

cisco *Live!*

Let's go



The bridge to possible

Custom Workflows for the Cisco Catalyst Center Integration with ServiceNow

Gabi Zapodeanu,
Principal Technical Marketing Engineer
@zapodeanu



BRKOPS-2471

Cisco Catalyst Center ITSM Integration Sessions

The screenshot displays the Cisco Catalyst Center interface. At the top, a 'CMDB Sync' button is highlighted. Below it, the 'Incident Management' module shows a list of incidents, including one for 'Interface GigabitEthernet0/1' with a priority of 'Critical'. The 'Change Management' module shows a list of change requests, including 'SDA Provision Creation Request' and 'SWIM Upgrade Request Creation Image Activation'.

BRKOPS-2032
Cisco Catalyst Center and ITSM
Workflows: CMDB, Incident
Management and Software Image
Management

BRKOPS-2471
Custom Workflows for the
Cisco Catalyst Center Integration with
ServiceNow

The screenshot shows the Network Troubleshooting App interface. It includes a 'Staging Tables' section with 'inventory_details' and 'event_details' tables. The 'event_details' table contains a log entry for an interface configuration issue. A 'Workflow' section shows a process flow: '1. Device and CLI Command', '2. Command sent', and '3. Command output', with a status message 'Field Margin = 2024-05-25 00:00:00'.

Agenda

- Cisco Catalyst Center Platform
- ITSM (ServiceNow) Integration Overview
- CMDB Sync to Staging Table
- Events Notifications to Generic REST API Endpoint
- Network Troubleshooting Custom Workflow
- Summary



Agenda

- Cisco Catalyst Center Platform
- ITSM (ServiceNow) Integration Overview
- CMDB Sync to Staging Table
- Events Notifications to Generic REST API Endpoint
- Network Troubleshooting Custom Workflow
- Summary

Cisco Catalyst Center Platform

Healthcare



Education



Hospitality



Workplaces



Retail



Manufacturing



Network Insights



Managed Services

Infrastructure-as-Code

Infrastructure provisioning, workflow automation and network management

Integrations



servicenow



PagerDuty

Cisco Spaces



Custom Integrations

DevOps Tools



GitHub
GitLab



Reports

REST APIs

Events

Cisco Catalyst

Center Platform



Cisco Physical and Virtual Infrastructure



Catalyst Center Platform

Event Notifications

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

IT Ecosystem Integrations

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

Northbound REST APIs

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



Developer Resources

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

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

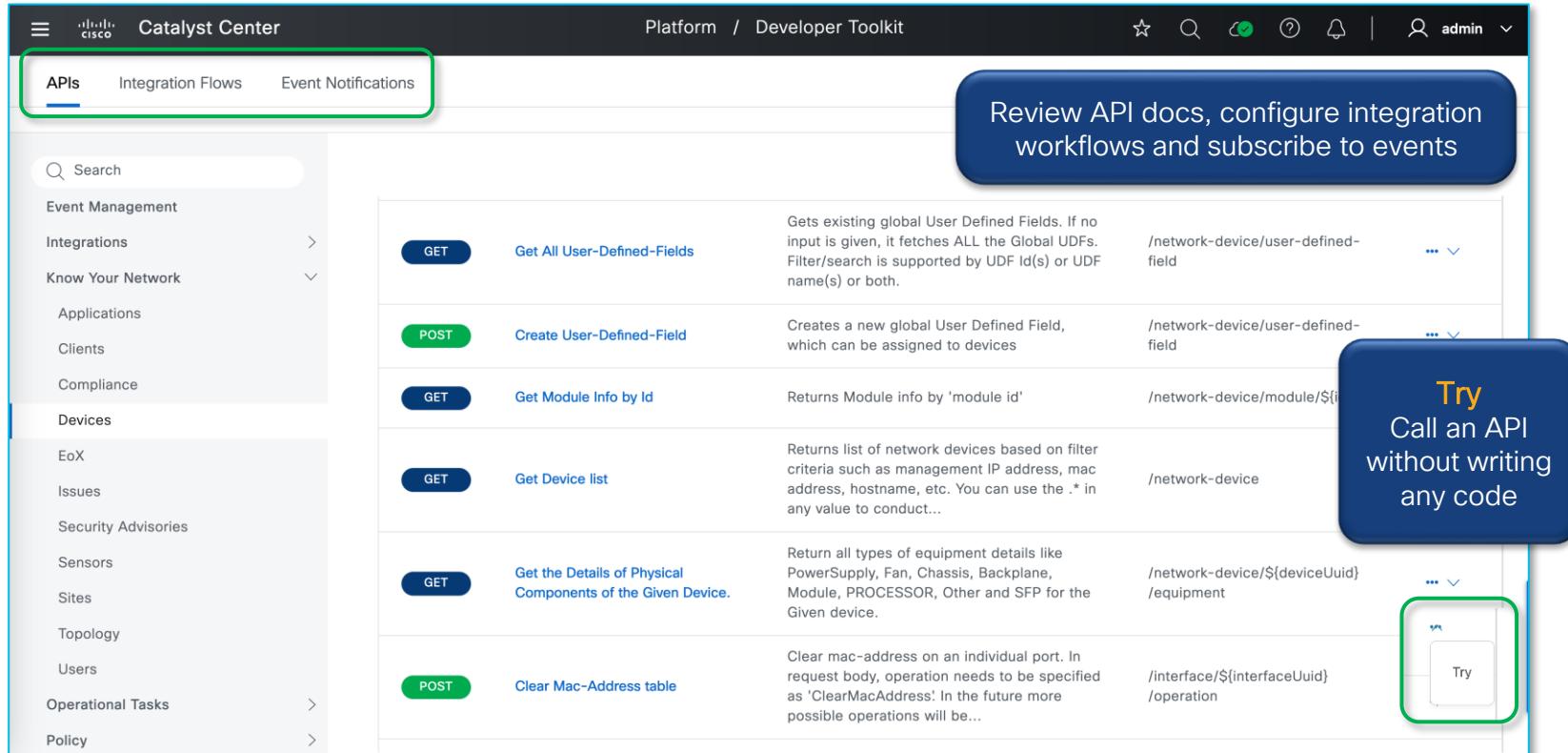
Find

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

Catalyst Center Platform – Developer Toolkit



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

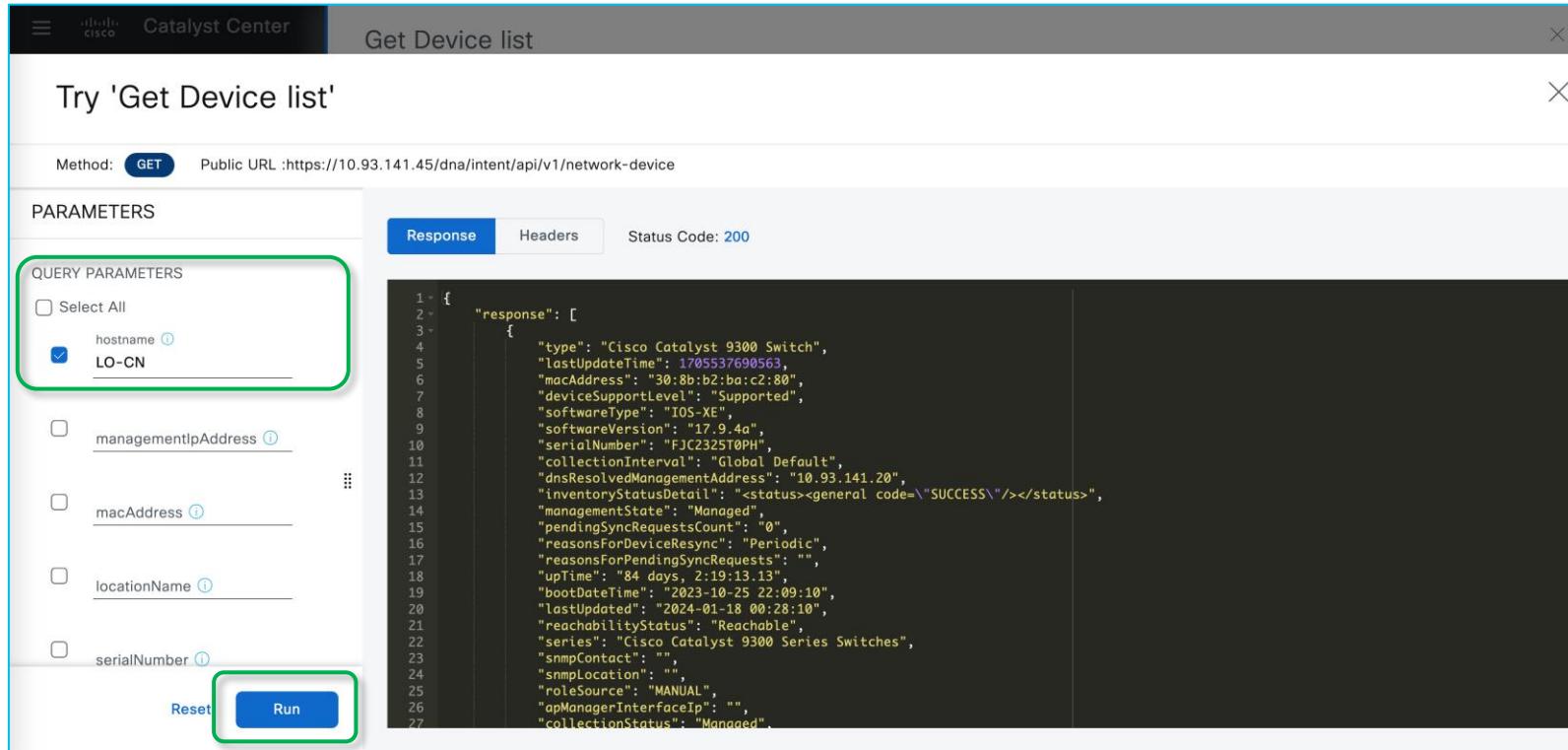
Policy

Review API docs, configure integration workflows and subscribe to events

Try
Call an API without writing any code

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 an API Call



The screenshot shows a web-based API tool interface for 'Catalyst Center'. The title bar says 'Catalyst Center' and the main window title is 'Get Device list'. The sub-header says '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 ①
LO-CN
- managementIpAddress ①
- macAddress ①
- locationName ①
- serialNumber ①

Response Headers Status Code: 200

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

Code Preview

The screenshot shows the Cisco Catalyst Center API documentation for the 'Get Device Count' endpoint. The left sidebar lists various API categories: APIs, Integration Flows, Events, Search, Event Management, Integrations, Know Your Network, Applications, Clients, Compliance, Devices, EoX, Issues, Security Advisories, Sensors, Sites, Topology, Users, Operational Tasks, and Policy. The main content area is titled 'Get Device Count' and shows a GET request to `https://10.93.141.45/dna/intent/api/v1/network-device/count`. A description states: 'Returns the count of network devices based on the filter criteria by management IP address, mac address, hostname and location name'. Below this is the 'Cisco DevNet API Guide'. A tab bar at the top of the content area includes 'Parameters', 'Features', 'Responses', and 'Code Preview', with 'Code Preview' being the active tab and highlighted with a green box. A dropdown menu under 'Language' shows options: Python (highlighted with a green box), Node - Unirest, Node - Request, Ruby, Javascript, and jQuery. The Python code preview is as follows:

```
1 //  
2 //  
3 //  
4 //  
5 //  
6 //  
7 //  
8 //  
9 //  
10 //  
11 //  
12 //
```

token-value'
location/json'

connection("10.93.141.45")

intent/api/v1/network-device/count?hostname=<hostname>&managementIpAddress=<managementIpAddress>&macAddress=<macAddress>&locationName=<locationName>")

)

Close Try

Code Preview
Generate code in
few programming
languages

Platform Runtime Dashboard

Catalyst Center Platform / Runtime Dashboard admin

API Summary

Call Status

API calls received

Total API's 7

Completed Call Performance

API Name	Version	Average	Low	High
Add border device ...	V1	3.399s	3.399s	3.399s
Execute Suggested...	V1	85.05s	0.014s	449.803s
Get CMDB Sync St...	V1	0.239s	0.239s	0.239s
Get Issue Enrichme...	V1	0.332s	0.035s	5.023s

[View All](#)

Event Summary

131 Events published

Search Table

ITSM Events workflows

Domain	Event Name	Count
Connectivity	Interface Connecting Network Devices is Down	34
Connectivity	Switch Unreachable	10
Connectivity	Router unreachable	16
Know Your Network	Device config collection event	46
Know Your Network	Network Device Interface Connectivity - EIGRP Adjacency Failure	1

12 Record(s) Show Records: 10 1 - 10 < 1 2 >

CMDB Synchronization Summary

CMDB sync status

Search Table

Devices from Inventory	Devices sent to ServiceNow	Devices synchronized	Failures	Unknown Sync. Error(s)	Synchronization Attempt
14	14	14	0	0	20 hours ago
14	14	14	0	0	2 days ago

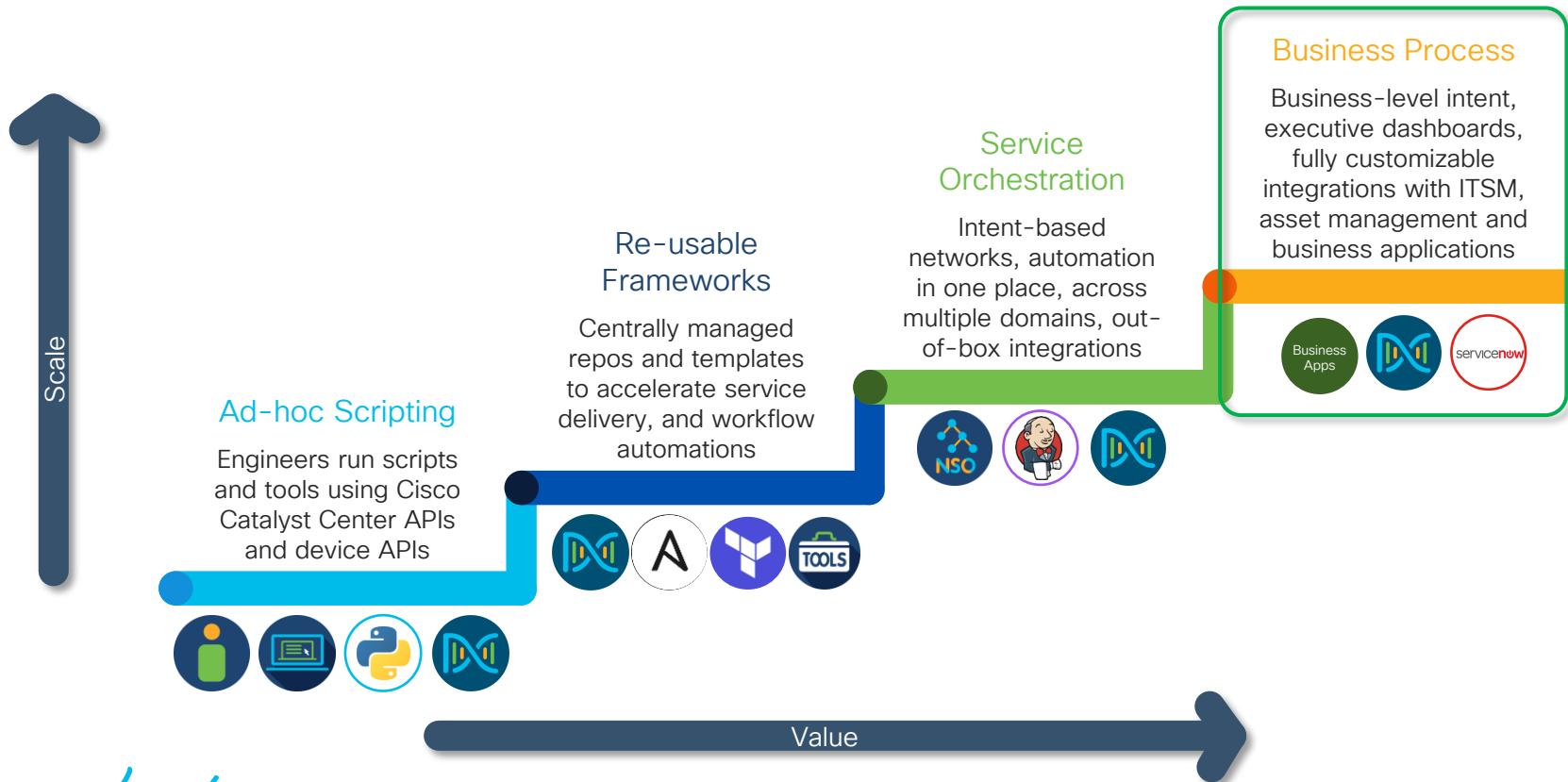
CISCO Live!

BRKOPS-2471

© 2024 Cisco and/or its affiliates. All rights reserved. Cisco Public

12

Cisco Catalyst Center and DevOps Journey

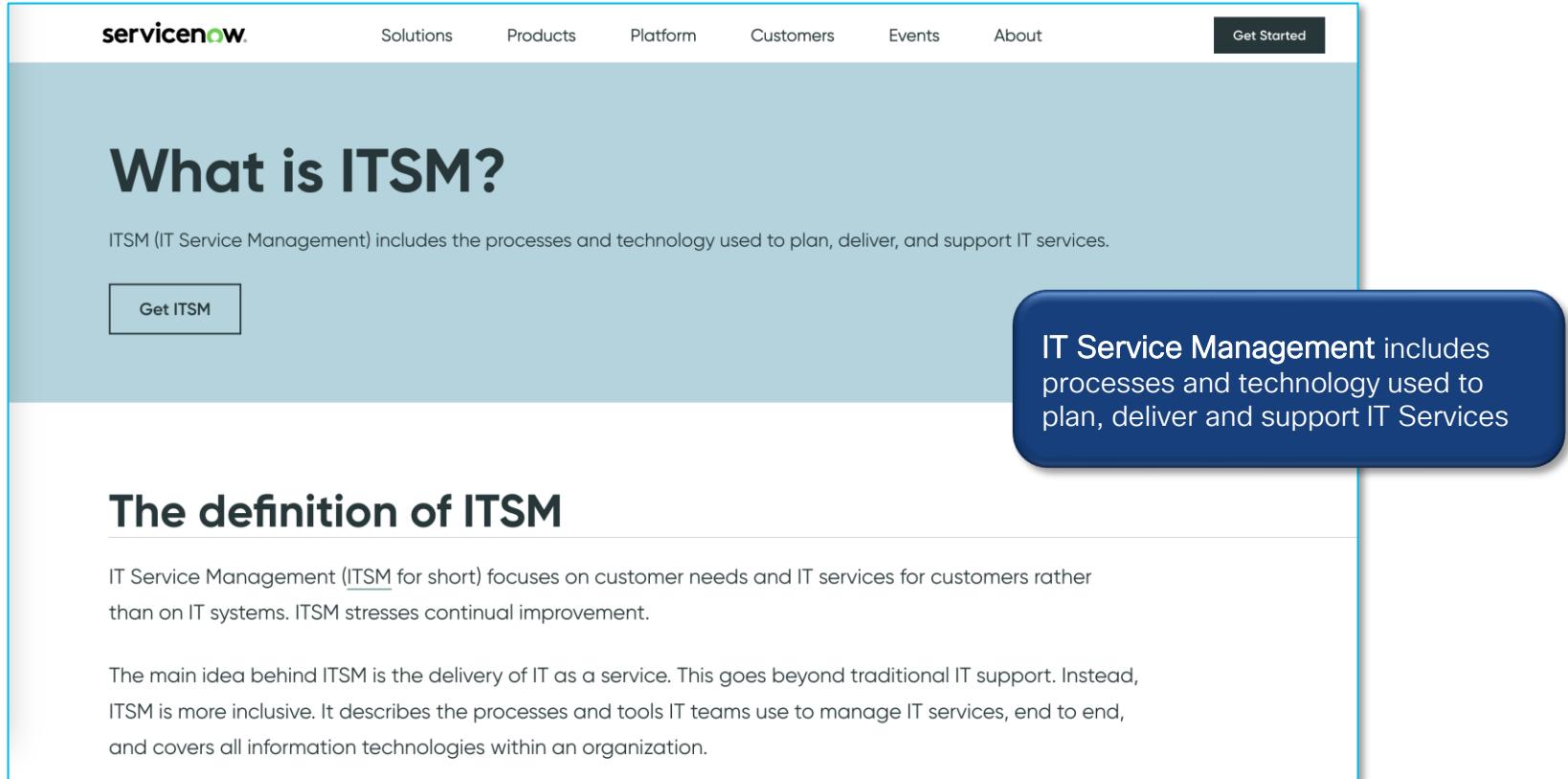


Agenda

CISCO Live!

- Cisco Catalyst Center Platform
- ITSM (ServiceNow) Integration Overview
- CMDB Sync to Staging Table
- Events Notifications to Generic REST API Endpoint
- Network Troubleshooting Custom Workflow
- Summary

ServiceNow IT Service Management (ITSM)



The screenshot shows the ServiceNow website with a navigation bar at the top. The menu items are: Solutions, Products, Platform, Customers, Events, About, and a prominent 'Get Started' button. The main content area has a light blue background. The title 'What is ITSM?' is displayed in large, bold, dark text. Below the title, a description states: 'ITSM (IT Service Management) includes the processes and technology used to plan, deliver, and support IT services.' A 'Get ITSM' button is located on the left. A callout box on the right contains the text: 'IT Service Management includes processes and technology used to plan, deliver and support IT Services'. The bottom section has a white background and features the heading 'The definition of ITSM'. Below this, two paragraphs explain ITSM's focus on customer needs and its delivery as a service, distinguishing it from traditional IT support.

What is ITSM?

ITSM (IT Service Management) includes the processes and technology used to plan, deliver, and support IT services.

Get ITSM

IT Service Management includes processes and technology used to plan, deliver and support IT Services

The definition of ITSM

IT Service Management (ITSM for short) focuses on customer needs and IT services for customers rather than on IT systems. ITSM stresses continual improvement.

The main idea behind ITSM is the delivery of IT as a service. This goes beyond traditional IT support. Instead, ITSM is more inclusive. It describes the processes and tools IT teams use to manage IT services, end to end, and covers all information technologies within an organization.

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?



+ service**now**

Cisco Catalyst Center ServiceNow Integration:

- Increased IT efficiency by streamlining processes
- Automated ServiceNow CMDB population 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 Cisco DNA App



Platform
and
Bundles

REST
APIs

Staging and
Event tables,
Generic REST
API endpoints

service**now**

A screenshot of a ServiceNow interface showing a list of incidents. The interface includes a header with filters like 'All', 'Opened', 'Short description', 'Priority', 'State', 'Cisco DNA-Center IP Address', 'Updated', and 'Cisco DNA-Created Incident'. Below the header is a table with three rows of incident data. Each row contains a checkbox, an incident number (INC00000000, INC00000001, INC00000002), a timestamp (2022-06-01 09:13:50, 2022-06-01 09:13:50, 2022-06-01 20:11:58), a priority (1 - Critical), a state (New), an IP address (10.0.1.41.40), a date (2022-06-01 17:13:50, 2022-06-01 17:13:50, 2022-06-01 20:11:58), and a 'true' value. The table also includes columns for 'Interface' and 'Interface description'. The interface description for the first incident is: 'Interface GigabitEthernet0/0
Interface description:-->
connecting the following two
nodes: Local Node: Node-1
Peer Node: Node-2
Peer Node IP: 10.0.1.40/24
Peer Node MAC: 00:0C:29:00:40:01
Peer Node ID: 1
Peer Node Name: Node-2
Peer Node Organization:'. The second and third incidents have similar descriptions but with different peer node details.

Notes:

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

Multi Cisco Catalyst Center
clusters integrated with one
ServiceNow Instance
supported

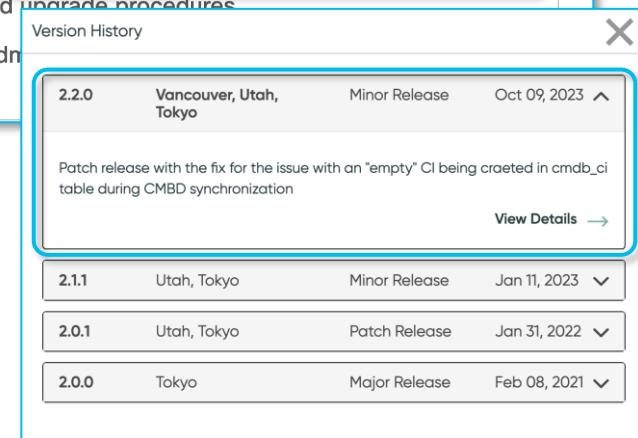
Integration Compatibility

Without the Cisco DNA App

Versions:
Cisco Catalyst Center, 2.3.7.4
ServiceNow

Table 2. Catalyst Center-to-ServiceNow Integration Without the Catalyst Center App Procedure

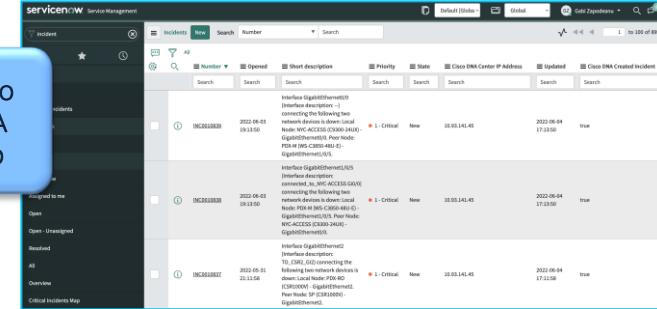
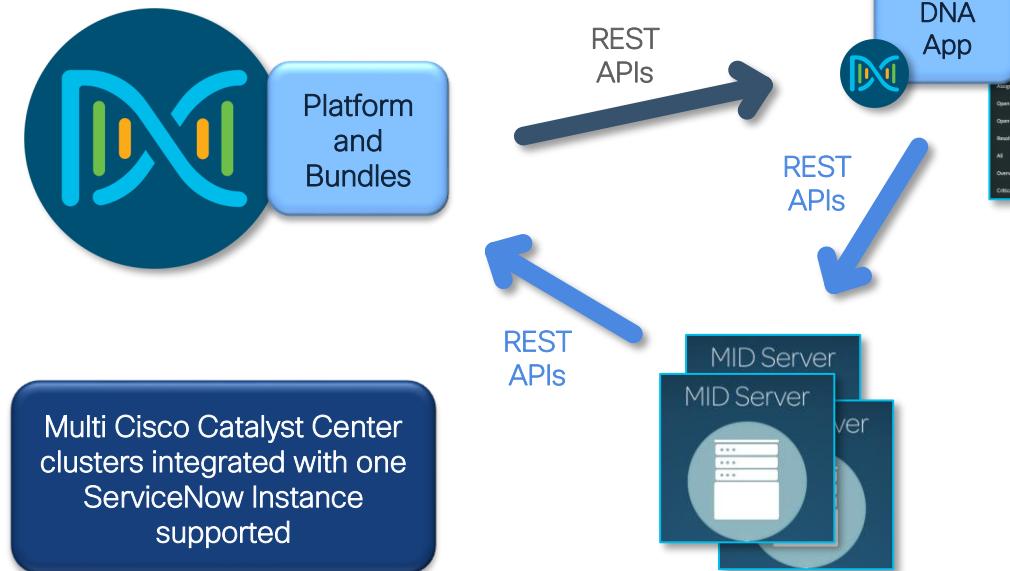
Step	Description
Step 1	<p>Install or upgrade to the latest Catalyst Center release.</p> <p>For information about <i>installing</i> Catalyst Center, see the Cisco Catalyst Center Installation Guide.</p>
Step 2	<p>Install or upgrade to a compatible version of ServiceNow mentioned on the ServiceNow Store website.</p> <p>Click the following link to access the ServiceNow Store website:</p> <p>https://store.servicenow.com/sn_appstore_store.do#!/store/application/03eb0f4ddbf6ba00f27978b5ae96197b</p> <p>Refer to your ServiceNow documentation for its installation and upgrade procedures.</p> <p>Note This procedure must be performed by a ServiceNow admin.</p>



Ref: Cisco Catalyst Center ITSM Integration Guide

ITSM Integration Architecture

With the Cisco DNA App



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

Integration Compatibility

With the Cisco DNA App

Versions:
Catalyst Center 2.3.7.4
ServiceNow Store
Cisco DNA App 2.2.0

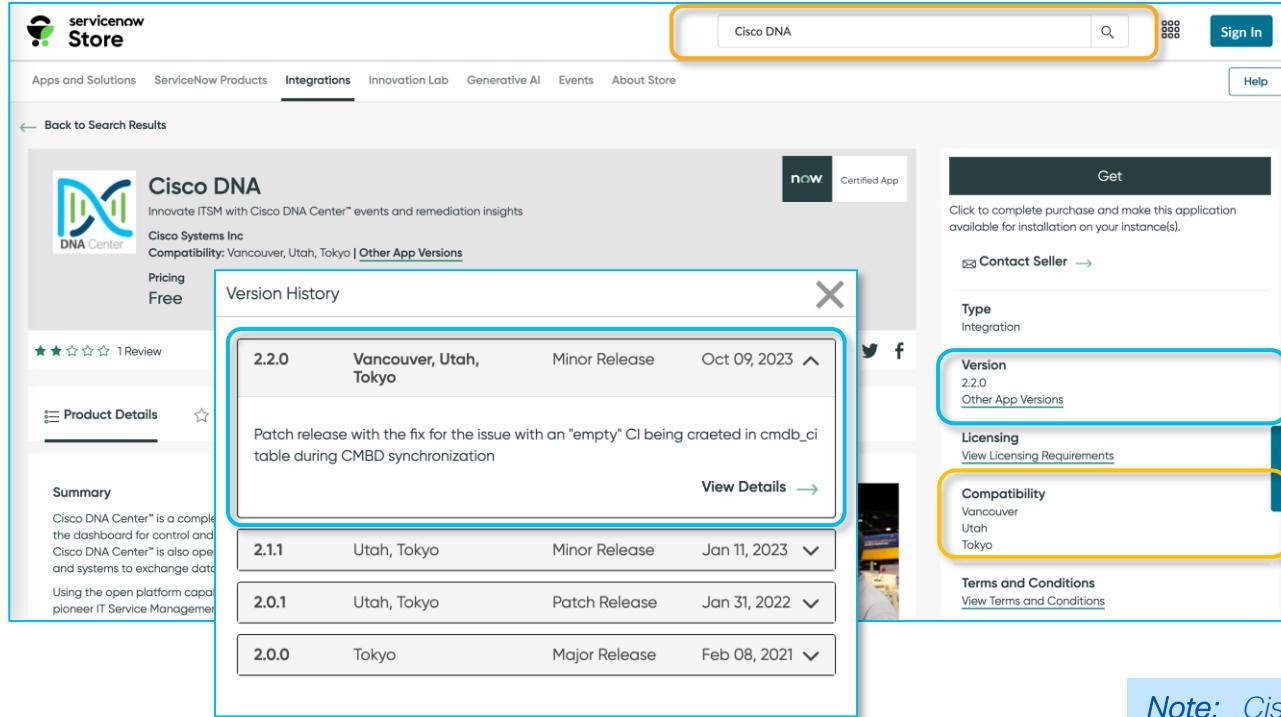
Table 3. Catalyst Center-to-ServiceNow Integration with Catalyst Center App Procedure

