

CISCO *Live!*



#CiscoLive



The bridge to possible

Ansible and NDFC!

Parity in Function and Value to Operate Your Fabric

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BRKDCN-2716



#CiscoLive

Cisco Webex App

Questions?

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

How

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

Webex spaces will be moderated by the speaker until June 17, 2022.



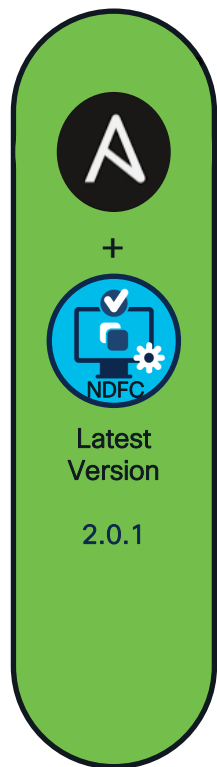
<https://cicolive.ciscoevents.com/cicolivebot/#BRKXXX-xxxx>



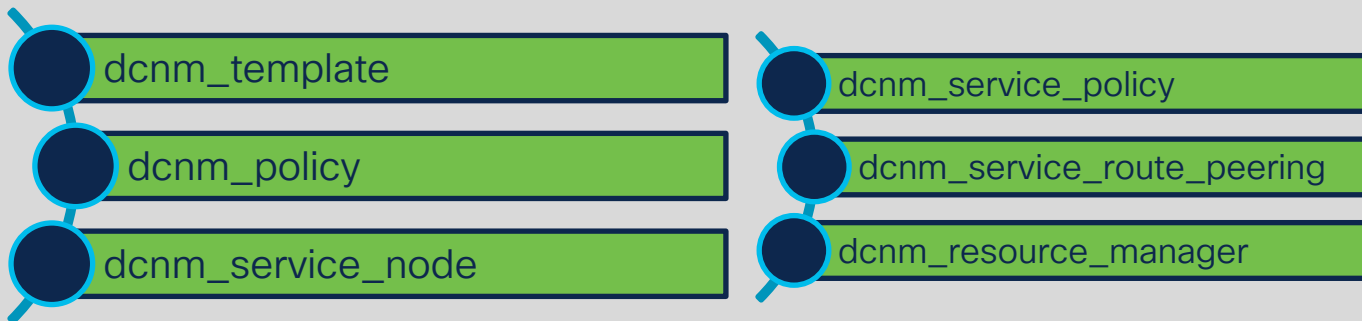
Agenda

- Introduction
- Getting Started: Ansible NDFC collection
- Automating workflows with the collection
- CI/CD Pipeline Integration
- Collection Roadmap
- Conclusion

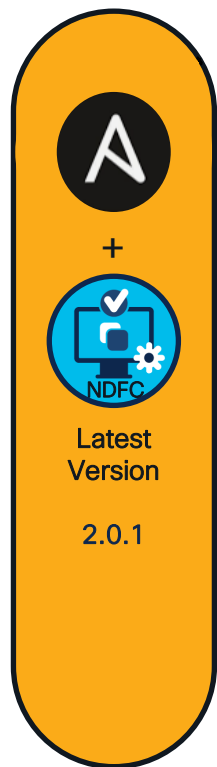
What's New in the Ansible NDFC collection?



