



The bridge to possible

Simple VXLAN/EVPN Fabric Setup with Nexus Dashboard

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@BrendenBuresh, @cobedien

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 until February 24, 2023.





Agenda

- Nexus Dashboard (ND)
- Nexus Dashboard Orchestrator (NDO)
- Nexus Dashboard Fabric Controller (NDFC)
 - Classic LAN Fabric
 - VXLAN EVPN Fabric
 - Multi Site Domain
 - External Connectivity
 - L4-L7 Services Insertion
- NDFC Automation & Programmability
- NDFC Demos

Cisco Nexus Dashboard Fabric Controller

New Name, New Architecture from Release 12.0

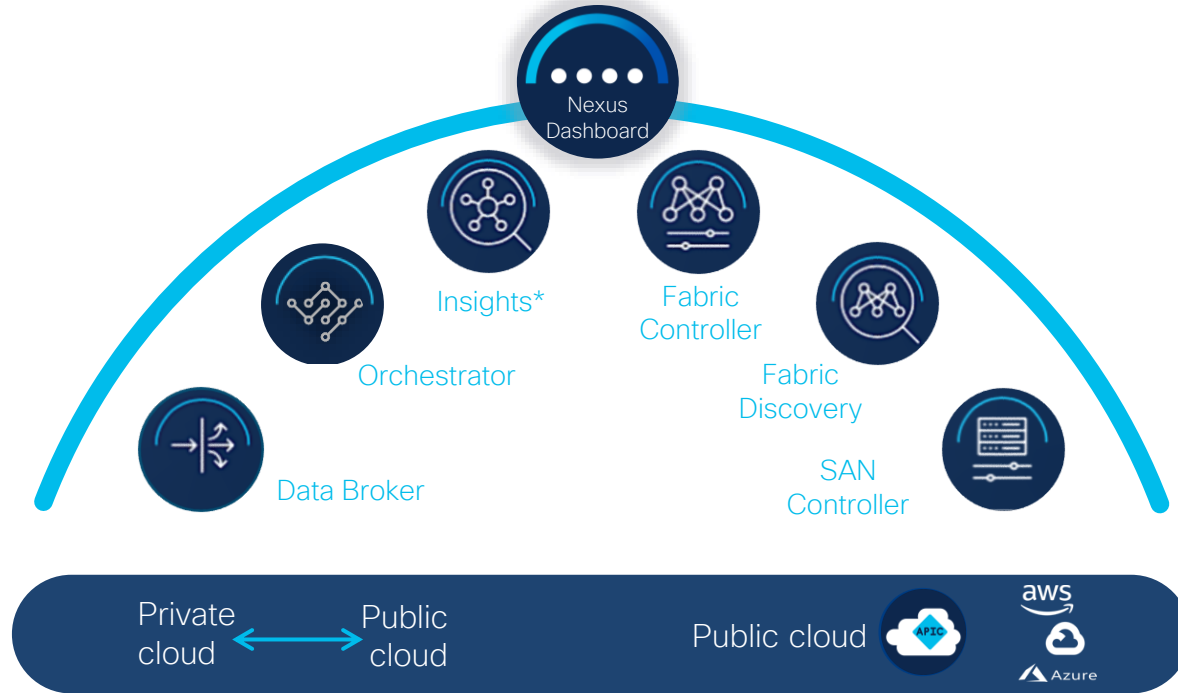


Nexus Dashboard



Cisco Nexus Dashboard

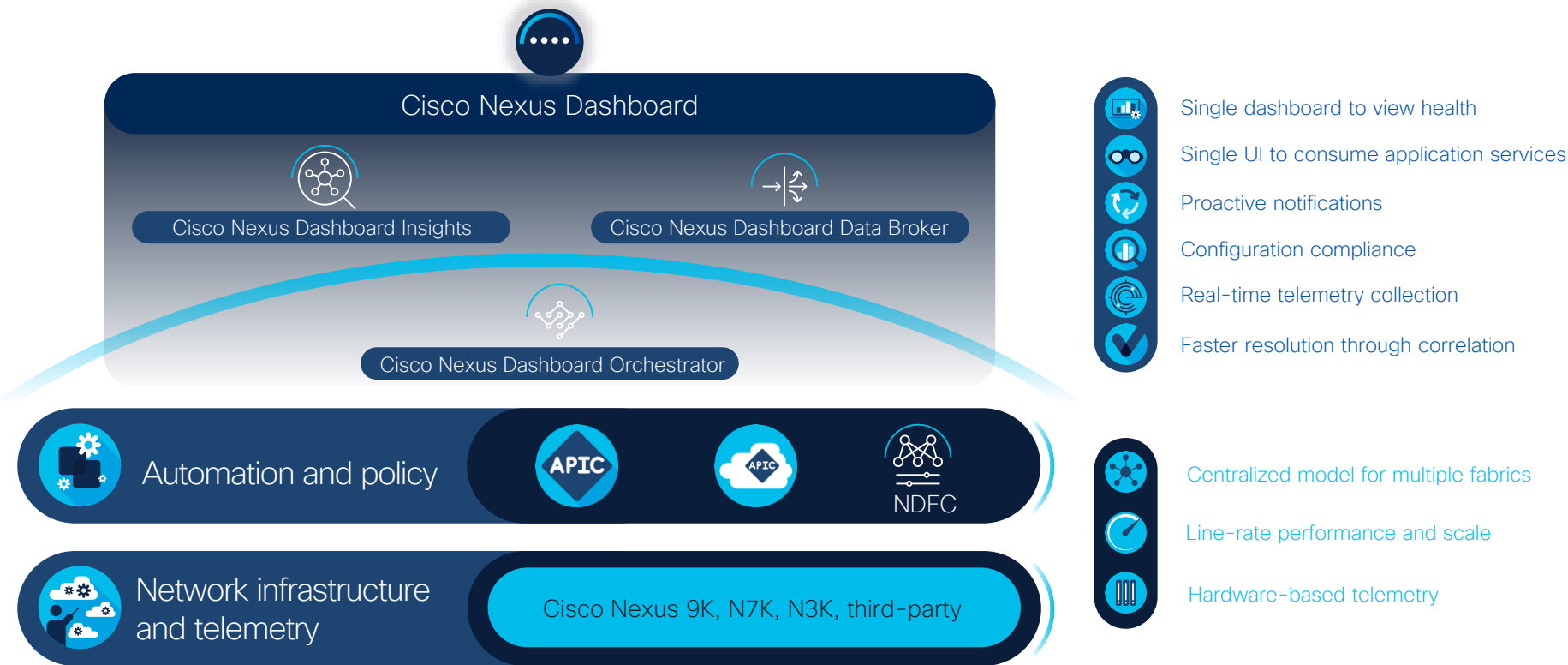
Simple to Automate, Simple to Consume



Consume all services in one place

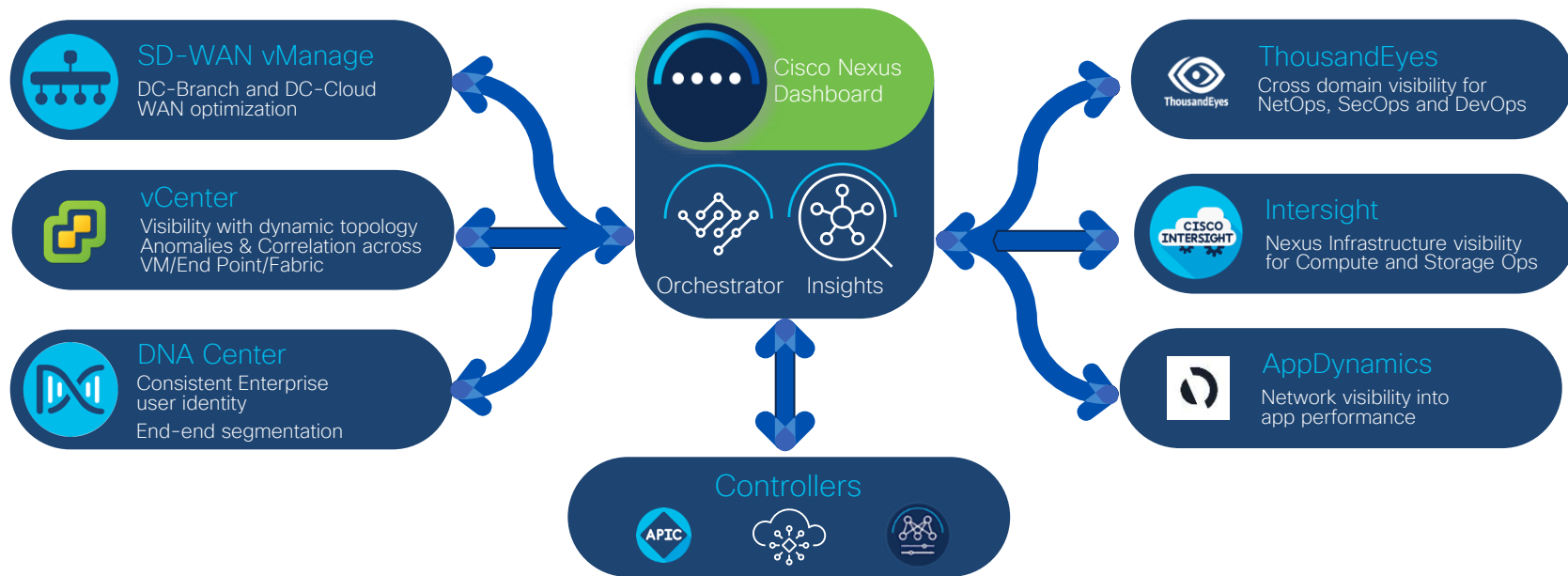
* Includes Cisco Network Assurance Engine