Step	Description
Step 1	<p>Install or upgrade to the latest Catalyst Center release.</p> <p>For information about installing Catalyst Center, see the <i>Cisco Catalyst Center Installation Guide</i>.</p>
Step 2	<p>Install or upgrade to a compatible version of ServiceNow mentioned on the ServiceNow Store website.</p> <p>Click the following link to access the ServiceNow Store website:</p> <p>https://store.servicenow.com/sn_appstore_store.do#!/store/application/03eb0f4ddbf6ba00f27978b5ae96197b/2.2.0</p> <p>Refer to your ServiceNow documentation for its installation and upgrade procedures.</p> <p>Note This procedure must be performed by a ServiceNow administrator.</p>
Step 3	<p>Click the following link to access the ServiceNow Store website where the Catalyst Center app is located:</p> <p>https://store.servicenow.com/sn_appstore_store.do#!/store/application/03eb0f4ddbf6ba00f27978b5ae96197b/2.2.0</p> <p>Download and install the Catalyst Center app (version 2.2.0) into ServiceNow by following the documentation available at the website.</p> <p>Note This procedure is to be performed by a ServiceNow administrator. The Catalyst Center app versions 2.1.1 and 2.0.1 are compatible with the Tokyo and Utah releases of ServiceNow. If you want to use the Vancouver release of ServiceNow, you must first upgrade the Catalyst Center app to version 2.2.0.</p>

Ref: Cisco Catalyst Center
ITSM Integration Guide

Cisco DNA App – ServiceNow Store

<https://store.servicenow.com>



The screenshot shows the ServiceNow Store interface. The search bar at the top is highlighted with a yellow box. The main page displays the Cisco DNA app by Cisco Systems Inc. The app is marked as a Certified App. The compatibility section indicates it is available for Vancouver, Utah, and Tokyo. A modal window titled 'Version History' is open, showing the following details:

Version	Location	Type	Release Date
2.2.0	Vancouver, Utah, Tokyo	Minor Release	Oct 09, 2023
2.1.1	Utah, Tokyo	Minor Release	Jan 11, 2023
2.0.1	Utah, Tokyo	Patch Release	Jan 31, 2022
2.0.0	Tokyo	Major Release	Feb 08, 2021

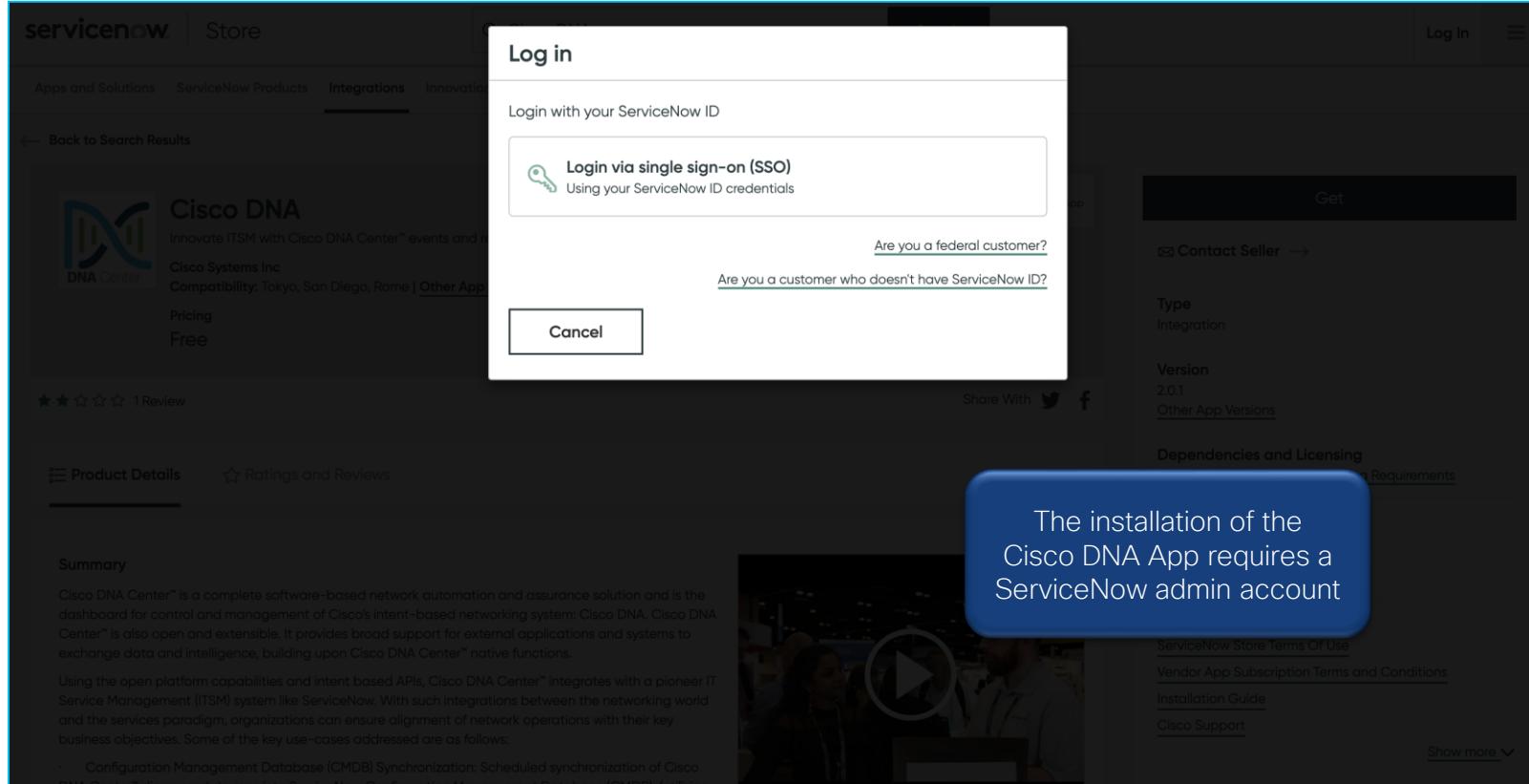
The compatibility section of the main page is also highlighted with a yellow box, showing Vancouver, Utah, and Tokyo.

Search Cisco DNA
Cisco DNA App 2.2.0
ServiceNow Compatibility

Cisco DNA App installation
and configuration guides
ServiceNow MID Server
installation and configuration
guide

*Note: Cisco DNA App and MID server
installations require ServiceNow Admin role*

Cisco DNA App Installation and Configuration



The screenshot shows the ServiceNow Store interface. On the left, the Cisco DNA app page is displayed, featuring the Cisco DNA logo, a brief description, and a 'Free' pricing status. On the right, a 'Log in' modal window is overlaid on the page. The modal has a title 'Log in', a sub-instruction 'Login with your ServiceNow ID', and a button 'Login via single sign-on (SSO)'. It also contains two links: 'Are you a federal customer?' and 'Are you a customer who doesn't have ServiceNow ID?'. A 'Cancel' button is at the bottom of the modal. The background of the store page shows other app categories like 'Integrations' and 'Innovations'.

The Cisco DNA app page includes the following details:

- Summary:** Cisco DNA Center™ is a complete software-based network automation and assurance solution and is the dashboard for control and management of Cisco's intent-based networking system: Cisco DNA. Cisco DNA Center™ is also open and extensible. It provides broad support for external applications and systems to exchange data and intelligence, building upon Cisco DNA Center™ native functions.
- Using the open platform capabilities and intent based APIs, Cisco DNA Center™ integrates with a pioneer IT Service Management (ITSM) system like ServiceNow. With such integrations between the networking world and the services paradigm, organizations can ensure alignment of network operations with their key business objectives. Some of the key use-cases addressed are as follows:**
- Configuration Management Database (CMDB) Synchronization: Scheduled synchronization of Cisco

The installation of the Cisco DNA App requires a ServiceNow admin account

ServiceNow Store Terms Of Use
Vendor App Subscription Terms and Conditions
Installation Guide
Cisco Support
Show more ▾

ServiceNow MID Server Installation

The screenshot shows the ServiceNow interface for downloading the MID Server. The left sidebar is titled 'MID Server' and includes 'Installation Instructions' (highlighted with a green box), 'Downloads' (highlighted with a green box), 'Dashboard', 'Servers', 'Server Issues', 'Upgrade History', 'Clusters', 'Properties', and 'Script Includes'. The main content area is titled 'Download MID Server' and contains sections for 'Windows Downloads' and 'Linux Downloads'. The 'Windows Downloads' section shows 'Windows (MSI)' and 'Windows Docker Recipe' both in 64-bit format. The 'Linux Downloads' section shows 'Linux (RPM)', 'Linux (DEB)', and 'Linux Docker Recipe' all in 64-bit format. A blue callout box points to the 'Windows Docker Recipe' and 'Linux Docker Recipe' sections with the text 'Supported on all major server operating systems, and Docker'. A blue box at the bottom left contains the text 'Notes: Installation instructions include all details for your host VM operating system Not required to have a dedicated MID server for the ITSM integration'.

Notes:
Installation instructions include all details for your host VM operating system
Not required to have a dedicated MID server for the ITSM integration

Select and download the MID Server for the appropriate operating system. If the download does not begin immediately, try the download at a later time as the system may be busy. Refer to the [installation instructions](#) for more details.
Note: Please refer release notes for MID Server Host OS compatibility matrix for current and upcoming releases.

Windows Downloads

For Windows docker recipe, please follow the steps in [Build MID Server Docker Image for Windows](#) .

Windows (MSI)	Windows Docker Recipe
64 bit	64 bit

Linux Downloads

For Linux docker recipe, please follow the steps in [Build MID Server Docker Image for Linux](#) .

Linux (RPM)	Linux (DEB)	Linux Docker Recipe
64 bit	64 bit	64 bit
64 bit signatures	64 bit signatures	64 bit signatures

ServiceNow MID Server Management

The screenshot displays the ServiceNow MID Server Management interface. On the left, a sidebar lists various management categories: MID Server, Installation Instructions, Downloads, Dashboard (highlighted with a green box), Servers, Server Issues, Upgrade History, Clusters, Properties, Script Includes, Script Files, IP Ranges, Applications, Mid Selector Override, Capabilities, and a circular icon. The main area shows the 'MID Server Dashboard' with a table of server status. One row for 'midserver2' is selected, showing details like Host name (gabi-lm), Status (Up), Validated (Yes), Version (tokyo-07-08-2022_patch1b-11-03-2022_11...), Logged in user (midserver-en2), Max memory used % (13), Mean CPU used % (1), Pending jobs (0), and Processing jobs (0). Below the dashboard is a 'MID Servers' list table with columns: Name, Host name, Status, Validated, Version, Last refreshed, Started, Stopped, Router, and Logged in user. The same 'midserver2' row is selected here. A context menu is open over this row, with 'Actions on selected rows...' at the top. The menu items are: Validate, Rekey, Invalidate, Clear auto invalidated, Delete, Delete with preview..., Create Application File, Pause MID, Resume MID, Restart MID, and Upgrade MID (which is highlighted with an orange box). A sub-section titled 'Assign Tag:' lists tags: New tag, Governance, Risk, and Compliance, Customer Service Management, Now Intelligence, Customer Service, and Risk. At the bottom of the menu is 'Performance Analytics and Reporting'.

Servers Menu:

- Hostname, status and validation, version, config details
- Server management – delete, rekey, update, restart, logs

MID Server IP Ranges

The screenshot shows the ServiceNow interface for managing MID Server IP ranges. The left sidebar is titled 'Service Management' and includes sections for MID Server, Installation Instructions, Downloads, Dashboard, Servers (which is selected and highlighted with a green box), Server Issues, Upgrade History, Clusters, Properties, Script Includes, Script Files, IP Ranges (which is also highlighted with a green box), and Applications. The main content area shows a 'MID Server' record for 'midserver2'. The 'IP Ranges' tab is selected. A callout box with a blue gradient background and white text says: 'Verify if your MID server will “route” traffic to the Cisco Catalyst Center subnet'. The IP range table shows one entry: 'IP range' 10.93.140.0/23 with 'Type' set to 'Include'. The bottom of the page has a footer with the Cisco Live! logo and the text 'BRKOPS-2471'.

Verify if your MID server will “route” traffic to the Cisco Catalyst Center subnet

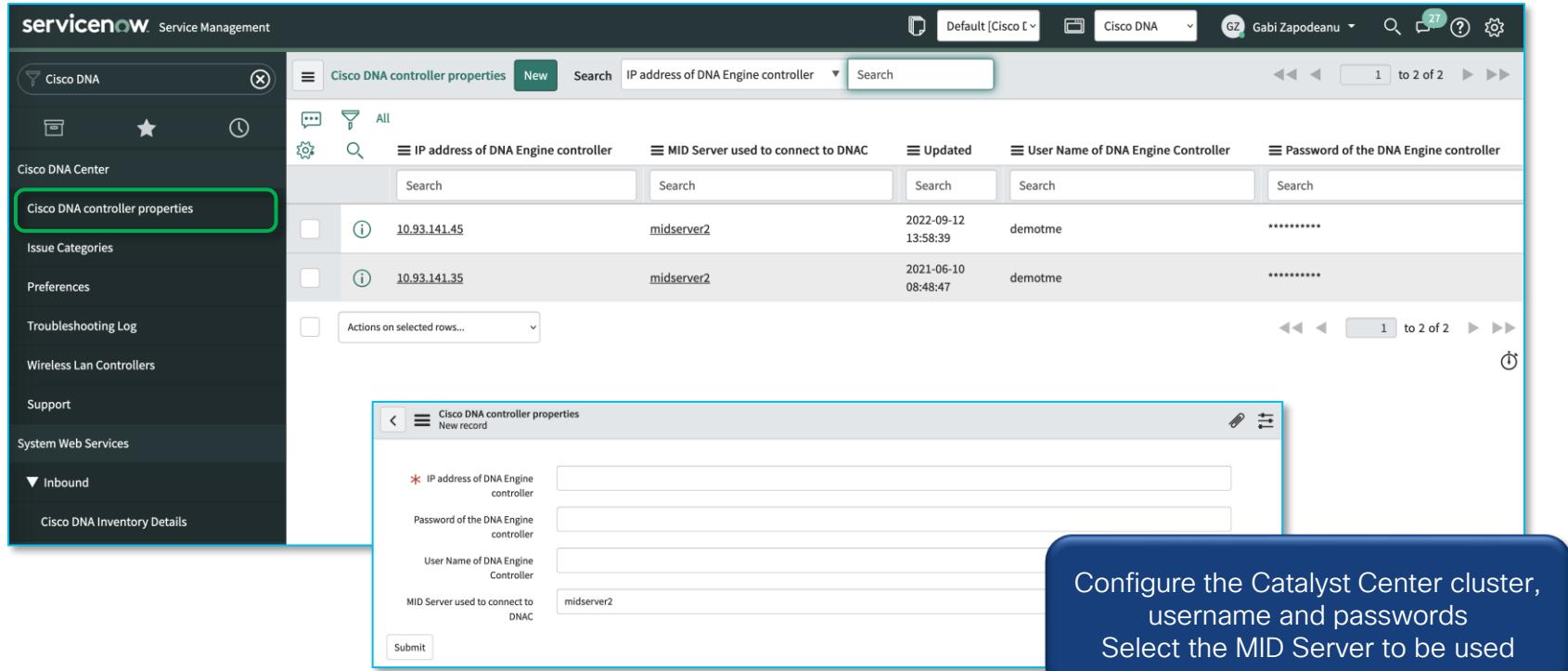
IP range	Type
10.93.140.0/23	Include

MID Server Logs

The screenshot shows a ServiceNow interface with two main panels. The left panel is a navigation tree for 'MID Server' with sections like MID Server, Installation Instructions, Downloads, Dashboard, Servers, Server Issues, Upgrade History, Clusters, Properties, Script Includes, Script Files, IP Ranges, and Applications. The right panel is a 'MID Server File' view for 'agent0.log'. It shows a table with two rows, both labeled 'agent0.log' with the path '/home/gabi/ServiceNow/midserver2/agent/l...'. The first row has a timestamp of '2022-12-17 00:48:43' and the second has '2022-12-17 00:48:43'. The 'Content' field displays log entries, with the first four entries highlighted by a red box. The log entries are:

```
2023-01-12 11:21:18 INFO (ECCSender.1) [ECCSenderCache:345] Sending ecc_queue.3b73e0a6db10e550dcba463d13961934.xml
2023-01-12 11:21:18 INFO (ECCSender.1) [ECCSenderCache:345] Sending ecc_queue.3373e0a6db10e550dcba463d13961934.xml
2023-01-12 11:21:18 INFO (ECCSender.1) [ECCSenderCache:345] Sending ecc_queue.3f73e0a6db10e550dcba463d13961934.xml
2023-01-12 11:21:43 INFO (LogStatusMonitor.60) [LogStatusMonitor:49] 2023-01-12T19:21:43.376Z, stats threads: 94, memory max: 910.0mb, allocated: 348.0mb, used: 85.0mb, standard.queued: 0 probes, standard.processing: 0 probes, expedited.queued: 0 probes, expedited.processing: 0 probes, interactive.queued: 0 probes, interactive.processing: 0 probes
2023-01-12 11:22:43 INFO (LogStatusMonitor.60) [LogStatusMonitor:49] 2023-01-12T19:22:43.358Z, stats threads: 92, memory max: 910.0mb, allocated: 314.0mb, used: 85.0mb, standard.queued: 0 probes, standard.processing: 0 probes, expedited.queued: 0 probes, expedited.processing: 0 probes, interactive.queued: 0 probes, interactive.processing: 0 probes
2023-01-12 11:23:21 INFO (Worker-Expedited:MidWorker-a73a4ee1b9065509dd1c8866e4bcbe) [AWorker:128] Worker starting: RESTProbe source: https://10.93.141.45/api/system/v1/auth/token
2023-01-12 11:23:21 INFO (Worker-Expedited:MidWorker-a73a4ee1b9065509dd1c8866e4bcbe) [ECCSender:206] Enqueuing: /home/gabi/ServiceNow/midserver2/agent/work/monitors/ECCSender/output/1ecc_queue.a73a4ee1b9065509dd1c8866e4bcbe.xml
2023-01-12 11:23:21 INFO (Worker-Expedited:MidWorker-a73a4ee1b9065509dd1c8866e4bcbe) [AWorker:136] Worker completed: RESTProbe source: https://10.93.141.45/api/system/v1/auth/token time: 0:00:00.051
2023-01-12 11:23:22 INFO (ECCSender.1) [ECCSenderCache:345] Sending ecc_queue.a73a4ee1b9065509dd1c8866e4bcbe.xml
2023-01-12 11:23:23 INFO (Worker-Expedited:MidWorker-8404a4ee1b9065509dd1c8866e4bcbe) [AWorker:128] Worker starting: RESTProbe source: https://10.93.141.45/dna/intent/api/v1/update-item-details
2023-01-12 11:23:23 INFO (Worker-Expedited:MidWorker-8404a4ee1b9065509dd1c8866e4bcbe) [ECCSender:206] Enqueuing: /home/gabi/ServiceNow/midserver2/agent/work/monitors/ECCSender/output/1ecc_queue.8404a4ee1b9065509dd1c8866e4bcbe.xml
2023-01-12 11:23:23 INFO (Worker-Expedited:MidWorker-8404a4ee1b9065509dd1c8866e4bcbe) [AWorker:136] Worker completed: RESTProbe source: https://10.93.141.45/dna/intent/api/v1/update-item-details
```

Cisco DNA Controller Properties



servicenow. Service Management

Cisco DNA controller properties New Search IP address of DNA Engine controller Search

All

	IP address of DNA Engine controller	MID Server used to connect to DNAC	Updated	User Name of DNA Engine Controller	Password of the DNA Engine controller
<input type="checkbox"/>	10.93.141.45	midserver2	2022-09-12 13:58:39	demotme	*****
<input type="checkbox"/>	10.93.141.35	midserver2	2021-06-10 08:48:47	demotme	*****

Actions on selected rows...

Cisco DNA controller properties New record

IP address of DNA Engine controller:

Password of the DNA Engine controller:

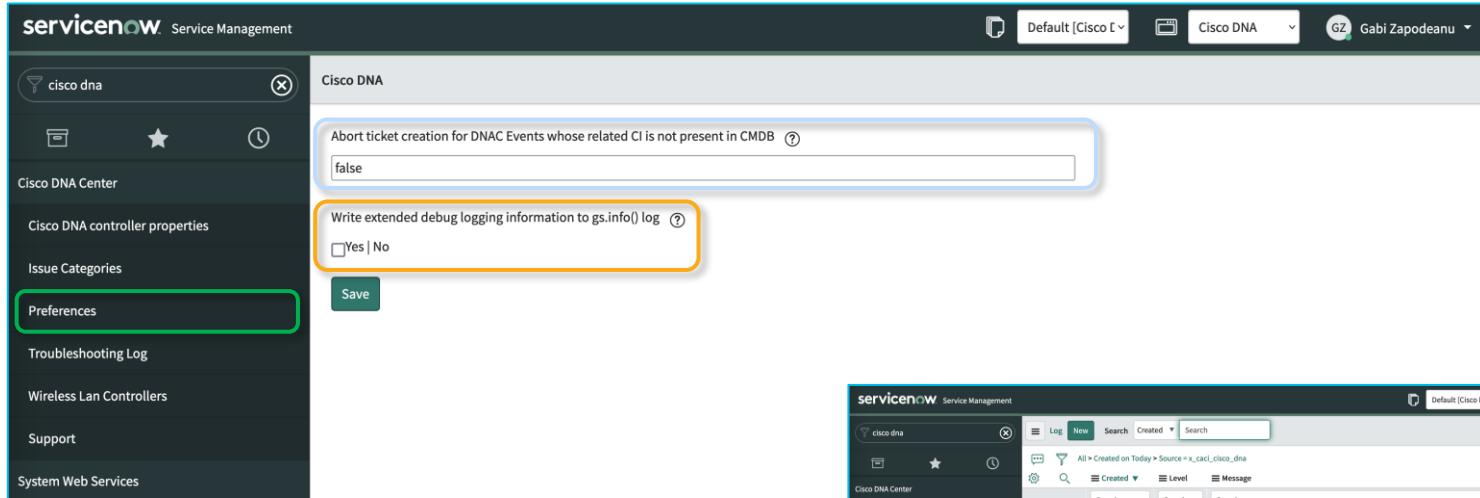
User Name of DNA Engine Controller:

MID Server used to connect to DNAC:

Submit

Configure the Catalyst Center cluster, username and passwords
Select the MID Server to be used

Cisco Catalyst Center Preferences

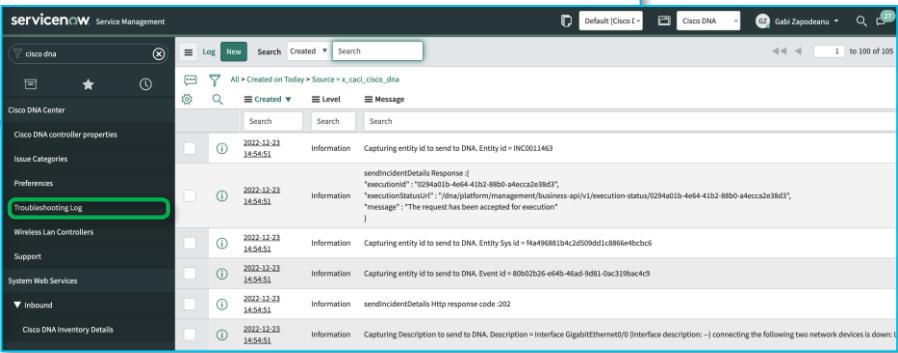


Abort ticket creation for DNAC Events whose related Ci is not present in CMDB false

Write extended debug logging information to gs.info() log Yes | No

Save

Allow to create incidents for networks devices not in the ServiceNow CI table
Enable debugging when troubleshooting: API calls, transform sets, business rules



Created	Level	Message
2022-12-23 14:54:51	Information	Capturing entity id to send to DNA. Entity id = INC0011463
2022-12-23 14:54:51	Information	sendincidentDetails Response : { "executionId": "0294a01b-4e64-41b2-88b0-a4ecc2a38d3", "executionStatus": "DNA/Platform/Management/Business-API/v1/execution-status/0294a01b-4e64-41b2-88b0-a4ecc2a38d3", "message": "The request has been accepted for execution" }
2022-12-23 14:54:51	Information	Capturing entity id to send to DNA. Entity Sys Id = f4a496881b4c2d509d4d1c8866e0bc0c6
2022-12-23 14:54:51	Information	Capturing entity id to send to DNA. Event id = 80b02b26-e44b-464d-9d81-0a319bac4c9
2022-12-23 14:54:51	Information	sendincidentDetails Http response code :202
2022-12-23 14:54:51	Information	Capturing Description to send to DNA. Description = Interface GigabitEthernet0/0 [Interface description: --] connecting the following two network devices down:

ITSM Destination Settings

1. Cisco Catalyst Center Settings → Destinations
2. Select ITSM, add new
3. Instance Name, Description
4. Hostname, username and password
5. Verify Connectivity

Notes:

The user account used by Cisco Catalyst Center to connect to ServiceNow requires specific roles.

Please find all details in the “Scope Certified Application Installation and Configuration Guide” included with the Cisco DNA App documentation on ServiceNow

The screenshot shows the Cisco Catalyst Center interface with the following steps highlighted:

1. The 'Destinations' tab in the Settings/External Services section.
2. The 'ITSM' tab in the Destinations list, which is highlighted with a green box.
3. The 'Add Instance' dialog box showing the 'INFORMATION' section with 'Instance Name' set to 'ven_03092_instance'.
4. The 'INFORMATION' section of the dialog box, showing 'Host Name' as 'https://ven03092.service-now.com', 'User Name' as 'AppAdmin-en2', and 'Password' as a masked value.
5. The 'Check connectivity' section of the dialog box, showing a green checkmark and the message 'Connection Established'.

The main Catalyst Center interface shows a table of destinations:

Name	Description
CL_Ven03092	Vendor 03092 Instance Events Generic REST API
ST_Ven03092	Vendor 03092 ServiceNow Instance Staging Table
ven03092	

Integration Settings

Catalyst Center

System / Settings

Search

Cisco Catalyst - Cloud

Webex Integration

ThousandEyes Integration

System Configuration

Debugging Logs

Visibility and Control of Configur...

Geo Map Settings

Proxy

High Availability

Multiple Cisco Catalyst Center S...

Integration Settings

System Health

Login Message

Authentication API Encryption

Terms and Conditions

Product Telemetry

Trust & Privacy

Account Lockout

Settings / System Configuration

Integration Settings

Callback URL Host Name or IP Address

10.93.141.45

This Host Name or IP Address will be used in the Integration Callback URLs

Clear

Apply

Cisco Catalyst Center → System → Settings → Integration Settings Verify or configure the callback IP address

Use Cases

Configuration Items		
	All	
	Name	Class
<input type="checkbox"/>	NYC-RO	IP Router
<input type="checkbox"/>	LO-CN	IP Switch
<input type="checkbox"/>	PDX-STACK	IP Switch
<input type="checkbox"/>	PDX-RN	IP Router
<input type="checkbox"/>	NYC-ACCESS	IP Switch
<input type="checkbox"/>	C9800-CL	Wireless Lan Controller
<input type="checkbox"/>	PDX-M	IP Switch
<input type="checkbox"/>	AP3800i	Wireless Access Point

CMDB Sync

Incident Management						
All		Number	Opened	Short description	Priority	State
Search	Search	Search	Search	Search	Search	Search
		INC0010830	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
		INC0010831	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
ITSM use cases supported						
<ul style="list-style-type: none">CMDB syncIncident managementSWIM, Group Based Policy, Fabric configuration, Configuration Visibility and ControlEndpoint attribute retrievalIncident enrichment						
Change Management						
Type	State	Planned start date	Search	Search	Search	Search
Request	Standard	Canceled	2022-05-05 23:45:00			
Creation Image	Standard	Canceled	2022-05-06 08:35:00			
CHG0030012	SWIM Upgrade Request Creation Image Activation	Standard	Canceled	2022-05-06 08:33:00		
CHG0030011	SWIM Upgrade Request Creation Image Activation	Standard	Closed	2021-10-05 17:30:00		
CHG0030010	SWIM Upgrade Request Creation Image Activation	Standard	Review	2021-10-05 17:00:00		

Cisco DNA App

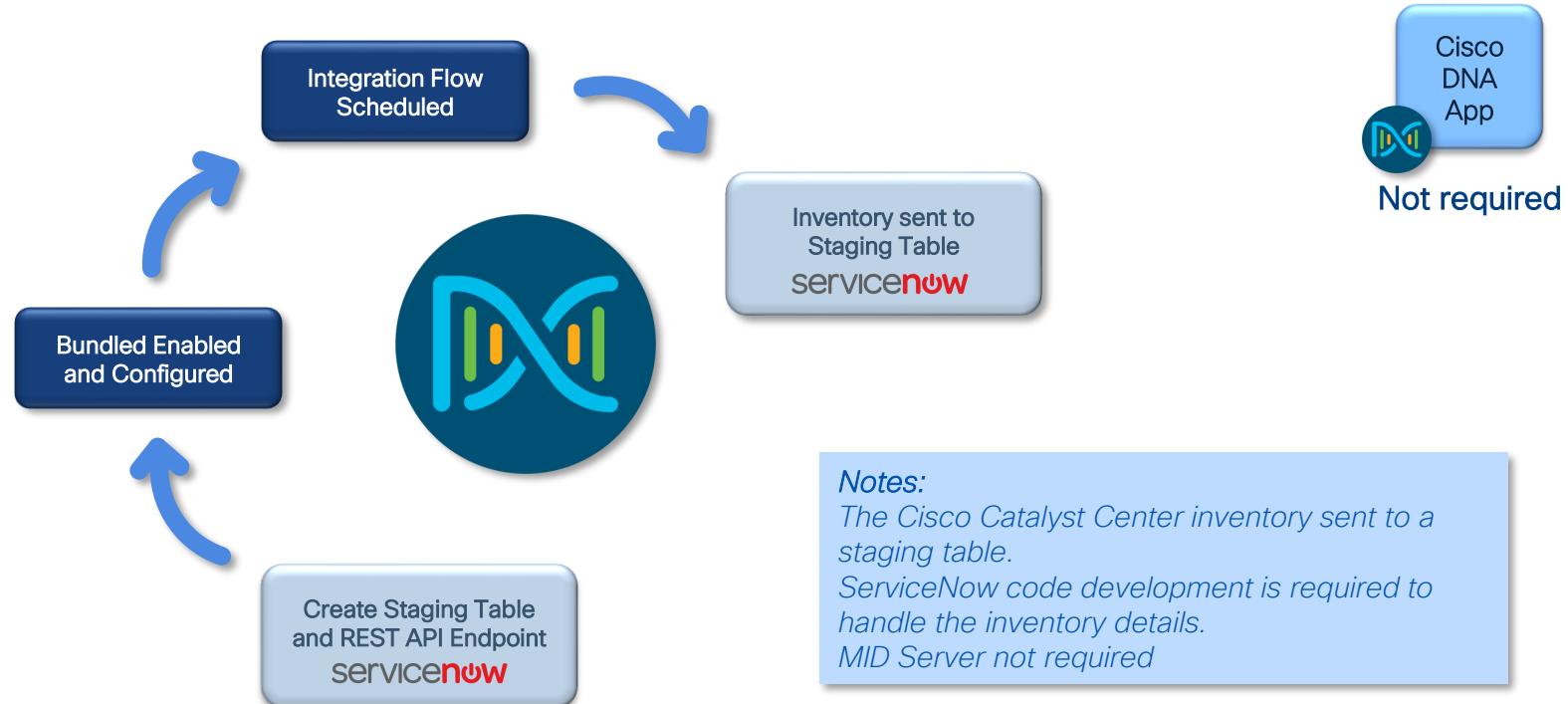
required

Agenda

CISCO Live!