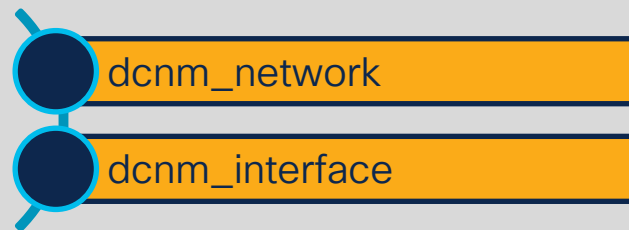
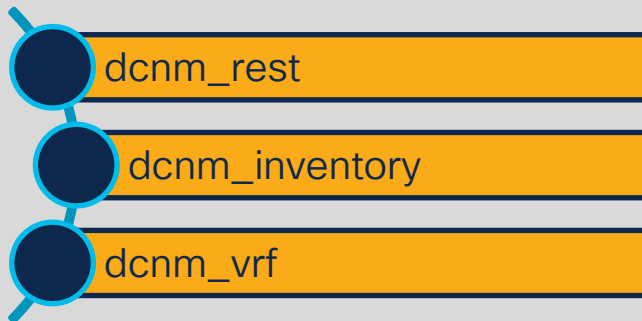
- NDFC Support (More on this later)
- Performance Enhancements / Extensions (VRF-Lite, Multisite)
- New Modules (6)



Existing Modules in the collection



Modules (5)



[Previous CL Session:](https://www.ciscolive.com/on-demand/on-demand-library.html?search=wiebe#/session/16360602395320017YeX) <https://www.ciscolive.com/on-demand/on-demand-library.html?search=wiebe#/session/16360602395320017YeX>

So...

What about NDFC?

