration App Baseline

GitHub

- Verify if repo exists
- Retrieve the content of each file

- Create or update project
- Create or update CLI template



master ▾ dnacenter_github_templates / csr_logging.txt

zapodeanu updated logging and ntp servers

1 contributor

9 lines (9 sloc) | 253 Bytes

```
1 !
2 logging buffered 81920
3 logging host 10.93.141.37 transport udp port 8514
4 logging source-interface Loopback100
5 no logging host 10.93.141.1 transport udp port 8514
6 !
7 service timestamps debug datetime localtime
8 service timestamps log datetime localtime
9 !
```

GitHub
Integration
App

Catalyst Center Design / CLI Templates

CLI Templates / csr_logging (11) Properties

Templates Variables Simulation Provision Conflicts

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

```
1 !
2 logging buffered 81920
3 logging host 10.93.141.37 transport udp port 8514
4 logging source-interface Loopback100
5 no logging host 10.93.141.1 transport udp port 8514
6 !
7 service timestamps debug datetime localtime
8 service timestamps log datetime localtime
9 !
```

Template History

Search

Latest Content
Author: python

Version 10
Author: python | 07 December 2023, 9:44 AM

Jenkins automation committed

Compare View

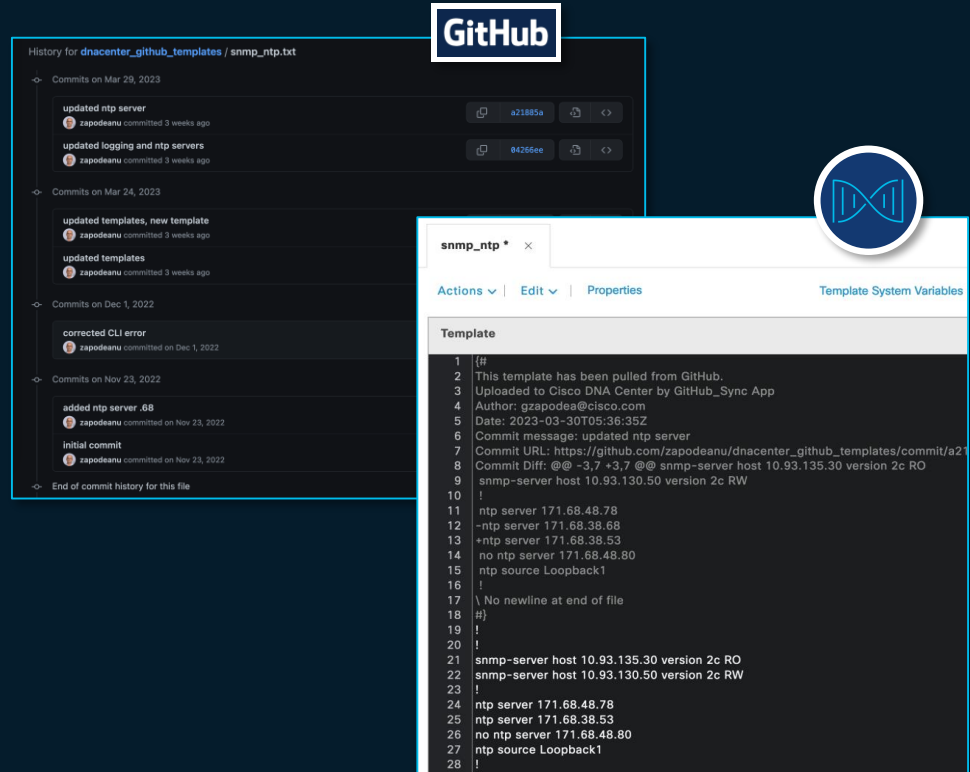
Version 9
Author: python | 07 December 2023, 9:31 AM

Version 8
Author: python | 02 December 2023, 3:50 AM

GitHub Integration App Enhancement

GitHub Commit Details to Cisco Catalyst Center

- Provide visibility in Cisco Catalyst Center for:
 - Commit author
 - Date
 - Comment
 - Changes
- Catalyst Center Templates will include the real source of change from GitHub