Cisco Nexus Dashboard



Nexus Dashboard

Platform for Integrations :: Open APIs



Nexus Dashboard

Appliance Specifications



Physical Form Factor

- UCS C220 M5 chassis
 - 2x10 core 2.2G Intel Xeon Silver CPU
 - 256G RAM
 - 4x2 4TB HDDs
 - 400GB SSD
 - 1.2TB NVMe
 - 4x25G Virtual Interface Card 1455
 - 1050W Power Supply
- Cluster PID: SE-CL-L3
- Node: SE-NODE-G2
- Minimum 3 nodes to run a cluster
- Support of max 2 standby nodes
- 4 additional worker nodes

Virtual Form Factor

- VMware ESXi 6.5, 6.7 or 7.0
- vCenter 6.x
- App Node
 - Memory: 64 GB
 - vCPU: 16
 - Storage: 550G + 50G (HDD or SSD)
- Data Node
 - Memory: 128 GB
 - vCPU: 32
 - Storage: 3TB + 50G (SSD/NVMe)

Cloud Market Place

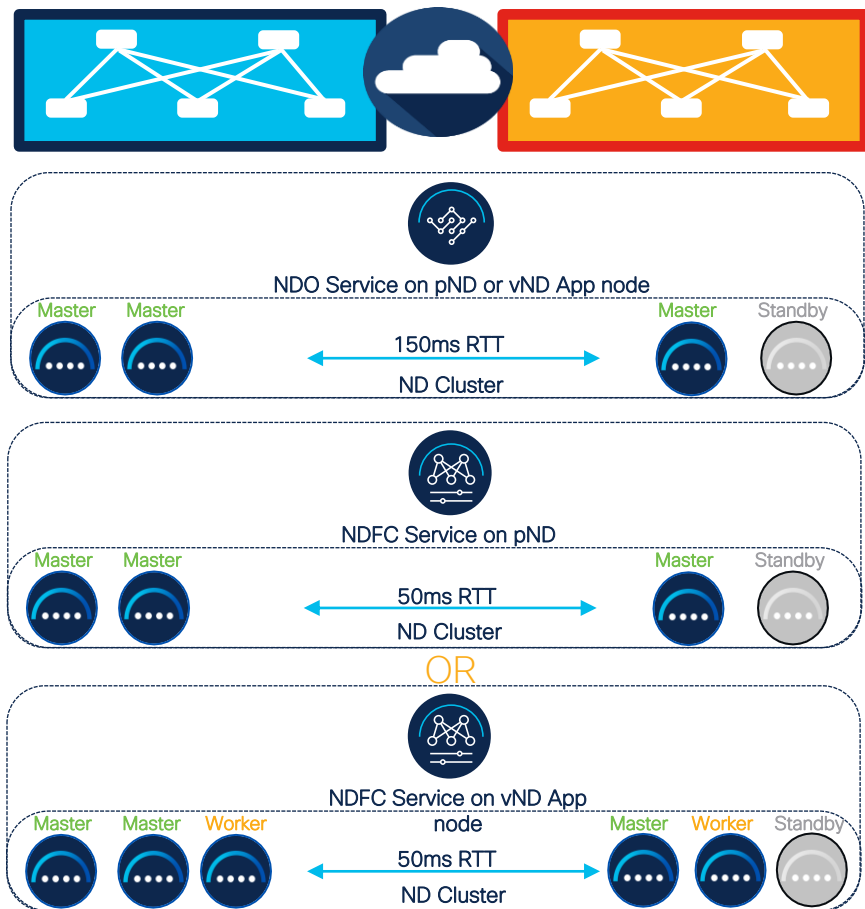
- Provider: AWS and Azure
- Instance Type:
 - AWS: m5.4xlarge
 - Azure: Standard_D16s_v3
- Storage:
 - AWS: 100G gp2 SSD, 300G gp2 SSD
 - Azure: OS: 50 GB, Data 250/500 GB
- Network:
 - VPC / VNET: 2
- IP Address:
 - Elastic: 6
 - Static: 3



Nexus Dashboard

Distributed Cluster Deployment

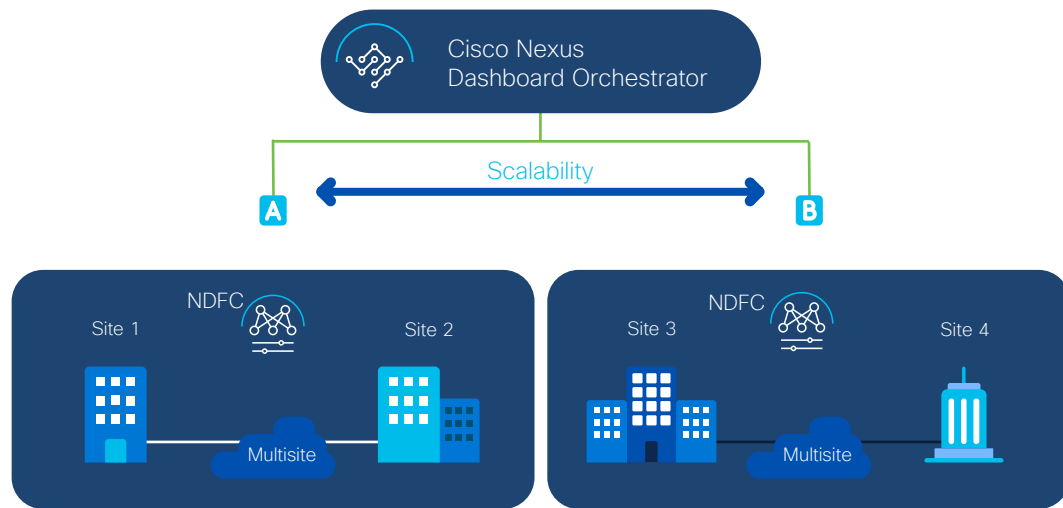
- **Master node:** Cluster control plane. Performs scheduling tasks when PODs are instantiated based on resources/load and maintains state of the cluster. 3 nodes of same form factor. Can replace 1 master node at any time
- **Worker node:** Horizontal scaling-out and execute containers applications. Additional 4 nodes (needs to be same type as master)
- **Standby node:** Increasing HA in case of Master node failure. Only a Standby node can be promoted to Master.
- NDFC tolerates failure of up to 1 Master node. The ND/NDFC cluster goes into read-only when 2 Master nodes are down.



Network Dashboard Orchestrator

Nexus Dashboard

Orchestration for NDFC



Scale out

- 30 Cisco NDFC VXLAN-EVPN fabrics (starting NDO 4.0)
- 500 VRFs and networks (L2–1500, L3–1000)



Virtual routing and forwarding stretch



L2/L3 network stretch



Overlay BGP EVPN/VXLAN connectivity across sites

- Full-mesh
- Centralized to route-server
- Inter-site connectivity automation through BGWs



Static port/VLAN provisioning



Visibility

- Fault information for NDFC objects within NDO
- Tunnel and NDFC object health within NDO

Benefits

Network
policy consistency

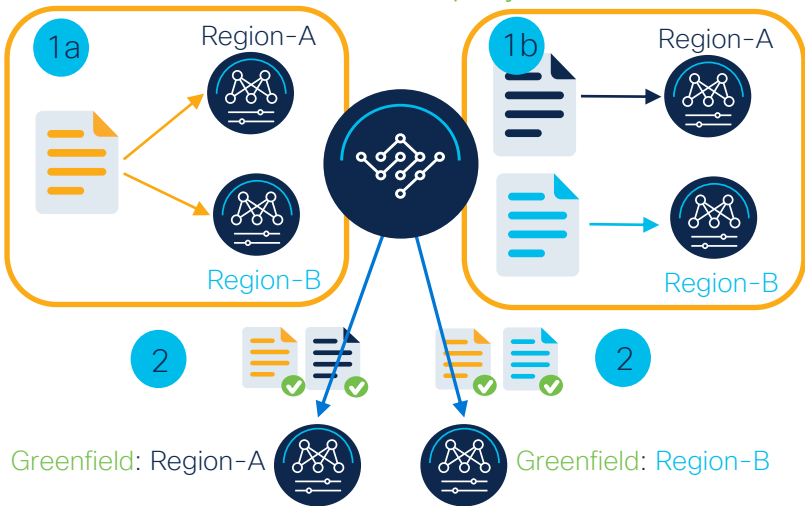
Change control
domains separation

Flexible geo-redundancy
for Cisco DCNM

Increased
scalability values

Greenfield and Brownfield Template Support

Greenfield Deployment

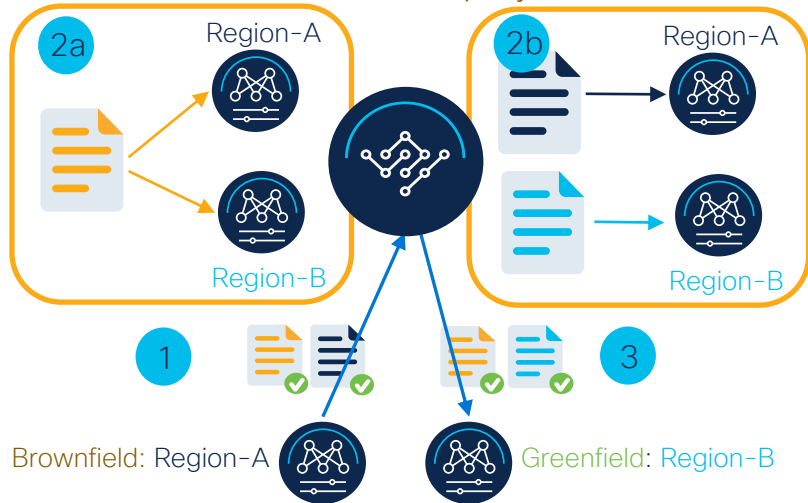


1a. Create new template for common objects such as VXLAN VRF and associate the template to both sites.