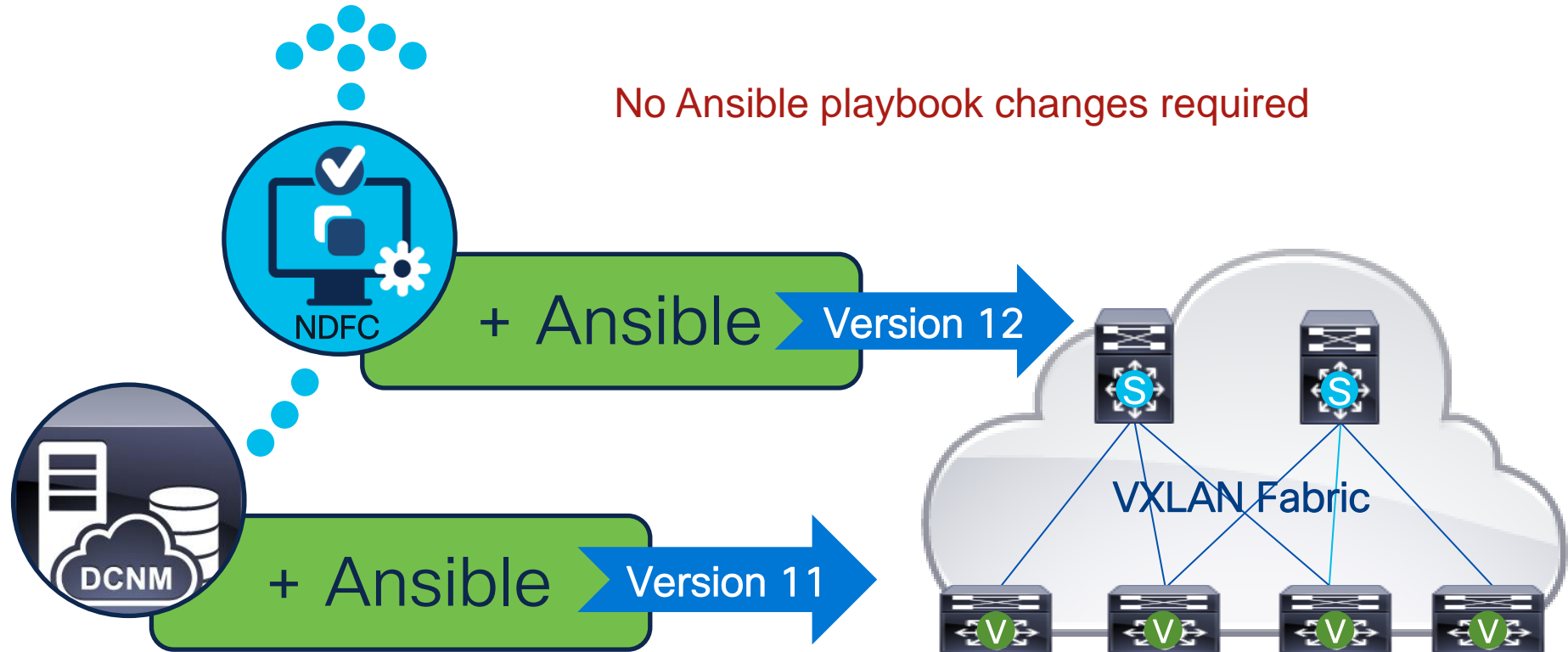
Nexus Dashboard Fabric Controller

Formerly DCNM (Data Center Network Controller)

- Application on Cisco Nexus Dashboard
- New Streamlined User Interface
- Kubernetes Microservices



Transparent NDFC/DCNM Controller Support





Agenda

- Introduction
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Getting started

- Ansible Collection Installation

Collection Location: <https://galaxy.ansible.com/cisco/dcnm>

Install Command:

```
* pip install ansible  
* ansible-galaxy collection install cisco.dcnm
```

Ansible uses the Fully Qualified Collection Name (FQCN)

Namespace: **cisco**

Collection Name: **dcnm**

NDFC Ansible Galaxy Collection Site

galaxy.ansible.com/cisco/dcnm

Getting Started Projects Toolkit SourceRepos Training Personal Process CEC NeXT DevX Engineering INSBU-RE Mac Self Support NeXT-RTP-NX Co... My files - OneDrive Employee Commu...

GALAXY

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dcnm
Ansible collection for the Cisco Nexus® Dashboard Fabric Controller (NDFC) - formerly DCM

5 / 5 Score 19828 Downloads
Login to Follow Repo

Details Read Me Content

Info

Installation

```
$ ansible-galaxy collection install cisco.dcnm
```

NOTE: Installing collections with ansible-galaxy is only supported in ansible 2.9+

[Download tarball](#)

Install Version

2.0.1 released 3 months ago (latest)

Tags

cisco ndfc dcnm nxos networking vxlan

Cisco DCM Collection

The Ansible Cisco Nexus® Dashboard Fabric Controller (NDFC) (formerly Cisco Data Center Network Manager (DCM)) collection includes modules to help automate common day 2 operations for VXLAN EVPN fabrics.

This collection is intended for use with the following release versions: * DCM Release 11.4(1) or later * NDFC Release 12.0 or later.

Ansible version compatibility

This collection has been tested against following Ansible versions: >=2.9.10,<2.12.

Content Score

Community Score 5 / 5
Based on 1 survey. [Show Details](#)

Tell us about this collection

Quality of docs? - +
Ease of use? - +
Does what it promises? Y N
Works without change? Y N
Ready for production? Y N

Link to repo

Read Me

Collection Version
& Install Command

NDFC Version



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NDFC Template Module

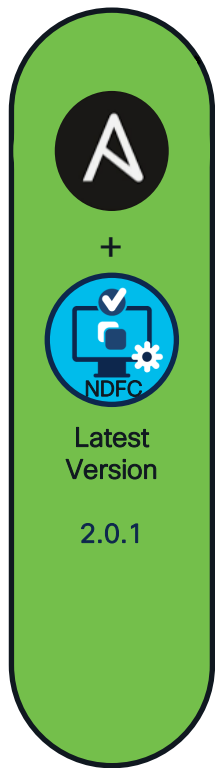
https://github.com/CiscoDevNet/ansible-dcnm/blob/main/docs/cisco.dcnm.dcnm_template_module.rst



dcnm_template

- **Purpose:** Create, Delete and Modify Templates
- **States:** Merged, Deleted, Query
- **Notes:** Used in combination with the dcnm_policy module