The image displays two overlapping screenshots. The background screenshot shows the GitHub commit history for the file `snmp_ntp.txt` in the repository `dnacenter_github_templates`. It lists several commits by user `zapodeanu` from November 2022 to March 2023, including updates to the ntp server, logging, and templates. A 'GitHub' logo is overlaid on the top right of this screenshot. The foreground screenshot shows a Cisco Catalyst Center template editor for `snmp_ntp`. It includes tabs for 'Actions', 'Edit', and 'Properties', and a 'Template System Variables' section. The main area shows a code snippet for a network configuration template, which includes comments about the template's origin (pulled from GitHub) and the commit details (author, date, message, URL, and diff). The code snippet is as follows:

```
1 {#
2 This template has been pulled from GitHub.
3 Uploaded to Cisco DNA Center by GitHub_Sync App
4 Author: gzapodea@cisco.com
5 Date: 2023-03-30T05:36:35Z
6 Commit message: updated ntp server
7 Commit URL: https://github.com/zapodeanu/dnacenter_github_templates/commit/a21885a
8 Commit Diff: @@ -3,7 +3,7 @@ snmp-server host 10.93.135.30 version 2c RO
9 snmp-server host 10.93.130.50 version 2c RW
10 !
11 ntp server 171.68.48.78
12 ~ntp server 171.68.38.68
13 +ntp server 171.68.38.53
14 no ntp server 171.68.48.80
15 ntp source Loopback1
16 !
17 \ No newline at end of file
18 #}
19 !
20 !
21 snmp-server host 10.93.135.30 version 2c RO
22 snmp-server host 10.93.130.50 version 2c RW
23 !
24 ntp server 171.68.48.78
25 ntp server 171.68.38.53
26 no ntp server 171.68.48.80
27 ntp source Loopback1
28 !
```

GitHub Integration App Enhancement

GitHub Commit Details to Cisco Catalyst Center

GitHub

zapodeanu / dnacenter_github_templates Public

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

updated ntp server

zapodeanu committed 3 weeks ago

Showing 1 changed file with 1 addition and 1 deletion.

snmp_ntp.txt

```
@@ -3,7 +3,7 @@ snmp-server host 10.93.135.30 version 2c RO
3 snmp-server host 10.93.130.50 version 2c RW
4 !
5 ntp server 171.68.48.78
6 - ntp server 171.68.38.68
7 no ntp server 171.68.48.80
8 ntp source Loopback1
9 !
```

GitHub
Integration
App

- Commit message, date and author
- Diff - what's changed
- File content = CLI template



snmp_ntp * x

Actions Edit Template System Variables

Template

```
1 {#
2 This template has been pulled from GitHub.
3 Uploaded to Cisco DNA Center by GitHub_Sync App
4 Author: gzapodea@cisco.com
5 Date: 2023-03-30T05:36:35Z
6 Commit message: updated ntp server
7 Commit URL: https://github.com/zapodeanu/dnacenter_github_templates/commit/a21
8 Commit Diff: @@ -3,7 +3,7 @@ snmp-server host 10.93.135.30 version 2c RO
9 snmp-server host 10.93.130.50 version 2c RW
10 !
11 ntp server 171.68.48.78
12 -ntp server 171.68.38.68
13 +ntp server 171.68.38.53
14 no ntp server 171.68.48.80
15 ntp source Loopback1
16 !
17 \ No newline at end of file
18 #}
19 !
20 !
21 snmp-server host 10.93.135.30 version 2c RO
22 snmp-server host 10.93.130.50 version 2c RW
23 !
24 ntp server 171.68.48.78
25 ntp server 171.68.38.53
26 no ntp server 171.68.48.80
27 ntp source Loopback1
28 !
```

GitHub Integration App Summary



Network Engineer

GitHub
Integration
App

GitHub

zapodeanu / dnacenter_github_template

- 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 template including the GitHub commit details
- Create CLI template, or update, if changes
- Commit the template
- Create report

```
ntp source Loopback0
```

```
INFO:root: Template "snmp_ntp" has changed, different template on Cisco DNA Center
INFO:root: Updating existing template "snmp_ntp" id: 27c20fe5-b66b-4884-8d82-94c841805c5f
INFO:root: Template "snmp_ntp" committed
```

snmp_ntp

Actions Edit Properties

Template System Variables

Template

```
1 {#
2 This template has been pulled from GitHub.
3 Uploaded to Cisco DNA Center by GitHub_Sync App
4 Author: gzapodea@cisco.com
5 Date: 2023-04-19T22:28:26Z
6 Commit message: updated ntp source
7 Commit URL: https://github.com/zapodeanu/dnacenter_github_templates/commit/82ed7d6
8 Commit Diff: @@ -5,5 +5,6 @@ snmp-server host 10.93.130.50 version 2c RW
9 ntp server 171.68.48.78
10 ntp server 171.68.38.53
11 no ntp server 171.68.48.80
12 -ntp source Loopback1
13 +no ntp source Loopback1
14 +ntp source Loopback0
15 !
16 \ No newline at end of file
17 #}
18 !
19 !
20 snmp-server host 10.93.135.30 version 2c RO
21 snmp-server host 10.93.130.50 version 2c RW
22 !
23 ntp server 171.68.48.78
24 ntp server 171.68.38.53
25 no ntp server 171.68.48.80
26 no ntp source Loopback1
27 ntp source Loopback0
28 !
```