1b. Create site-specific templates for site-specific template such as VXLAN Network and associate them to each site.

2. Push template to NDFC sites.

Brownfield Deployment



1. Import existing objects such as VXLAN VRF and Network from NDFC VXLAN Brownfield MSD to new common and site-specific templates on NDO.

2a. Associate common template to both sites (for stretched objects).

2b. Associate site-specific templates to each site.

3. Push the template back to the NDFC sites.

Nexus Dashboard Fabric Controller

Cisco Nexus Dashboard Fabric Controller

NDFC Key Pillars



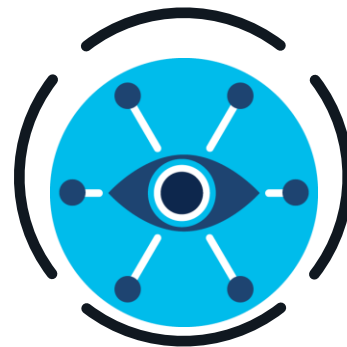
Automation

Accelerate provisioning
and simplify deployments



Management

In depth Management
and control for all
network deployments



Visibility

Get Centralized Visibility
and Monitoring views

Complete life cycle automation for VXLAN-EVPN, LAN, SAN, and
Media fabrics for Cisco NX-OS Nexus and MDS infrastructure

Why NDFC?



Multi-
Architecture

3-stage & 5-stage CLOS, 3-Tier Hierarchical, Collapsed Core, Routed Access



Multi-Topology,
Multi-Protocol

For example – In Legacy networks, choose from 3 Tier or Collapsed Core, choose to run IGP or BGP

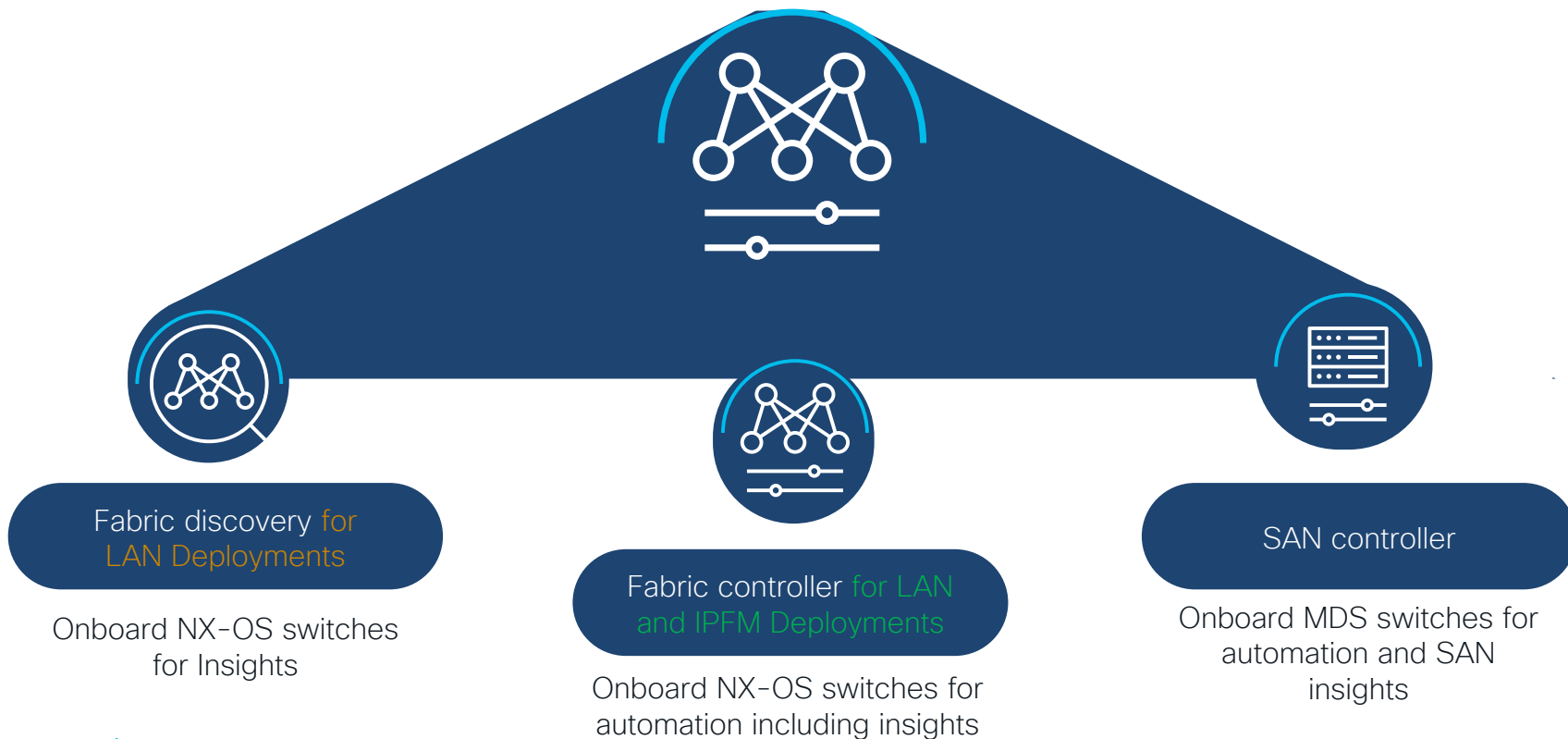


Multi-Domain,
Multi-Platform























LAN,SAN,IPFM
Nexus 2k/5k/6k/7k/9k, MDS, IOS-XE,
IOS-XR, Non-Cisco

Cisco Nexus Dashboard Fabric Controller

Operational Modes

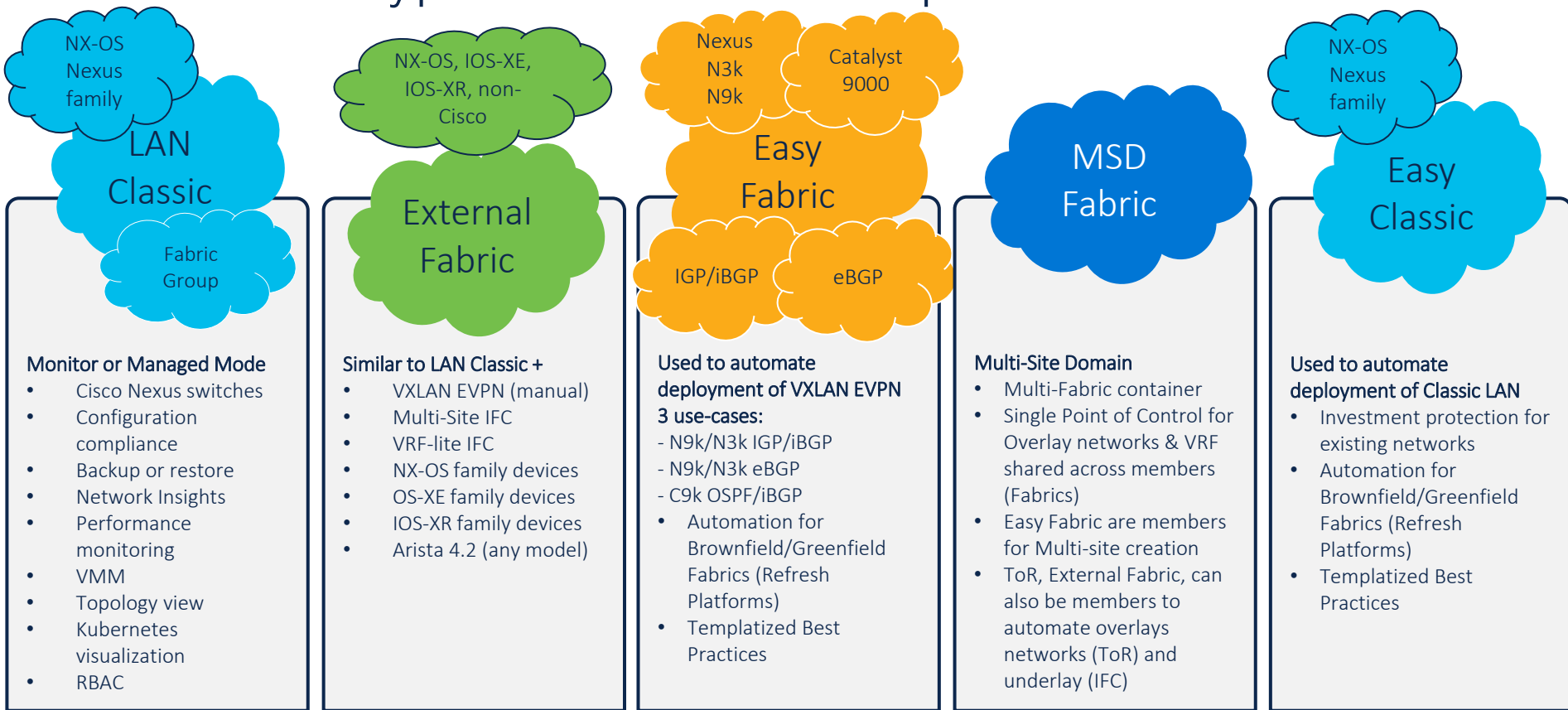


NDFC and Other Network Device Operations

Device type	Monitor	Manual Config**	Automate	Automate IFC
Nexus 9000 Classic LAN				
Nexus 9000 VXLAN EVPN				
Catalyst 9000 Classic LAN				
Catalyst 9000 VXLAN EVPN				
ASR 1000 series IOS-XE				
ASR 1000 series IOS-EX SD-WAN				
ISR 1100 series IOS-EX SD-WAN				
ASR 9000 series IOS-XR				
Non-Cisco platforms	Arista			