NDFC Template Module

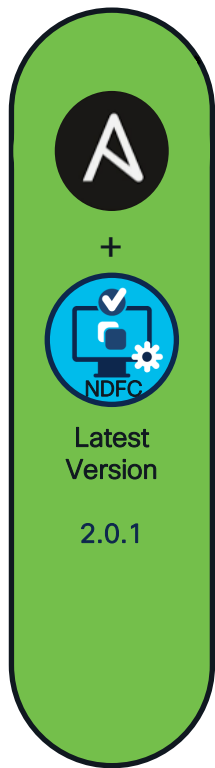


```
content: |
  telemetry
    certificate /bootflash/telegraf.crt telegraf
    destination-profile
      use-vrf management
    destination-group 101
      ip address 10.195.225.176 port 57101 protocol gRPC...
    sensor-group 101
      data-source DME
      path sys/ch depth unbounded
    subscription 101
      dst-grp 101 snsr-grp 101 sample-interval 10101
```

`content: |` (config content follows)

NDFC Policy Module

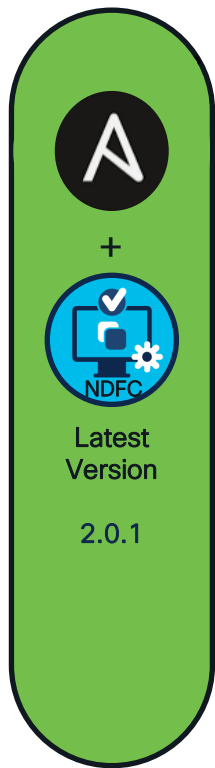
https://github.com/CiscoDevNet/ansible-dcnm/blob/main/docs/cisco.dcnm.dcnm_policy_module.rst



dcnm_policy

- **Purpose:** Create, Delete and Modify Policies
- **States:** Merged, Deleted, Query
- **Notes:**
 - Used in combination with the dcnm_template module
 - Flag to control policy creation if one already exists

NDFC Policy Module – Static Config



dcnm_policy

- name: Manage policies
- cisco.dcnm.dcnm_policy:**
 - fabric:** "{{ ndfc_fabric_name }}"
 - state:** merged | deleted | query
 - deploy:** true
 - config:**
 - name: template_telemetry
 - create_additional_policy:** false
 - priority:** 101
 - switch:
 - ip: "{{ device_leaf1 }}"

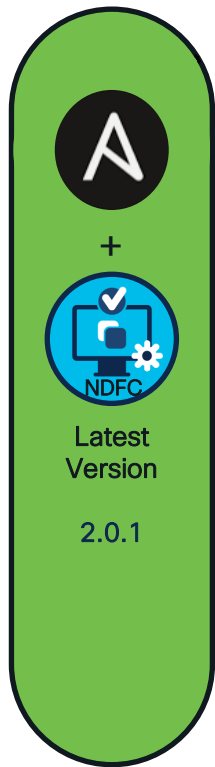
A decorative graphic in the top right corner consisting of a cluster of circles in various sizes and colors, including blue, cyan, green, orange, and red, against a dark blue background.

Demo

Template + Policy Modules

Part 1

NDFC Policy Module – V



dcnm_policy

```
- name: Manage poli
  cisco.dcnm.dcnm_p
  {...}
  config:
    - name: ntp_se
      {...}
  policy_vars:
    NTP_SERVER: 192.168.55.1
    NTP_SERVER_VRF: management
```

Create Policy

Switch List:
staging-leaf1 >

Priority*
500
1-1000

Description
NTP Server For Leaf Devices

Template Name
ntp_server >

NTP Server Name/IP*
192.168.55.1

NTP Server VRF*
management

A decorative graphic in the top right corner of the slide, consisting of a cluster of circles in various sizes and colors including blue, cyan, green, orange, and red, set against a dark blue background.