- Cisco Catalyst Center Platform
- ITSM (ServiceNow) Integration Overview
- CMDB Sync to Staging Table
- Events Notifications to Generic REST API Endpoint
- Network Troubleshooting Custom Workflow
- Summary

Configuration Management Database Sync To Staging Table



ServiceNow Create New Staging Table

The screenshot shows the ServiceNow interface for creating a new table. The left sidebar is collapsed, and the main area shows a list of tables. A blue callout box contains the following steps:

1. Apply filter **Tables**
2. Select **System Definition/Tables**
3. Create new table

A blue callout box on the right contains the following notes:

Notes:
ServiceNow staging tables are used to import and store data.
A transform map will process the data and update the target table.

Label	Name	Type	Value	Created
Events REST API	u_events_rest_api			2023-01-14 00:24:35
Model State Transition	sttrm_state_transition	Application File	true	2023-01-14 00:24:35
Model State Transition Condition	sttrm_transition_condition	Application File	true	2023-01-14 00:24:35
Model State	sttrm_state	Application File	true	2023-01-14 00:24:34
Additional MetricBase Trigger Filtering	sys_metric_trigger_moderator	Application File	false	2022-12-28 12:11:30
MetricBase Model Trigger Level	sys_metric_trigger_level_model	MetricBase Trigger Level	false	2022-12-28 12:11:30
Retention Policy Schedule	sys_metric_schedule	Application File	false	2022-12-28 12:11:30
MetricBase Status	v_clotho_series			
MetricBase Trigger Log	sys_metric_trigger_log0006			
MetricBase Band Trigger Level	sys_metric_trigger_level_band			
MetricBase Trigger Log	sys_metric_trigger_log0007			
MetricBase Trigger Log	sys_metric_trigger_log0004	Log Entry	false	2022-12-28 12:11:28

ServiceNow Create Table and REST API Endpoint

The image shows the ServiceNow Service Management interface. On the left, the navigation bar includes 'Tables', 'System Definition', 'Tables & Columns', 'Decision Tables', 'Remote Tables' (expanded), 'Tables', 'Definitions', 'System Diagnostics', 'Session Debug' (expanded), 'Debug SQL (Large Tables)', 'System Import Sets', 'Import Set Tables' (expanded), and 'Cleanup'. The main area is titled 'Table New record' with a 'Label' field set to 'Staging Table API' and a 'Name' field set to 'u_staging_table_api'. A callout bubble with a blue border and a numbered circle '1' highlights these fields. The 'Application' dropdown is set to 'Global' and the 'Create module' checkbox is checked. A 'Submit' button is visible. Below this, the 'Dictionary Entries' table shows a single row for 'inventory_details' with a type of 'String' and a maximum length of '100000'. A callout bubble with a blue border and a numbered circle '2' highlights this row. At the bottom, a 'Submit' button is visible. A third numbered circle '3' is located at the bottom left of the interface.

1. Create a new Label. The table name will be created for you, customize if needed
2. Create a new Column label, Type, Max length
example: `inventory_details, string, 100,000`
1. Submit

Column label	Type	Max length	Default value	Display
inventory_details	String	100000		false

ServiceNow New REST API Endpoint

The screenshot shows the ServiceNow interface for managing a table named "Staging Table API". The left sidebar includes sections for System Definition, Tables, Tables & Columns, Decision Tables, and Remote Tables. The main content area shows the table's details, including its name, a list of related links (Design Form, Layout Form, Layout List, Show Form, Show List, Show Schema Map, Add to Service Catalog, Run Point Scan, and Explore REST API), and a tab for Access Controls (4). A callout box with a blue background and white text says: "Verify the operations allowed for the new REST API endpoint" and "Explore the new REST API endpoint". The Access Controls table is highlighted with an orange border and shows four entries for the "u_staging_table_api" operation, all of which are "true" for Active. A callout box with a light blue background and white text says: "Note: The API allows the data to be sent to the staging table".

Access Control	Name	Operation	Type	Active	Updated by	Updated
1	u_staging_table_api	create	record	true	gzapodea2	2023-04-24 15:24:33
2	u_staging_table_api	delete	record	true	gzapodea2	2023-04-24 15:24:33
3	u_staging_table_api	read	record	true	gzapodea2	2023-04-24 15:24:33
4	u_staging_table_api	write	record	true		

ServiceNow New REST API Endpoint - continued

REST API Explorer

Note: Save the new REST API endpoint:
url = 'https://ven03092.service-now.com/api/now/table/u_staging_table_api'

The screenshot shows the REST API Explorer interface. On the left, a sidebar lists various actions: Create a record (POST), Retrieve a record (GET), Modify a record (PUT), Delete a record (DELETE), Update a record (PATCH), Export OpenAPI Specification (YAML), and Export OpenAPI Specification (JSON). The main area is titled 'Table API' and describes it as allowing CRUD operations on existing tables. A 'Create a record' section shows a POST request to 'https://ven03092.service-now.com/api/now/table/{tableName}'. The 'Prepare request' section includes a 'Path parameters' table with a row for 'tableName' set to 'Staging Table API (u_staging_table_api)'. The 'Request Body' section shows a JSON builder with the following content:

```
{"inventory_details": {"device": "PDX-M", "location": "floor-2"}}
```

A blue callout bubble on the right says: 'Identify the new REST API endpoint' and 'Test the new REST API endpoint'.

Create a New ServiceNow Destination

The image shows the Cisco Catalyst Center interface. On the left, a sidebar menu is open with the following items:

- Design
- Policy
- Provision
- Assurance
- Workflows
- Tools
- Platform
- Activities
- Reports
- System** (highlighted with a blue circle and the number 2)
- Explore

Under the System menu, the following sub-options are listed:

- System 360
- Settings** (highlighted with a blue circle and the number 3)
- Data Platform
- Users & Roles
- Backup & Restore
- Software Management
- Disaster Recovery

The main content area of the interface includes the following sections:

- Global Issues**: Shows 7 P1 and 2 P2 issues.
- Trends and Insights**: Shows 0 AP Performance Advertisements and 0 Trend Deviations.
- Devices**: Shows 4 unclaimed, 1 unprovisioned, and 3 unreachable devices.
- Application QoS Policies**: Shows 0 successful, 0 errored, and 0 stale policies.

A callout box with a blue border and rounded corners is positioned over the System menu item. It contains the following list:

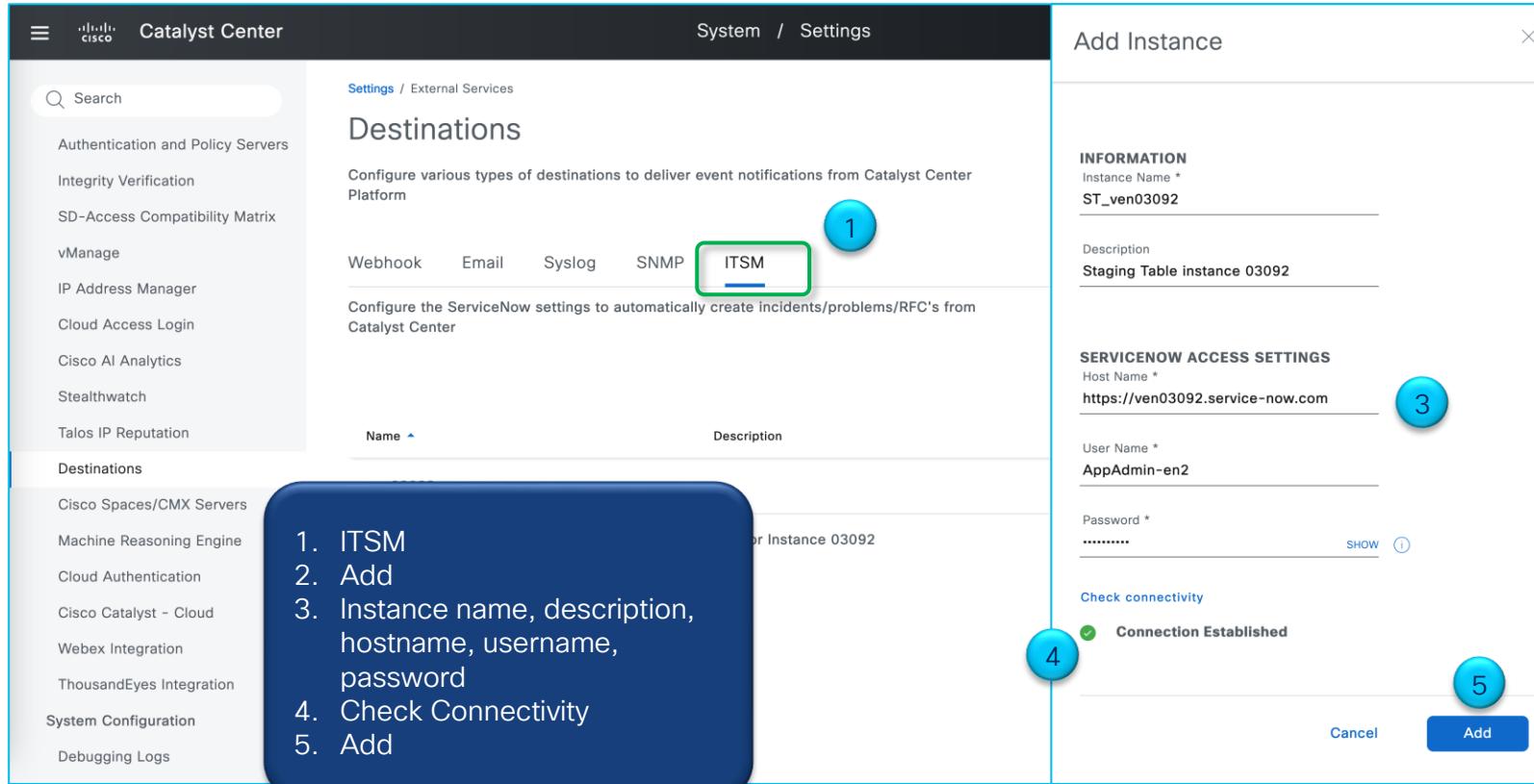
1. Catalyst Center Menu
2. System
3. Settings

Create a New ServiceNow Destination - continued

The screenshot shows the 'External Services' page in the Cisco DNA Center interface. The left sidebar lists various integration options, with 'Destinations' highlighted by a green box and a blue circular badge with the number '1'. A blue callout bubble labeled '1. Destinations' points to the 'Destinations' section. The main content area displays several integration points, each with a brief description:

- Umbrella**: Register Umbrella with your Cisco DNA Center.
- Integrity Verification**: Set Integrity verification to monitor the devices for unexpected or invalid changes that could indicate a risk that the devices were compromised.
- vManage**: Connect Cisco DNA Center to the vManage server.
- Cloud Access Login**: Configure automatic login for Platform Suite users from Cisco DNA cloud to this Cisco Catalyst Center.
- Stealthwatch**: Register the Stealthwatch Management Console with your Cisco DNA Center.
- Destinations**: Configure various types of destinations to deliver event notifications.
- Authentic**: Specify the authentication method for the Cisco DNA Center.
- SD-Access Compatibility Matrix**: Cisco DNA Center periodically compares operational SD-Access Fabric Nodes hardware and software attributes against the information published in the Cisco SD-Access Compatibility Matrix.
- IP Address Manager**: Connect Cisco DNA Center to an IP Address Manager.
- Cisco AI Analytics**: Set up the Cisco artificial intelligence (AI) and Machine Learning configuration.
- Talos IP Reputation**: Enabling Cisco Talos IP Reputation connects Catalyst Center to Talos, detecting when endpoints attempt to access IPs with an untrusted reputation. Talos Intelligence Group manages the world's most comprehensive real-time threat detection network.
- Cisco Spaces/CMX Servers**: Connect Cisco DNA Center to a Cisco Spaces/CMX server.

Create a New ServiceNow Destination – continued



1. ITSM

2. Add

3. Instance name, description, hostname, username, password

4. Check Connectivity

5. Add

Catalyst Center

System / Settings

Destinations

Configure various types of destinations to deliver event notifications from Catalyst Center Platform

Webhook Email Syslog SNMP **ITSM**

Configure the ServiceNow settings to automatically create incidents/problems/RFC's from Catalyst Center

INFORMATION

Instance Name * ST_ven03092

Description Staging Table instance 03092

SERVICENOW ACCESS SETTINGS

Host Name * <https://ven03092.service-now.com>

User Name * AppAdmin-en2

Password * [SHOW](#)

[Check connectivity](#) **Connection Established**

[Cancel](#) **Add**

CMDB Sync Bundle Configuration

The screenshot shows the Catalyst Center interface with the following elements:

- 1. Catalyst Center Menu:** A blue circle highlights the 'Catalyst Center' link in the top navigation bar.
- 2. Platform:** A blue circle highlights the 'Platform' menu item in the left sidebar.
- 3. Manage:** A blue circle highlights the 'Manage' menu item in the left sidebar.
- 4. Runtime Dashboard:** A blue circle highlights the 'Runtime Dashboard' link in the left sidebar.

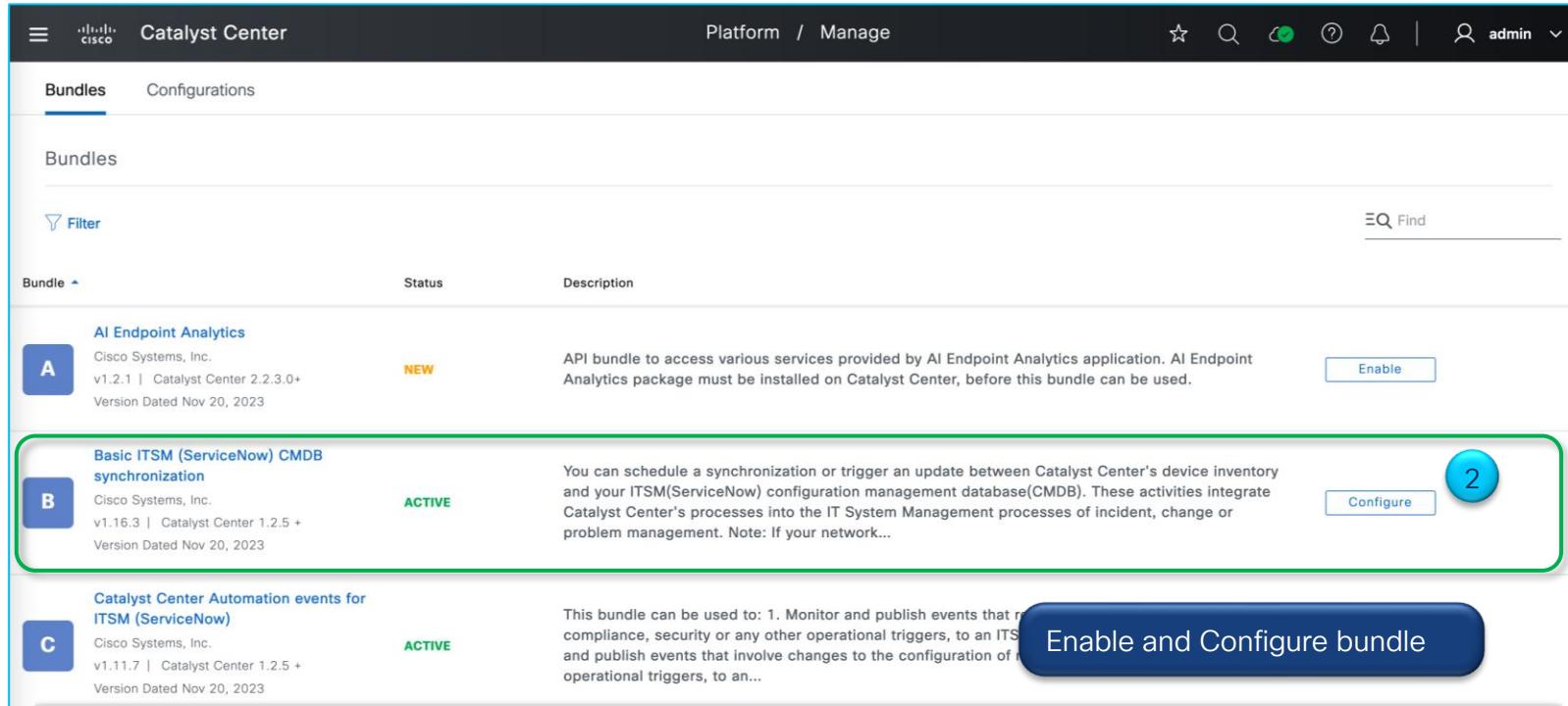
The main dashboard displays the following data:

- Global Issues:** 3 P1, 1 P2. [View Details](#)
- Devices:** 4 Unclaimed: 0, Unprovisioned: 1, Unreachable: 0. [Find New Devices](#)
- Trends and Insights:** Last 30 Days. 0 AP Performance Advertisements, 0 Trend Deviations.
- Application QoS Policies:** As of Jan 23, 2024 7:43 PM. 0 Successful Deployments, 0 Errored Deployments, 0 Stale Policies. [Add New Policy](#)

A blue callout box in the bottom right corner lists the three steps:

1. Catalyst Center Menu
2. Platform
3. Manage

CMDB Sync Bundle Configuration - continued



Catalyst Center Platform / Manage

Bundles Configurations

Bundles

Filter Find

Bundle	Status	Description	Actions
A AI Endpoint Analytics	NEW	API bundle to access various services provided by AI Endpoint Analytics application. AI Endpoint Analytics package must be installed on Catalyst Center, before this bundle can be used.	Enable
B Basic ITSM (ServiceNow) CMDB synchronization	ACTIVE	You can schedule a synchronization or trigger an update between Catalyst Center's device inventory and your ITSM(ServiceNow) configuration management database(CMDB). These activities integrate Catalyst Center's processes into the IT System Management processes of incident, change or problem management. Note: If your network...	Configure
C Catalyst Center Automation events for ITSM (ServiceNow)	ACTIVE	This bundle can be used to: 1. Monitor and publish events that relate to compliance, security or any other operational triggers, to an ITSM system. 2. Monitor and publish events that involve changes to the configuration of network devices, to an ITSM system. 3. Monitor and publish events that relate to operational triggers, to an ITSM system.	Enable and Configure bundle

CMDB Sync Bundle Configuration - continued

The screenshot shows the Catalyst Center interface with the 'Bundles' tab selected. Three bundles are listed:

- A** AI Endpoint Analytics: Cisco Systems, Inc. v1.2.1 | Catalyst Center 2.2.3.0+. Status: NEW.
- B** Basic ITSM (ServiceNow) CMDB synchronization: Cisco Systems, Inc. v1.16.3 | Catalyst Center 1.2.5+. Status: ACTIVE.
- C** Catalyst Center Automation events for ITSM (ServiceNow): Cisco Systems, Inc. v1.11.7 | Catalyst Center 1.2.5+. Status: ACTIVE.

A modal window titled 'Configure Basic ITSM (ServiceNow) CMDB synchronization' is open. It displays a message: 'This bundle has additional configurations for its Schedule-Based Integration Flows. [View Flows](#)' with a bullet point: 'Schedule to Publish Inventory Details - ServiceNow Connector - Recurring daily in intervals of 24 hours'. A green callout box highlights the 'ServiceNow Access Settings' section, which contains a note: 'This is used to specify the connection settings to a ServiceNow instance'. It shows two radio buttons: 'Select an existing instance' (selected) and 'Create a new instance'. A dropdown menu shows 'ven_03092_instance' and 'ST_ven03092', with 'ST_ven03092' highlighted by a yellow box and a blue circle with the number '1'.

ServiceNow Access Settings

1. Select existing instance or create new one
2. Next

Note:
CMDB Sync requires configuration of:
ServiceNow access settings
ServiceNow inventory settings

Next 2

CMDB Sync Bundle Configuration - continued

Catalyst Center

Bundles **Configurations**

Bundles

Filter

Bundle **Status**

A	AI Endpoint Analytics Cisco Systems, Inc. v1.2.1 Catalyst Center 2.2.3.0+ Version Dated Nov 20, 2023	NEW
B	Basic ITSM (ServiceNow) CMDB synchronization Cisco Systems, Inc. v1.16.3 Catalyst Center 1.2.5 + Version Dated Nov 20, 2023	ACTIVE
C	Catalyst Center Automation events for ITSM (ServiceNow) Cisco Systems, Inc. v1.11.7 Catalyst Center 1.2.5 + Version Dated Nov 20, 2023	ACTIVE

Configure Basic ITSM (ServiceNow) CMDB synchronization

Configure your bundle

INFO This bundle has additional configurations for its Schedule-Based Integration Flows. [View Flows](#)

- Schedule to Publish Inventory Details - ServiceNow Connector - Recurring daily in intervals of 24 hours

CMDB Inventory Settings

This is used to specify the CMDB Configuration details for ServiceNow, which includes the list of device attributes(mandatory/optional) that needs to be synced, type of destination within ServiceNow to receive the CMDB details, connection settings to the ServiceNow instance, transformation mapping between Cisco DNA Center device families and ServiceNow CI classes, maximum number of devices that can be synced in a single API call and the discovery source details.

Select an existing instance Create a new instance

Instance Name * **ST_ven03092** 1

Description

CMDB Inventory Settings

1. Select existing instance or create new one
2. Next

Exit **Back** **Next** 2

CMDB Sync Bundle Configuration – continued

The screenshot shows the Catalyst Center interface with the following details:

- Bundles** tab is selected.
- Configurations** tab is visible.
- Bundles** list:
 - A** AI Endpoint Analytics (Cisco Systems, Inc., v1.2.1, Catalyst Center 2.2.3.0+, Version Dated Nov 20, 2023, NEW)
 - B** Basic ITSM (ServiceNow) CMDB synchronization (Cisco Systems, Inc., v1.16.3, Catalyst Center 1.2.5+, Version Dated Nov 20, 2023, ACTIVE)
 - C** Catalyst Center Automation events for ITSM (ServiceNow) (Cisco Systems, Inc., v1.11.7, Catalyst Center 1.2.5+, Version Dated Nov 20, 2023, ACTIVE)
- Configure Basic ITSM (ServiceNow) CMDB synchronization** dialog is open.
- Cisco ServiceNow Application** section:
 - Question: Do you have Cisco ServiceNow Application installed? [?](#)
 - Yes
 - No
- Cisco DNA App** callout box:
 1. Select “No”
 2. Next
- Buttons**: Exit, Back, Next.

CMDB Sync Bundle Configuration – continued

The image shows a screenshot of the Catalyst Center interface. On the left, there is a sidebar with a navigation menu and a list of bundles. The list includes:

- AI Endpoint Analytics** (Status: NEW): Version v1.2.1 | Catalyst Center 2.2.3.0+, Dated Nov 20, 2023.
- Basic ITSM (ServiceNow) CMDB synchronization** (Status: ACTIVE): Version v1.16.3 | Catalyst Center 1.2.5+, Dated Nov 20, 2023.
- Catalyst Center Automation events for ITSM (ServiceNow)** (Status: ACTIVE): Version v1.11.7 | Catalyst Center 1.2.5+, Dated Nov 20, 2023.

The central part of the interface is a configuration dialog titled "Configure Basic ITSM (ServiceNow) CMDB synchronization". The dialog has a sub-section titled "Select Destination".

Destination Type *

- Synchronize device inventory direc...
- Post device inventory details to a s...** (highlighted with a green box and a blue circle with the number 1)

1. Select Destination:
Post device inventory details to a staging table
2. Next

At the bottom of the configuration dialog are "Exit", "Back", and "Next" buttons. A blue circle with the number 2 is located in the bottom right corner of the slide.

CMDB Sync Bundle Configuration – continued

Configure Basic ITSM (ServiceNow) CMDB synchronization

Configure your bundle

Select Destination

Destination Type *

Post device inventory details to a st...

Destination Uri *

/api/now/table/u_staging_table_api

Enter a Custom Endpoint

1

1. Configure the destination with the new Staging Table REST API endpoint
2. Save

Note: Use the new Staging Table REST API endpoint
- /api/now/table/u_staging_table_api

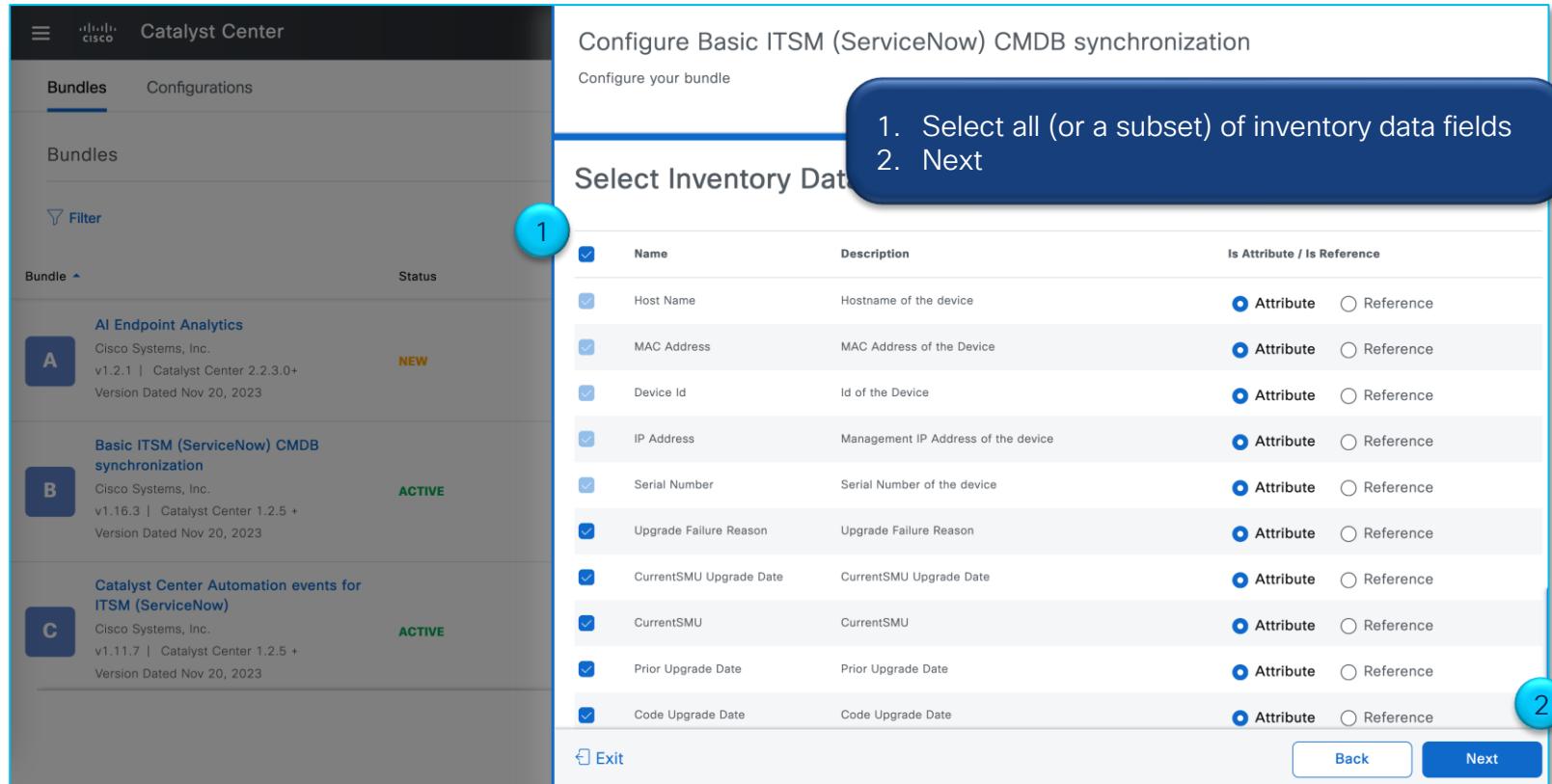
2

Exit

Back

Next

CMDB Sync Bundle Configuration – continued



Configure Basic ITSM (ServiceNow) CMDB synchronization

Configure your bundle

Select Inventory Data

1. Select all (or a subset) of inventory data fields
2. Next

	Name	Description	Is Attribute / Is Reference
<input checked="" type="checkbox"/>	Name	Description	<input checked="" type="radio"/> Attribute <input type="radio"/> Reference
<input checked="" type="checkbox"/>	Host Name	Hostname of the device	<input checked="" type="radio"/> Attribute <input type="radio"/> Reference
<input checked="" type="checkbox"/>	MAC Address	MAC Address of the Device	<input checked="" type="radio"/> Attribute <input type="radio"/> Reference
<input checked="" type="checkbox"/>	Device Id	Id of the Device	<input checked="" type="radio"/> Attribute <input type="radio"/> Reference
<input checked="" type="checkbox"/>	IP Address	Management IP Address of the device	<input checked="" type="radio"/> Attribute <input type="radio"/> Reference
<input checked="" type="checkbox"/>	Serial Number	Serial Number of the device	<input checked="" type="radio"/> Attribute <input type="radio"/> Reference
<input checked="" type="checkbox"/>	Upgrade Failure Reason	Upgrade Failure Reason	<input checked="" type="radio"/> Attribute <input type="radio"/> Reference
<input checked="" type="checkbox"/>	CurrentSMU Upgrade Date	CurrentSMU Upgrade Date	<input checked="" type="radio"/> Attribute <input type="radio"/> Reference
<input checked="" type="checkbox"/>	CurrentSMU	CurrentSMU	<input checked="" type="radio"/> Attribute <input type="radio"/> Reference
<input checked="" type="checkbox"/>	Prior Upgrade Date	Prior Upgrade Date	<input checked="" type="radio"/> Attribute <input type="radio"/> Reference
<input checked="" type="checkbox"/>	Code Upgrade Date	Code Upgrade Date	<input checked="" type="radio"/> Attribute <input type="radio"/> Reference

Exit

Back Next

CMDB Sync Bundle Configuration – continued

The screenshot shows the Catalyst Center interface. On the left, there's a sidebar with a 'Bundles' tab selected, showing three entries: 'AI Endpoint Analytics' (status: NEW), 'Basic ITSM (ServiceNow) CMDB synchronization' (status: ACTIVE), and 'Catalyst Center Automation events for ITSM (ServiceNow)' (status: ACTIVE). A callout box labeled 'Note:' provides a note about configuration requirements. The main right panel is titled 'Configure Basic ITSM (ServiceNow) CMDB synchronization' and 'Set Source Identifier and Operational Limit'. It shows a dropdown for 'Source Identifier(Exact Match)' set to 'Cisco DNA 10.93.141.45' and an input field for 'Inventory Items Per Iteration' set to '100'. A blue callout box on the right lists three steps: 1. Select the ServiceNow source identifier, 2. Configure number of inventory items per iteration (recommendation – 100), and 3. Next. A blue circle with the number '2' is positioned next to the 'Inventory Items Per Iteration' input field. A blue circle with the number '3' is positioned next to the 'Next' button.

Note:
This configuration step requires the integration ServiceNow user account to have this role:
personalize_choices

Configure Basic ITSM (ServiceNow) CMDB synchronization

Configure your bundle

Set Source Identifier and Operational Limit

Source Identifier(Exact Match) *

Cisco DNA 10.93.141.45

Inventory Items Per Iteration *

100

1. Select the ServiceNow source identifier
2. Configure number of inventory items per iteration (recommendation – 100)
3. Next

Back

Next

CMDB Sync Bundle Configuration – continued

Catalyst Center

Bundles Configurations

Bundles

Filter

Bundle	Status
A AI Endpoint Analytics Cisco Systems, Inc. v1.2.1 Catalyst Center 2.2.3.0+ Version Dated Nov 20, 2023	NEW
B Basic ITSM (ServiceNow) CMDB synchronization Cisco Systems, Inc. v1.16.3 Catalyst Center 1.2.5+ Version Dated Nov 20, 2023	ACTIVE
C Catalyst Center Automation events for ITSM (ServiceNow) Cisco Systems, Inc. v1.11.7 Catalyst Center 1.2.5+ Version Dated Nov 20, 2023	ACTIVE

Configure Basic ITSM (ServiceNow) CMDB synchronization

Configure your bundle

Summary

Review your configuration and make any changes.