* based on NDFC release 12.1

Different Types of Fabric Templates



Benefits of NDFC



Complete Cloud-Native Micro-services architecture on ND with Active Active HA Cluster



Joins the ecosystem of services that runs natively on top of Nexus Dashboard



Simple download and installation from the Cisco App Store



Single Experience with a common Web GUI which simplifies adoption across the entire Cloud Networking Product Portfolio



Easier implementation of various personas namely LAN, SAN, IPFM controller



Easier scalability with adding extra nodes to the cluster dynamically

What's New with NDFC



Complete Cloud-Native Micro-services architecture on ND with Active Active HA Cluster



New Look & Feel with Modern Topology View, Consistent UI across all Cisco ND Apps



Fabric Features

- Enhanced Topology View
- Ability to modify switch discovery IP
- Flexible CLI option – config profile or native NXOS CLI
- Performance Programmable reports
- Granular RBAC



Image Mgmt & POAP

- Secure POAP User
- Simplified and flexible Image Management
- Server Smart Licensing



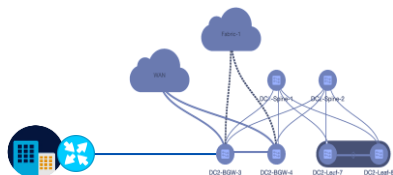
IOS-XR/IOS-XE Features

- Automate IOS-XR configuration
- Automate VXLAN EVPN fabric deployment with Cat9k

NDFC Classic LAN Fabric

NDFC LAN Fabric

Enhanced Visibility + Connectivity Automation
Define your network configuration and deploy it on multiple switches/routers



Programmability

REST/JSON

Infrastructure-as-Code
(Terraform/Ansible)

Strengths

Automation

Deploy your Fabrics &
Overlay networks
with a few clicks

Auto-bootstrap
Integrated best-
practices

Control

Extensible &
Customizable

Free-form Templates

Health Visibility

Real-time monitoring
Daily Operations

Per device, interface &
End-Point - OAM

Reliability

Preserve compliance

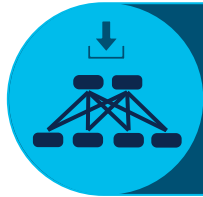
Configuration consistency
checks

NDFC LAN Foundation Focus Areas



➤ Classic LAN Operation

- Centralize Management and monitor Classic LAN
- Leverage Policy and Free-Form templates For device configuration



➤ VXLAN EVPN BrownField Fabric

- Transition existing VXLAN BGP EVPN Fabric Management to NDFC
- Import existing Fabric while Checking the Config following Cisco Best Practices



➤ VXLAN EVPN GreenField Fabric including Multi-Site Domain

- Zero-touch POAP process following Cisco Best Practices (N3k, N9k & C9k)
- Automate Networks and VRF deployment



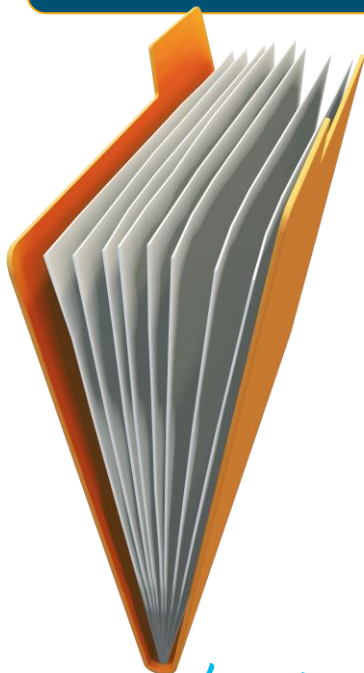
➤ Single Pane of Glass

- Integrates all types of Network Fabrics under the same Topology
- Configure, Monitor, Alarm, Operation Tools, Programming Reports

VXLAN EVPN Fabric

Nexus 9000 Series and Catalyst 9000 Series

VXLAN EVPN Operation for Multiple Cisco Platforms



Easy Fabric
Template for
Nexus 9000
series
NX-OS

Easy Fabric
Template for
Catalyst 9000
series
IOS-XE

NDFC Fabric Management & Operations



Visibility & Maintenance

Real-Time Network Topology & Fabric Health

Compute Stack Visualizer

3rd Party integration

Performance Monitoring & Reports

Event Analytics

Configuration Compliance

Image Management, Upgrades and RMA

Enhanced RBAC support

Backup & Restore Configuration

NDFC



E2E Network Provisioning

GUI/API-based Auto-provisioning

Classic LAN, VXLAN EVPN Fabric

BrownField import and GreenField creation

Multiple Fabrics & Multi-Site

Advanced Network services

External Layer 3 connectivity (VRF-Lite, MPLS, SR)