Demo

Template + Policy Modules

Part 2

NDFC L4-L7 Service Insertion

Fabric Controller

Dashboard

Topology

LAN

Fabrics

Switches

Policies

Interfaces

Services

Settings

Operations

Services

Service Nodes Audit History Sample Setup

In a VXLAN fabric, you can define

Service Node

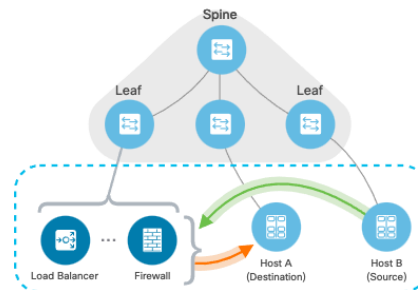
Onboard a service device such as a *firewall* or *load balancer*. Specify service node name, type, and interface attachment details

Route Peering

Specify deployment type, network parameters, peering protocol, and service IP

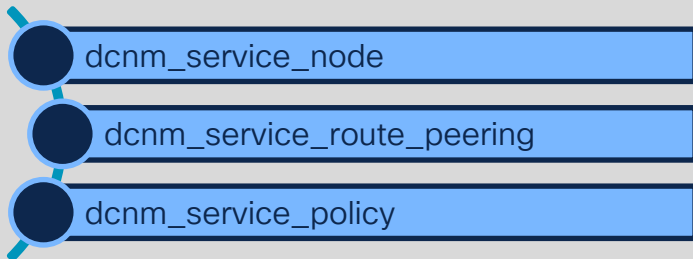
Service Policy

Specify traffic redirection rules to/from the service node



NDFC Service Node Module

[https://github.com/CiscoDevNet/ansible-dcnm/blob/main/docs/cisco.dcnm.dcnm_service_\[node|route_peering|policy\]_module.rst](https://github.com/CiscoDevNet/ansible-dcnm/blob/main/docs/cisco.dcnm.dcnm_service_[node|route_peering|policy]_module.rst)



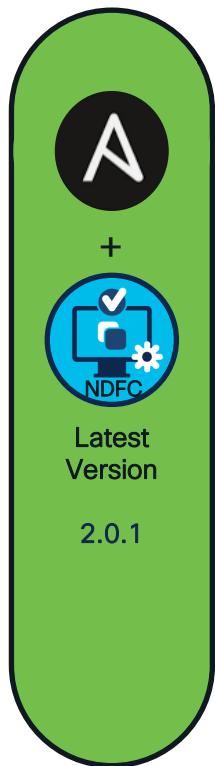
Purpose: Create, Modify, Delete Service Node (Layer 4 – 7 services)

States: Merged, Replaced, Overridden, Deleted, Query

Notes:

- Service Node Resides in the External Fabric
- Route Peerings are created under the service node
- Each Route Peering can have multiple service policies

NDFC Service Node Module – Task Example

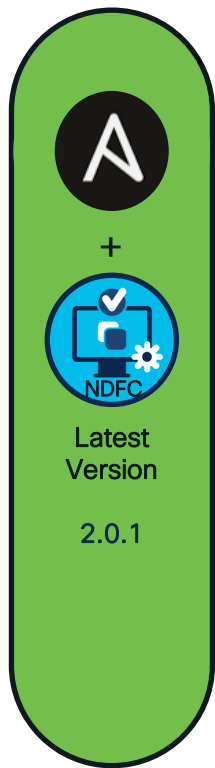


dcnm_service_node

- name: Create FireWall Service Node

```
cisco.dcnm.dcnm_service_node:
  fabric: cl-fabric
  service_fabric: service-fabric
  state: merged | replaced | overridden | deleted | query
  config:
    - name: Firewall-CL
      type: firewall
      form_factor: virtual
      svc_int_name: svc1
      attach_interface: Ethernet1/15
      switches:
        - "{{ leaf1_device }}"
```