Destination and Instance

Destination: Staging Table Domain: <https://ven03092.service-now.com> Uri: /api/now/table/u_staging_table_api Username: AppAdmin-en2 Password: *****

Inventory Data Fields [Edit](#)

Send To Destination: Host Name (A), MAC Address (A), Device Id (A), IP Address (A), Serial Number (A), Upgrade Failure Reason (A), CurrentSMU Upgrade Date (A), CurrentSMU (A), Prior Upgrade Date (A), Code Upgrade Date (A), Building (RF), Location (RF), Time Since Code Upgrade (A), Ports (A), Number Of Users (A), Role (A), Fabric Role (A), Uptime (A), Reachability status (A), Part Number (RF), Type (A), Software Version (A)

Limit and source [Edit](#)

Source Identifier: Cisco DNA 10.93.141.45 Inventory Items Per Iteration: 100

1. Review settings and configure

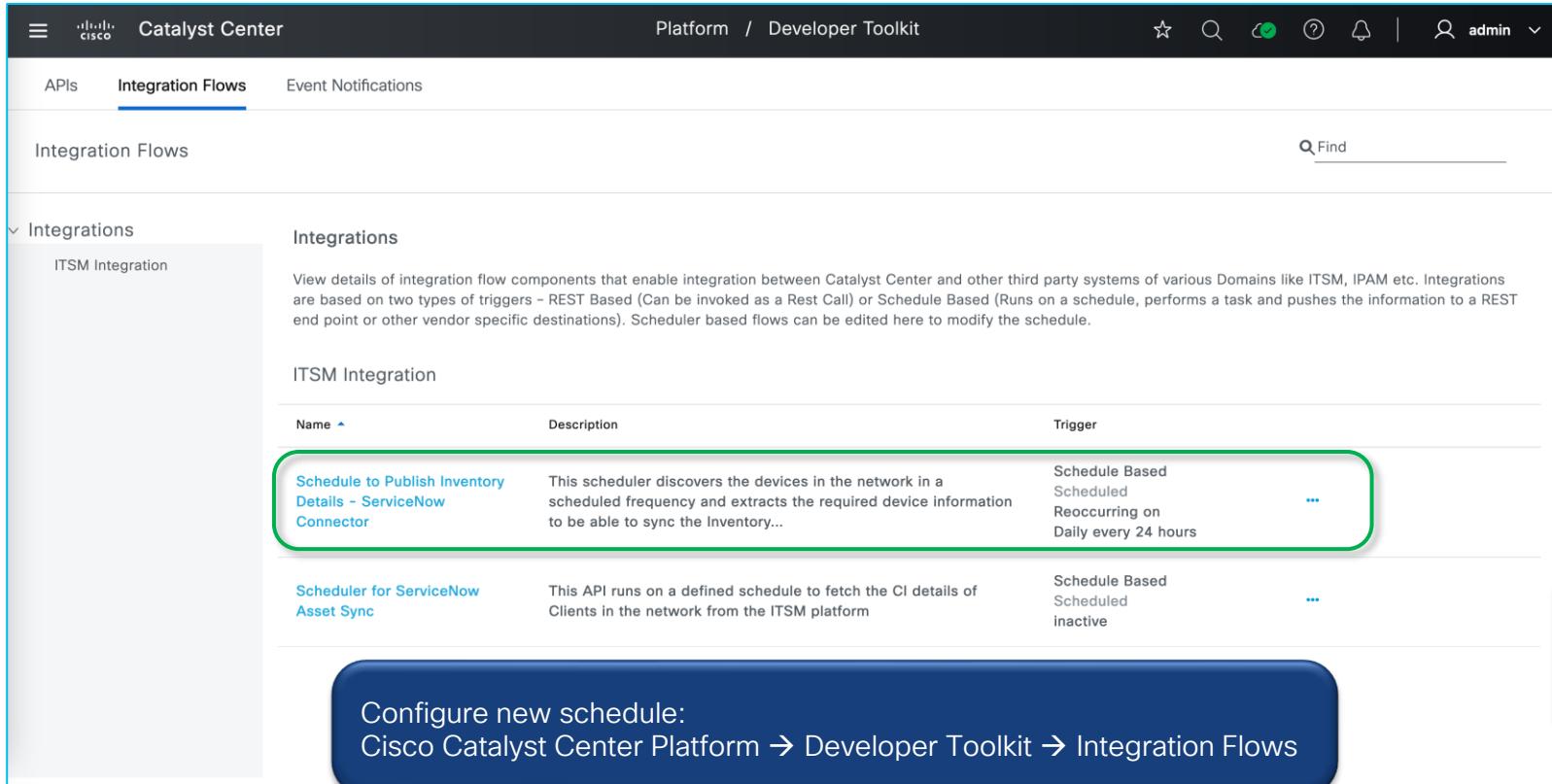
1

[Exit](#)

[Back](#)

[Configure](#)

CMDB Sync Schedule Configuration



Platform / Developer Toolkit

APIs **Integration Flows** Event Notifications

Find

Integrations

ITSM Integration

View details of integration flow components that enable integration between Catalyst Center and other third party systems of various Domains like ITSM, IPAM etc. Integrations are based on two types of triggers – REST Based (Can be invoked as a Rest Call) or Schedule Based (Runs on a schedule, performs a task and pushes the information to a REST end point or other vendor specific destinations). Scheduler based flows can be edited here to modify the schedule.

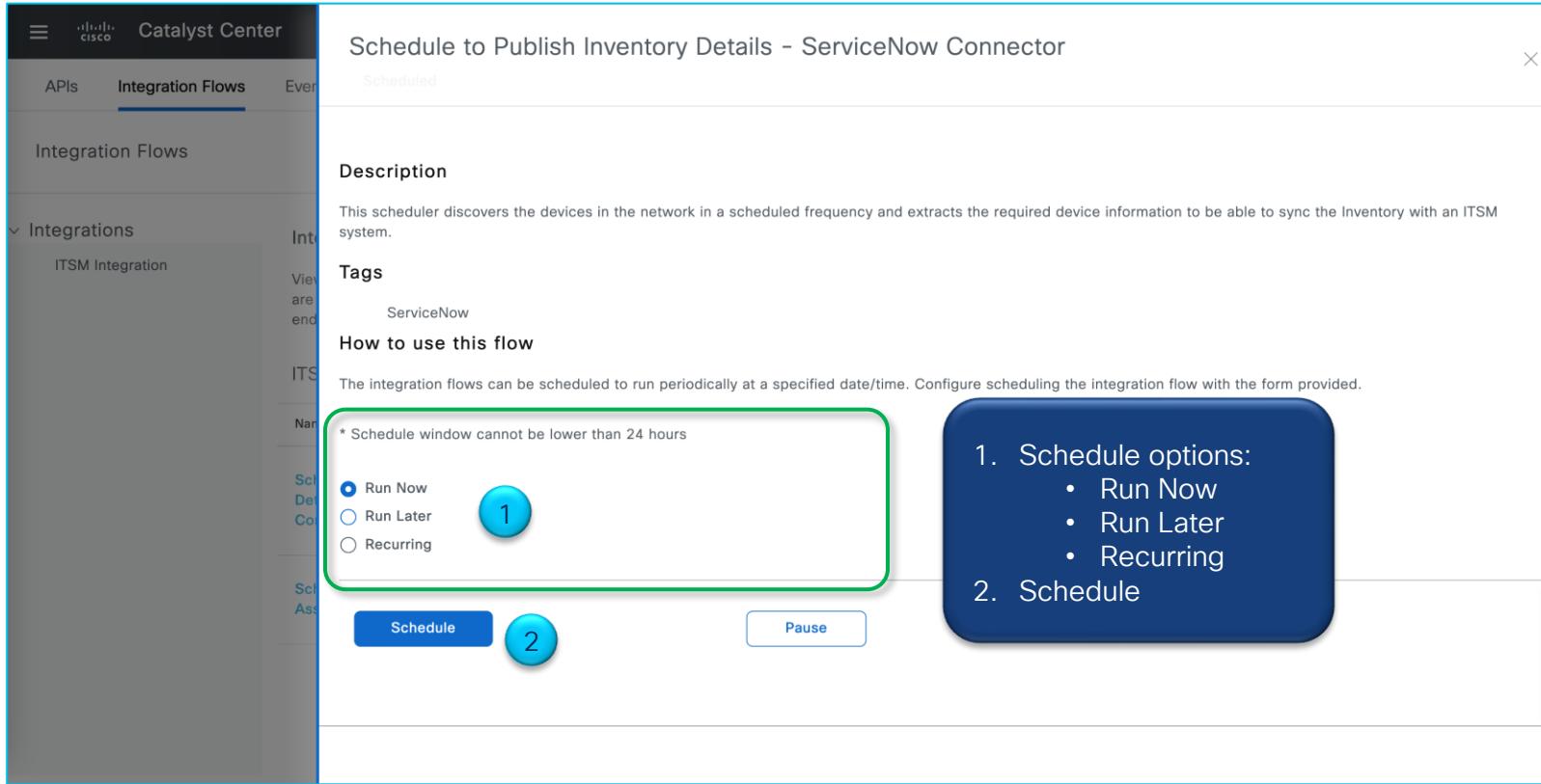
Integrations

ITSM Integration

Name	Description	Trigger
Schedule to Publish Inventory Details – ServiceNow Connector	This scheduler discovers the devices in the network in a scheduled frequency and extracts the required device information to be able to sync the inventory...	Schedule Based Scheduled Reoccurring on Daily every 24 hours
Scheduler for ServiceNow Asset Sync	This API runs on a defined schedule to fetch the CI details of Clients in the network from the ITSM platform	Schedule Based Scheduled inactive

Configure new schedule:
Cisco Catalyst Center Platform → Developer Toolkit → Integration Flows

CMDB Sync Schedule Configuration - continued



The screenshot shows the Cisco Catalyst Center interface with the 'Integration Flows' tab selected. A specific integration flow for 'ServiceNow Connector' is displayed, titled 'Schedule to Publish Inventory Details - ServiceNow Connector'. The flow is set to 'Scheduled'.

Description:
This scheduler discovers the devices in the network in a scheduled frequency and extracts the required device information to be able to sync the inventory with an ITSM system.

Tags:
ServiceNow

How to use this flow:
The integration flows can be scheduled to run periodically at a specified date/time. Configure scheduling the integration flow with the form provided.

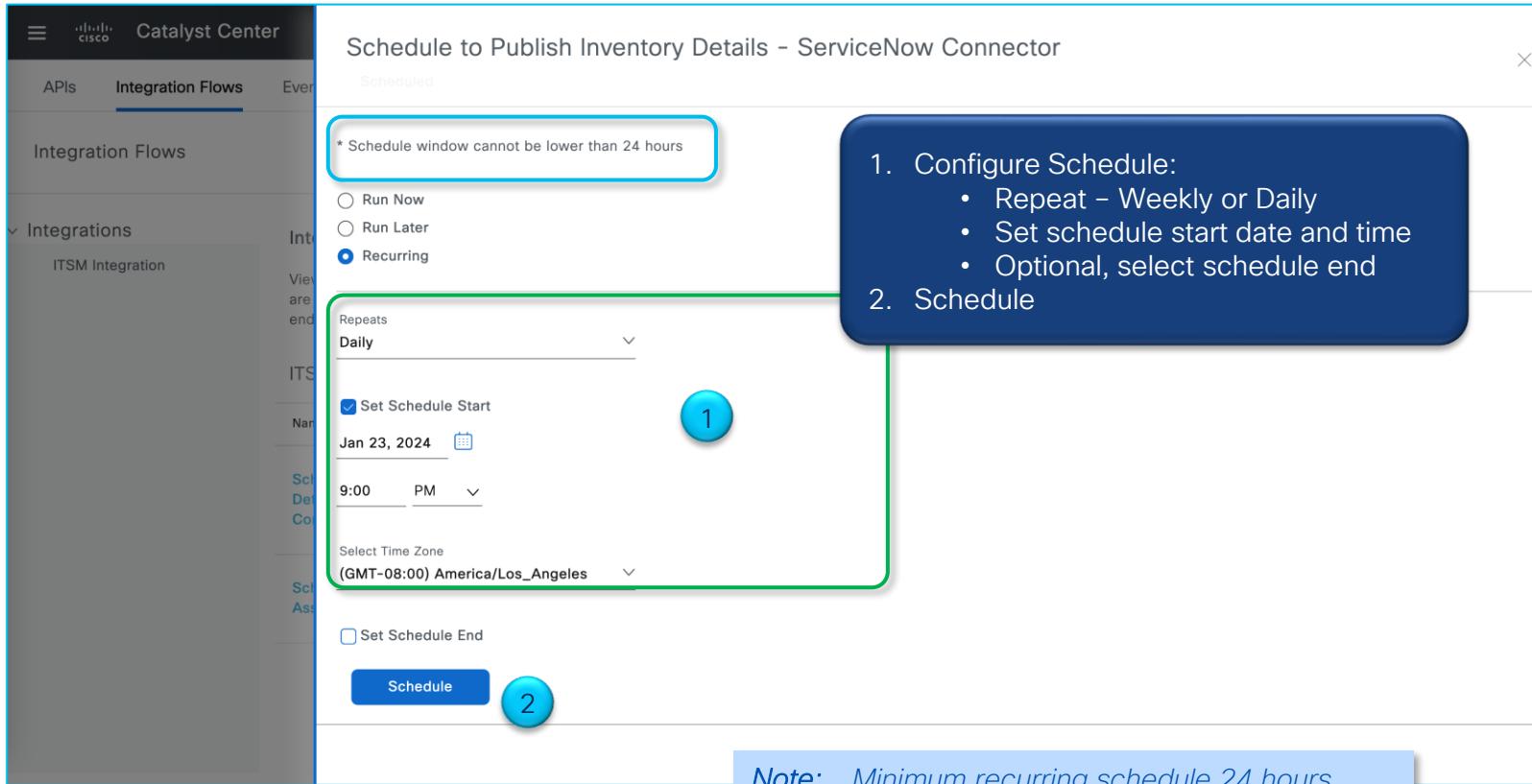
1. Schedule options:

- Run Now (selected)
- Run Later
- Recurring

2. Schedule

A callout box highlights the 'Schedule options' section, and a numbered callout '1' points to the radio buttons. A numbered callout '2' points to the 'Schedule' button.

CMDB Sync Schedule Configuration – Recurring

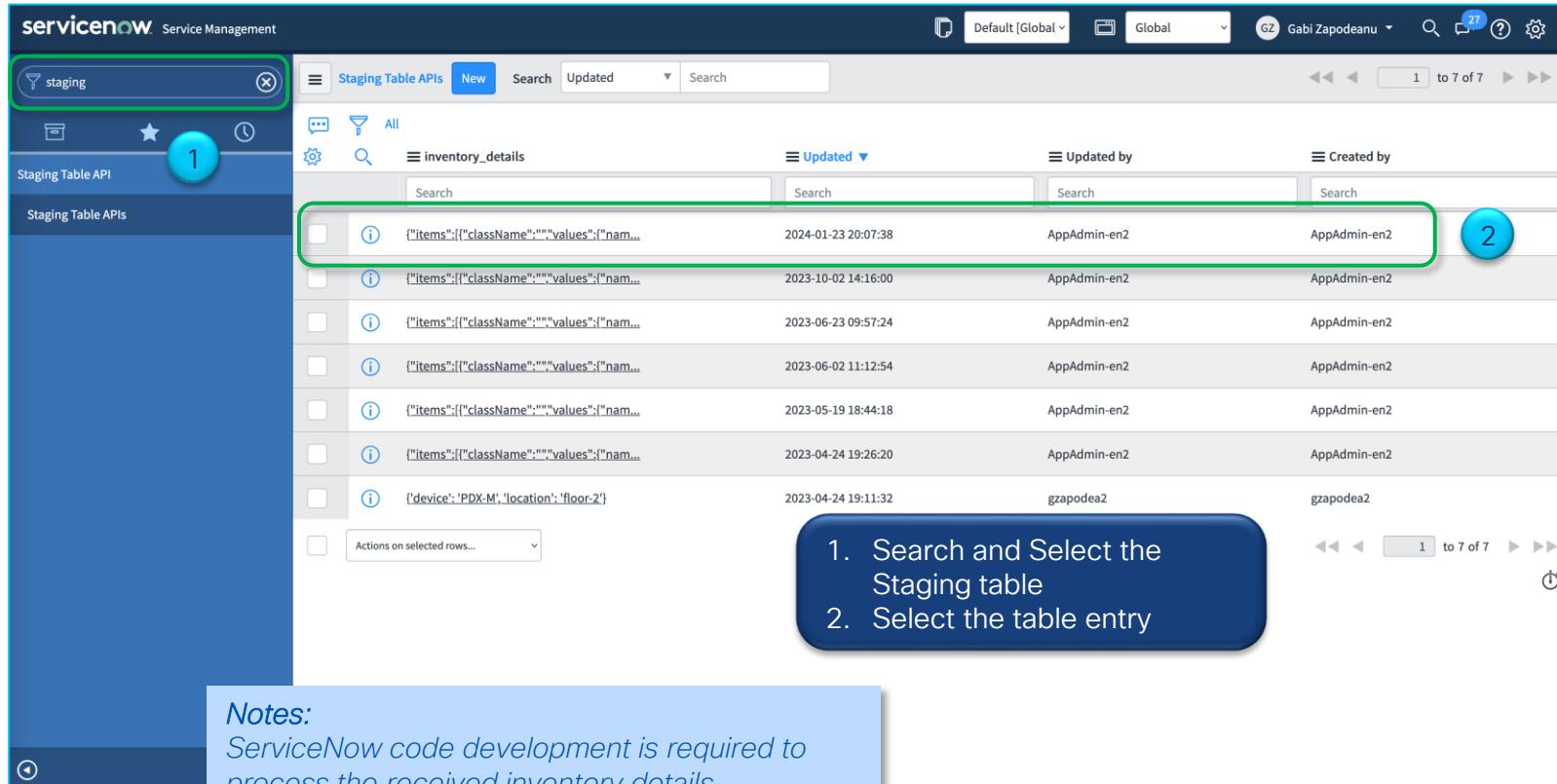


The screenshot shows the Catalyst Center Integration Flows interface. A modal window titled "Schedule to Publish Inventory Details - ServiceNow Connector" is open. The "Scheduled" tab is selected. The "Recurring" option is chosen, and the "Repeats" dropdown is set to "Daily". The "Set Schedule Start" checkbox is checked, and the start date is set to "Jan 23, 2024" at "9:00 PM". The "Select Time Zone" dropdown shows "(GMT-08:00) America/Los_Angeles". The "Set Schedule End" checkbox is unchecked. A "Schedule" button is at the bottom. A callout box with a blue border and rounded corners contains the following steps:

1. Configure Schedule:
 - Repeat – Weekly or Daily
 - Set schedule start date and time
 - Optional, select schedule end
2. Schedule

A note at the bottom right of the callout box states: "Note: Minimum recurring schedule 24 hours".

Verify CMDB Inventory in the Staging Table



1. Search and Select the Staging table
2. Select the table entry

Notes:
ServiceNow code development is required to process the received inventory details

	inventory_details	Updated	Updated by	Created by
<input type="checkbox"/>	{"items": [{"className": "...", "values": {"name": "...", "value": "..."}}, {"device": "PDX-M", "location": "floor-2"}]}	2024-01-23 20:07:38	AppAdmin-en2	AppAdmin-en2
<input type="checkbox"/>	{"items": [{"className": "...", "values": {"name": "...", "value": "..."}}, {"device": "PDX-M", "location": "floor-2"}]}	2023-10-02 14:16:00	AppAdmin-en2	AppAdmin-en2
<input type="checkbox"/>	{"items": [{"className": "...", "values": {"name": "...", "value": "..."}}, {"device": "PDX-M", "location": "floor-2"}]}	2023-06-23 09:57:24	AppAdmin-en2	AppAdmin-en2
<input type="checkbox"/>	{"items": [{"className": "...", "values": {"name": "...", "value": "..."}}, {"device": "PDX-M", "location": "floor-2"}]}	2023-06-02 11:12:54	AppAdmin-en2	AppAdmin-en2
<input type="checkbox"/>	{"items": [{"className": "...", "values": {"name": "...", "value": "..."}}, {"device": "PDX-M", "location": "floor-2"}]}	2023-05-19 18:44:18	AppAdmin-en2	AppAdmin-en2
<input type="checkbox"/>	{"items": [{"className": "...", "values": {"name": "...", "value": "..."}}, {"device": "PDX-M", "location": "floor-2"}]}	2023-04-24 19:26:20	AppAdmin-en2	AppAdmin-en2
<input type="checkbox"/>	{"device": "PDX-M", "location": "floor-2"}	2023-04-24 19:11:32	gzapodea2	gzapodea2

Verify CMDB Inventory in the Staging Table

Notes:

ServiceNow code development is required to process the received inventory details

CISCO Live!

Inventory Details

BRKOPS-2471

© 2024 Cisco and/or its affiliates. All rights reserved. Cisco Public

Demo CMDB Sync to Staging Table

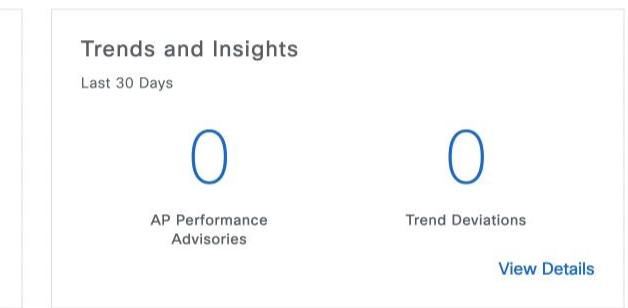
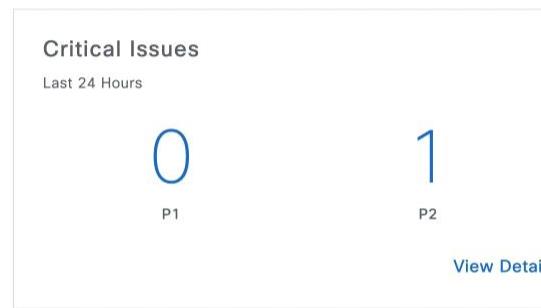
Home - Cisco Catalyst Center System Administration | Services https://10.93.141.45/dna/home 120% star

Cisco Systems, Inc APIs Tools LAB_Access CiscoLive Meraki Dashboard L... Cisco Box SFEH-NAS - Synolo... CDETS DNACaaP Cisco.DNA.Center.D... SharePoint APIs and Owners - ... JIRA Engineering SJ... Uno - MaglevCloud ... Other Bookmarks

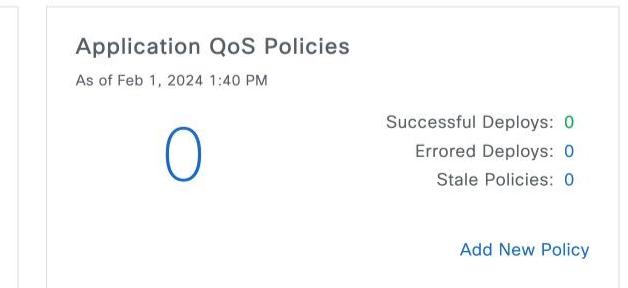
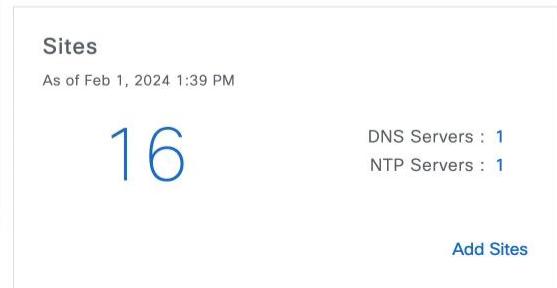
Catalyst Center admin

Welcome to Catalyst Center!

Assurance Summary



Network Snapshot



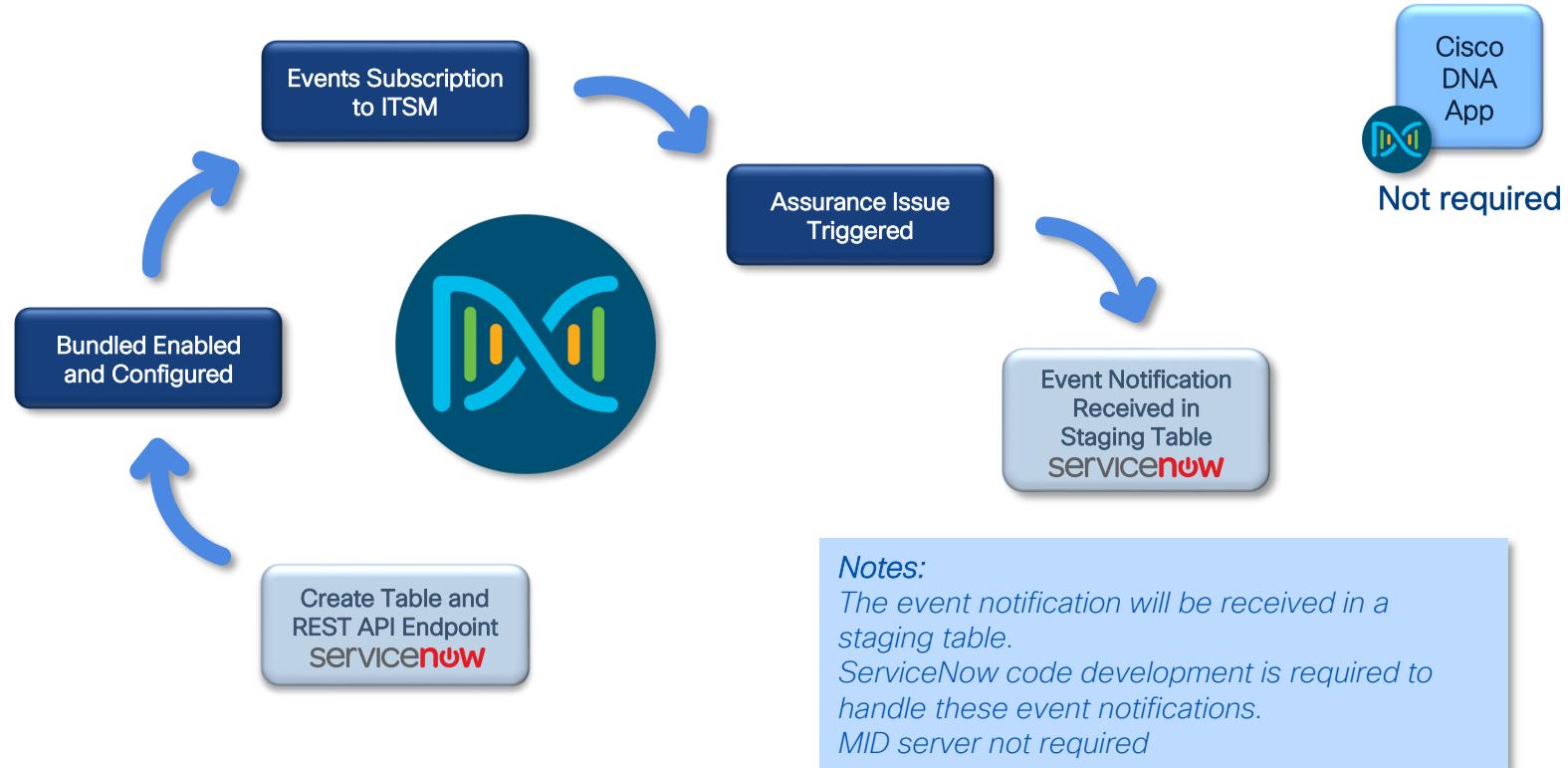
Agenda

CISCO Live!

- Cisco Catalyst Center Platform
- ITSM (ServiceNow) Integration Overview
- CMDB Sync to Staging Table
- Events Notifications to Generic REST API Endpoint
- Network Troubleshooting Custom Workflow
- Summary

Network Issue Monitor and Enrichment

To Generic REST API Endpoint

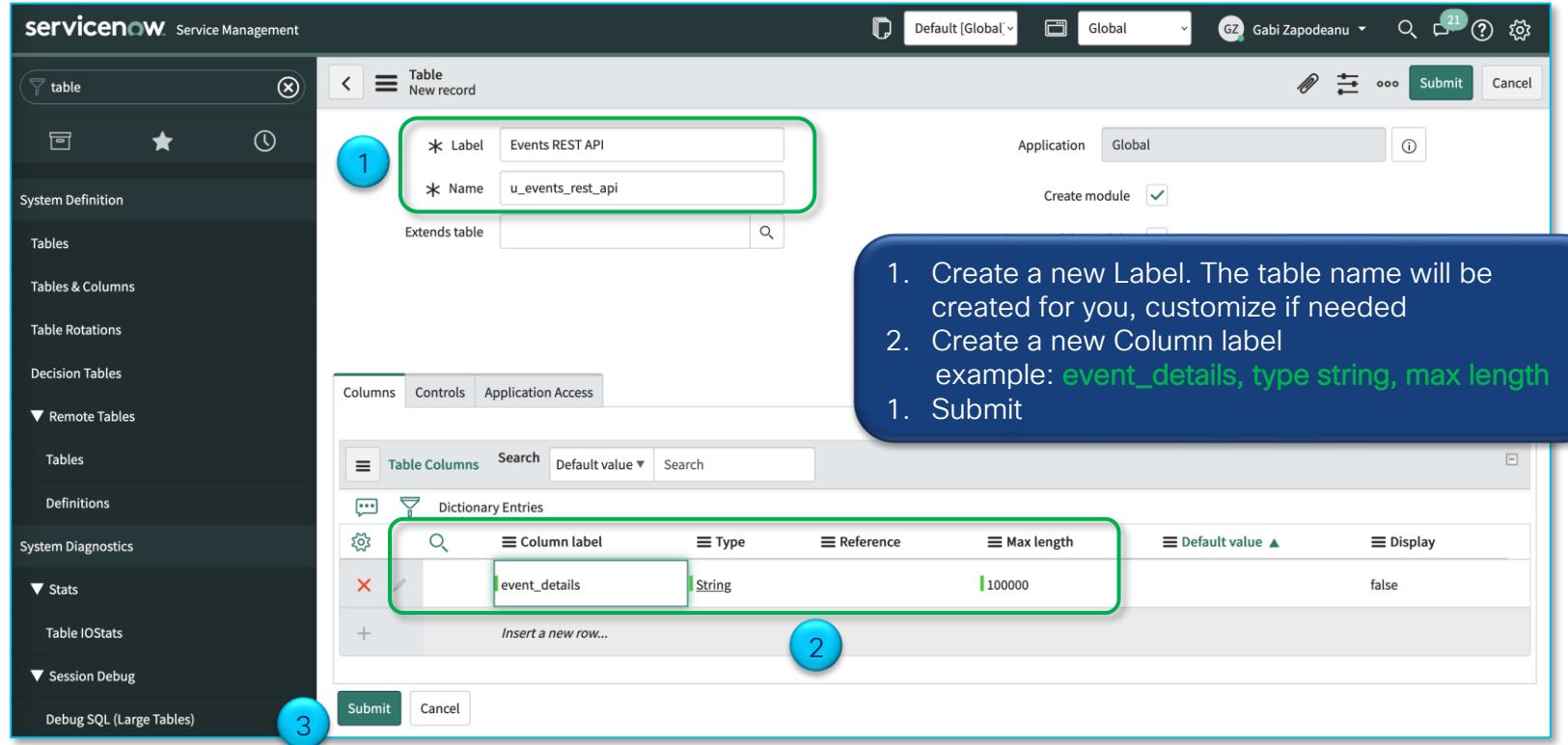


ServiceNow Create New Table

The image shows the ServiceNow Tables view. The left sidebar is titled 'System Definition' and contains 'Tables' (highlighted with a green box and numbered 1), 'Tables & Columns', 'Decision Tables', and 'Remote Tables' (with 'Tables' and 'Definitions' under it, highlighted with a green box and numbered 2). The main content area shows a list of tables with columns: Label, Name, Extends table, Extensible, and Updated. A green box highlights the 'New' button in the top navigation bar (numbered 3). A callout box in the bottom right corner lists the steps: 1. Apply filter Tables, 2. Select System Definition/Tables, and 3. Create new table.