NDFC Automation



Accelerate provisioning from days to minutes

Easy to understand approach to auto-bootstrapping of entire fabric

Rapid Deployment with Fabric Builder best practice templates for VXLAN-EVPN

DevOps friendly

Enhanced Programmability

Scale within and across data centers with Nexus Dashboard Orchestrator

Benefits

Simplify fabric deployments

Developer agility

Multi-site

NDFC Management



Single point for management
for data center operations

Optimized for both large deployments
and traditional deployment models

Ensure consistency and reliability
of data center fabrics

License management

Role based access control (RBAC)
to reduce administrative workflows

Management for non-Nexus platforms

Benefits

Reliability

Compliance

Secure

NDFC Visibility and Monitoring



Get comprehensive monitoring

Enhanced topology views

Compute and endpoint visibility

OAM support with NDFC

Obtain detailed inventory, health, resource consumption information on devices

End-to-end visibility, monitoring and troubleshooting

Integrate with Day 2 operations

Benefits

Intuitive

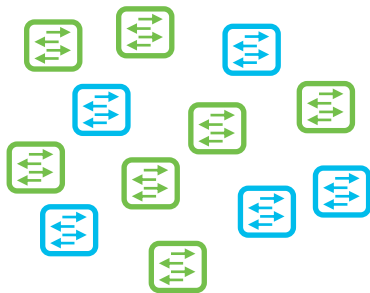
Deep Visibility

Enhanced monitoring

Automate VXLAN EVPN Deployments

Provision a New Fabric in Minutes

Un-provisioned switches



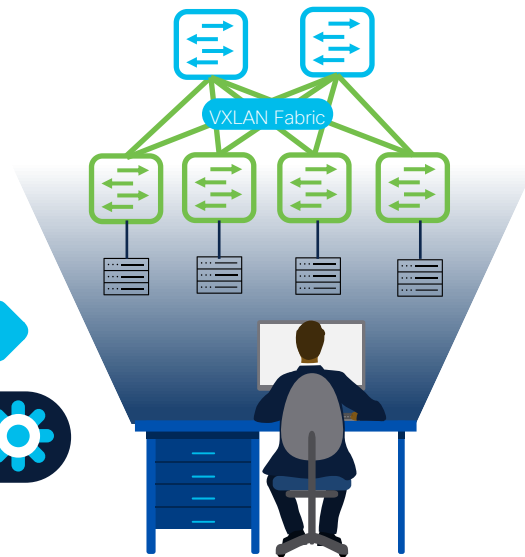
Within NDFC
select fabric builder



Fast, automated process



Cisco best practice implemented



Benefit

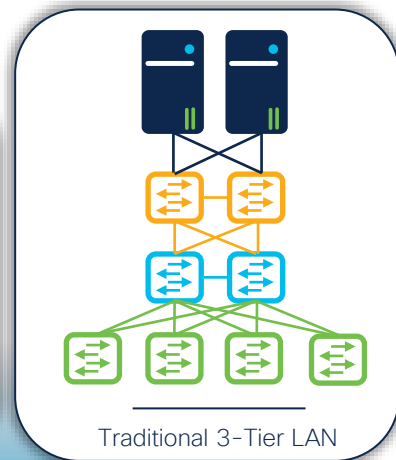
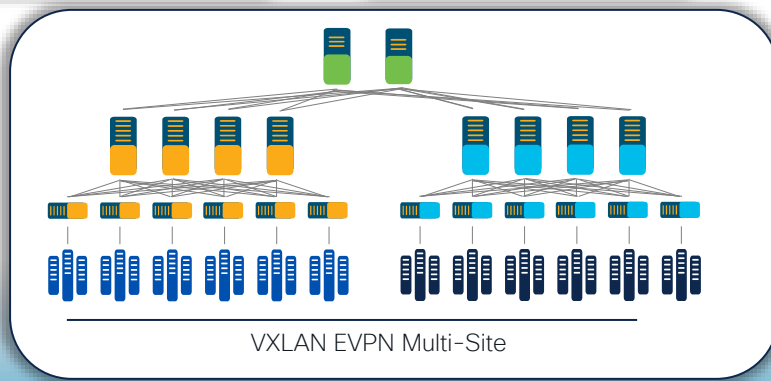
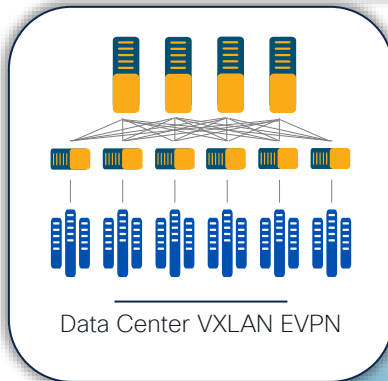
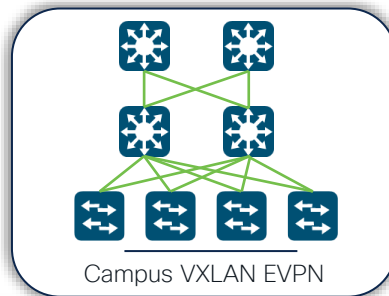
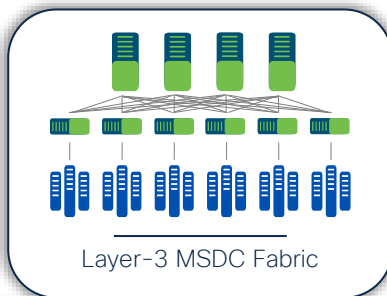
Accelerate fabric deployments

Automated consistency

Minimize risk

Support for both Greenfield and Brownfield deployment

Fabric Builder



VXLAN EVPN Greenfield Setup

Not on VXLAN EVPN Today?



NDFC Fabric Controller Mode



Build VXLAN fabric in few minutes



Templates already embed best practices



IP addresses, overlay routing profiles, replication attributes - all taken care by NDFC

Step 2 Discover

Import switches with POAP or Day-0 config
Define switch Roles (Border, Leaf, Spine, etc)
[Optional] Create vPC pairs



Step 1 Create

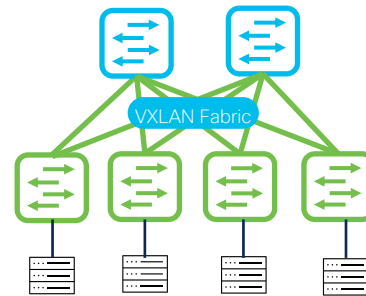
Define fabric settings (Underlay, Overlay) - AS#, Replication Mode, IGP, IP Pools, etc.



Step 3

Recalculate and Deploy
Generates config based on intent
Preview side by side diffs

Cisco best practice implemented



Fast, automated process



VXLAN EVPN Brownfield Migration

Already using VXLAN?
Want to use NDFC for managing your fabric?



NDFC fully supports
Brownfield



Non-disruptive import
of existing VXLAN
EVPN deployments



Learns topology, all
configuration,
associated resources, IP
subnets, VNIs, VLANs,
etc.



Start Managing fabric as
provisioned from
NDFC

Step 2

Discover

Import switches with **Preserve Config**
Define switch Roles (Border, Leaf, Spine, etc)



Step 1

Create

Define fabric settings (Underlay, Overlay) –
Match AS#, Replication Mode, IGP, etc.



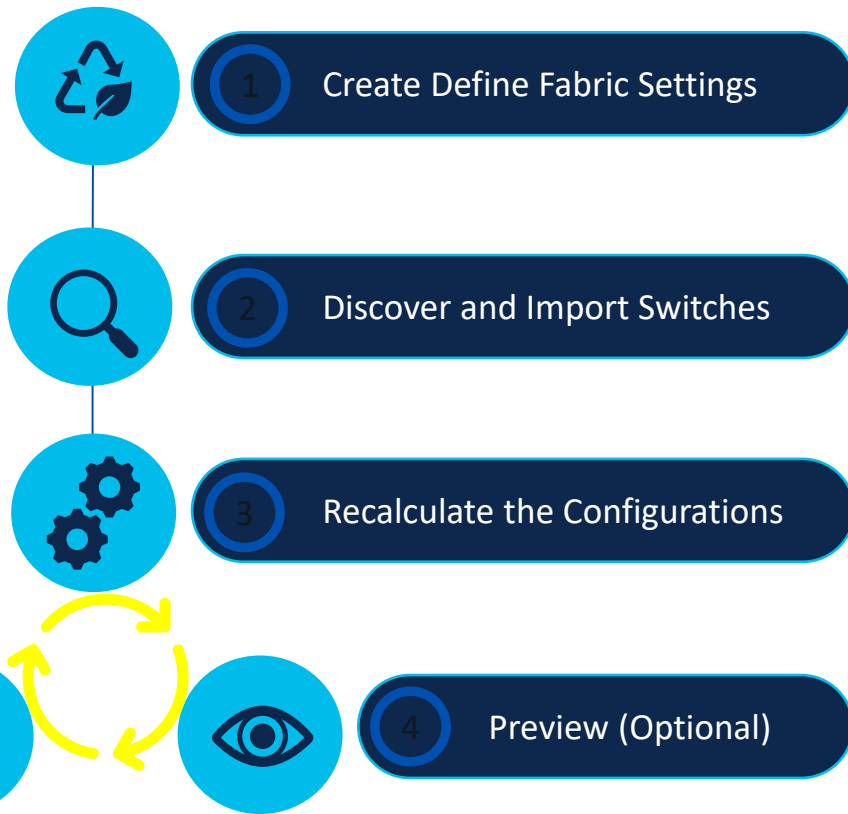
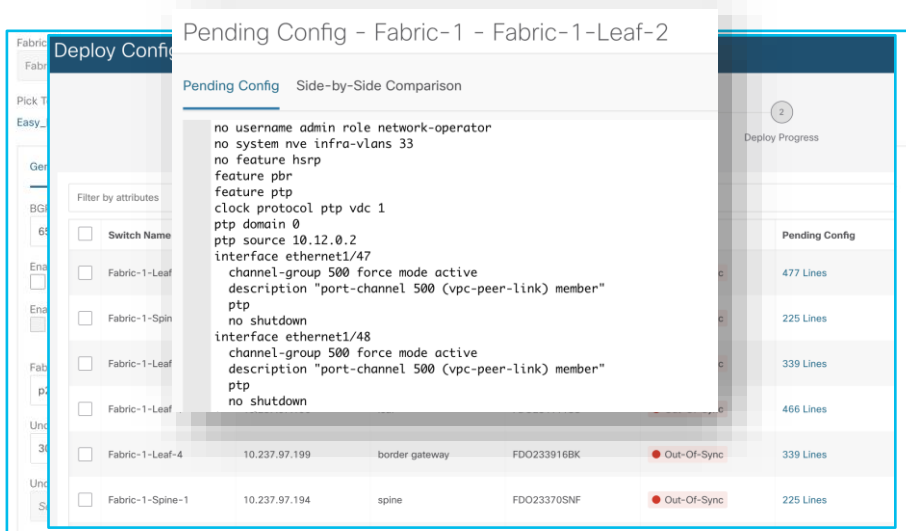
Step 3

Recalculate and Deploy

Sanity checks for mis-config and Normalizes configuration
to best practices

Day in the Life of NDFC

Underlay Using Fabric Builder



Your VXLAN EVPN Underlay/Routed fabric is ready in a few minutes

Day in the Life of NDFC

Overlay Network Management

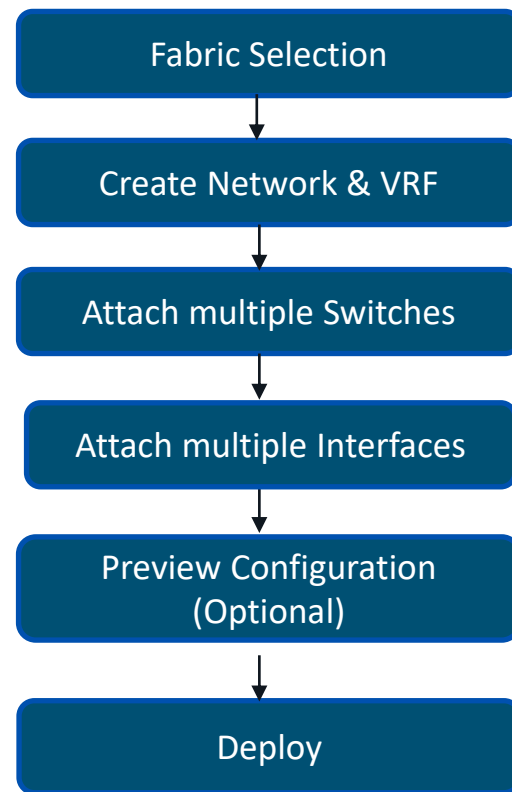
Top-Down deployment via GUI or REST APIs

Network/VRF Creation with custom Overlay Policies

Attach Network to Switches and Interfaces

Per Network/Per Switch deployment History

Centralized Overlay Resource Manager Tracking for VNIs, VLANs etc.