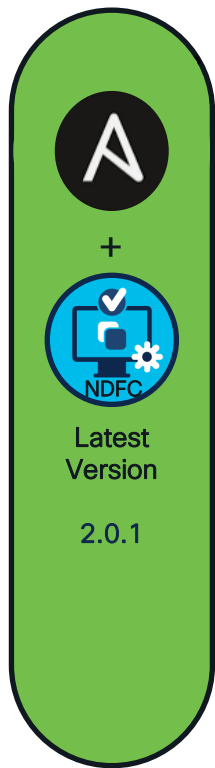
NDFC Service Route Peering Module – Task (Firewall)



dcnm_service_route_peering

```
- name: Create FireWall Service Network
  cisco.dcnm.dcnm_service_route_peering:
    state: merged
    fabric: cl-fabric
    service_fabric: service-fabric
    attach: true
    deploy: true
    config:
      - name: FireWall-CL-RP
        node_name: Firewall-SN
        deploy_mode: intra_tenant_fw
        next_hop: 192.161.1.100
        reverse_next_hop: 192.161.2.100
```

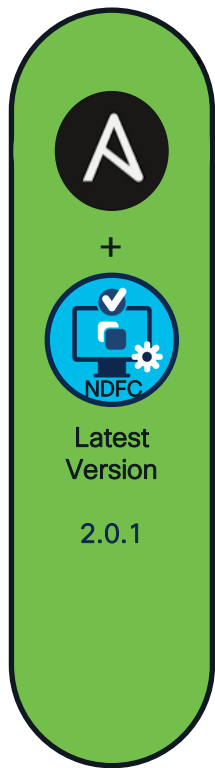

NDFC Service Route Peering Module – Task (inside ntwk)



dcnm_service_route_peering

```
- name: Manage service route peerings
  cisco.dcnm.dcnm_service_route_peering:
    state: merged
    {...}
  config:
    {...}
  inside_network:
    vrf: vrf_app1
    name: rp1-fw-inside-net
    vlan_id: 101
  profile:
    ipv4_gw: 192.161.1.1/24
    ipv6_gw: 2001:db01::1/64
    vlan_name: rp1-fw-inside
    int_descr: "RP1 FW inside interface"
    tag: 11111
```

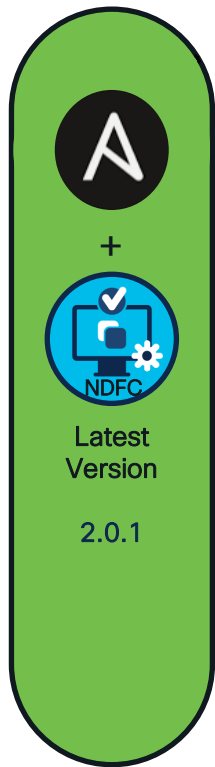
NDFC Service Route Peering Module – Task (outside ntwk)



dcnm_service_route_peering

```
- name: Manage service route peerings
  cisco.dcnm.dcnm_service_route_peering:
    state: merged
    {...}
    config:
      {...}
      outside_network:
        vrf: vrf_app1
        name: rp1-fw-outside-net
        vlan_id: 102
        profile:
          ipv4_gw: 192.161.2.1/24
          ipv6_gw: 2001:db02::1/64
          vlan_name: rp1-fw-outside
          int_descr: "RP1 FW outside interface"
          tag: 11112
```

NDFC Service Policy Module



dcnm_service_policy

- name: Manage service policies
`cisco.dcnm.dcnm_service_policy:`
 - `fabric:` cl-fabric
 - `service_fabric:` service-fabric
 - `state:` merged | replaced | overridden | deleted | query
 - `config:`
 - name: fw_service_policy
 - `node_name:` FireWall-CL
 - `rp_name:` FireWall-CL-RP
 - `src_vrf:` vrf_app1
 - `dest_vrf:` vrf_app1
 - `src_network:` net_11
 - `dest_network:` net_12
 - `next_hop:` 192.161.1.100
 - `reverse_next_hop:` 192.161.2.100
 - `reverse:` true