Running the Integration App

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

GitHub
Integration
App

```
Run: 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-b002-49b1-9e0d-9ec7fac04dcb
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/gzapodeanu/dnacenter\_github\_templates/commit/50724c24f7f7e6e35bafdbd61419adf648ec41f
  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 Dashboard

Dashboard > GitHub Sync >

Full Stage View

Open Blue Ocean

Rename

Pipeline Syntax

Build History

trend

Filter builds... /

#478

Jun 1, 2024, 9:42 PM

#477

May 31, 2024, 9:42 PM

#476

May 30, 2024, 9:42 PM

#475

May 29, 2024, 9:42 PM

#474

May 28, 2024, 9:42 PM

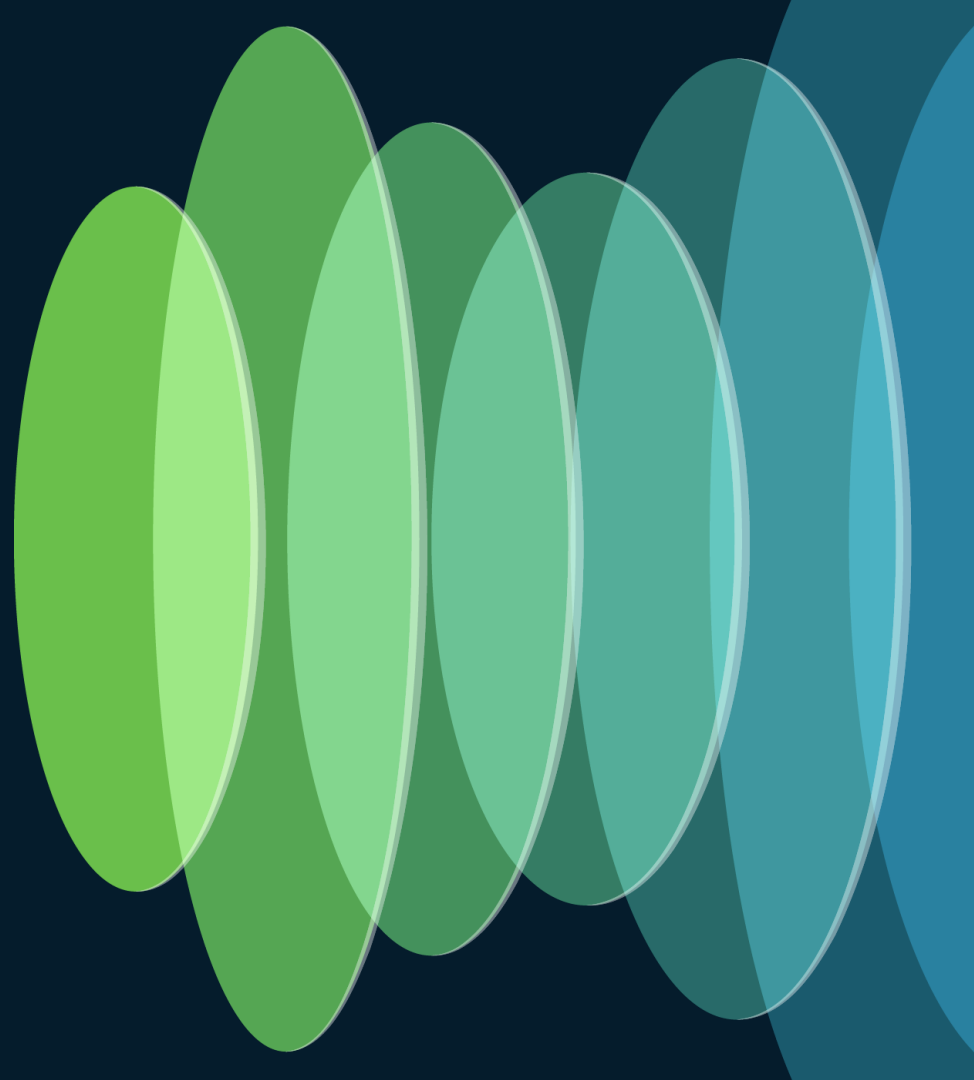
Stage View

Average stage times:
(Average full run time: ~31s)

	Environment variables	Build Python Environment	Pull or Clone the source code	Install Python libraries	Test	Deploy
#478 Jun 01 21:42 No Changes	91ms	66ms	1s	6s	18s	72ms
#477 May 31 21:42 No Changes	91ms	70ms	1s	7s	18s	63ms
#476 May 30 21:42 No Changes	88ms	69ms	1s	6s	19s	73ms
#475 May 29 21:42 No Changes	92ms	62ms	1s	6s	19s	72ms

- Pipeline Name
- Build queue and history
- Pipeline stats – stages status, average time

Demo GitHub Sync Integration App



Firefox

File

Edit

View

History

Bookmarks

Tools

Window

Help

Home - Cisco Catalyst Center x OpsView [Jenkins] x dnacenter_github_templates/c/ x +

https://10.93.141.45/dna/home120%

Cisco Systems, IncAPIsToolsLAB_AccessCiscoLiveMeraki Dashboard L...Cisco BoxSFEH-NAS - Synolo...CDETSDNACaaPCisco.DNA.Center.D...SharePointAPIs and Owners - ...JIRA Engineering SJ...Uno - MaglevCloud ...Other Bookmarks

Catalyst Center

admin

Welcome to Catalyst Center!

Assurance Summary

Health ⓘ

Healthy as of Feb 1, 2024 10:27 AM

100%

Network Devices

--%

Wireless Clients

100%

Wired Clients

View Details

Critical Issues

Last 24 Hours

0

P1

1

P2

View Details

Trends and Insights