1 Create VRFs

2 Create Networks per VRF

3 Attach Networks



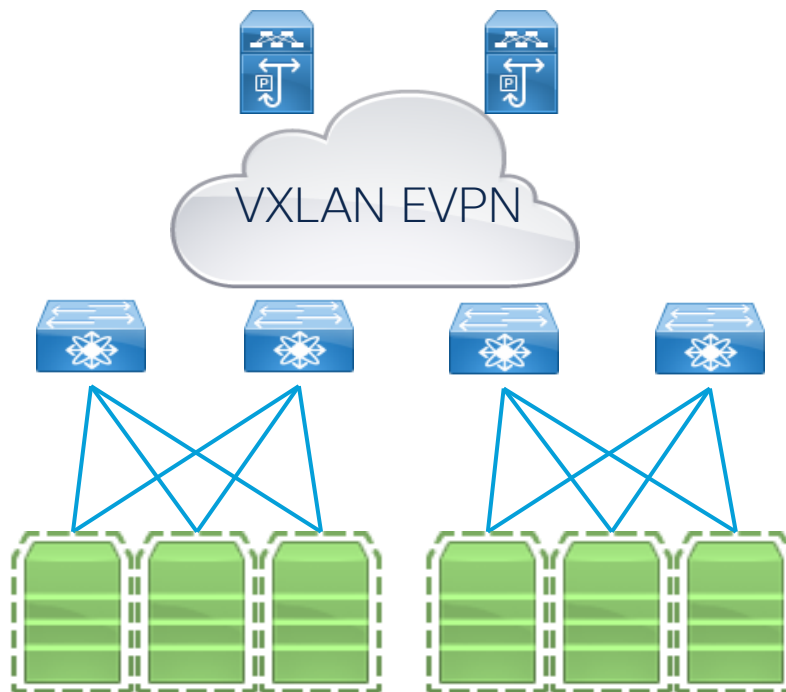
VRF Bleu



VRF Green



VRF Orange



NDFC Automation & Programmability



NDFC Automation Tools

Overlay Networks & VRF Deployment



Day-0 Operations involve One-time steps

Day-1 Operations involve Multiple-time steps

NDFC Offers Features and Tools in addition to its Web UI

NDFC Programming with IaC

- API-Docs (formerly Swagger)
- Postman, Boomi, Oracle API Mgr
- Ansible Playbooks, Terraform

NDFC Bulk Attachment and Detachment

VXLAN Multi Site

Different Roles for Border Gateway (BGW)

Border Gateway

Layer 3 based Anycast BGW deployed at the leaf Layer

vPC Border Gateway

Used to locally dual-attach Layer 2 networks or Endpoints
Allows Distributed Anycast Gateway (DAG)

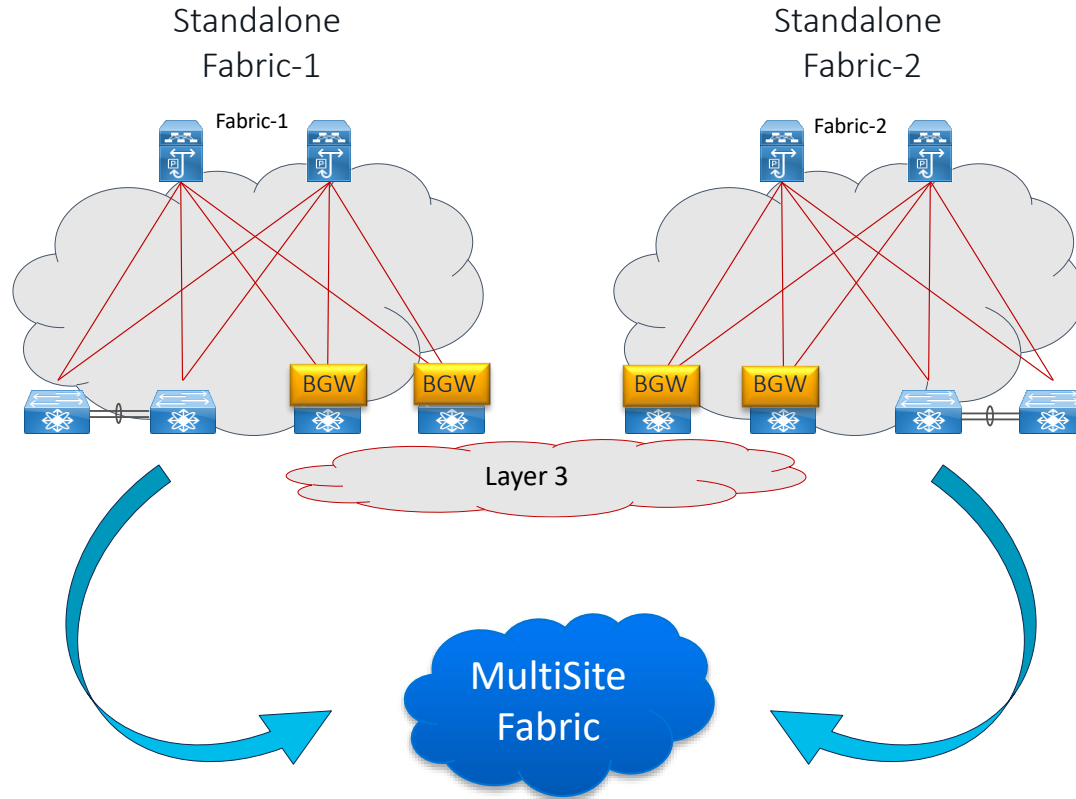
Border Gateway Spine

Layer 3 based Anycast BGW deployed at the Spine Layer

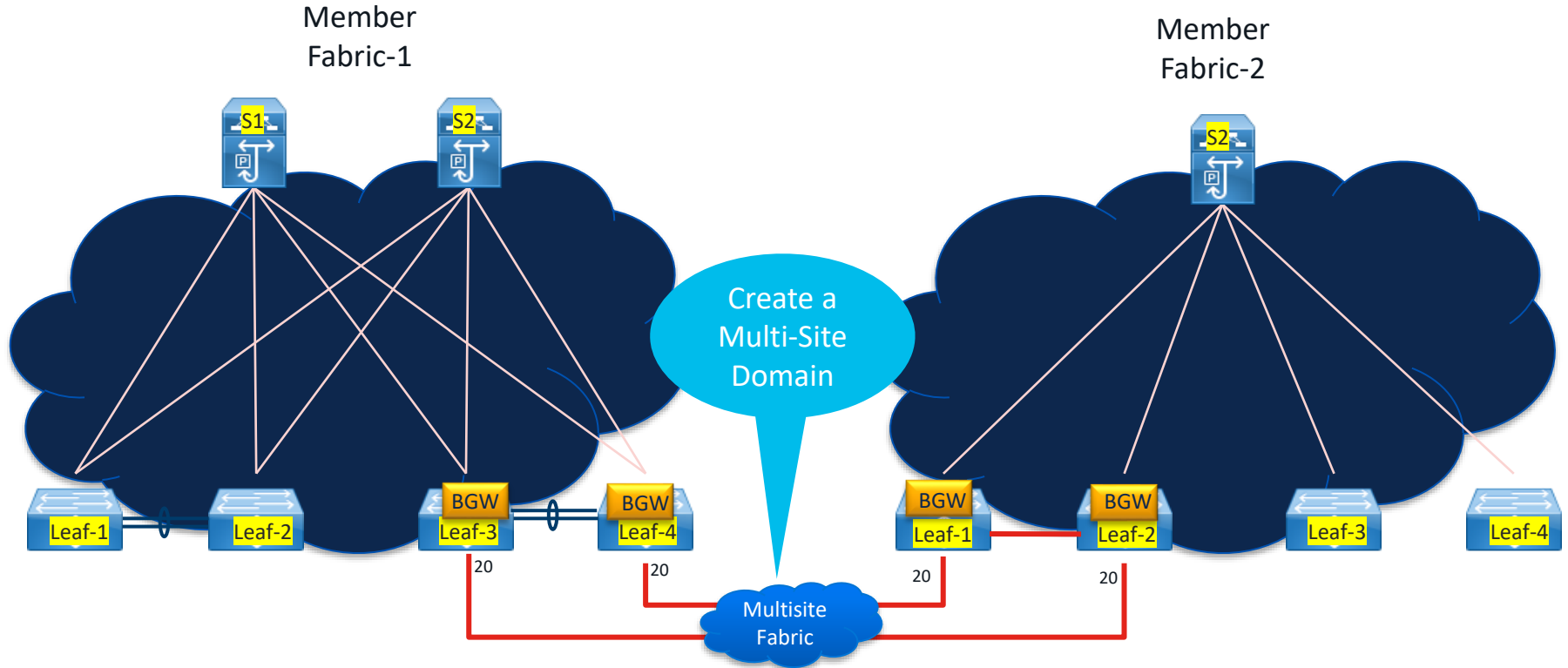
Spine
Leaf
Border
Border Spine
Border Gateway (current)
Border Gateway Spine
Super Spine
Border Super Spine
Border Gateway Super Spine