Fabric Controller

- Dashboard
- Topology
- LAN
- Fabrics
- Switches
- Policies
- Interfaces
- Services
- Settings
- Operations

Services

Service Nodes Audit History Sample Setup

Filter by attributes

Actions

| <input type="checkbox"/> | Name | Type | External Fabric | Service Node Interface | Form Factor | Attached Fabric | Attached Switch | Attached Interface | Route Peering | Service Policies | Last Updated |
|--------------------------|-------------|----------|-----------------|------------------------|-------------|-----------------|-----------------|--------------------|---------------|------------------|----------------------|
| <input type="checkbox"/> | FireWall-CL | Firewall | Service-Fabric | svc1 | Virtual | fabric-stage | staging-leaf1 | Ethernet1/15 | 1 | 0 | 06/10/2022, 13:50:01 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

FireWall-CL Detail

Overview Route Peering Service Policy

Filter by attributes

Actions

| | | | | | | Service Network One | | | Service Network Two | | | | | Last Updated |
|--------------------------|----------------|---------------|----------------|---------|-------------------|---------------------|-------------------|----------------|---------------------|--------------------|----------------|---------------|---------------------|----------------------|
| <input type="checkbox"/> | Peering Name | Deployment | Peering Option | Status | Attachment Status | VRF | Network Name | Gateway IP | VRF | Network Name | Gateway IP | Next Hop IP | Reverse Next Hop IP | |
| <input type="checkbox"/> | FireWall-CL-RP | IntraTenantFW | None | In-Sync | Attached | vrf_app1 | rp1-fw-inside-net | 192.161.1.1/24 | vrf_app1 | rp1-fw-outside-net | 192.161.2.1/24 | 192.161.1.100 | 192.161.2.100 | 06/10/2022, 14:47:46 |

NDFC Resource Manager Module

https://github.com/CiscoDevNet/ansible-dcnm/blob/main/docs/cisco.dcnm.dcnm_resource_manager_module.rst



dcnm_resource_manager

- **Purpose:** Manage NDFC Resources
- **States:** Merged, Deleted, Query
- **Notes:**
 - Format of entity depends on the scope type
 - Scope Types: Fabric, Device, Device Pair, Device Interface, Link

NDFC Resource Manager Module



dcnm_resource_manager

- name: Manage NDFC Resources
- ```
cisco.dcnm.dcnm_resource_manager:
 state: merged | deleted | query
 fabric: cl-fabric
 config:
 - entity_name: "l3_vni_fabric"
 pool_type: "ID"
 pool_name: "L2_VNI"
 scope_type: "fabric"
 resource: "101"
```

These 3  
parameters  
act as  
selectors  
for different  
resources

# NDFC Resources Allocation Screen

## Fabric Overview - fabric-stage

Actions ▾



Overview Switches Links Interfaces Interface Groups Policies Networks VRFs Services Event Analytics History Resources

Resource Type contains VNI ✕

✕

Actions ▴

| <input type="checkbox"/> | Scope Type | Scope        | Device Name | Device IP | Allocated Resource | Allocated To    | Resource Type | Is Allocated? | Allocated on         |    |
|--------------------------|------------|--------------|-------------|-----------|--------------------|-----------------|---------------|---------------|----------------------|----|
| <input type="checkbox"/> | Fabric     | fabric-stage |             |           | 130001             | network_devnet1 | L2_VNI        | Yes           | Jun 09 2022 21:01:30 | 68 |
| <input type="checkbox"/> | Fabric     | fabric-stage |             |           | 130002             | network_devnet2 | L2_VNI        | Yes           | Jun 09 2022 21:01:30 | 71 |

Allocate Resource

Release Resource(s)