Last 30 Days

0

AP Performance Advisories

0

Trend Deviations

View Details

Network Snapshot

Sites

As of Feb 1, 2024 10:27 AM

16

DNS Servers : 1

NTP Servers : 1

Add Sites

Network Devices

As of Feb 1, 2024 10:27 AM

14

Unclaimed: 0

Unprovisioned: 1

Unreachable: 0

Find New Devices

DEVNET-1087

Application QoS Policies

As of Feb 1, 2024 10:28 AM

0

Successful Deploys: 0

Errored Deploys: 0

Stale Policies: 0

Add New Policy

55

Catalyst Center Version Control Integration

https://github.com/zapodeanu/catalyst_center_version_control

zapodeanu / catalyst_center_version_control

Type to search

<> Code Issues Pull requests Actions Projects Wiki Security Insights Settings

catalyst_center_version_control Public

Pin Unwatch 1 Fork 0 Star 0

main 1 branch 0 tags

Go to file Add file <> Code

About

Repo for Catalyst Center Integration with GitHub - Templates/Projects sync from GitHub and Network State sync to GitHub

Readme View license Code of conduct Activity 0 stars 1 watching 0 forks

Releases

No releases published [Create a new release](#)

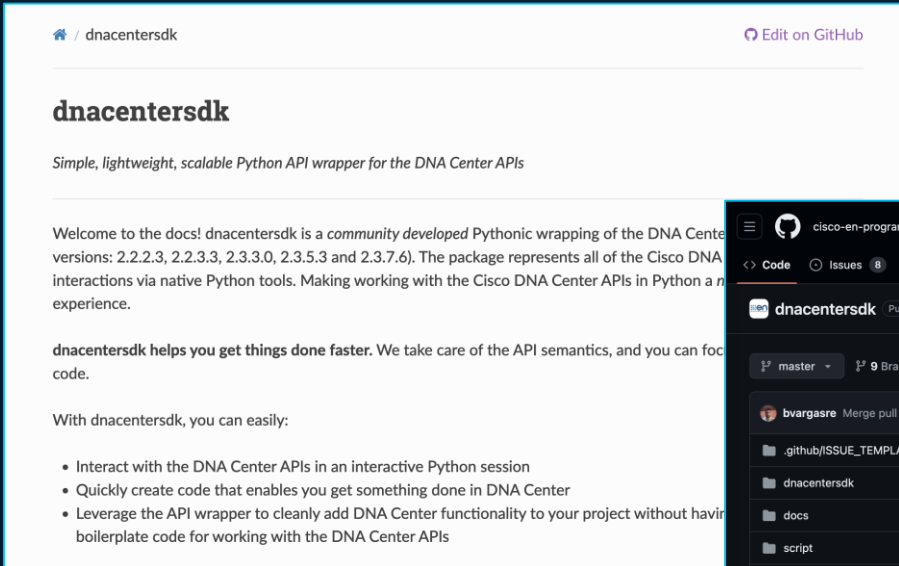
File	Commit	Time
.gitignore	initial commit	14 minutes ago
CODE_OF_CONDUCT.md	initial commit	1 minute ago
CONTRIBUTING.md	initial commit	1 minute ago
LICENSE	initial commit	1 minute ago
NOTICE	initial commit	1 minute ago
README.md	initial commit	1 minute ago
catalyst_center_github_sync.py	initial commit	1 minute ago
catalyst_center_network_state_syn...	initial commit	1 minute ago
github_apis.py	initial commit	1 minute ago
requirements.txt	initial commit	1 minute ago



Agenda

- Catalyst Center Platform Overview
- REST APIs
- Event Notifications
- Integrations
- Developer Resources
- Summary

Catalyst Center Python SDK

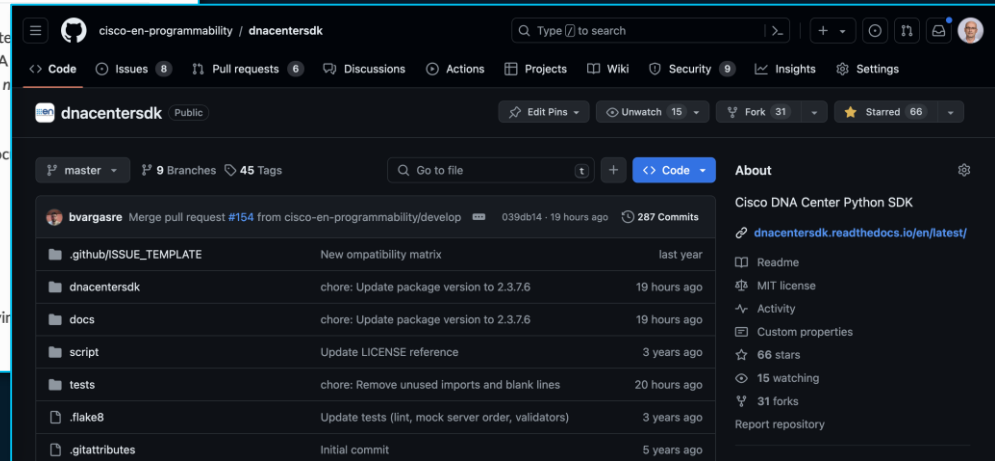