Interconnect Multiple VXLAN EVPN Fabrics

VXLAN EVPN Multi Site Domain (MSD)



Create and Deploy the Multi-Site Domain



VXLAN EVPN

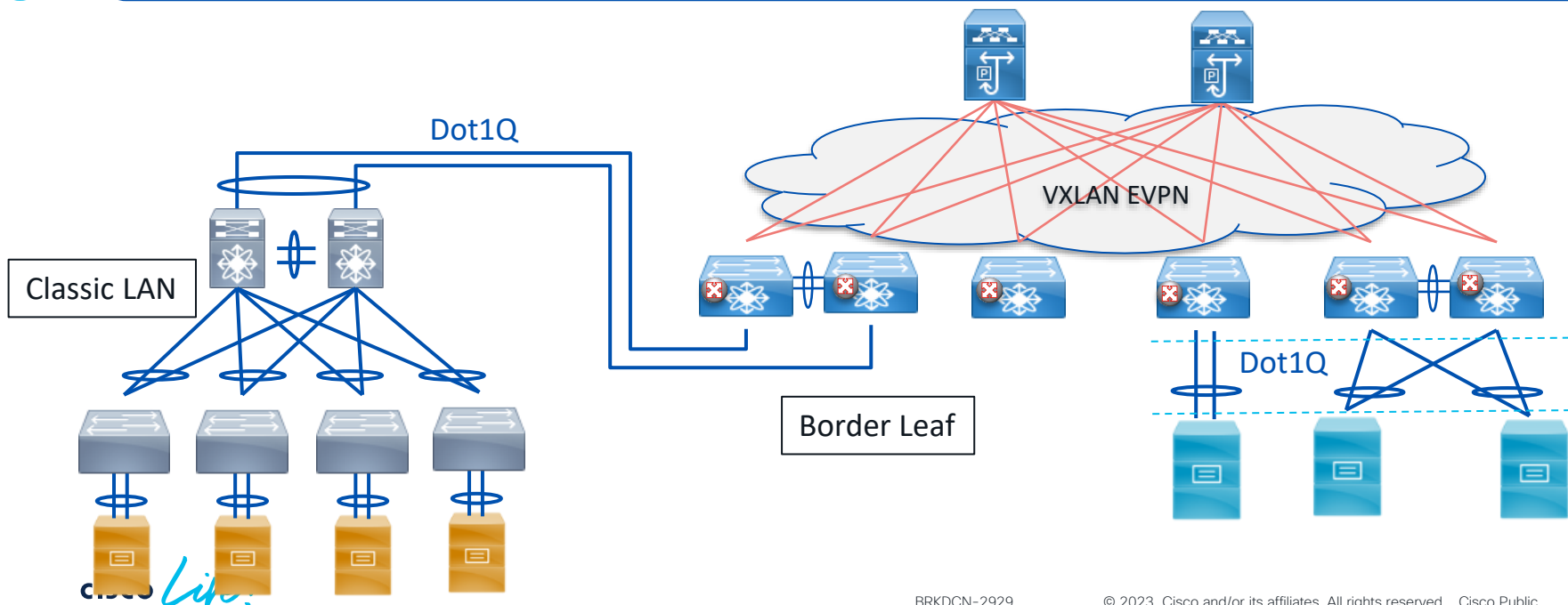
External Layer 2 Connectivity

1

Endpoints locally attached at Layer 2 (e.g. Servers, IPS, Service Node in Bridge mode)

2

Classic LAN to Border Leaf nodes at Layer 2 (Hot live Motion, Migration, Ops simplicity)



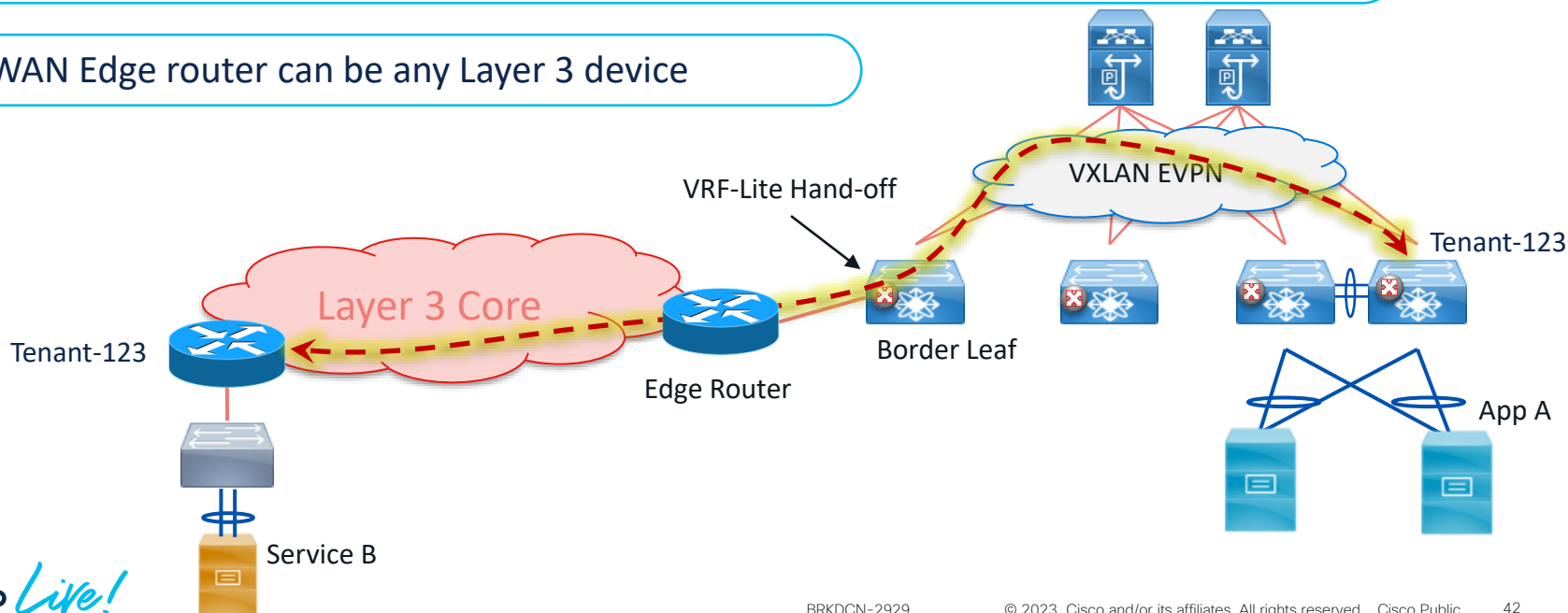
VXLAN EVPN

External Layer 3 Connectivity

VRF Lite is used for connecting the fabric to an external Layer 3 domain (N-S)

Each Tenants (VRF) can connect outside the Fabric via a Borders Leaf Node

The WAN Edge router can be any Layer 3 device



VXLAN EVPN External Layer 3 Connectivity

Prerequisites and Guidelines

NDFC auto deployment of VRF-Lite rules

1

The target router must be part of an External Fabric or Easy Fabric

2

VRF-Lite hand-off must be initiated from an Easy Fabric

3

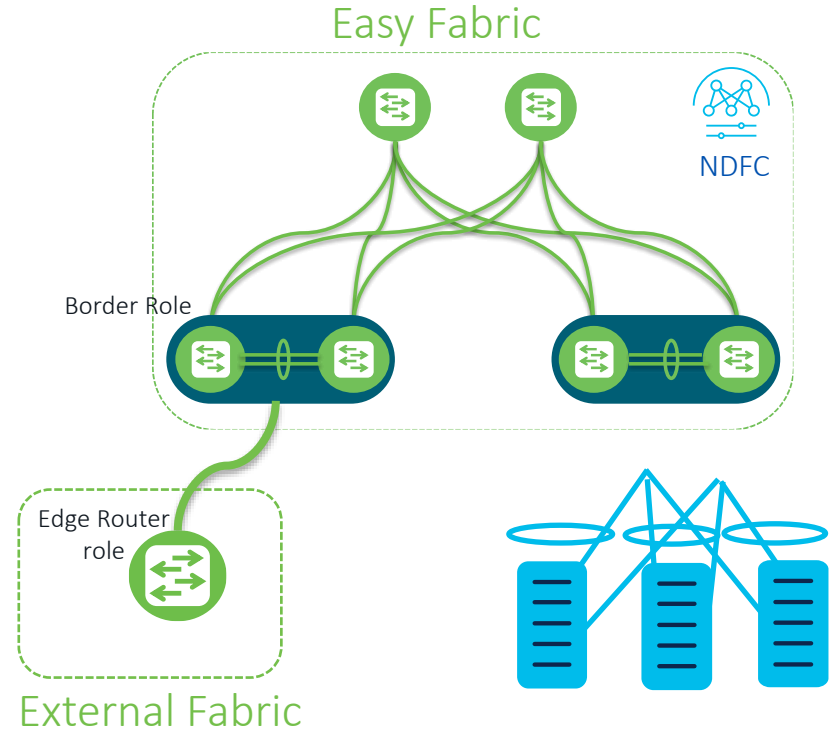
The Role of the border device must be Border <role>