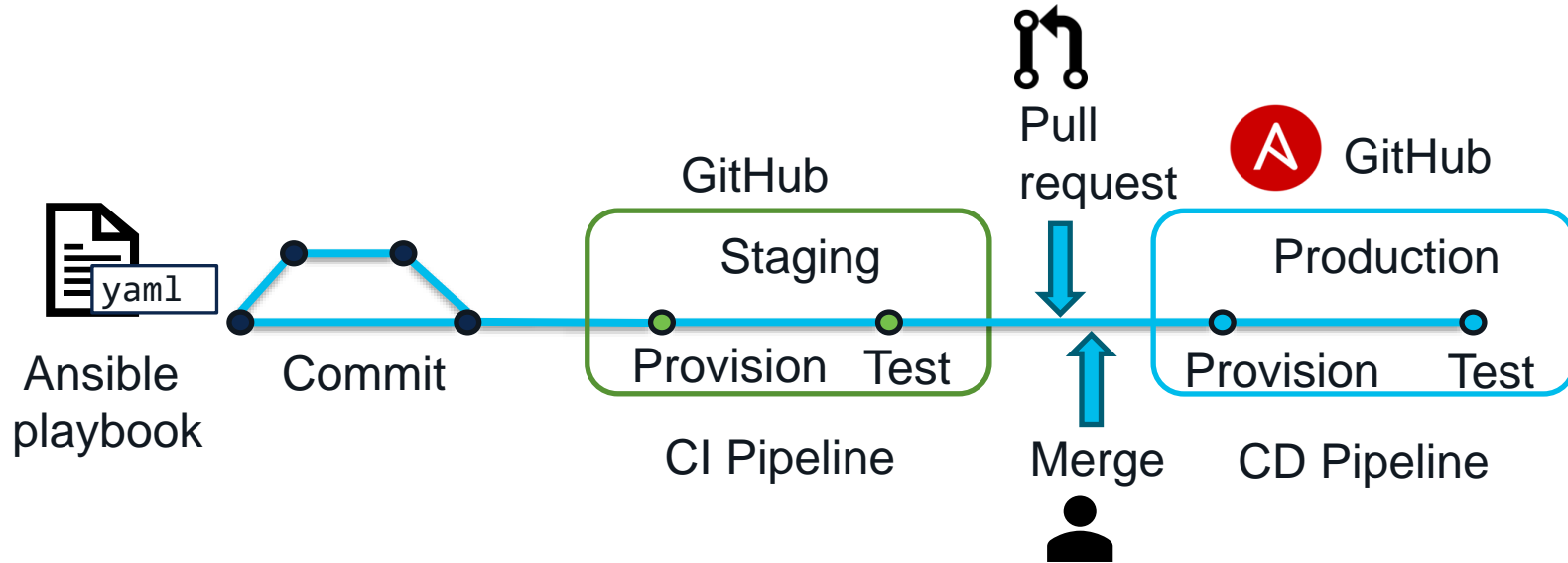


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- **CI/CD Pipeline Integration**
- Collection Roadmap
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# CI/CD Pipeline – Network as Code



# General CI/CD Pipeline Steps

1. [Changes](#) made in a [Staging](#) branch
2. [Commit Code](#) → Pre Merge Validation
3. [Open PR](#) From [Staging](#) – CI Pipeline Starts
4. [Merge Code](#) into [Main Branch](#) → CD Pipeline Starts
5. [Deploy](#) changes to [Production](#) environment





Demo

# Ansible NDFC CI/CD Pipeline



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# Roadmap

- POAP switch discovery and pre-provision
- Support for additional roles
- VPC Pairing
- RMA Workflows
- External Fabric Interface Support
- Customized Template Support
- Enhanced VRF and Network module capabilities
- Image and Patch management





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# Technical Session Surveys

- Attendees who fill out a minimum of four session surveys and the overall event survey will get Cisco Live branded socks!
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- These points help you get on the leaderboard and increase your chances of winning daily and grand prizes.



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The bridge to possible

# Thank you

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