The screenshot shows the Read the Docs page for the `dnacentersdk` project. At the top, it says `/ dnacentersdk` and has a link to `Edit on GitHub`. The title is **dnacentersdk** with the subtitle *Simple, lightweight, scalable Python API wrapper for the DNA Center APIs*. The main text welcomes users to the docs, stating that `dnacentersdk` is a community-developed Pythonic wrapping of the DNA Center versions: 2.2.2.3, 2.2.3.3, 2.3.3.0, 2.3.5.3 and 2.3.7.6. It mentions that the package represents all of the Cisco DNA interactions via native Python tools, making working with the Cisco DNA Center APIs in Python a more pleasant experience. Below this, it states that `dnacentersdk` helps you get things done faster, taking care of the API semantics so you can focus on your code. Finally, it says "With `dnacentersdk`, you can easily:" followed by a bulleted list:

- Interact with the DNA Center APIs in an interactive Python session
- Quickly create code that enables you get something done in DNA Center
- Leverage the API wrapper to cleanly add DNA Center functionality to your project without having boilerplate code for working with the DNA Center APIs

<https://dnacentersdk.readthedocs.io>

- Covers all Cisco Catalyst Center REST APIs
- Support for Cisco Catalyst Center version 2.3.7.6
- First SDK version August 2019
- Average downloads/month 4,500+



The screenshot shows the GitHub repository page for `dnacentersdk` under the `cisco-en-programmability` organization. The repository is public and has 15 unwatchers, 31 forks, and 66 stars. It shows a merge pull request #154 from `cisco-en-programmability/develop` to `master` by `bvargasre`, merged 19 hours ago. The commit history shows several recent commits, including updates to the package version to 2.3.7.6, updates to the LICENSE reference, and updates to tests. The repository also has a README, a .github/ISSUE_TEMPLATE, a docs directory, a script directory, a tests directory, a .flake8 file, and a .gitattributes file.

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

How to Use the Python SDK