Label	Name	Extends table	Extensible	Updated
.NET Application	cmdb_ci_appl_dot_net	Application	false	2021-06-09 21:22:50
A10 Load Balancer	cmdb_ci_lb_a10	Load Balancer	false	2021-06-09 21:22:40
Access Control	sys_security_acl	Application File	false	2021-06-09 21:13:25
Access Roles	sys_security_acl_role	Application File	false	2021-06-09 21:13:25
Accessory	cmdb_ci_acc	Configuration Item	false	2021-06-09 21:22:53
ACE	cmdb_ci_lb_ace	Load Balancer	false	2021-06-09 21:22:53
ACL Endpoint	cmdb_ci_endpoint_acl	Endpoint	false	2021-06-09 21:22:53
Action	sn_ex_sp_action	Action	false	2021-06-09 21:14:21
Action	ecc_action	(empty)	false	2021-06-09 21:14:21
Action Assignment	sys_declarative_action_assignment	Application File	false	2021-06-09 21:51:51
Action Binding	sys_ux_page_action_binding	Application File	false	2021-06-09 21:36:23
Action Category	sys_hub_category	Application File	false	2021-06-09 21:46:36

ServiceNow Create Table and REST API Endpoint



The image shows the ServiceNow interface for creating a new table. The left sidebar shows 'System Definition' and 'Tables'. The main window is titled 'Table New record' with 'Label' set to 'Events REST API' and 'Name' set to 'u_events_rest_api'. A callout box with a blue border and a numbered circle '1' highlights these fields. A blue callout box with numbered steps 1-3 is overlaid on the right, containing the following instructions:

1. Create a new Label. The table name will be created for you, customize if needed
2. Create a new Column label
example: `event_details, type string, max length`
3. Submit

The 'Dictionary Entries' table below shows a single row with 'event_details' as the column label, 'String' as the type, and '100000' as the max length. A callout box with a blue border and a numbered circle '2' highlights this table. A blue callout box with a numbered circle '3' highlights the 'Submit' and 'Cancel' buttons at the bottom.

Column label	Type	Max length
event_details	String	100000

ServiceNow New REST API Endpoint

The screenshot shows the ServiceNow interface with the following details:

- Header:** Default [Global], Global, Gabi Zapodeanu, 21 notifications.
- Left Sidebar:** Tables, System Definition, Tables, Tables & Columns, Decision Tables, Remote Tables, Tables, Definitions, System Diagnostics, Session Debug, Debug SQL (Large Tables), System Import Sets, Import Set Tables, Cleanup.
- Current View:** Table - Events REST API [Tables view].
- Actions Bar:** Layout Form, Layout List, Show Form, Show List, Show Schema Map, Add to Service Catalog, Run Point Scan, Explore REST API (highlighted with a blue box).
- Table Headers:** Access Controls (4), Labels (1), Database Indexes (1), Table Subscription Configuration (1).
- Access Controls Table:** Shows four rows of access controls for the 'u_events_rest_api' table. The rows are highlighted with a yellow box.

	Name	Operation	Type	Active	Updated by	Updated
<input type="checkbox"/>	u_events_rest_api	create	record	true	gzapodea2	2023-01-18 21:37:42
<input type="checkbox"/>	u_events_rest_api	delete	record	true	gzapodea2	2023-01-18 21:37:42
<input type="checkbox"/>	u_events_rest_api	read	record	true	gzapodea2	2023-01-18 21:37:42
<input type="checkbox"/>	u_events_rest_api	write	record	true	gzapodea2	2023-01-18 21:37:42

- Callout Boxes:**
 - Verify the operations allowed for the new REST API endpoint
 - Explore the new REST API endpoint

ServiceNow New REST API Endpoint - continued

REST API Explorer

Note: Save the new REST API endpoint:
Table url = 'https://ven03092.service-now.com/api/now/table/u_events_rest_api'

Allows you to perform create, read, update and delete (CRUD) operations on existing tables

Create a record

POST https://ven03092.service-now.com/api/now/table/{tableName}

Prepare request

Path parameters

Name	Value
* tableName	Events REST API (u_events_rest_api)

Query parameters

Name	Value
sysparm_display_value	Event Rule Order (em_event_rule_order) Event Rule Simple Field Exclusion List (em_event_rule_black_list) Event Rule XML (em_rule_xml) Event Staging Map (em_map_event_to_staging) Event Type (em_event_type)
sysparm_exclude_reference_link	Events and Groups (em_events_and_groups)
sysparm_fields	Events REST API (u_events_rest_api)
sysparm_input_display_value	Set field values using their display value (true) or actual value (false) (default: false)

Identify the new REST API endpoint
Test the new REST API endpoint

Network Issue Monitor and Enrichment Configuration

Catalyst Center Platform / Manage admin

Bundles Configurations

Bundles

Filter Find

Bundle	Status	Description
Endpoint Attribute Retrieval with ITSM (ServiceNow) Cisco Systems, Inc. v1.6.2 Catalyst Center 2.1.1 + Version Dated Nov 20, 2023	ACTIVE	You can schedule a synchronization or trigger an update between the Endpoint Inventory and your ITSM (ServiceNow) configuration management database (CMDB). Endpoint attribute information from ServiceNow can be used to help profile endpoints on your network. ServiceNow appears in the endpoint profiling workspace as an... Configure
Network Issue Monitor and Enrichment for ITSM Cisco Systems, Inc. v1.11.10 Catalyst Center 1.2.5 + Version Dated Nov 20, 2023	ACTIVE	You can use this bundle to monitor your network for assurance and maintenance issues, and then publish the event details about these issues to an ITSM(ServiceNow) system. This bundle also contains APIs that extract rich network context data. This bundle also enables closed loop integration. Please note that, for the ServiceNow... Configure
Rogue and aWIPS Cisco Systems, Inc. v1.2.1 Catalyst Center 2.1.2.0 + Version Dated Nov 20, 2023	NEW	Use Rogue Management and the Cisco Adaptive Wireless Intrusion Prevention System (aWIPS) to detect wired and wireless threats, including rogue access points. Enable

Enable and Configure bundle

N

R

Network Issue Monitor and Enrichment Configuration

The screenshot shows the Catalyst Center interface with the following details:

- Left Sidebar:** Displays three bundles:
 - Endpoint Attribute Retrieval with ITSM (ServiceNow):** Status ACTIVE, Version v1.6.2, Catalyst Center 2.1.1+, Version Dated Nov 20, 2023.
 - Network Issue Monitor and Enrichment for ITSM:** Status ACTIVE, Version v1.11.10, Catalyst Center 1.2.5+, Version Dated Nov 20, 2023.
 - Rogue and aWIPS:** Status NEW, Version v1.2.1, Catalyst Center 2.1.2.0+, Version Dated Nov 20, 2023.
- Right Panel:** Titled "Configure Network Issue Monitor and Enrichment for ITSM". It shows a configuration step for "Destination to receive events".
 - Destination Type:** "Select an existing instance" (radio button) is selected, while "Create a new instance" (radio button) is selected and highlighted with a green box and a circled "1".
 - Instance Name:** "ET_ven03092" is entered in the input field.
 - Description:** An empty input field.
- Bottom Right:** A blue callout box titled "Destination settings" contains the steps:
 1. Select or create the instance
 2. Next
- Bottom Buttons:** "Exit" and "Next" (highlighted with a circled "2").

Network Issue Monitor and Enrichment Configuration

The screenshot shows the Catalyst Center interface with the following details:

- Left Sidebar:** Contains a 'Bundles' tab (selected) and a 'Configurations' tab. A 'Bundles' section lists three items: 'Endpoint Attribute Retrieval with ITSM (ServiceNow)', 'Network Issue Monitor and Enrichment for ITSM', and 'Rogue and aWIPS'. Each item has a status indicator (ACTIVE or NEW) and a version date (Nov 20, 2023).
- Central Panel:** A modal window titled 'Configure Network Issue Monitor and Enrichment for ITSM' is open. It displays the configuration for the selected bundle. A green box highlights the 'Destination to receive events' section.
- Destination Settings (Callout):** A blue callout box with a numbered list and a yellow box highlights the 'Generic REST Endpoint in ServiceNow' option. The callout text is:

Destination Settings

 1. Select ServiceNow
 2. Select the destination option to send the events to: **Generic REST Endpoint in ServiceNow**
- Bottom Buttons:** 'Exit', 'Back', and 'Next' buttons.

Network Issue Monitor and Enrichment Configuration

The screenshot shows the Catalyst Center interface. On the left, a sidebar lists 'Bundles' and 'Configurations'. Under 'Bundles', there are three items: 'Endpoint Attribute Retrieval with ITSM (ServiceNow)' (ACTIVE), 'Network Issue Monitor and Enrichment for ITSM' (ACTIVE), and 'Rogue and aWIPS' (NEW). The 'Network Issue Monitor and Enrichment for ITSM' bundle is selected. On the right, a configuration dialog box is open with the title 'Configure Network Issue Monitor and Enrichment for ITSM'. The dialog contains fields for 'Destination to receive events' (set to 'ServiceNow'), 'Select ITSM Type' (set to 'ServiceNow'), and 'Destination Uri' (set to '/api/now/table/u_events_rest_api'). A note at the top right of the dialog box reads: 'Note: Use the created ServiceNow REST API endpoint - /api/now/table/u_events_rest_api'. A red box highlights the 'Destination Uri' field. A blue callout box with a numbered list provides instructions: 1. 'Configure the destination with the new REST API endpoint' and 2. 'Save'. At the bottom of the dialog are 'Exit', 'Back', and 'Next' buttons. The 'Back' and 'Next' buttons are highlighted with blue circles containing the numbers 1 and 2 respectively.

Configure Network Issue Monitor and Enrichment for ITSM

Configure your bundle

Note:
Use the created ServiceNow REST API endpoint -
/api/now/table/u_events_rest_api

Destination to receive events

Select ITSM Type *

ServiceNow

Destination to receive events *

Generic REST Endpoint in ServiceNow

Destination Uri *

/api/now/table/u_events_rest_api

1

2

1. Configure the destination with the new REST API endpoint

2. Save

Exit

Back

Next

Network Issue Monitor and Enrichment Configuration

Catalyst Center

Bundles Configurations

Bundles

Filter

Bundle ▾ **Status**

E	Endpoint Attribute Retrieval with ITSM (ServiceNow) Cisco Systems, Inc. v1.6.2 Catalyst Center 2.1.1 + Version Dated Nov 20, 2023	ACTIVE
N	Network Issue Monitor and Enrichment for ITSM Cisco Systems, Inc. v1.11.10 Catalyst Center 1.2.5 + Version Dated Nov 20, 2023	ACTIVE
R	Rogue and aWIPS Cisco Systems, Inc. v1.2.1 Catalyst Center 2.1.2.0 + Version Dated Nov 20, 2023	NEW

Configure Network Issue Monitor and Enrichment for ITSM

Configure your bundle

ServiceNow Access Settings

This is used to specify the connection settings to a ServiceNow instance

Select an existing instance Create a new instance

Select Instance * **ET_ven03092**

ServiceNow Access Settings

1. Select or create the instance
2. Next

Exit **Back** **Next**

Network Issue Monitor and Enrichment Configuration

Catalyst Center

Bundles Configurations

Bundles

Filter

Bundle Status

E	Endpoint Attribute Retrieval with ITSM (ServiceNow) Cisco Systems, Inc. v1.6.2 Catalyst Center 2.1.1 + Version Dated Nov 20, 2023	ACTIVE
N	Network Issue Monitor and Enrichment for ITSM Cisco Systems, Inc. v1.11.10 Catalyst Center 1.2.5 + Version Dated Nov 20, 2023	ACTIVE
R	Rogue and aWIPS Cisco Systems, Inc. v1.2.1 Catalyst Center 2.1.2.0 + Version Dated Nov 20, 2023	NEW

Configure Network Issue Monitor and Enrichment for ITSM

Configure your bundle

Summary

Review your configuration and make any changes.

Destination to receive events [Edit](#) 1

Destination to receive events: Generic REST Endpoint in ServiceNow

Destination URI: /api/now/table/u_events_rest_api

ITSMType: ServiceNowConnection

ServiceNow Access Settings

Domain: https://ven03092.service-now.com

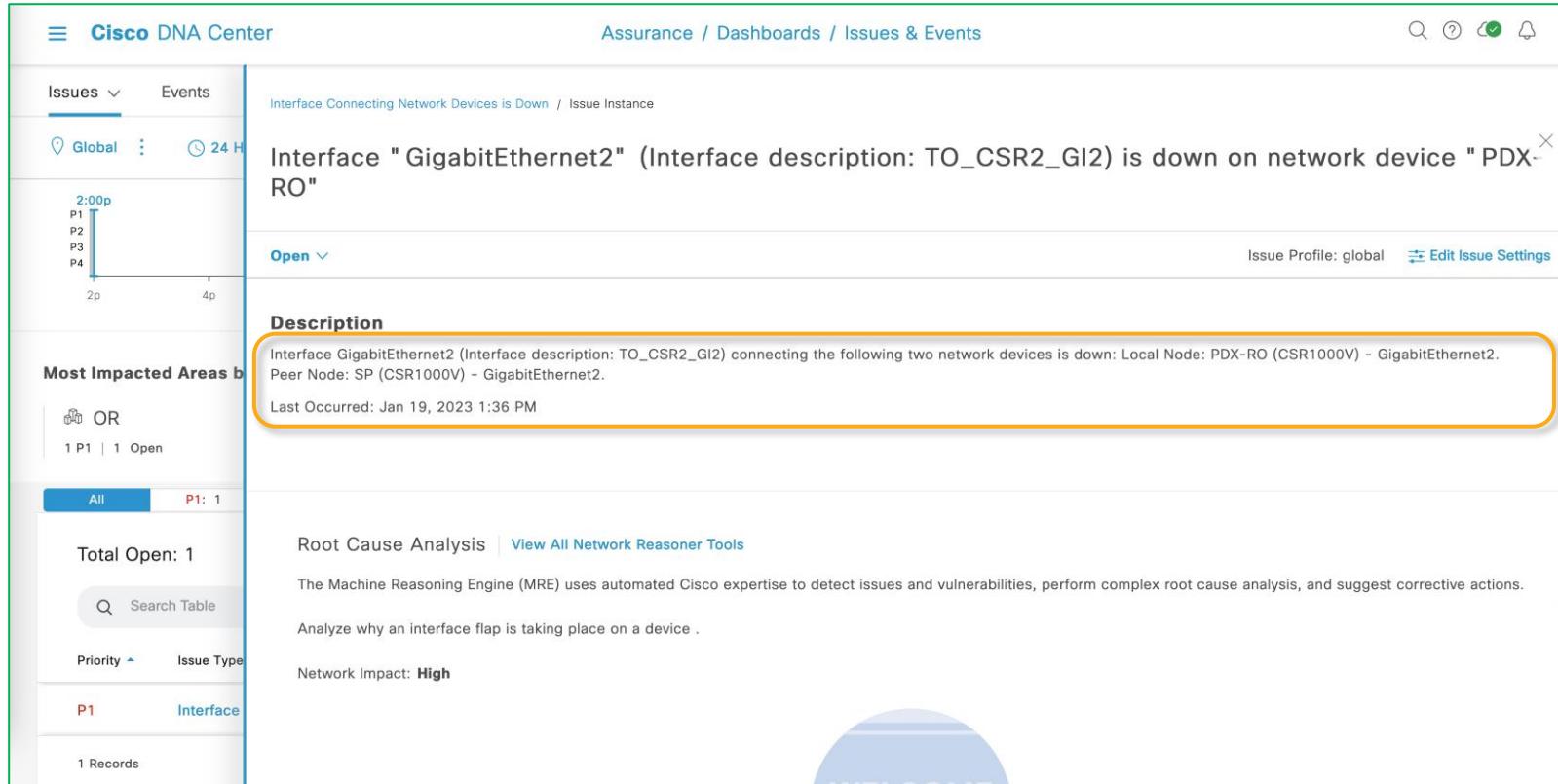
Username: AppAdmin-en2

Password: *****

1. Review configuration
2. Configure

[Exit](#) 2 [Back](#) [Configure](#)

Trigger a Cisco Catalyst Center Assurance Issue



The screenshot shows the Cisco DNA Center Assurance dashboard. The main title is "Assurance / Dashboards / Issues & Events". On the left, there are tabs for "Issues" (selected) and "Events". Below the tabs, there are filters for "Global" and "24 H", and a timeline from "2:00p" to "4p" with markers for P1, P2, P3, and P4. A section titled "Most Impacted Areas" shows "1 P1" and "1 Open". On the right, a critical issue is displayed: "Interface "GigabitEthernet2" (Interface description: TO_CSR2_GI2) is down on network device "PDX-RO"". The "Description" section contains the following text, which is highlighted with an orange border: "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) - GigabitEthernet2." Below this, it says "Last Occurred: Jan 19, 2023 1:36 PM". At the bottom, there is a "Root Cause Analysis" section with a "Search Table" button, and a note about the Machine Reasoning Engine (MRE) using automated Cisco expertise for analysis. The "Network Impact" is listed as "High".

Issues **Events**

Interface Connecting Network Devices is Down / Issue Instance

Global 24 H

2:00p P1 P2 P3 P4 4p

Most Impacted Areas

1 P1 | 1 Open

All P1: 1

Total Open: 1

Search Table

Priority Issue Type

P1 Interface

1 Records

Root Cause Analysis | View All Network Reasoner Tools

The Machine Reasoning Engine (MRE) uses automated Cisco expertise to detect issues and vulnerabilities, perform complex root cause analysis, and suggest corrective actions.

Analyze why an interface flap is taking place on a device.

Network Impact: **High**

Verify Received Events in the New Table

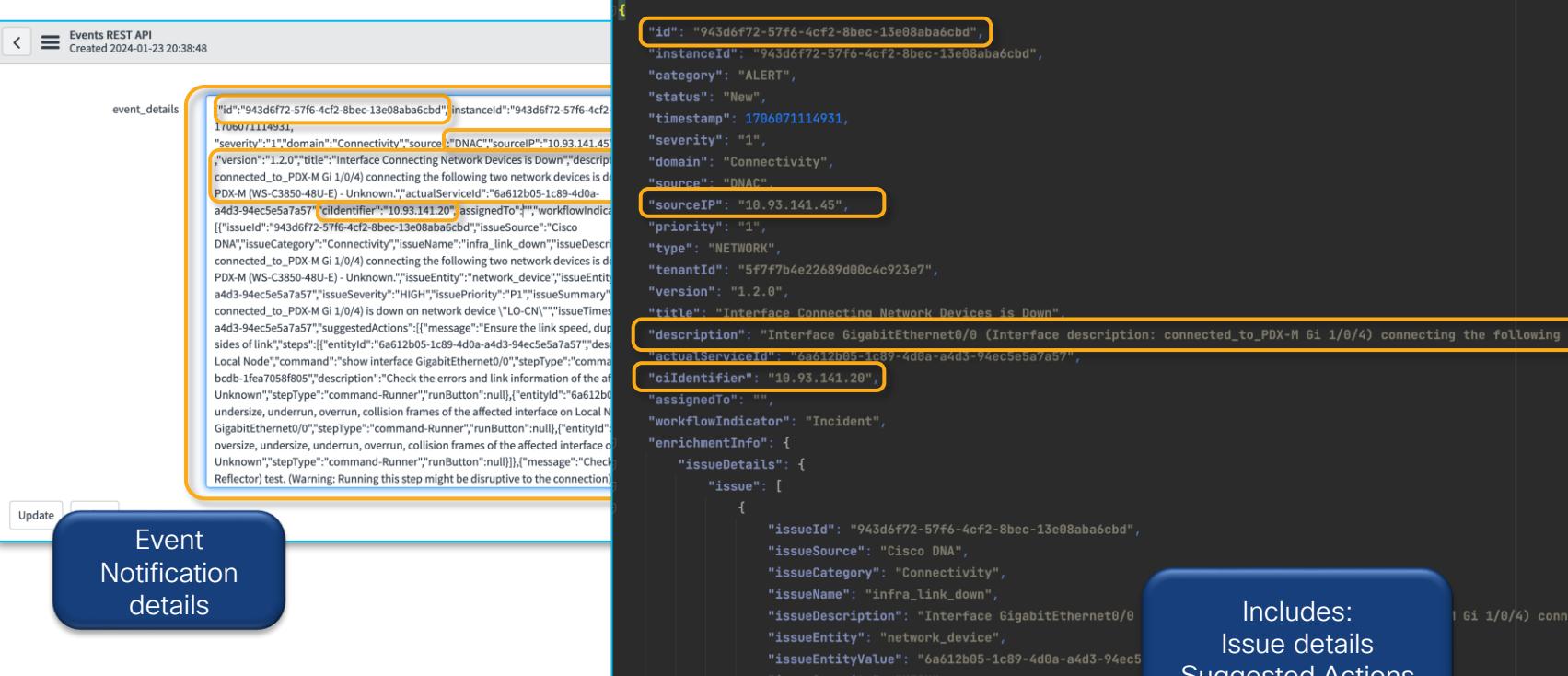
The screenshot shows the ServiceNow interface for the 'Events REST APIs' table. The left sidebar is collapsed, and the main content area displays a list of events. The first event in the list is highlighted with a green border and a blue circle containing the number 3, indicating it is the received event. The event details are as follows:

Created	Created by
2024-01-23 20:38:48	AppAdmin-en2
2024-01-23 20:38:45	AppAdmin-en2
2023-10-02 14:19:44	AppAdmin-en2
2023-10-02 14:19:13	AppAdmin-en2
2023-10-02 14:19:07	AppAdmin-en2
2023-10-02 14:19:05	AppAdmin-en2
2023-06-02 11:40:23	AppAdmin-en2
2023-06-02 11:39:18	AppAdmin-en2
2023-06-02 11:32:50	AppAdmin-en2
2023-06-02 11:32:43	AppAdmin-en2

Three numbered callouts point to specific elements:

1. The 'Events' button in the top-left corner of the interface.
2. The 'Events REST APIs' table in the main content area.
3. The first event in the list, which is the received event.

Verify Received Events in the New Table



Events REST API
Created 2024-01-23 20:38:48

event_details

```
{
  "id": "943d6f72-57f6-4cf2-8bec-13e08aba6cbd",
  "instanceId": "943d6f72-57f6-4cf2-8bec-13e08aba6cbd",
  "category": "ALERT",
  "status": "New",
  "timestamp": 1706071114931,
  "severity": "1",
  "domain": "Connectivity",
  "source": "DNAC",
  "sourceIP": "10.93.141.45",
  "sourcePort": 1706071114931,
  "priority": "1",
  "type": "NETWORK",
  "tenantId": "5f777b4e22689d00c4c923e7",
  "version": "1.2.0",
  "title": "Interface Connecting Network Devices is Down",
  "description": "Interface GigabitEthernet0/0 (Interface description: connected_to_PDX-M Gi 1/0/4) connecting the following two network devices is down on network device \"LO-CN\". (Warning: Running this step might be disruptive to the connection.)",
  "actualServiceId": "6a612b05-1c89-4d0a-a4d3-94ec5e5a7a57",
  "actualServiceIp": "10.93.141.20",
  "clientIdentifier": "10.93.141.20",
  "assignedTo": "",
  "workflowIndicator": "Incident",
  "enrichmentInfo": {
    "issueDetails": {
      "issue": {
        "issueId": "943d6f72-57f6-4cf2-8bec-13e08aba6cbd",
        "issueSource": "Cisco DNA",
        "issueCategory": "Connectivity",
        "issueName": "infra_link_down",
        "issueDescription": "Interface GigabitEthernet0/0 (Interface description: connected_to_PDX-M Gi 1/0/4) connecting the following two network devices is down on network device \"LO-CN\". (Warning: Running this step might be disruptive to the connection.)",
        "issueEntity": "network_device",
        "issueEntityValue": "6a612b05-1c89-4d0a-a4d3-94ec5e5a7a57",
        "issueSeverity": "HIGH",
        "issuePriority": "1",
        "issueSummary": "Interface GigabitEthernet0/0 (Interface description: connected_to_PDX-M Gi 1/0/4) is down on network device \"LO-CN\". (Warning: Running this step might be disruptive to the connection.)"
      }
    }
  }
}
```

Event
Notification
details

Includes:
Issue details
Suggested Actions
Topology

Demo Events to Generic REST API Endpoint

Home - Cisco Catalyst Center Events REST APIs | ServiceNow https://10.93.141.45/dna/home 120%  Catalyst Center admin Explore

Welcome to Catalyst Center! 

Assurance Summary

Health

Healthy as of Feb 1, 2024 2:01 PM

100%	---	100%
Network Devices	Wireless Clients	Wired Clients

[View Details](#)

Critical Issues

Last 24 Hours

1	P1
2	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 2:01 PM

16

DNS Servers : 1
NTP Servers : 1

[Add Sites](#)

Network Devices

As of Feb 1, 2024 2:01 PM

14

Unclaimed: 0
Unprovisioned: 1
Unreachable: 1

[Find New Devices](#)

Application QoS Policies

As of Feb 1, 2024 2:01 PM

0

Successful Deploy: 0
Errored Deploy: 0
Stale Policies: 0

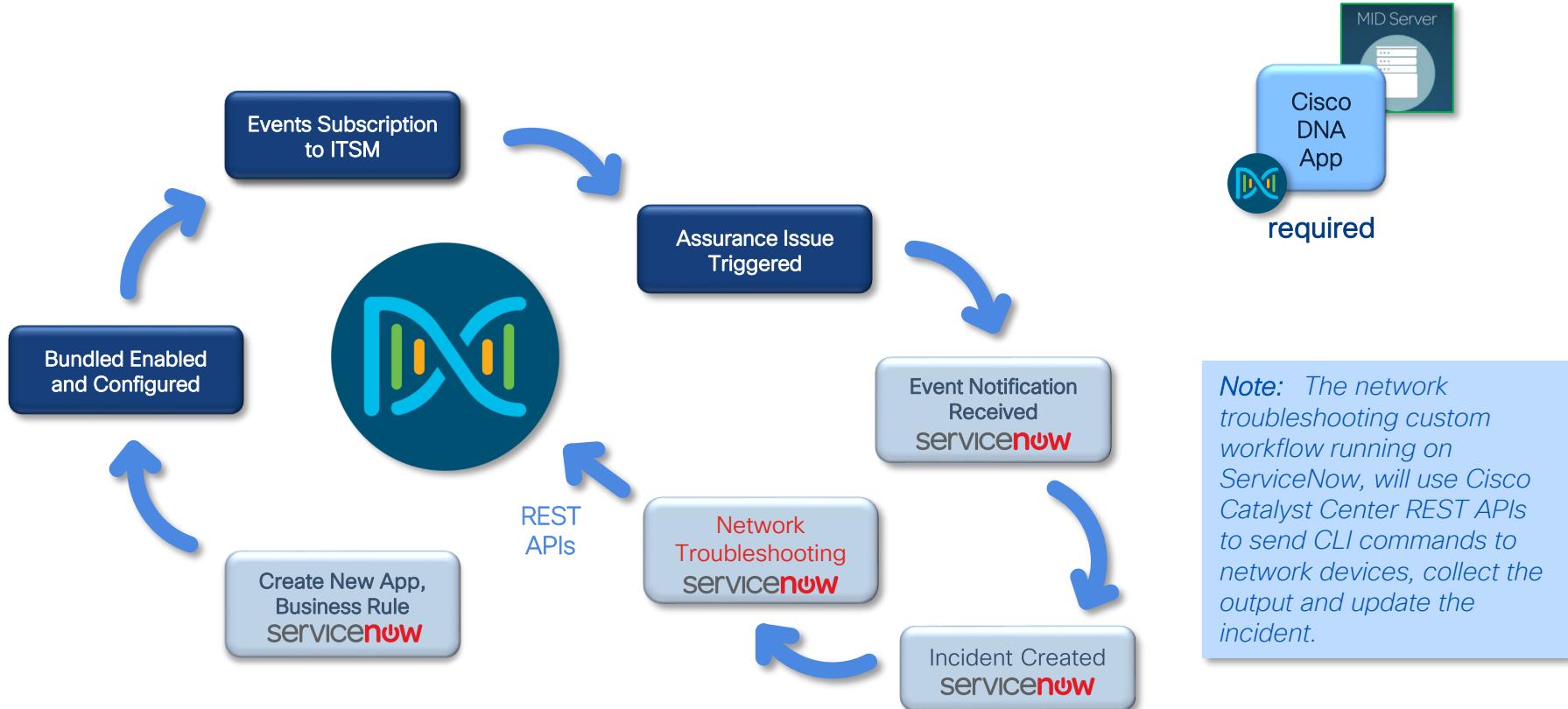
[Add New Policy](#)

Agenda

CISCO Live!