```
91
92 # create a DNACenterAPI "Connection Object" to use the Python SDK
93 catalyst_center_api = DNACenterAPI(username=CATALYST_CENTER_USER, password=CATALYST_CENTER_PASS,
94                                     base_url=CATALYST_CENTER_URL, version='2.3.5.3', verify=False)
95
96 # collect device inventory
97 # get the device count
98 response = catalyst_center_api.devices.get_device_count()
99 device_count = response['response']
100 logging.info(' Number of devices managed by Cisco DNA Center: ' + str(device_count))
101
102 # get the device info list
103 offset = 1
104 limit = 500
105 device_list = []
106 while offset <= device_count:
107     response = catalyst_center_api.devices.get_device_list(offset=offset)
108     offset += limit
109     device_list.extend(response['response'])
110 logging.info(' Collected the device list from Cisco DNA Center')
111
```

Specify Cisco Catalyst Center credentials and version

Get the device count

Get the device list using the API pagination

- Accelerates and simplifies apps development
- Developer focus on the use case, and not each API call

Cisco Catalyst Center Ansible Modules

<https://galaxy.ansible.com/ui/repo/published/cisco/dnac>

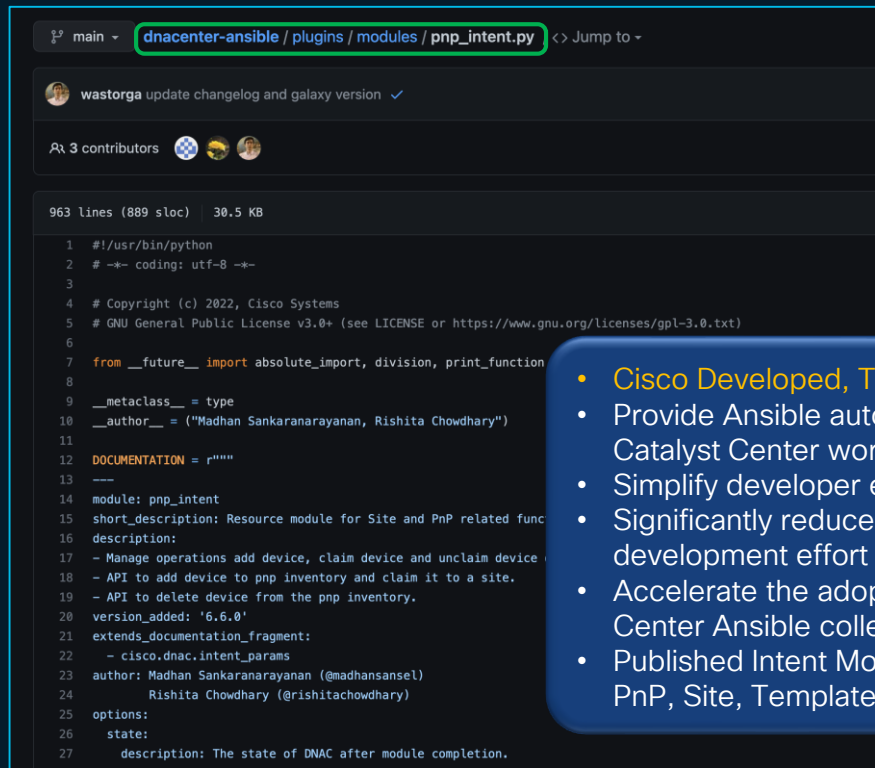
The screenshot shows the Ansible Galaxy interface for the 'cisco.dnac' collection. The left sidebar contains navigation links: Ansible Galaxy, Search, Collections (selected), Namespaces, Roles, Documentation, and Terms of Use. The main content area shows the 'cisco.dnac' collection details, including the version (6.14.0), last updated time (15 hours ago), and download count (47,243). The 'Install' tab is active, displaying the installation command: 'ansible-galaxy collection install cisco.dnac'. A note states: 'Note: Installing collections with ansible-galaxy is only supported'. There are also links for 'Docs site', 'Website', 'Issue tracker', and 'Repo'.

- Complete set of Ansible modules for all Cisco Catalyst Center REST APIs
- First library version Dec 2020
- Certified by RedHat v 2.9 – 04/2021
- Community certified – 05/2022
- Support for Cisco Catalyst Center version 2.3.7.6
- 47,200+ downloads

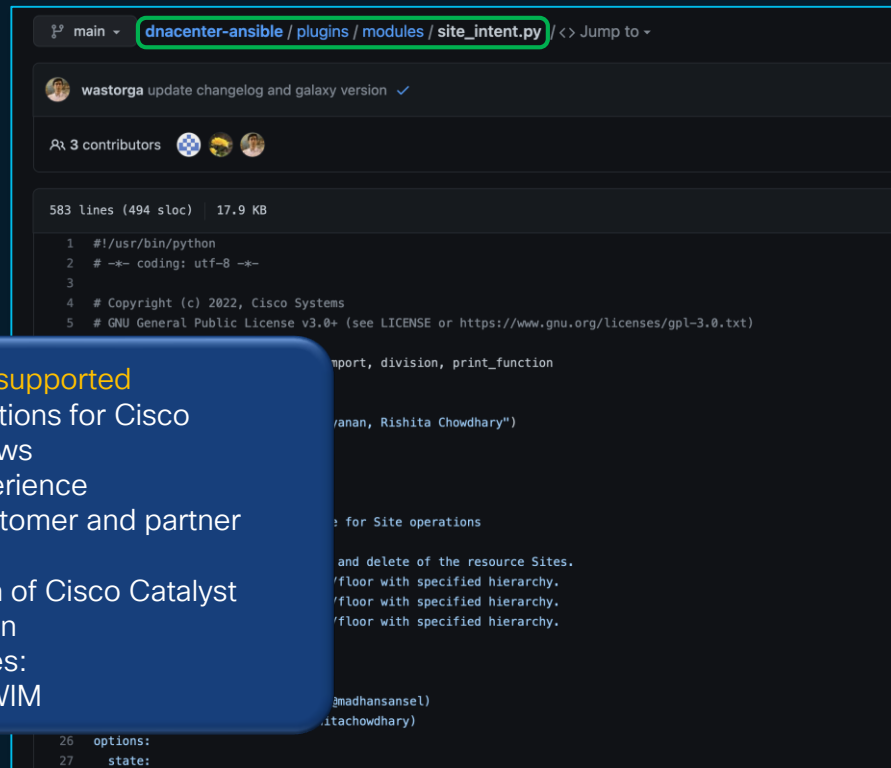
The screenshot shows the GitHub repository page for 'cisco-en-programmability/dnacenter-ansible'. The repository is public and has 79 tags, 7 branches, and 1,721 commits. The commit history table is visible, showing recent updates to docs, changelogs, and playbooks. The repository description is 'Cisco DNA Center Ansible modules' and the link to the repository is 'cisco-en-programmability.github.io/dnacenter-ansible'. The repository also has 25 stars, 10 watchers, and 36 forks.

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

Intent Modules – Cisco Developed and Supported