- Cisco Catalyst Center Platform
- ITSM (ServiceNow) Integration Overview
- CMDB Sync to Staging Table
- Events Notifications to Generic REST API Endpoint
- Network Troubleshooting Custom Workflow
- Summary

Network Troubleshooting Custom Workflow

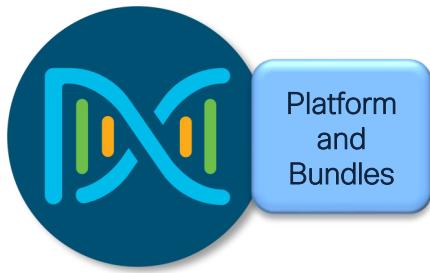
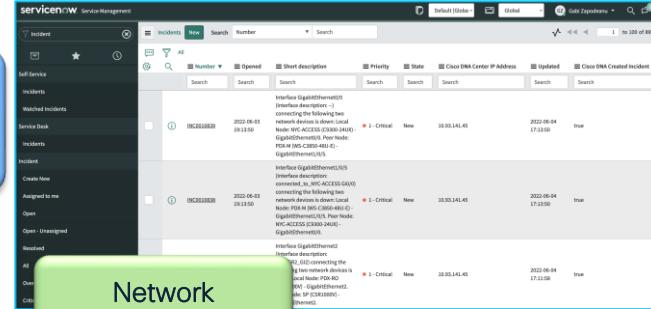


Network Troubleshooting Custom Workflow

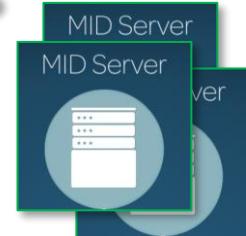
Requires the Cisco DNA App



servicenow



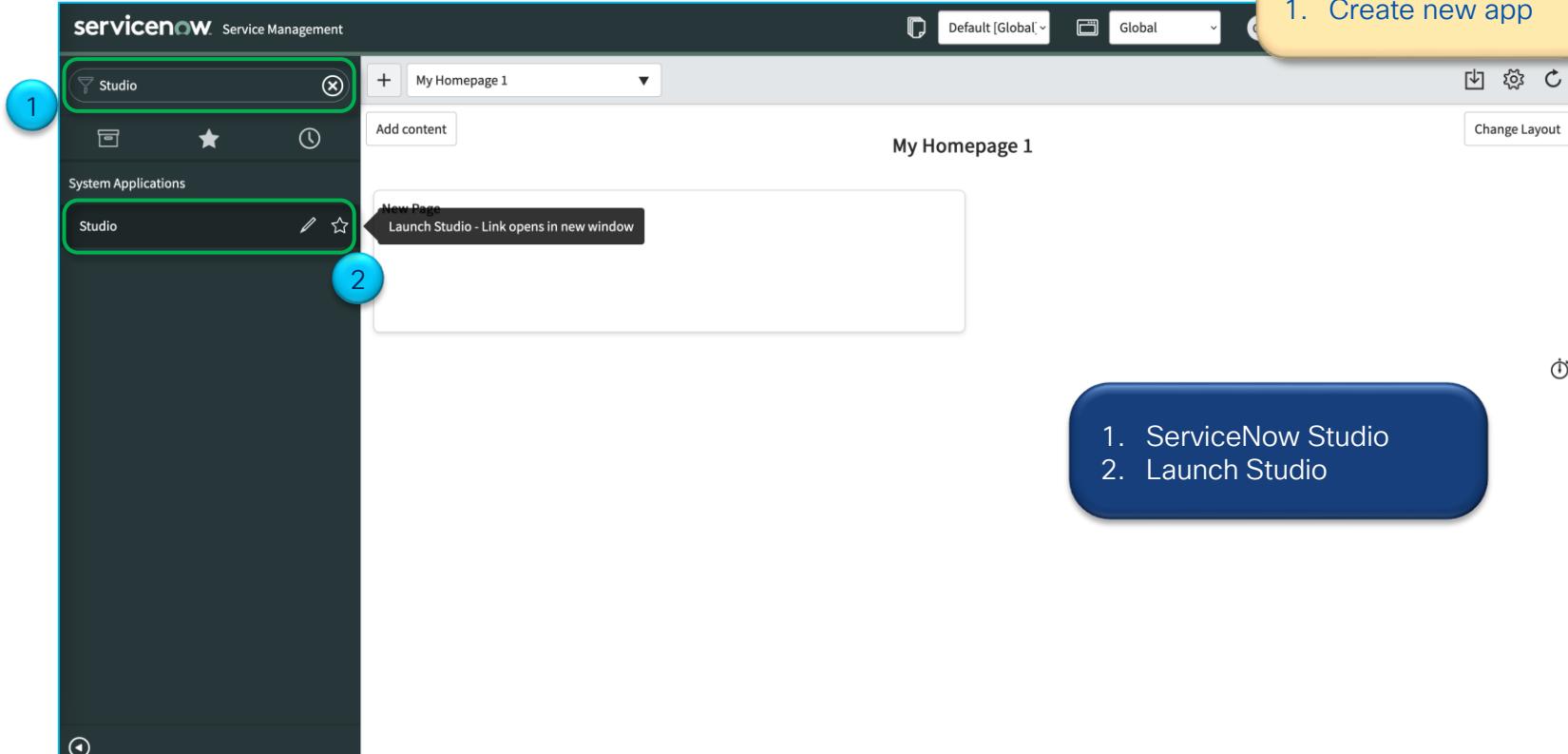
Multi Cisco Catalyst Center clusters supported



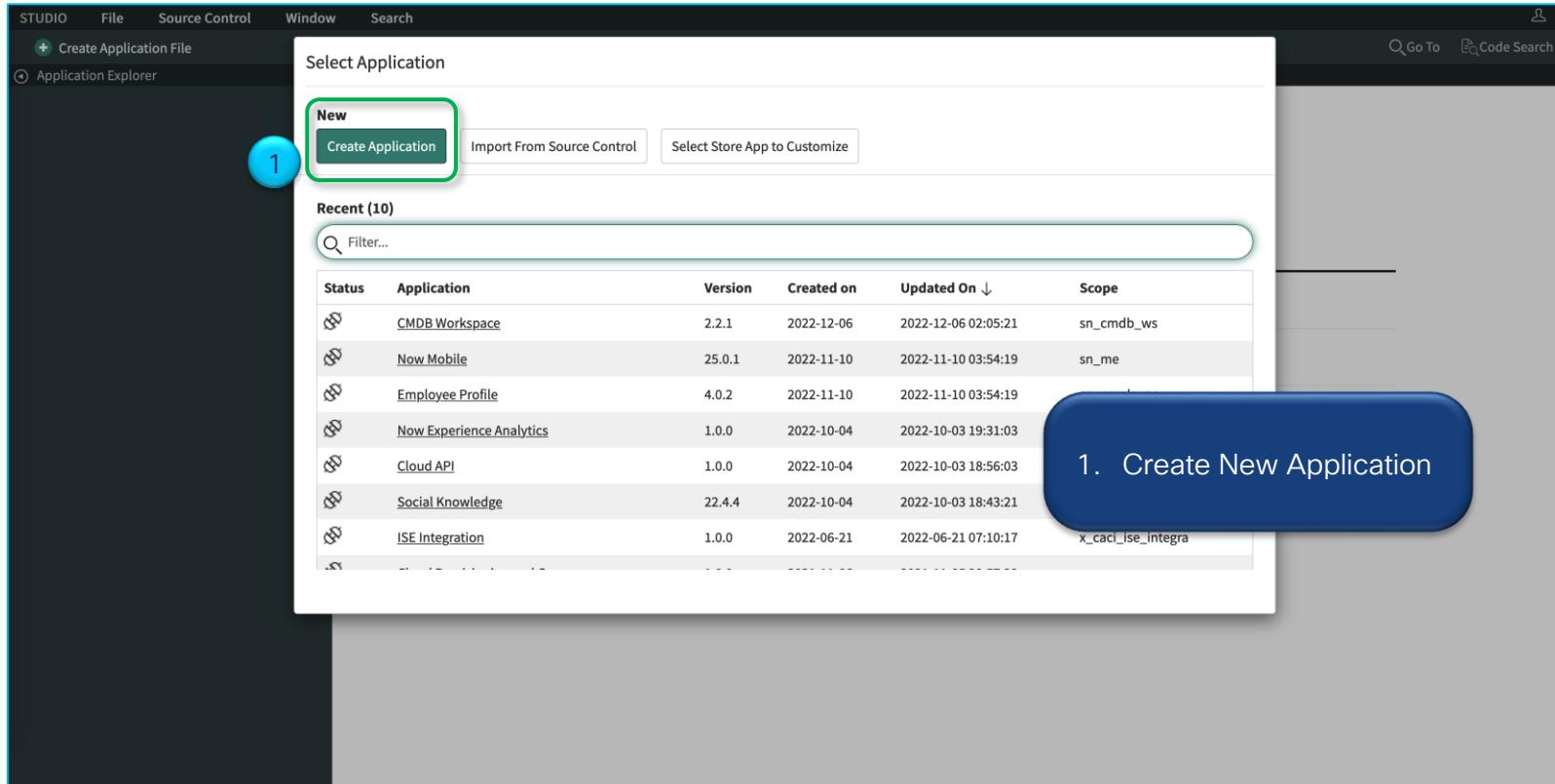
Note:

The Network Troubleshooting custom workflow will call the Cisco Catalyst Center REST APIs using the Cisco DNA App configured MID server and username.

ServiceNow Create New App



ServiceNow Create New App - continued



ServiceNow Create New App - continued

STUDIO File Source Control Window Search

General Info — Data — Design

OK. Let's get started on your new app

This app needs a name, description, and logo (optional). If you want to create more than one app, we'll build them one at a time.

Name ⓘ
Cisco DNA Custom Workflows

Description ⓘ
App for Cisco DNA Center custom workfl

Advanced settings ▾

Scoped ⓘ Global ⓘ

Remove Image

Cancel Create

1. App name and description
2. Scoped or Global
3. Optional - update a logo image
4. Create

ServiceNow Create New App - continued

STUDIO File Source Control Window Search

Create Application File

Application Explorer

General Info — Data — Design

Let's create some roles for this app

You can search for existing roles or select "Create new role" to add new ones.

Roles ⓘ

admin X

+ Create new role

1

2

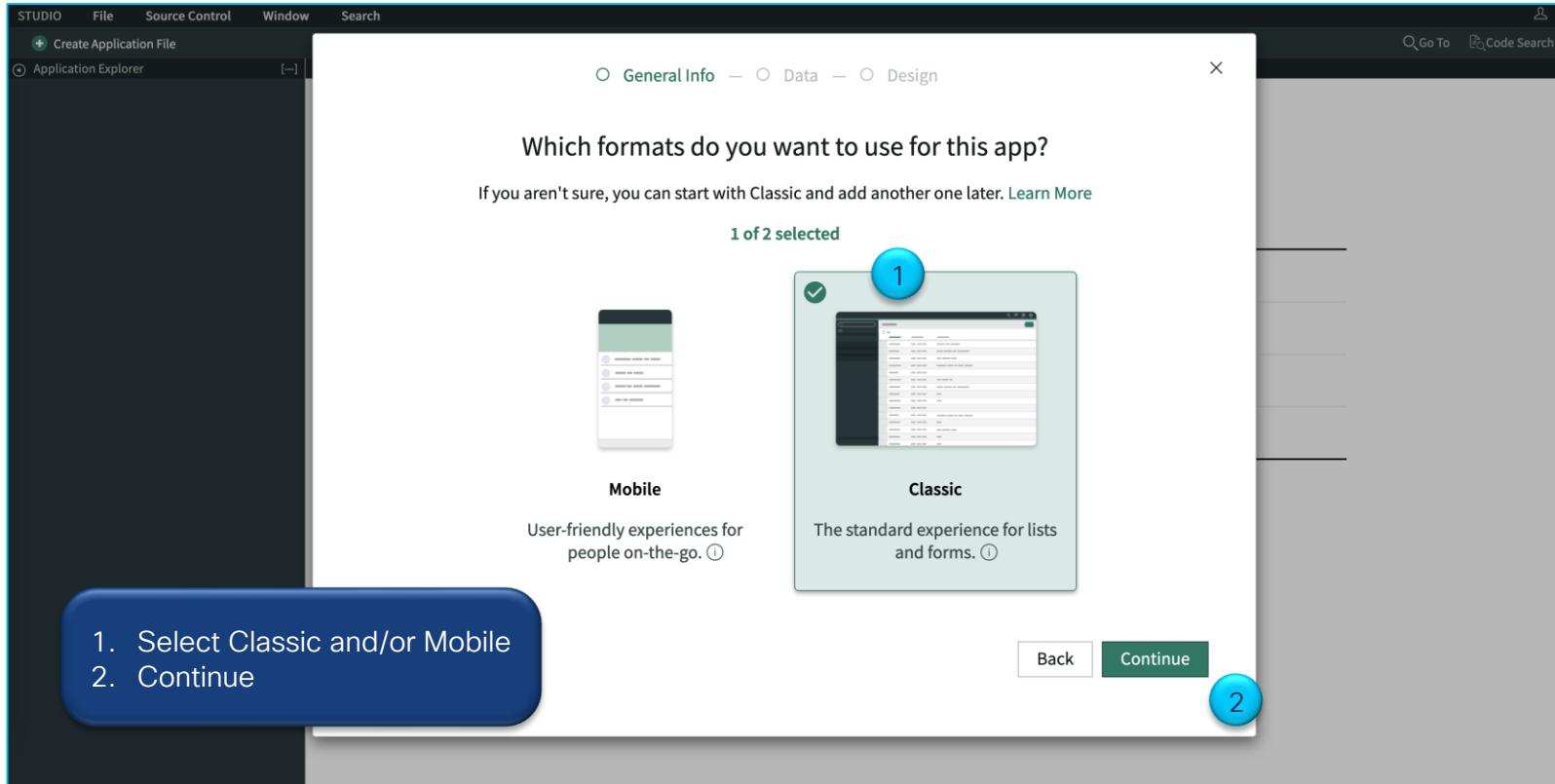
Continue in Studio (Advanced)

1. Select a role or create a new role
2. Continue

Continue

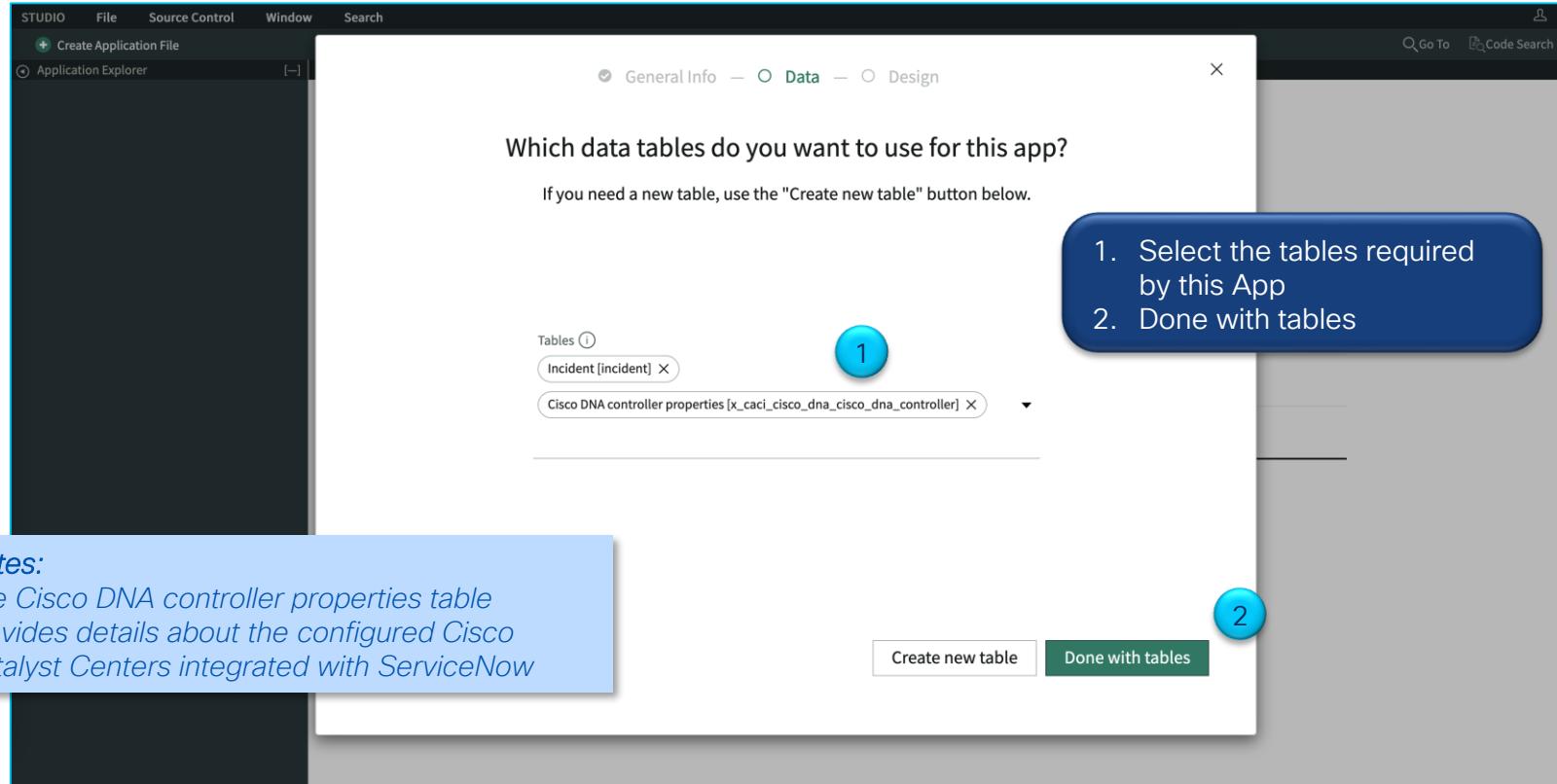
This screenshot shows the ServiceNow Studio interface for creating a new application. The 'General Info' tab is selected. A callout box highlights the 'Roles' dropdown menu, which currently contains 'admin'. Below the dropdown is a link to '+ Create new role'. A large blue callout box contains two numbered steps: '1. Select a role or create a new role' and '2. Continue'. A 'Continue' button is located to the right of the callout. The bottom left of the screen shows a link to 'Continue in Studio (Advanced)'. The bottom right of the screen shows a copyright notice: '© 2024 Cisco and/or its affiliates. All rights reserved. Cisco Public'.

ServiceNow Create New App - continued



1. Select Classic and/or Mobile
2. Continue

ServiceNow Create New App - continued



STUDIO File Source Control Window Search

General Info — Data — Design

Which data tables do you want to use for this app?

If you need a new table, use the "Create new table" button below.

Tables ⓘ

Incident [incident] X

Cisco DNA controller properties [x_caci_cisco_dna_cisco_dna_controller] X

1

2

Create new table Done with tables

Notes:
The Cisco DNA controller properties table provides details about the configured Cisco Catalyst Centers integrated with ServiceNow

1. Select the tables required by this App
2. Done with tables

ServiceNow Create New App - end

STUDIO File Source Control Window Search

Create Application File

Application Explorer

General Info — Data — Design

OK. It's time to design your apps!

The app formats you selected earlier are ready to be customized.



CLASSIC APPLICATION NAME STATUS

Not Ready Start

1

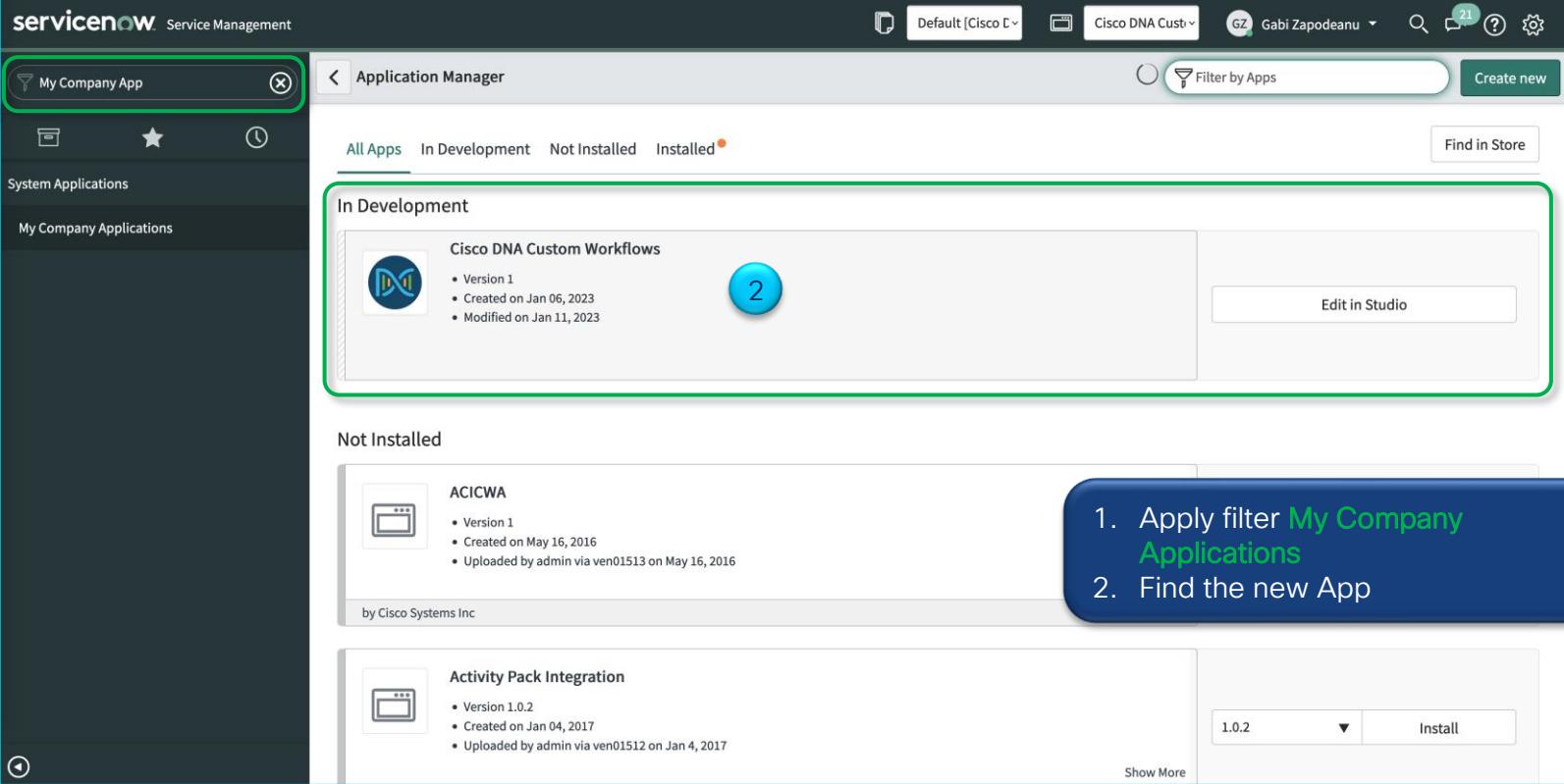
Back

1. Start

Note:
No user interface or forms will be created for our simple App

1

ServiceNow Create New App - Verify



1

2

Application Manager

All Apps In Development Not Installed Installed

In Development

Cisco DNA Custom Workflows

- Version 1
- Created on Jan 06, 2023
- Modified on Jan 11, 2023

Edit in Studio

Not Installed

ACICWA

- Version 1
- Created on May 16, 2016
- Uploaded by admin via ven01513 on May 16, 2016

by Cisco Systems Inc

Activity Pack Integration

- Version 1.0.2
- Created on Jan 04, 2017
- Uploaded by admin via ven01512 on Jan 4, 2017

Show More

1.0.2

Install

1. Apply filter **My Company Applications**
2. Find the new App

ServiceNow Create New Business Rule

The screenshot shows the ServiceNow interface for creating a new business rule. The left sidebar has 'Business Rules' selected under 'System Definition'. The top navigation bar shows 'Business Rules' and a 'New' button, which is highlighted with a green box and a blue circle containing the number 1. The main list of business rules is shown, with the first item highlighted and a blue circle containing the number 4. The list includes various system-defined business rules. A large blue callout box contains the following steps:

1. Apply filter Business Rules
2. Select System Definition/Business Rules
3. Verify the App scope is the new App
4. Create new business rule

A yellow callout box in the top right corner says 'Create Custom Workflow' with the following steps:

1. Create new app
2. Write business rule

A note in a blue box at the bottom right says: "Note: 'A business rule is a server-side script that runs when a record is displayed, inserted, deleted, or when a table is queried. Use business rules to automatically change values in form fields when the specified conditions are met'".

Condition	Action	Table	Scope	Created
Display: Fulfiller UI and Queues	true	Chat Setup [sys_cs_live_agent_setup]	Global	2020-03-23 00:00:32
GTD Tour Name Validation			Global	2020-07-27 22:40:07
80-20 split for t			Global	2021-10-13 09:48:24
Able to disable testing			Global	2018-06-29 10:33:57
Abort CMDB Po deletion			Global	2021-10-28 18:24:30
Abort action if no license type	true	Software Model [cmdb_software_product_model]	Global	2012-04-03 19:35:58
Abort Activation/Deactivation of topics	true	Topic [topic]		
Abort active records for same source	true	Event Grouping Definition [
Abort adding more than one taxonomy	true	Portal Taxonomy [m2m_sp		
Abort adding same flow twice	true	Remediation Subflow [em		

ServiceNow Create New Business Rule – continued

A business rule is a server-side script that runs when a record is displayed, inserted, deleted, or when a table is queried. Use business rules to automatically change values in forms, when the specified conditions are met. [More Info](#)

1. Name: Send Command Runner

2. Table: -- None --
Incident [incident]
Incident DNA Import
[x_caci_cisco_dna_incident_dna_import]
Incident Fact Table [incident_fact_table]
Incident Task [incident_task]
Task Template [em_incident_template]

3. Application: Cisco DNA Custom Workflows

4. Advanced:

Note:
Most of the selected values are predefined options, from pull-down menus

1. New business rule, name
2. Select the table required – Incident Table
3. Verify the App scope is the new App
4. Select Advanced

ServiceNow Create New Business Rule – continued

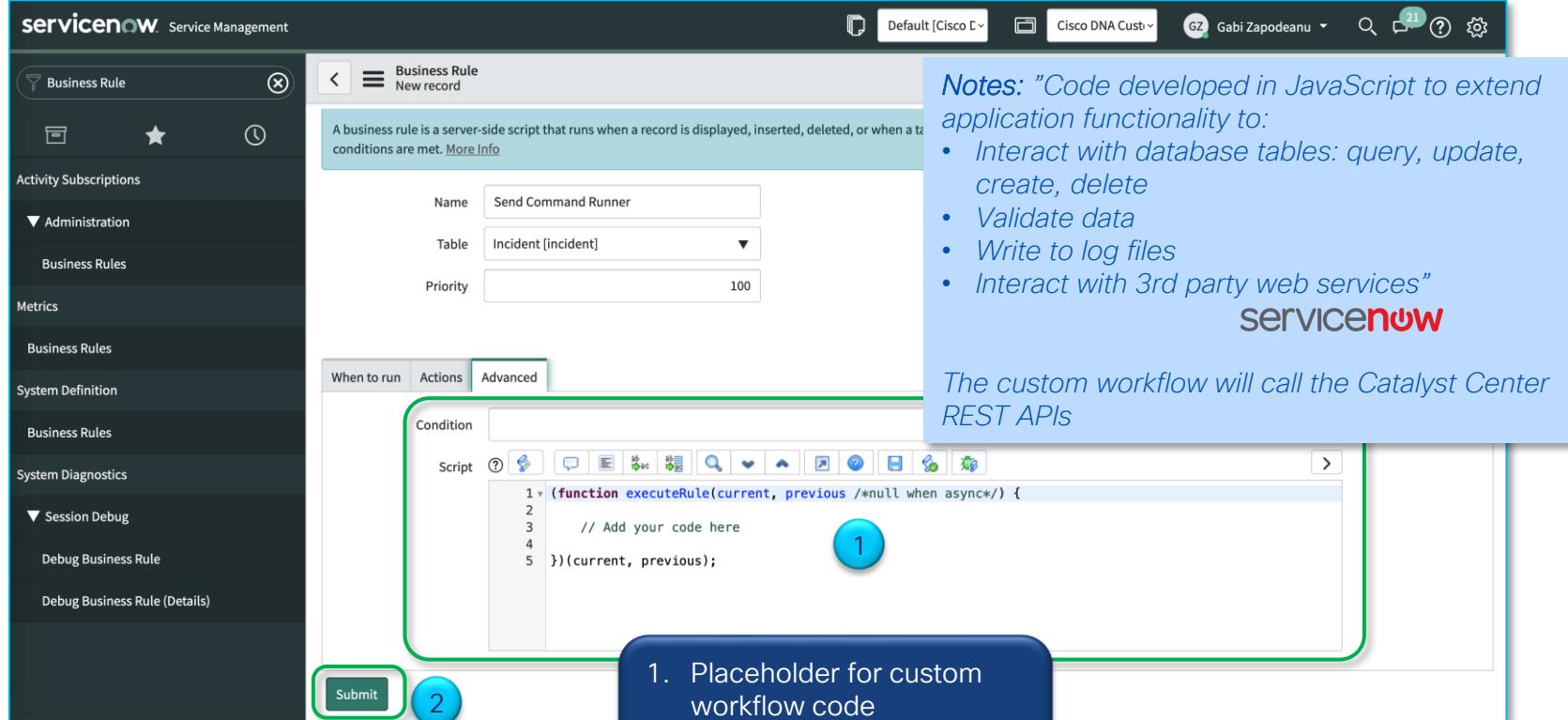
The image shows the ServiceNow interface for creating a new Business Rule. The left sidebar shows the navigation path: Business Rule > Business Rules > Business Rules. The main window is titled 'Business Rule New record'. The 'Table' dropdown is set to 'Incident [incident]' (highlighted with a yellow box and circled with a blue circle labeled '4'). The 'When to run' tab is selected, showing 'When' set to 'async' (highlighted with a green box and circled with a blue circle labeled '1'). The 'Actions' tab shows 'Insert' and 'Update' checkboxes checked (highlighted with an orange box and circled with a blue circle labeled '2'). The 'Advanced' tab is visible. The 'Filter Conditions' section at the bottom (highlighted with a yellow box and circled with a blue circle labeled '3') contains a dropdown set to 'Additional comments' with 'changes' selected, and 'AND' and 'OR' buttons. A large blue callout box on the right lists four steps:

1. Select when the business rule will execute – before, after, **async**
2. What changes will trigger – **insert** and **update** to records
3. Additional filters – execute only when changes to **Additional comments** field
4. Select **Advanced**

Notes:
This Business Rule will execute every time:

- an incident is created or updated, **AND**
- additional comments field is changed

ServiceNow Create New Business Rule – end



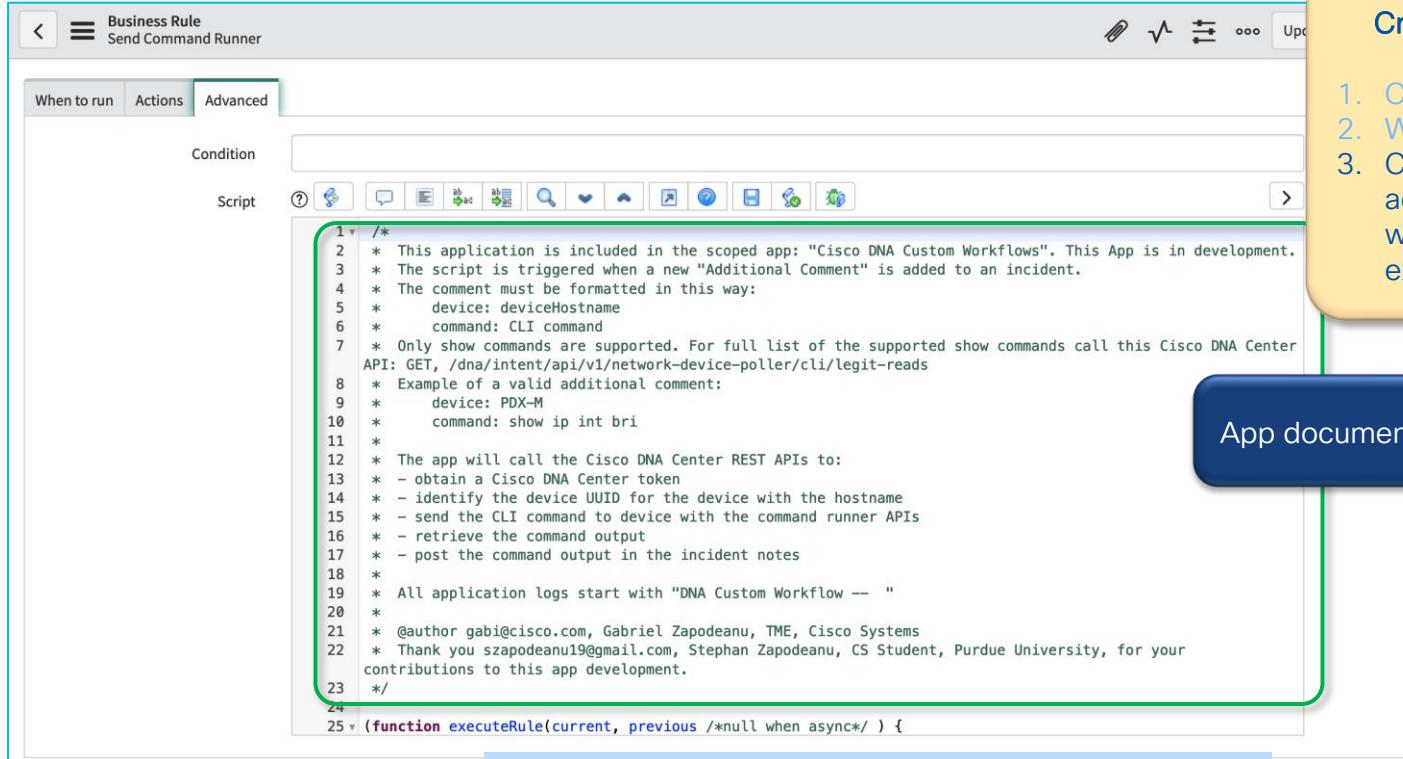
Notes: "Code developed in JavaScript to extend application functionality to:

- Interact with database tables: query, update, create, delete
- Validate data
- Write to log files
- Interact with 3rd party web services"

The custom workflow will call the Catalyst Center REST APIs

1. Placeholder for custom workflow code
2. Submit

Network Troubleshooting – Code Development



```
1 * /
2 *  This application is included in the scoped app: "Cisco DNA Custom Workflows". This App is in development.
3 *  The script is triggered when a new "Additional Comment" is added to an incident.
4 *  The comment must be formatted in this way:
5 *    device: deviceHostname
6 *    command: CLI command
7 *  Only show commands are supported. For full list of the supported show commands call this Cisco DNA Center
API: GET, /dna/intent/api/v1/network-device-poller/cli/legit-reads
8 * Example of a valid additional comment:
9 *    device: PDX-M
10 *   command: show ip int bri
11 *
12 * The app will call the Cisco DNA Center REST APIs to:
13 *   - obtain a Cisco DNA Center token
14 *   - identify the device UUID for the device with the hostname
15 *   - send the CLI command to device with the command runner APIs
16 *   - retrieve the command output
17 *   - post the command output in the incident notes
18 *
19 * All application logs start with "DNA Custom Workflow --- "
20 *
21 * @author gabi@cisco.com, Gabriel Zapodeanu, TME, Cisco Systems
22 * Thank you szapodeanu19@gmail.com, Stephan Zapodeanu, CS Student, Purdue University, for your
contributions to this app development.
23 */
24
25 (function executeRule(current, previous /*null when async*/ ) {
```

Note: Source-code co-development with
Stephan Zapodeanu, MS Student, Purdue University

Network Troubleshooting – App Workflow

- Select the last additional comment from incident (the current table)
- Verify the pre-defined format for device and command
- Retrieve from incident the IP address for the Cisco Catalyst Center reporting the issue
- Using the IP address, retrieve the Cisco Catalyst Center username and MID server from the configuration of the Cisco DNA app
- GET the Cisco Catalyst Center Auth token
- API call to retrieve the device UUID by hostname.
- Command Runner API, method POST, send the CLI command to device
- Update incident with status
- Retrieve the file content using the GET file API, parse the content
- Update the current record with the CLI command output or error message, if any

Incident
INC0017887

Activities: 5

GZ Gabi Zapodeanu
Assigned to Gabi Zapodeanu
Incident state In Progress was New

GZ Gabi Zapodeanu
Additional comments • 2024-01-24 15:11:17

Command Output:

```
show ip bgp
BGP table version is 18, local router ID is 10.93.141.23
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, l Long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

Network Next Hop Metric LocPrf Weight Path
-> 10.93.130.0/24 10.93.141.17 0 0 65003 i
-> 10.93.141.23/32 0.0.0.0 32768 i
-> 1.1.1.1/32 10.93.141.42 0 0 65001 i
PDX-RO#
```

GZ Gabi Zapodeanu
Additional comments • 2024-01-24 15:11:17

Command: show ip bgp, Sent to device: PDX-RO

GZ Gabi Zapodeanu
Additional comments • 2024-01-24 15:11:17

device: PDX-RO
command: show ip bgp

Command output

Command sent

Device and CLI Command

Network Troubleshooting – Code Development – cont.

The image shows a Business Rule editor on the left and an incident detail page on the right. The Business Rule editor displays a script for a 'Send Command Runner' action. The script retrieves the last comment from the current incident, retrieves the Cisco DNA Center IP address from a preconfigured controller table, and then uses this IP address to retrieve the Cisco Catalyst Center username and MID server from the Cisco DNA app configuration. The incident detail page shows a comment with the IP address 10.93.141.45 listed under the 'Cisco DNA' tab.

Business Rule Editor (Left):

```
24
25  (function executeRule(current, previous /*null when async*/ ) {
26    // Retrieve the last comment from incident
27    var lastComment = current.comments.getJournalEntry(1);
28    gs.info("DNA Custom Workflow -- last comment: \n" + lastComment);
29
30    lastCommentList = lastComment.split("\n");
31
32    // Retrieve the Cisco DNA Center IP address from current table of preconfigured controllers
33    var dnacIpAddress = current.x_caci_cisco_dna_cisco_dna_center_ip_address;
34    gs.info("DNA Custom Workflow -- Cisco DNA Center: " + dnacIpAddress);
35
36    // Get the username and midserver for the DNAC
37    var prop = new GlideRecord('x_caci_cisco_dna_cisco_dna_controller');
38    prop.addQuery('ip_address_of_dna_engine_controller', dnacIpAddress);
39    prop.query();
40    while (prop.next()) {
41      var username = prop.getValue('user_name');
42      var midserver = prop.getDisplayValue('mid_server_used_to_connect_to_dnac');
43      //var password = prop.password_of_the_dna_engine_controller.getDecryptedValue();
44    }
45    gs.info("DNA Custom Workflow -- Cisco DNA Center username : " + username);
46    gs.info("DNA Custom Workflow -- Cisco DNA Center MID server : " + midserver);
47
48    // Set password (for demo)
49    var PASSWORD;
50  }
```

Incident Detail Page (Right):

INCIDENT INC0017887

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

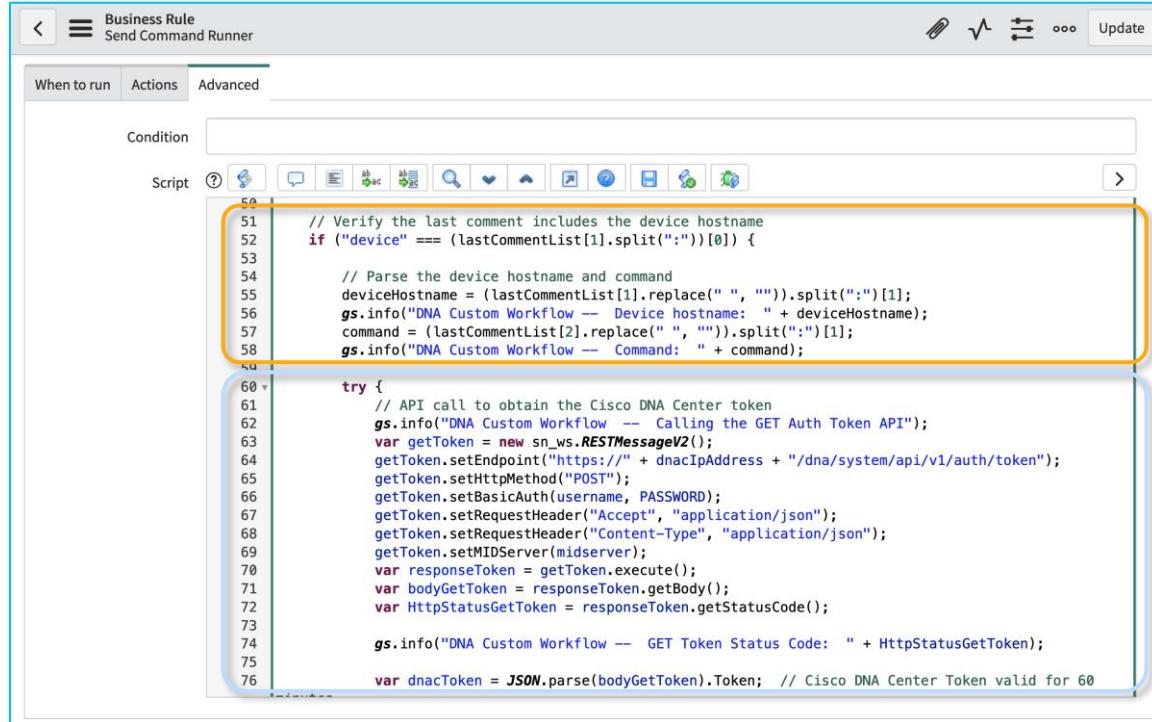
Cisco DNA

Cisco DNA Center IP Address	10.93.141.45
-----------------------------	--------------

Annotations:

- Select the last additional comment from incident (the current table)
- Retrieve from the current incident the IP address for the Cisco Catalyst Center reporting the issue
- Using the IP address, retrieve the Cisco Catalyst Center username and MID server from the configuration of the Cisco DNA app

Network Troubleshooting – Code Development – cont.



```
51 // Verify the last comment includes the device hostname
52 if ("device" === (lastCommentList[1].split(":"))[0]) {
53
54     // Parse the device hostname and command
55     deviceHostname = (lastCommentList[1].replace(" ", "")).split(":")[1];
56     gs.info("DNA Custom Workflow -- Device hostname: " + deviceHostname);
57     command = (lastCommentList[2].replace(" ", "")).split(":")[1];
58     gs.info("DNA Custom Workflow -- Command: " + command);
59
60     try {
61         // API call to obtain the Cisco DNA Center token
62         gs.info("DNA Custom Workflow -- Calling the GET Auth Token API");
63         var getToken = new sn_ws.RESTMessageV2();
64         getToken.setEndpoint("https://" + dnacIpAddress + "/dna/system/api/v1/auth/token");
65         getToken.setHttpMethod("POST");
66         getToken.setBasicAuth(username, PASSWORD);
67         getToken.setRequestHeader("Accept", "application/json");
68         getToken.setRequestHeader("Content-Type", "application/json");
69         getToken.setMidServer(midserver);
70         var responseToken = getToken.execute();
71         var bodyGetToken = responseToken.getBody();
72         var HttpStatusGetToken = responseToken.getStatusCode();
73
74         gs.info("DNA Custom Workflow -- GET Token Status Code: " + HttpStatusGetToken);
75
76         var dnacToken = JSON.parse(bodyGetToken).Token; // Cisco DNA Center Token valid for 60
    }
```

Verify the pre-defined format for device and command

GET the Cisco Catalyst Center Auth token

Network Troubleshooting – API call details

API call to retrieve the device UUID by hostname:
.setEndpoint – API resource
.setHttpMethod – API method
.setRequestHeaders – content type and auth token
.setMIDServer – the MID server reaching out Cisco Catalyst Center

Call the API and parse the response

Log the API status code and device Id

```
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
//gs.info("DNA Custom Workflow -- Token: " + dnacToken); // For Troubleshooting
// API to get the device uid using the device hostname
gs.info("DNA Custom Workflow -- Calling the GET device API");
var getDevice = new sn_ws.RESTMessageV2();
getDevice.setEndpoint("https://" + dnacIpAddress + "/dna/intent/api/v1/network-
device?hostname=" + deviceHostname);
getDevice.setHttpMethod("GET");
getDevice.setRequestHeader("Accept", "application/json");
getDevice.setRequestHeader("Content-Type", "application/json");
getDevice.setRequestHeader("x-auth-token", dnacToken);
getDevice.setMIDServer(midserver);
var responseGetDevice = getDevice.execute();
var bodyGetDevice = responseGetDevice.getBody();
var HttpStatusGetDevice = responseGetDevice.getStatusCode();

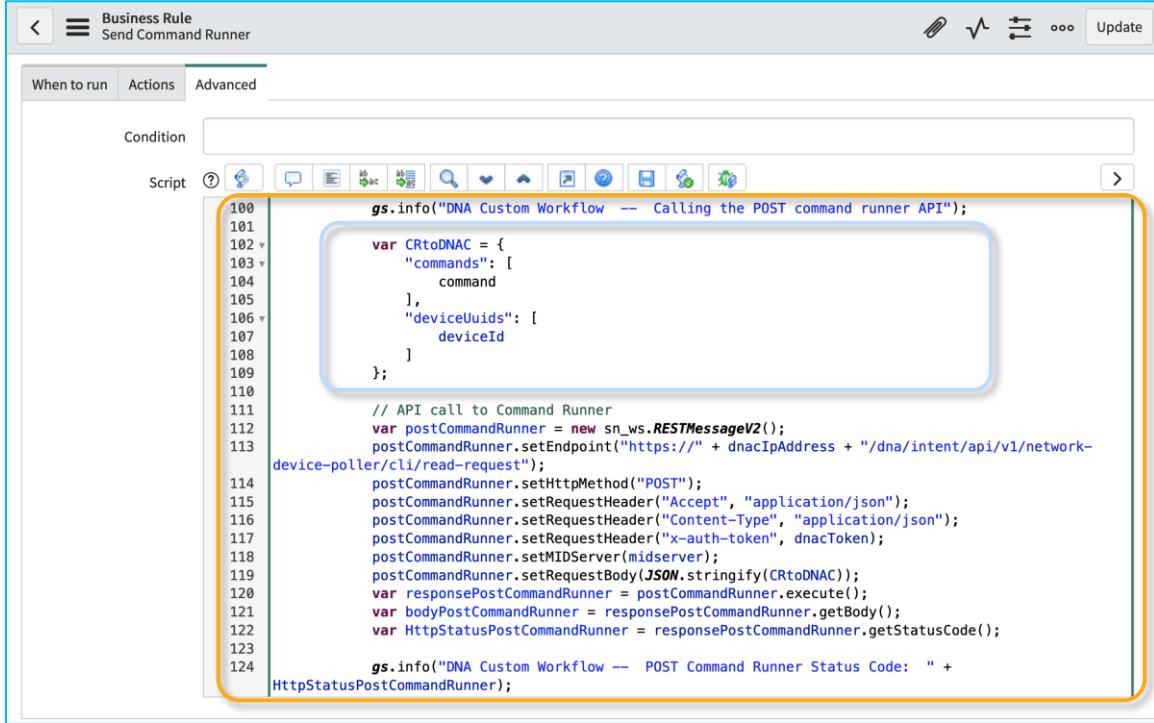
gs.info("DNA Custom Workflow -- GET Device Status Code: " + HttpStatusGetDevice);
//gs.info("DNA Custom Workflow -- GET device details: " + bodyGetDevice); // For
Troubleshooting

var deviceId = JSON.parse(bodyGetDevice).response[0].id;
gs.info("DNA Custom Workflow -- Device Id: " + deviceId);

// Payload for API call to Command Runner
gs.info("DNA Custom Workflow -- Calling the POST command runner API");
```

Note: You will need to provide a MID server for the API call

Network Troubleshooting – Code Development – cont.



The screenshot shows a Business Rule editor window titled "Business Rule" and "Send Command Runner". The "Actions" tab is selected. The "Script" section contains the following code:

```
100 gs.info("DNA Custom Workflow -- Calling the POST command runner API");
101
102 var CRtoDNAC = {
103   "commands": [
104     command
105   ],
106   "deviceUuids": [
107     deviceId
108   ]
109 };
110
111 // API call to Command Runner
112 var postCommandRunner = new sn_ws.RESTMessageV2();
113 postCommandRunner.setEndpoint("https://" + dnacIpAddress + "/dna/intent/api/v1/network-
device-poller/cli/read-request");
114 postCommandRunner.setHttpMethod("POST");
115 postCommandRunner.setRequestHeader("Accept", "application/json");
116 postCommandRunner.setRequestHeader("Content-Type", "application/json");
117 postCommandRunner.setRequestHeader("x-auth-token", dnacToken);
118 postCommandRunner.setMIDServer(midserver);
119 postCommandRunner.setRequestBody(JSON.stringify(CRtoDNAC));
120 var responsePostCommandRunner = postCommandRunner.execute();
121 var bodyPostCommandRunner = responsePostCommandRunner.getBody();
122 var HttpStatusPostCommandRunner = responsePostCommandRunner.getStatusCode();
123
124 gs.info("DNA Custom Workflow -- POST Command Runner Status Code: " +
125 HttpStatusPostCommandRunner);
```

Command Runner API payload – requires the CLI command and device UUID

Command Runner API, method POST, send the CLI command to devices

Network Troubleshooting – Code Development – cont.

The screenshot shows a Business Rule titled 'Send Command Runner' and an incident detail page for 'INC0017887'.

Business Rule: Send Command Runner

- When to run:** Condition (empty)
- Actions:** Advanced
- Script:**

```
// Update incident with the status
current.comments = "Command: " + command + ", Sent to device: " + deviceHostname;
current.update();

// 3 second timer (in ms), wait for execution of command runner to complete
var sleepTimer = 3000;
var endSleep = new GlideDuration().getNumericValue() + sleepTimer;
while (new GlideDuration().getNumericValue() < endSleep) {
    // Wait
}

// GET the task Id status
var getTask = new sn_ws.RESTMessageV2();
getTask.setEndpoint("https://" + dnacIpAddress + "/dna/intent/api/v1/network-device/tasks");
getTask.setHttpMethod("GET");
getTask.setRequestHeader("Accept", "application/json");
getTask.setRequestHeader("Content-Type", "application/json");
getTask.setRequestHeader("x-auth-token", dnacToken);
getTask.setIDServer(midserver);
var requestGetTask = getTask.execute();
var bodyGetTask = requestGetTask.getBody();
var HttpStatusGetTask = requestGetTask.getStatusCode();

gs.info("DNA Custom Workflow");
//gs.info("DNA Custom Workflow Troubleshooting")
```

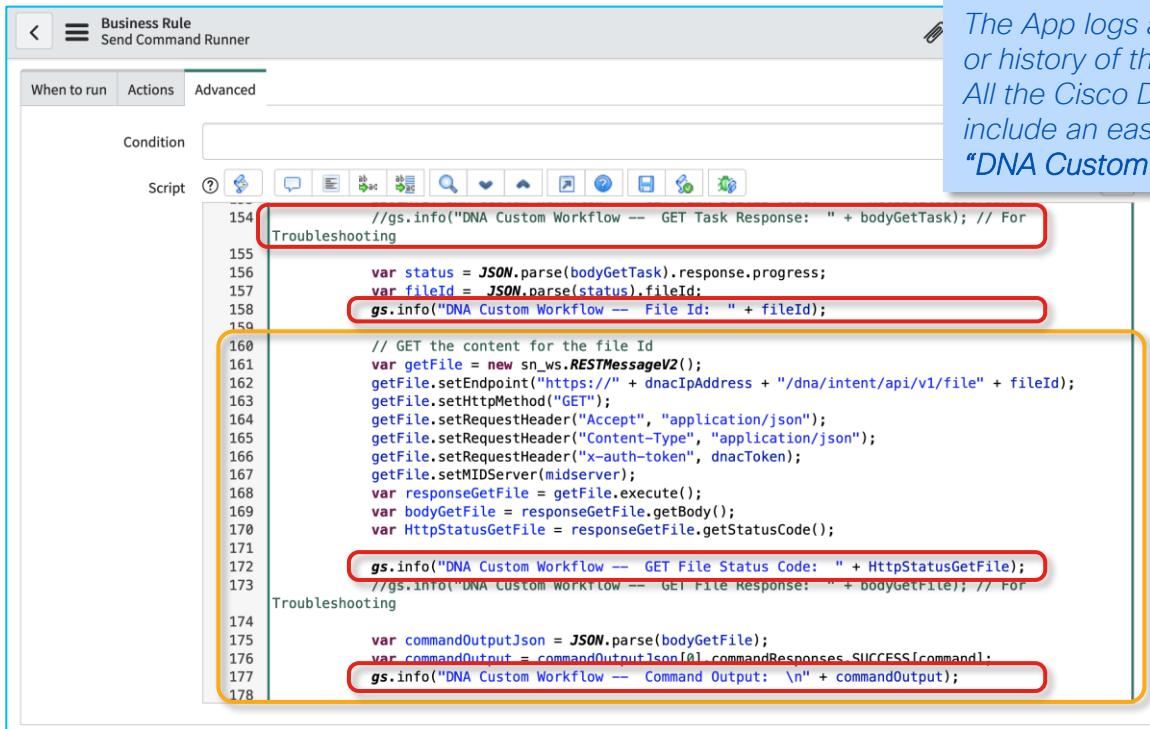
Update incident with status

Incident: INC0017887

- Comments:**
 - GZ Gabi Zapodeanu: Command: show ip bgp, Sent to device: PDX-RO
 - GZ Gabi Zapodeanu: device: PDX-RO command: show ip bgp

Note:
Incident updated only if API calls to obtain the Cisco Catalyst Center token and the device UUID are successful

Network Troubleshooting – Code Development – cont.



```
154 //gs.info("DNA Custom Workflow -- GET Task Response: " + bodyGetTask); // For
155 // Troubleshooting
156 var status = JSON.parse(bodyGetTask).response.progress;
157 var fileId = JSON.parse(status).fileId;
158 gs.info("DNA Custom Workflow -- File Id: " + fileId);
159
160 // GET the content for the file Id
161 var getFile = new sn_ws.RESTMessageV2();
162 getFile.setEndpoint("https://" + dnacIpAddress + "/dna/intent/api/v1/file" + fileId);
163 getFile.setHttpMethod("GET");
164 getFile.setRequestHeader("Accept", "application/json");
165 getFile.setRequestHeader("Content-Type", "application/json");
166 getFile.setRequestHeader("x-auth-token", dnacToken);
167 getFile.setMIDServer(midserver);
168 var responseGetFile = getFile.execute();
169 var bodyGetFile = responseGetFile.getBody();
170 var HttpStatusGetFile = responseGetFile.getStatusCode();
171
172 gs.info("DNA Custom Workflow -- GET File Status Code: " + HttpStatusGetFile);
173 //gs.info("DNA CUSTOM WORKFLOW -- GET File Response: " + bodyGetFile); // For
174 // Troubleshooting
175
176 var commandOutputJson = JSON.parse(bodyGetFile);
177 var commandOutput = commandOutputJson[0].commandResponses.SUCCESS[command];
178 gs.info("DNA Custom Workflow -- Command Output: \n" + commandOutput);
```

Notes:

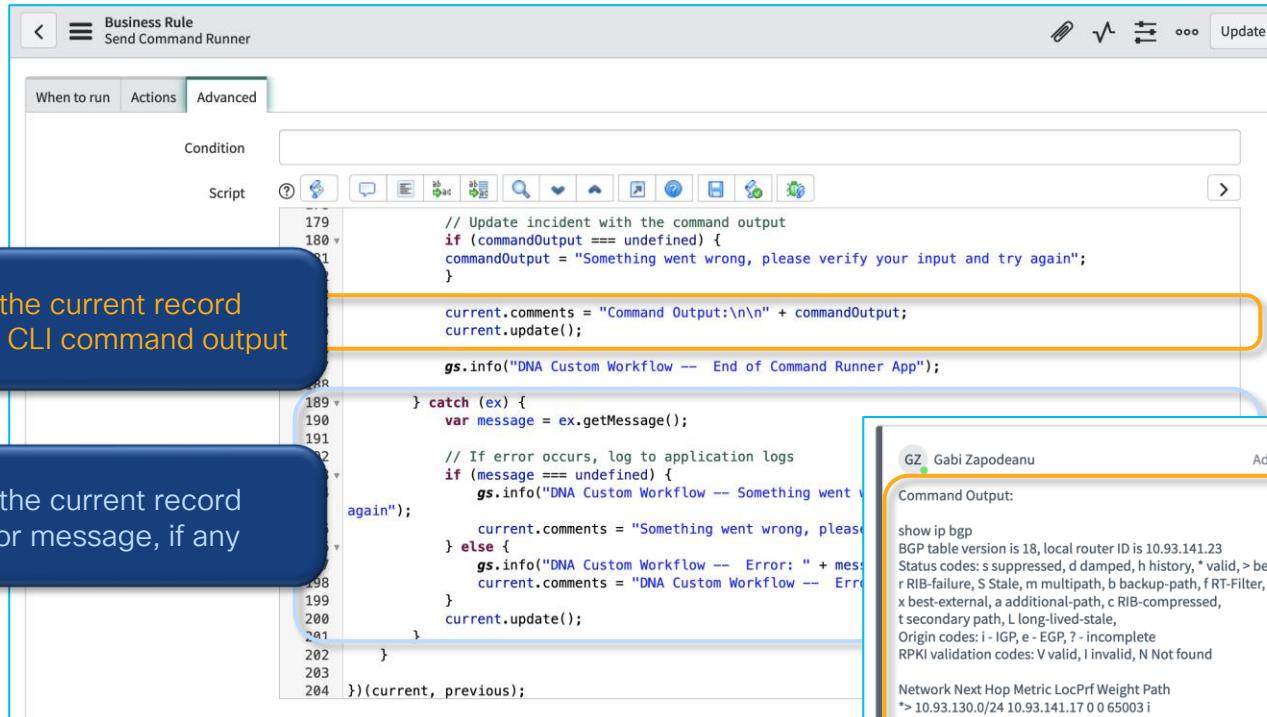
The App logs are very useful for troubleshooting, or history of the business rule's executions.

All the Cisco DNA Custom Workflow App logs include an easy to identify comment – example:

"DNA Custom Workflow -- "

Retrieve the file content using the GET file API, parse the content and log info

Network Troubleshooting – Code Development – cont.



```
// Update incident with the command output
if (commandOutput === undefined) {
  commandOutput = "Something went wrong, please verify your input and try again";
}

current.comments = "Command Output:\n\n" + commandOutput;
current.update();

gs.info("DNA Custom Workflow -- End of Command Runner App");

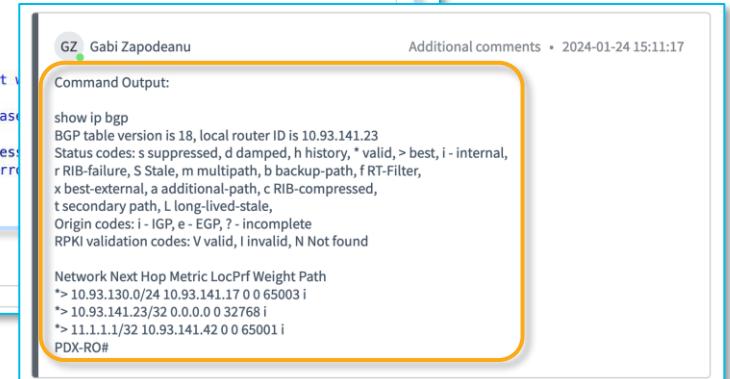
} catch (ex) {
  var message = ex.getMessage();

  // If error occurs, log to application logs
  if (message === undefined) {
    gs.info("DNA Custom Workflow -- Something went wrong, please verify your input and try again");
    current.comments = "Something went wrong, please verify your input and try again";
  } else {
    gs.info("DNA Custom Workflow -- Error: " + message);
    current.comments = "DNA Custom Workflow -- Error: " + message;
  }
  current.update();
}

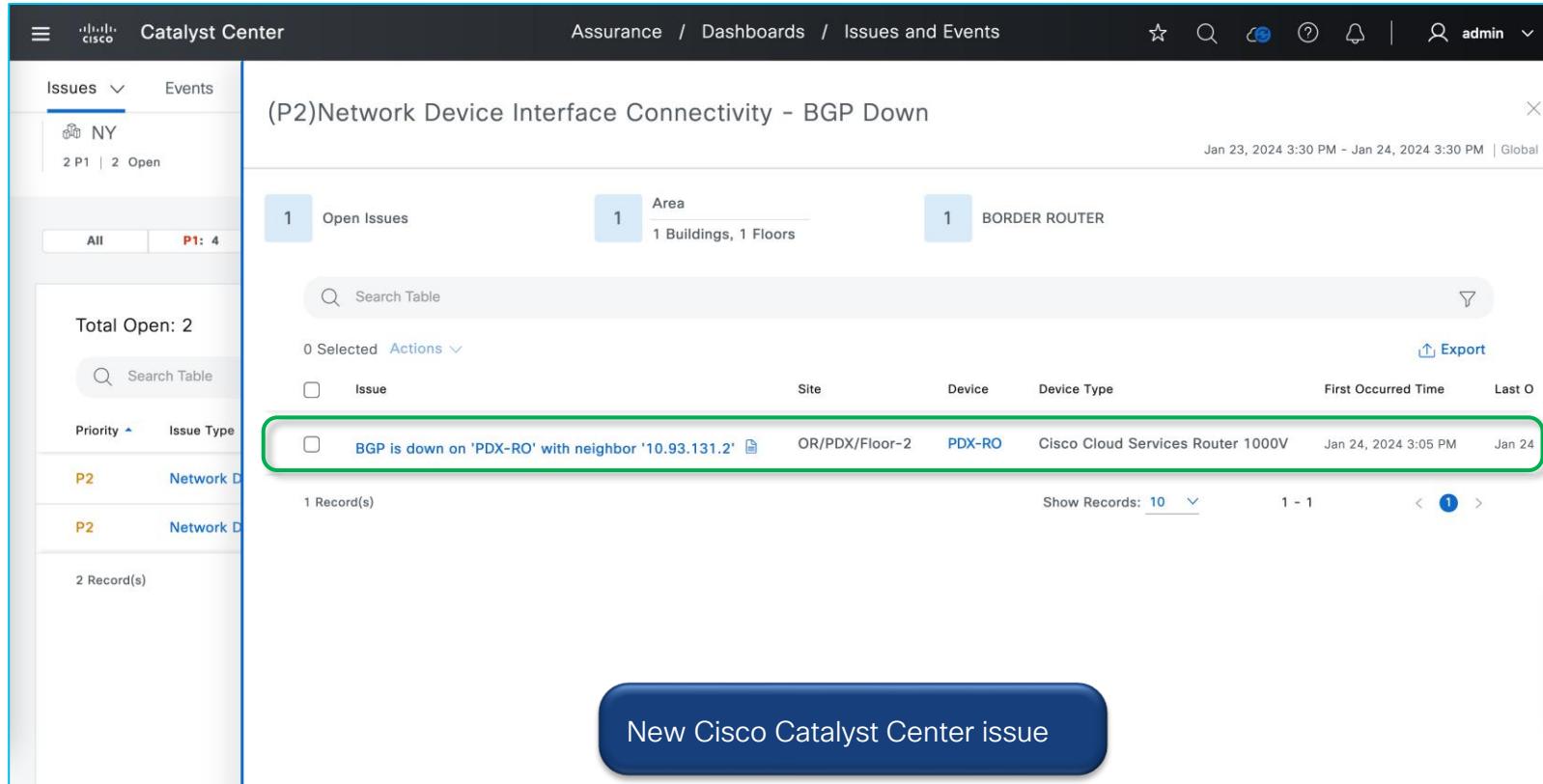
})(current, previous);
```

Update the current record with the CLI command output

Update the current record with error message, if any



Network Troubleshooting App Workflow



The screenshot shows the Cisco Catalyst Center Network Troubleshooting App interface. The left sidebar displays 'Issues' (2 P1, 2 Open) and 'Events' for the 'NY' location. The main content area shows a summary for '(P2)Network Device Interface Connectivity - BGP Down' with 1 Open Issue, 1 Area (1 Buildings, 1 Floors), and 1 BORDER ROUTER. A table lists the issue: 'BGP is down on 'PDX-RO' with neighbor '10.93.131.2''. The table includes columns for Issue, Site, Device, Device Type, First Occurred Time, and Last Occurred Time. The row for the BGP issue is highlighted with a green border. A blue button at the bottom right says 'New Cisco Catalyst Center issue'.