```
1 #!/usr/bin/python
2 # -*- coding: utf-8 -*-
3
4 # Copyright (c) 2022, Cisco Systems
5 # GNU General Public License v3.0+ (see LICENSE or https://www.gnu.org/licenses/gpl-3.0.txt)
6
7 from __future__ import absolute_import, division, print_function
8
9 __metaclass__ = type
10 __author__ = ("Madhan Sankaranarayanan, Rishita Chowdhary")
11
12 DOCUMENTATION = r"""
13 ---
14 module: pnp_intent
15 short_description: Resource module for Site and PnP related functions
16 description:
17 - Manage operations add device, claim device and unclaim device
18 - API to add device to pnp inventory and claim it to a site.
19 - API to delete device from the pnp inventory.
20 version_added: '6.6.0'
21 extends_documentation_fragment:
22 - cisco.dnac.intent_params
23 author: Madhan Sankaranarayanan (@madhansansel)
24       Rishita Chowdhary (@rishitachowdhary)
25 options:
26   state:
27     description: The state of DNAC after module completion.
```



```
1 #!/usr/bin/python
2 # -*- coding: utf-8 -*-
3
4 # Copyright (c) 2022, Cisco Systems
5 # GNU General Public License v3.0+ (see LICENSE or https://www.gnu.org/licenses/gpl-3.0.txt)
6
7 from __future__ import absolute_import, division, print_function
8
9 __metaclass__ = type
10 __author__ = ("Madhan Sankaranarayanan, Rishita Chowdhary")
11
12 DOCUMENTATION = r"""
13 ---
14 module: site_intent
15 short_description: Resource module for Site operations
16 description:
17 - Manage operations add and delete of the resource Sites.
18 - API to add site to inventory with specified hierarchy.
19 - API to delete site from inventory with specified hierarchy.
20 version_added: '6.6.0'
21 extends_documentation_fragment:
22 - cisco.dnac.intent_params
23 author: Madhan Sankaranarayanan (@madhansansel)
24       Rishita Chowdhary (@rishitachowdhary)
25 options:
26   state:
27     description: The state of DNAC after module completion.
```

- Cisco Developed, TAC supported
- Provide Ansible automations for Cisco Catalyst Center workflows
- Simplify developer experience
- Significantly reduce customer and partner development effort
- Accelerate the adoption of Cisco Catalyst Center Ansible collection
- Published Intent Modules: PnP, Site, Template, SWIM

Terraform Provider and Go SDK

<https://registry.terraform.io/providers/cisco-en-programmability/dnacenter>

The screenshot shows the Terraform Registry page for the **dnacenter** provider. The page is titled "dnacenter" and includes a search bar, a list of resources, and a section for "dnacenter Provider". The provider description states: "The Cisco DNA Center provider is used to interact with Cisco DNA Center APIs (2.3.5.3). The provider needs to be configured with the proper credentials before it can be used." The "Example Usage" section shows the following configuration:

```
# Configure provider with your Cisco DNA Center SDK credentials
provider "dnacenter" {
  # ... configuration details ...
}
```

- Extended coverage of Cisco Catalyst Center REST APIs
- Support for Cisco DNA Center version 2.3.5.3 (2.3.7.x pending release)
- Released January 2021
- 41,700+ downloads

The screenshot shows the GitHub repository for **terraform-provider-dnacenter**. The repository is public and has 11 branches and 65 tags. The commit history shows a merge pull request #199 from cisco-en-programmability/... and a commit by cca4be last month. The repository includes a README, a MIT license, and a Code of conduct. The releases section shows the latest release, **v1.1.31-beta**, released on Dec 7, 2023, with 60 releases in total.

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

Cisco EN Programmability GitHub Org

The screenshot shows the GitHub organization page for Cisco EN Programmability. The organization has 53 followers and 41 repositories. The pinned repositories are:

- dnacentersdk** (Public): Cisco DNA Center Python SDK. 62 stars, 29 forks.
- dnacenter-ansible** (Public): Cisco DNA Center Ansible modules. 22 stars, 24 forks.
- terraform-provider-dnacenter** (Public): Cisco DNA Center Terraform Provider. 13 stars, 11 forks.
- splunk-apps** (Public): Splunk Add-On App for Cisco DNA Center. 2 stars, 2 forks.
- dnacenter_day_n** (Public): 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): Sample code for a Cisco DNA Center Webhook Receiver.

- DevOps Catalyst Center use cases
- Python SDK (support 2.3.7.6)
- Ansible modules (support 2.3.7.6)
- Go SDK and Terraform provider (support 2.3.5.x, pending support 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 Use Cases
- Custom Integration App (Jira Service Desk)
- Webhook Receiver
- Other sample code

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



Agenda

- Catalyst Center Platform Overview
- REST APIs
- Event Notifications
- Integrations
- Developer Resources
- Summary

Catalyst Center APIs, Events, Integrations

- Manage Catalyst Center and the infrastructure efficiently, consistent and at scale
- Real-time insights and notifications with webhooks, rich Assurance data available via APIs
- Ready-to-use Integrations or build custom integrations
- Enable GenAI use cases

Catalyst Center Platform Sessions

Session	Title	Room	Date
BRKOPS-2548	Network Troubleshooting Using Cisco Catalyst Center APIs	L2, Mandalay Bay I	06/03/24, 8:00 AM
IBOOPS-2882	Let's Talk about Catalyst Center Integrations	L2, Lagoon D	06/03/24, 1:00 PM
DEVNET-1087	Cisco Catalyst Center Platform: APIs, Event Notifications, Integrations, and DevOps Resources	WoS - DevNet Classroom 2	06/04/24, 12:00 PM
BRKOPS-2032	3 Cisco Catalyst Center and ITSM Workflows: CMDB, Incident Management, and SWIM	L2, Mandalay Bay E	06/05/24, 10:30 AM
DEVNET-3000	ChatBot for Catalyst Center – an Open-Source GenAI based Bot	WoS - DevNet Classroom 2	06/05/24, 3:00 PM
SKILLS-1660	Introduction to Catalyst Center	WoS - DevNet & Cisco U. Skills Stage	06/06/24, 9:00 AM
SKILLS-1661	Introduction to Catalyst Center Platform	WoS - DevNet & Cisco U. Skills Stage	06/06/24, 10:00 AM

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- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs
- Visit the On-Demand Library for more sessions at www.CiscoLive.com/on-demand

Contact me at: gabi@cisco.com



The bridge to possible

Thank you

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