Issue	Site	Device	Device Type	First Occurred Time	Last Occurred Time
BGP is down on 'PDX-RO' with neighbor '10.93.131.2'	OR/PDX/Floor-2	PDX-RO	Cisco Cloud Services Router 1000V	Jan 24, 2024 3:05 PM	Jan 24

Network Troubleshooting App Workflow – cont.

The screenshot shows the ServiceNow Network Troubleshooting App interface for an incident. The top navigation bar includes 'Follow', 'Update', 'Create Cisco DNA Change Request', 'Resolve', and 'Delete' buttons. The incident details are as follows:

- Number:** INC0017887
- Opened:** 2024-01-24 15:09:12
- Urgency:** 2 - Medium
- Assigned to:** Gabi Zapodeanu
- Assignment group:** Network
- State:** In Progress

A callout box labeled '1' highlights the assignment details. Below the incident details, there is a 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) and Configuration item fields are present. The Cisco DNA tab is active, showing the following data:

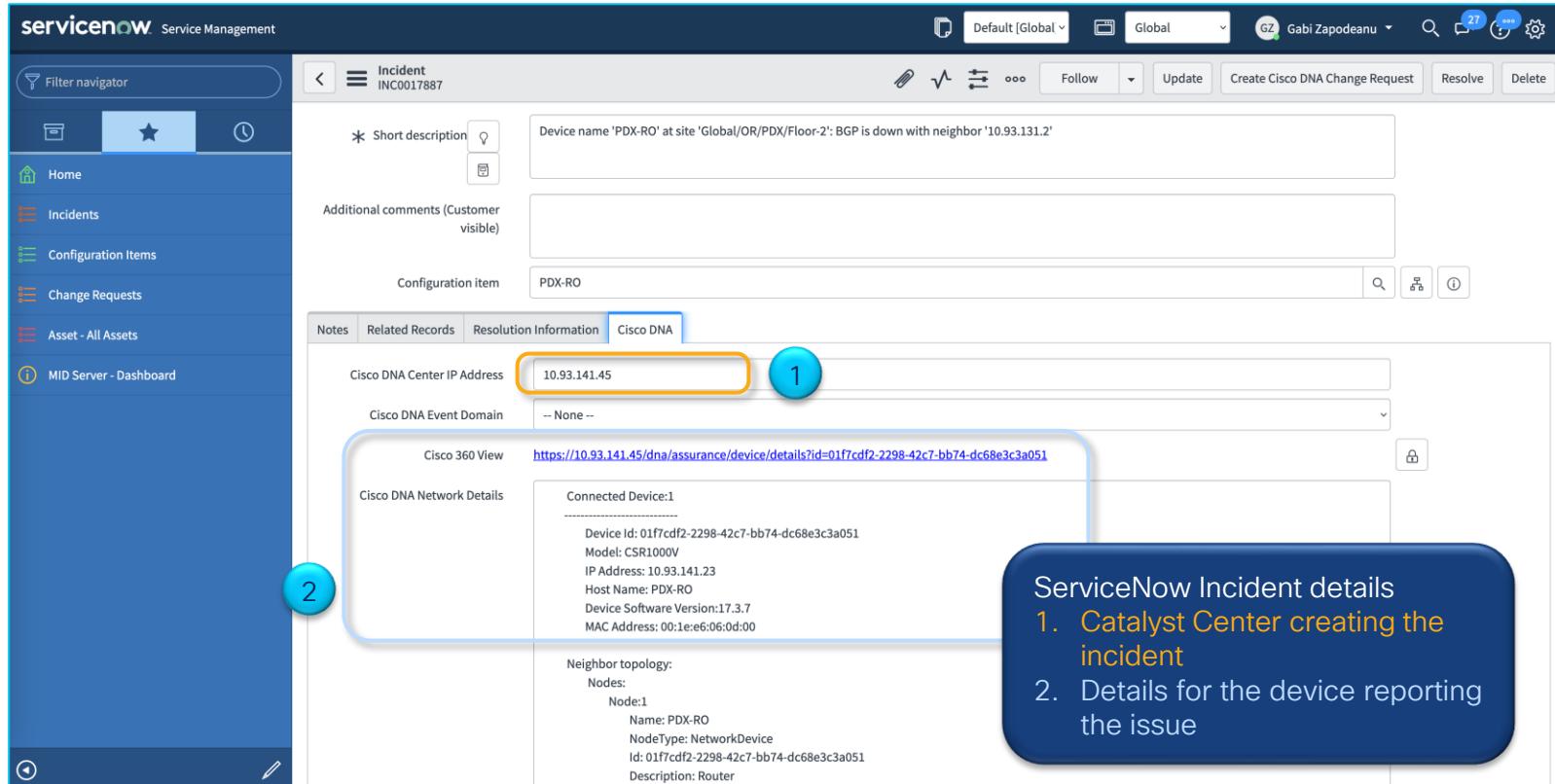
- Cisco DNA Center IP Address:** 10.93.141.45
- Cisco DNA Event Domain:** -- None --
- Cisco 360 View:** <https://10.93.141.45/dna/assurance/device/details?id=01f7cdf2-2298-42c7-bb74-dc68e3c3a051>

A callout box labeled '2' highlights the Cisco DNA tab.

ServiceNow Incident details

1. If needed, update:
 - incident urgency
 - assign to team and engineer
 - state
2. Find more details about the incident in the Cisco DNA tab

Network Troubleshooting App Workflow – cont.



servicenow. Service Management

Incident INC0017887

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

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>

Cisco DNA Network Details

Connected Device:1

Device Id: 01f7cdf2-2298-42c7-bb74-dc68e3c3a051
Model: CSR1000V
IP Address: 10.93.141.23
Host Name: PDX-RO
Device Software Version: 17.3.7
MAC Address: 00:1e:60:0d:00

Neighbor topology:

Nodes:

Node:1
Name: PDX-RO
NodeType: NetworkDevice
Id: 01f7cdf2-2298-42c7-bb74-dc68e3c3a051
Description: Router

1

2

ServiceNow Incident details

1. Catalyst Center creating the incident
2. Details for the device reporting the issue

Network Troubleshooting App Command/Output

Incident
INC0017887

Follow Update Create Cisco DNA Change Request

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): device: PDX-RO, command: show ip bgp

Configuration item: PDX-RO

Notes Related Records Resolution Information Cisco DNA

Work notes list

Work notes

Additional Comments:
1. CLI command to device, using the predefined format
2. Update – send command

Incident
INC0017887

Follow Update Create Cisco DNA Change Request Resolve Delete

Activities: 8

3. Command output

GZ Gabi Zapodeanu Additional comments • 2024-01-24 15:34:25

Command Output:

```
show ip bgp
BGP table version is 18, local router ID is 10.93.141.23
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
x best-external, a additional-path, c RIB-compressed,
t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found
```

Network Next Hop Metric LocPrf Weight Path
*> 10.93.130.0/24 10.93.141.17 0 0 65003 i
*> 10.93.141.23/32 0.0.0.0 0 32768 i
*> 11.1.1.32 10.93.141.42 0 0 65001 i
PDX-RO#

2. Command sent

GZ Gabi Zapodeanu Additional comments • 2024-01-24 15:34:25

Command: show ip bgp, Sent to device: PDX-RO

1. Device and CLI Command

GZ Gabi Zapodeanu Additional comments • 2024-01-24 15:34:25

device: PDX-RO
command: show ip bgp

Note: The network troubleshooting workflow does not require VPN access, or SSH to network devices.

Network Troubleshooting App Command/Output – cont.

The image shows two screenshots of the Cisco DNA Center Network Troubleshooting App. The left screenshot shows the 'Incident' screen for INC0017887, with a green box highlighting the 'Additional comments (Customer visible)' field. The right screenshot shows the 'Activities' list for the same incident, with a blue box highlighting the first activity (1) and a yellow box highlighting the timestamp in the second activity (2).

Left Screenshot (Incident Screen):

- Incident ID: INC0017887
- Follow, Update buttons
- Short description: Device name 'PDX-RO' at site 'Global/OR/PDX/Floor-2': B
- Additional comments (Customer visible): device: PDX-RO
command: show ip int bri
- Configuration item: PDX-RO
- Command sent button

Right Screenshot (Activities List):

- Incident ID: INC0017887
- Follow, Update, Create Cisco DNA Change Request, Resolve, Delete buttons
- Activities: 11
- Activity 1 (blue box): GZ Gabi Zapodeanu, Command Output:
show ip int bri
Interface IP-Address OK? Method Status Protocol
GigabitEthernet1 10.93.141.41 YES NVRAM up up
GigabitEthernet2 10.93.131.1 YES NVRAM administratively down down
GigabitEthernet3 unassigned YES NVRAM down down
Loopback1 10.93.141.23 YES NVRAM up up
PDX-RO#
- Activity 2 (yellow box): GZ Gabi Zapodeanu, Additional comments • 2024-01-24 15:39:58
Command: show ip int bri, Sent to device: PDX-RO
- Activity 3 (blue box): GZ Gabi Zapodeanu, Additional comments • 2024-01-24 15:39:46

Bottom Callout:

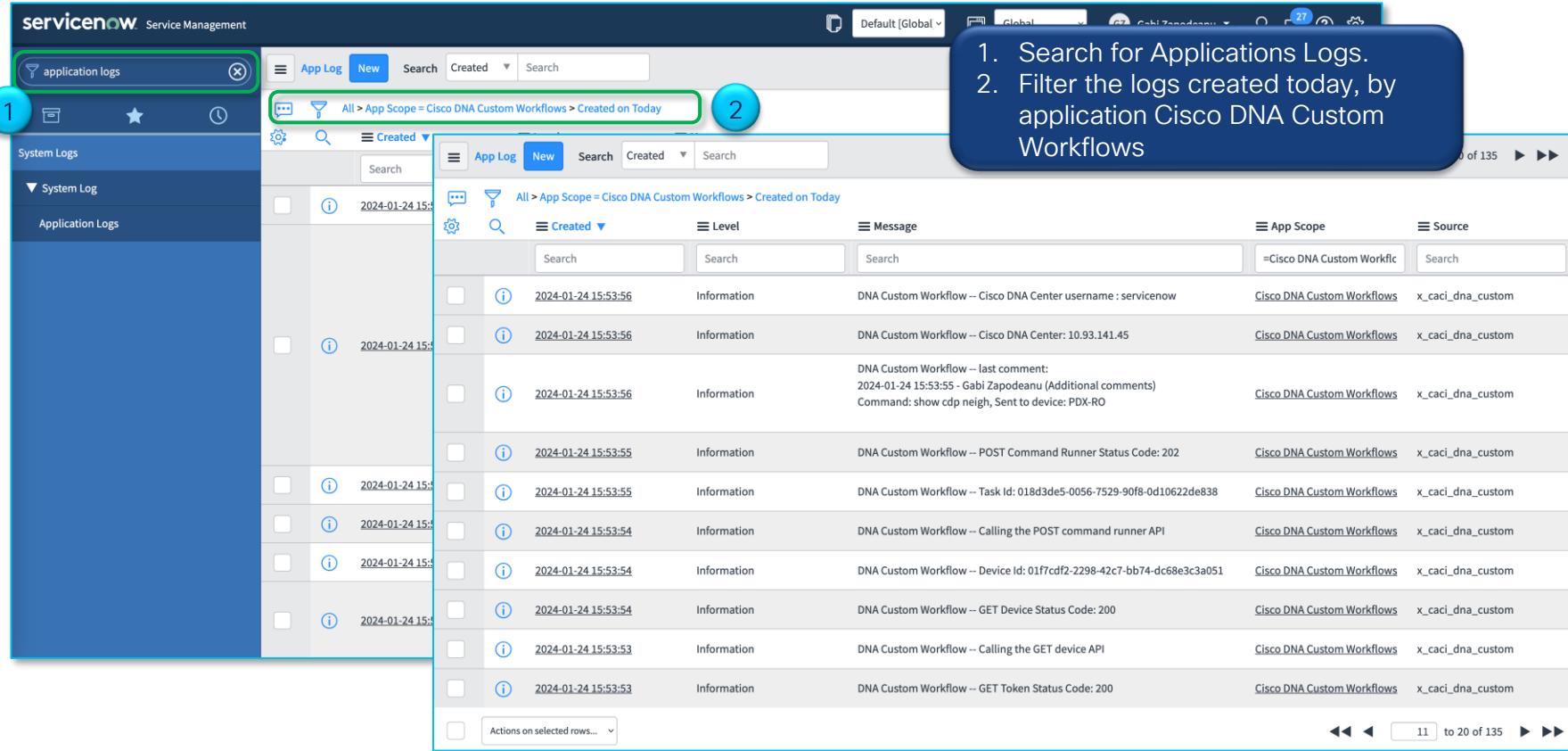
1. Command output
2. Timestamps – average of 10 seconds between command sent and response

Network Troubleshooting App Command/Output – cont.

The screenshot shows the Cisco DNA Center Network Troubleshooting App interface. At the top, there is an 'Incident' card for 'INC0017887' with buttons for 'Follow', 'Update', 'Create Cisco DNA Change Request', 'Resolve', and 'Delete'. Below this, there are two sections: 'Short description' and 'Additional comments (Customer visible)'. The 'Short description' section contains a text input field with the placeholder 'Device name 'PDX-RO' at site 'Global/OR/PDX/Floor-2': BO'. The 'Additional comments' section contains a 'device: PDX-RO' field and a 'command: show logging' field. A green box highlights the 'Configuration item' field, which contains 'PDX-RO'. A blue box highlights the 'Command sent' button, which is labeled 'Command sent'. A blue box also highlights the 'Interface was disabled via NETCONF by user "demotme", at the time the ServiceNow incident was created' message. The right side of the screen shows a log of events with a blue box highlighting several entries related to user authentication and interface status changes. The log entries are as follows:

```
Jan 24 15:05:03: %SEC_LOGIN-5-LOGIN_SUCCESS: Login Success [user: dnacenter] [Source: 10.93.141.45] [localport: 22] at 15:05:03 PST Wed Jan 24 2024
Jan 24 15:05:06: %DMI-5-AUTH_PASSED: R0/0: dmiauthd: User 'dnacenter' authenticated successfully from 10.93.141.45 and was authorized for netconf over ssh. External groups: PRIV15
Jan 24 15:05:54: %DMI-5-AUTH_PASSED: R0/0: dmiauthd: User 'demotme' authenticated successfully from 10.24.137.51:54014 and was authorized for netconf over ssh. External groups: PRIV15
Jan 24 15:05:56: %BGP-5-NBR_RESET: Neighbor 10.93.131.2 reset (Interface flap)
Jan 24 15:05:56: %DUAL-5-NBRCHANGE: EIGRP-IPv4 123: Neighbor 10.93.131.2 (GigabitEthernet2) is down; interface down
Jan 24 15:05:56: %BGP-5-ADJCHANGE: neighbor 10.93.131.2 Down Interface flap
Jan 24 15:05:56: %BGP_SESSION-5-ADJCHANGE: neighbor 10.93.131.2 IPv4 Unicast topology base removed from session Interface flap
Jan 24 15:05:56: %SYS-5-CONFIG_P: Configured programmatically by process
iosp_vty_100001_dmiauthd_fd_170 from console as NETCONF on vty63
Jan 24 15:05:56: %DMI-5-CONFIG_I: R0/0: dmiauthd: Configured from NETCONF/RESTCONF by demotme, transaction-id 566
Jan 24 15:05:58: %LINK-5-CHANGED: Interface GigabitEthernet2, changed state to administratively down
Jan 24 15:05:59: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet2, changed state to down
Jan 24 15:06:22: %SEC_LOGIN-5-LOGIN_SUCCESS: Login Success [user: dnacenter] [Source: 10.93.141.45] [localport: 22] at 15:06:22 PST Wed Jan 24 2024
Jan 24 15:07:13: %SYS-6-LOGOUT: User dnacenter has exited tty session 1(10.93.141.45)
Jan 24 15:07:26: %SEC_LOGIN-5-LOGIN_SUCCESS: Login Success [user: dnacenter] [Source: 10.93.141.45] [localport: 22] at 15:07:26 PST Wed Jan 24 2024
```

Application Logs – Network Troubleshooting



The screenshot shows the ServiceNow application logs interface. The left sidebar has 'System Logs' and 'Application Logs' sections. The main area shows a list of logs with columns: Created, Level, Message, App Scope, and Source. A search bar at the top is set to 'All > App Scope = Cisco DNA Custom Workflows > Created on Today'. A blue callout box with numbered steps 1 and 2 points to this search bar and the results table respectively.

1. Search for Applications Logs.
2. Filter the logs created today, by application Cisco DNA Custom Workflows

Created	Level	Message	App Scope	Source
2024-01-24 15:53:56	Information	DNA Custom Workflow -- Cisco DNA Center username : servicenow	Cisco DNA Custom Workflows	x_caci_dna_custom
2024-01-24 15:53:56	Information	DNA Custom Workflow -- Cisco DNA Center: 10.93.141.45	Cisco DNA Custom Workflows	x_caci_dna_custom
2024-01-24 15:53:56	Information	DNA Custom Workflow -- last comment: 2024-01-24 15:53:55 - Gabi Zapodeanu (Additional comments) Command: show cdp neigh, Sent to device: PDX-RO	Cisco DNA Custom Workflows	x_caci_dna_custom
2024-01-24 15:53:55	Information	DNA Custom Workflow -- POST Command Runner Status Code: 202	Cisco DNA Custom Workflows	x_caci_dna_custom
2024-01-24 15:53:55	Information	DNA Custom Workflow -- Task Id: 018d3de5-0056-7529-90f8-0d10622de838	Cisco DNA Custom Workflows	x_caci_dna_custom
2024-01-24 15:53:54	Information	DNA Custom Workflow -- Calling the POST command runner API	Cisco DNA Custom Workflows	x_caci_dna_custom
2024-01-24 15:53:54	Information	DNA Custom Workflow -- Device Id: 01f7cdf2-2298-42c7-bb74-dc68e3c3a051	Cisco DNA Custom Workflows	x_caci_dna_custom
2024-01-24 15:53:54	Information	DNA Custom Workflow -- GET Device Status Code: 200	Cisco DNA Custom Workflows	x_caci_dna_custom
2024-01-24 15:53:53	Information	DNA Custom Workflow -- Calling the GET device API	Cisco DNA Custom Workflows	x_caci_dna_custom
2024-01-24 15:53:53	Information	DNA Custom Workflow -- GET Token Status Code: 200	Cisco DNA Custom Workflows	x_caci_dna_custom

Demo Network Troubleshooting App

Home - Cisco Catalyst Center Incidents | ServiceNow https://10.93.141.45/dna/home 120%  Cisco Systems, Inc APIs Tools LAB_Access CiscoLive Meraki Dashboard L... Cisco Box SFEH-NAS - Synolo... CDETS DNACaaP Cisco.DNA.Center.D... SharePoint APIs and Owners - ... JIRA Engineering SJ... Uno - MaglevCloud ... Other Bookmarks

Catalyst Center

Welcome to Catalyst Center!

Assurance Summary

Health

Healthy as of Feb 1, 2024 2:56 PM

100%  100%

Network Devices Wireless Clients Wired Clients

[View Details](#)

Critical Issues

Last 24 Hours

2  1 

[View Details](#)

Trends and Insights

Last 30 Days

0  0 

AP Performance Advisories Trend Deviations

[View Details](#)

Network Snapshot

Sites

As of Feb 1, 2024 2:56 PM

16  

[Add Sites](#)

Network Devices

As of Feb 1, 2024 2:56 PM

14   

[Find New Devices](#)

Application QoS Policies

As of Feb 1, 2024 2:56 PM

0   

Successful Deployments: 0
Errored Deployments: 0
Stale Policies: 0

[Add New Policy](#)

Cisco DNA Custom Workflows Open-Source Code

https://github.com/zapodeanu/dna_custom_workflows

Search or jump to... / Pull requests Issues Codespaces Marketplace Explore

zapodeanu/dna_custom_workflows Public

Pin Unwatch 1 Fork 0 Star 0

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

main 1 branch 0 tags Go to file Add file <> Code

zapodeanu added screenshot 303e6c9 3 minutes ago 35 commits

CODE_OF_CONDUCT.md added Licenses and some error cleanup 20 hours ago

CONTRIBUTING.md added Licenses and some error cleanup 20 hours ago

LICENSE.txt added Licenses and some error cleanup 20 hours ago

NOTICE.txt Update NOTICE.txt 20 hours ago

README.md added screenshot 3 minutes ago

command_runner.js added command output validation 27 minutes ago

network_troubleshooting_message... initial commit 10 minutes ago

README.md

About

Repo for Cisco DNA Center ITSM Integration (ServiceNow) Custom Workflows

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

Releases

No releases published Create a new release

The open-source code is for demos and proof-of-concepts only.

Agenda

CISCO Live!

- Cisco Catalyst Center Platform
- ITSM (ServiceNow) Integration Overview
- CMDB Sync to Staging Table
- Events Notifications to Generic REST API Endpoint
- Network Troubleshooting Custom Workflow
- Summary

ITSM Integration Benefits

- Real-time incident and change control integration
- Enable innovation and business agility
- Ready to use, fully customizable
- Cost reduction and increased efficiencies

servicenow Service Management

Default [Global] Global Gabi Zapodeanu

Configuration Items New Search Discovery source Search

All > Discovery source = Cisco DNA 10.93.141.45

Name	Class	IP Address	Discovery source	Location	Serial number
LO-CN	IP Switch	10.93.141.20	Cisco DNA 10.93.141.45	Global/IRL/ Floor.3	FJC2325TOPH
PDX-M	IP Switch	10.93.141.17	Cisco DNA 10.93.141.45	Global/IR/ Floor.2	FOC18020XSC

Incident INC0017887

Action: Cisco DNA Center Suggested Action 3: Ping the BGP peer with max interface MTU and 'do not fragment' bit set.

Step Count: 1

Step Description: Ping the BGP peer with max interface MTU and do not fragment bit set

Device Id: 01f7cf2f-2298-42c7-bb74-dc58e3c3a051

Host Name: PDX-RO

Command: ping 10.93.131.2 size 1500 df

Command Output: ping 10.93.131.2 size 1500 df

Type escape sequence to abort.

Sending 5, 1500-byte ICMP Echoes to 10.93.131.2, timeout is 2 seconds:

Packet sent with the DF bit set

Success rate is 0 percent (0/5)

PDX-RO#

Action: Cisco DNA Center 5

Step Count: 1

Step Description: Check

Device Id: 01f7cf2f-2298-42c7-bb74-dc58e3c3a051

Host Name: PDX-RO

Command: show ip bgp

Command Output: show ip bgp

For address family: IPv4 Unicast

Cisco DNA Event Id: a62bbb1f-5e73-42ba-9f1b-

Activities: 17

Gabi Zapodeanu Additional comments • 2024-01-24 15:54:03

Command Output:

show cdp neigh

Capability Codes: R - Router; T - Trans Bridge; B - Source Route Bridge

S - Switch; H - Host; I - IGMP; R - Repeater; P - Phone;

D - Remote; C - CTV; L - Line; M - Multicast; E - Ethernet

Device ID Local interface Holding Capability Platform Port ID

10GE1/1/1 1.177 H1GEV-PM000000000000000000000000000000

C9800-CL Gig 1 159 R1 C9800-CL Gig 2

C9800-CL Gig 1 164 R1 C9800-CL Gig 1

PDX-RN Gig 1 142 R1 CSR1000V Gig 1

Total cdp entries displayed : 4

PDX-RO#

Gabi Zapodeanu Additional comments • 2024-01-24 15:53:53

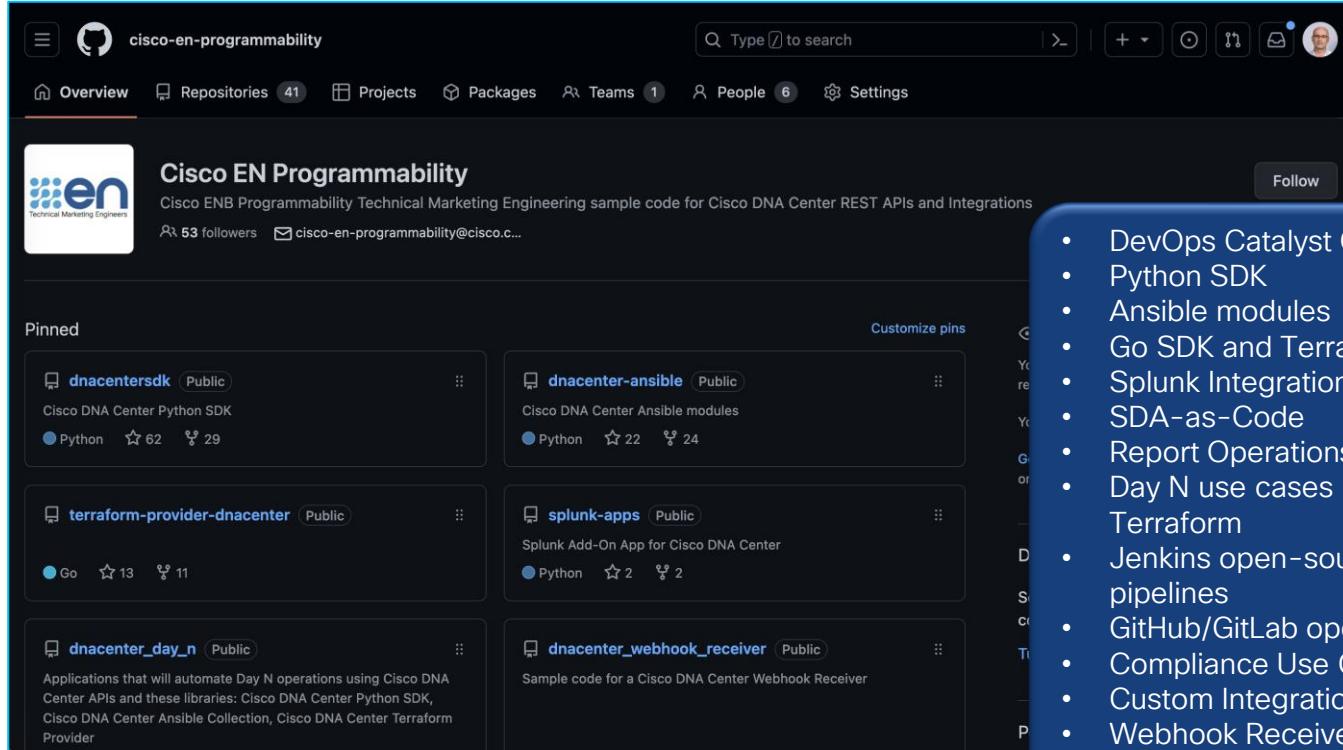
Command: show cdp neigh, Sent to device: PDX-RO

Gabi Zapodeanu Additional comments • 2024-01-24 15:53:49

device: PDX-RO

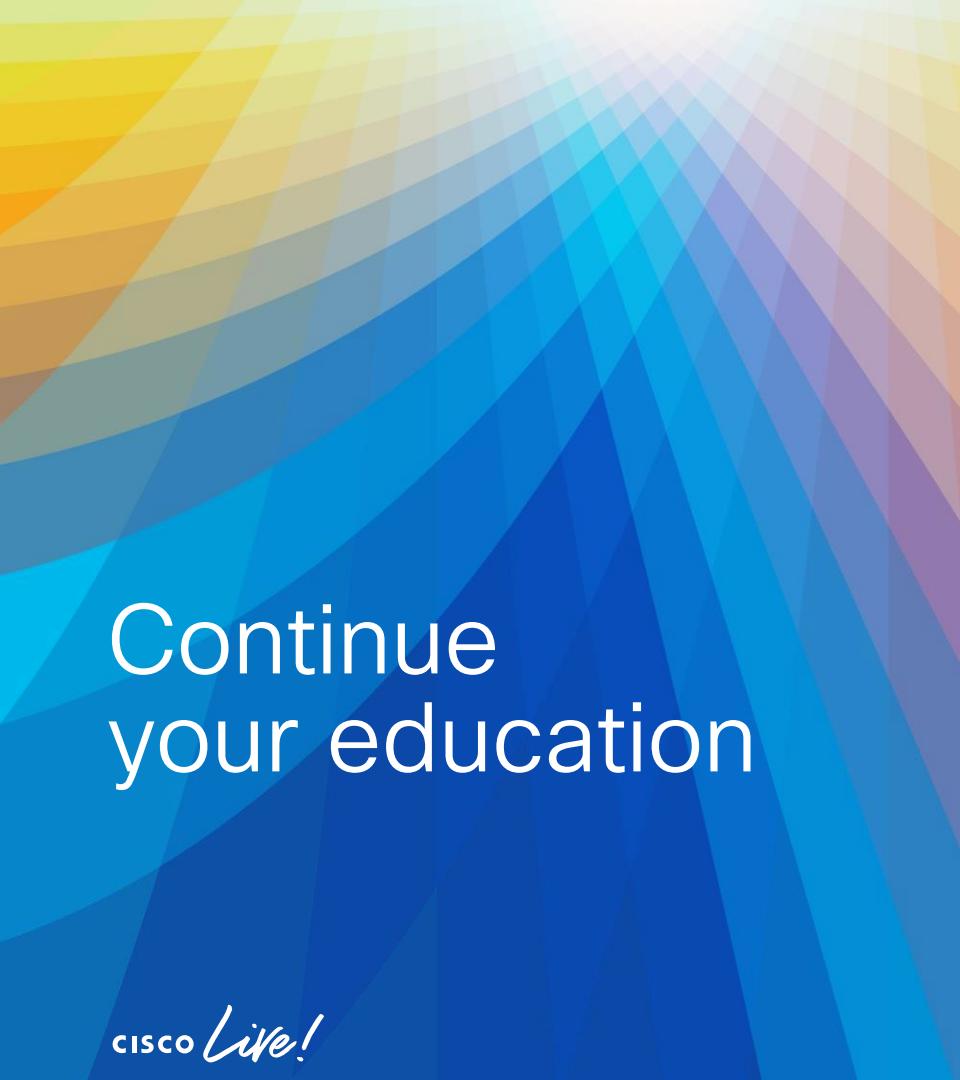
command: show cdp neigh

Cisco EN Programmability GitHub Org



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

- DevOps Catalyst Center use cases
- Python SDK
- Ansible modules
- Go SDK and Terraform provider
- Splunk Integration Apps
- 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 Case
- Custom Integration App
- Webhook Receiver
- Other sample code



Continue your education

CISCO Live!

TECOPS-2158

Cisco Catalyst Center Out-of-the-Box and Custom Integrations

Lab 8 - G106, 02/05/24, 08:45 AM

DEVNET-2958

Version Control Tools Integrations – Cisco Catalyst Center Infrastructure-as-Code Use Cases

DevNet Classroom 1, 02/05/24, 01:30 PM

BRKOPS-2032

3 Cisco Catalyst Center and ITSM Workflows: CMDB, Incident Management and SWIM

Session Room A10, 02/06/24, 11:30 AM

DEVNET-2157

Cisco Catalyst Center-as-Code Network Compliance Use Cases

DevNet Classroom 1, 02/06/24, 01:30 PM

BRKOPS-2471

Custom Workflows for the Cisco Catalyst Center Integration with ServiceNow

Session Room A14, 02/08/24, 05:00 PM



The bridge to possible

Thank you



cisco *Live!*

Let's go