4

The Role of the Target router must be Edge Router or Border node

5

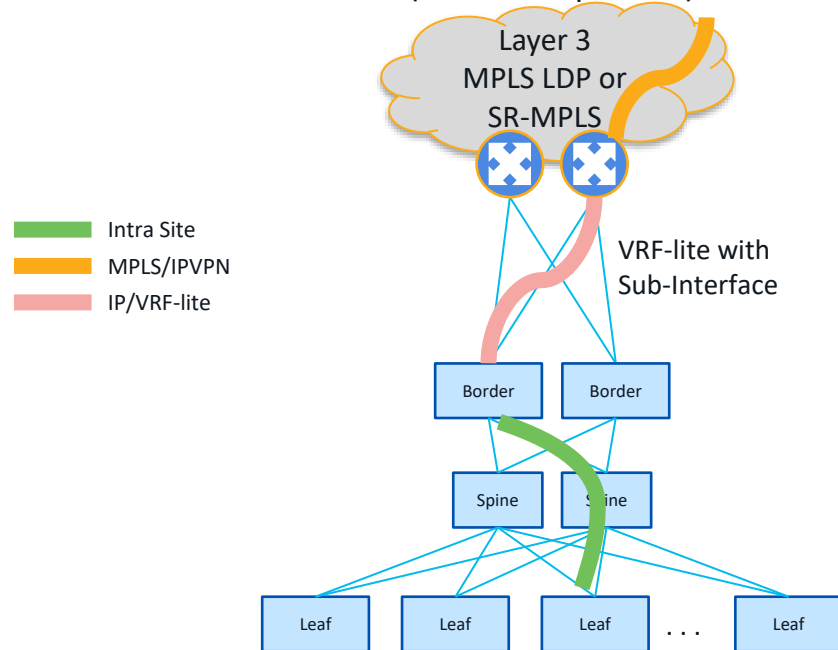
Advertise Default Route is enough for ext. L3 conn



Seamless Protocol Gateway

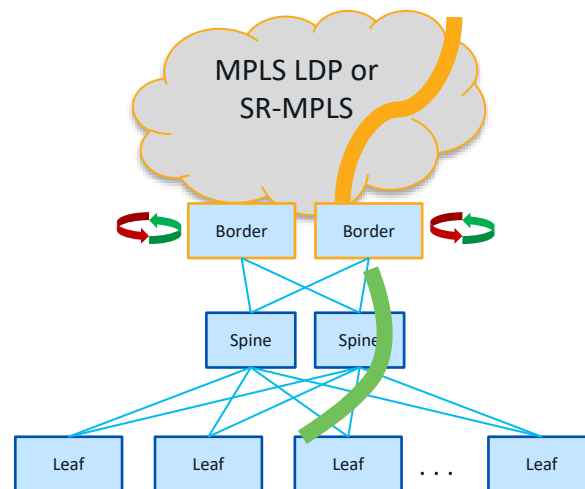
Various Models

Separated Border + PE (Inter-AS Option A)



Seamless Data-Plane Stitching
between VXLAN, MPLS and
Segment Routing

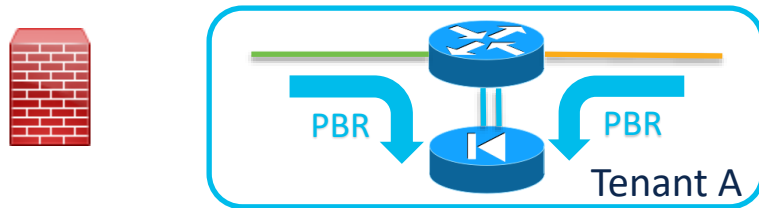
Collapsed Border + PE



L4-L7 Service Insertion Use Cases

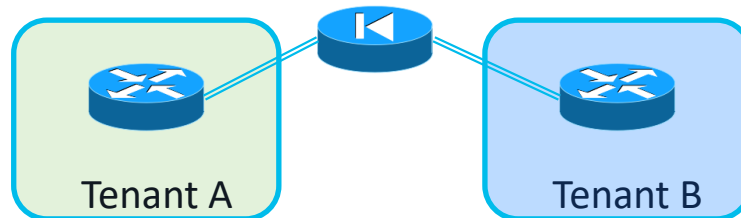
Virtual & Physical Form Factor
Static & Dynamic Peering
vPC/Non-vPC Attachments

Intra-Tenant



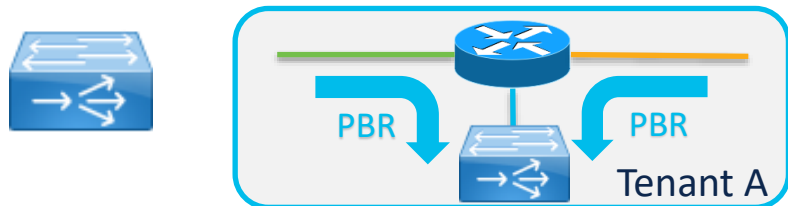
PBR Use-Cases

Inter-Tenant



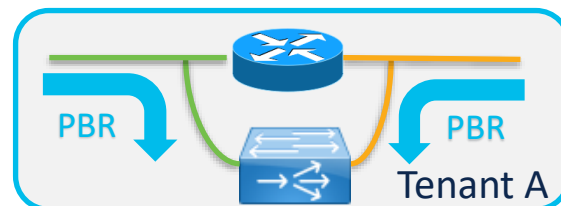
Tenant-Edge Firewall

One-Arm



PBR Use-Cases (no SNAT)

Two-Arms



L4-L7 Service Node Guidelines

Supported on VXLAN EVPN with the Easy_Fabric Template

Enabled on CloudScale based Switches (Cisco Nexus 9300-EX/-FX)

Leaf, Border Leaf, Border Spine, Border Super Spine, Border Gateway

L4-L7 Service node automation using NDFC UI or NDFC REST API

L4-L7 Services generate Kafka Notification for Real-Time Interaction

Display Cumulative statistics From the Service Policy and Redirected Flows

NDFC Elements Management Config Options

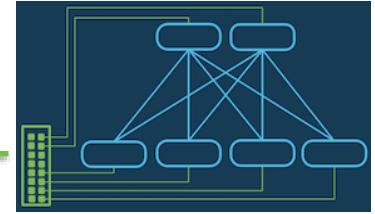
End-user



NDFC Mgmt



OoB Mgmt



Issue commands through NDFC on each Device To Operate and Troubleshoot

NDFC
GUI

<https://ND-Mgmt-IP/>

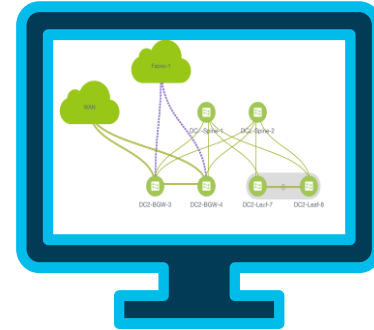
NDFC
REST API

<https://ND-Mgmt-IP/apidocs/>
https://ND-Mgmt-IP/appcenter/cisco/ndfc/api/*

NDFC
Terraform
Ansible

Plugin: NDFC HTTPAPI / IaC

* <https://ND-Mgmt-IP/appcenter/cisco/ndfc/api/v1/lan-fabric/rest/control/fabrics>



NDFC REST API

Embedded API Docs

Select the definition of interest and Expand it

"Try it out" And fill-up the variables with the desired values

The screenshot displays the NDFC REST API Embedded API Docs interface. On the left, a sidebar lists API endpoints under the 'LAN FABRIC API' section. The 'Create Network' endpoint is selected, showing its details in the main panel. The endpoint is a POST request to `/api/v1/lan-fabric/rest/top-down/fabrica/{fabric-name}/networks`. The 'Try it out' button is circled in red. Below the endpoint details, the 'Path params' section shows a required `fabric-name` parameter. The 'Body' section contains a form with input fields for various parameters: `fabric`, `networkName`, `displayName`, `networkId`, `networkTemplate`, `networkExtensionTemplate`, `networkTemplateConfig`, `vrf`, `tenantName`, `serviceNetworkTemplate`, and `interfaceGroups`. A 'Run' button is located at the bottom right of the form. On the right side, a 'Body' section shows the JSON structure of the request body, with values entered in the input fields: `fabric` is 'BFL-MSD', `networkName` is 'Net1-APIdocs', `displayName` is 'Net1-APIdocs', `networkId` is '301234', `networkTemplate` is 'Default_Network_U', `networkExtensionTemplate` is 'Default_Network_E', `networkTemplateConfig` is `{"vlandId": "1234", "ga"}`, `vrf` is 'Tenant-1', `tenantName` is 'Tenant-1', `serviceNetworkTemplate` is empty, and `interfaceGroups` is empty.

API DOCS

Search

General

Auth

Service Node

Route Peering

Service Policy

LAN FABRIC API

Control - Fabrica

Control - Inventory

Control - Links

Control - Switches

Control - Interface Service

Control - Policies

Top Down LAN Network Operations

Create Network

This api is used to create a Network under the selected fabric

POST `/api/v1/lan-fabric/rest/top-down/fabrica/{fabric-name}/networks`

PATH PARAMETERS

`fabric-name` string required
Name of the selected fabric

REQUEST BODY SCHEMA: `application/json`

LAN Network Object with required parameters

`fabric` string

`networkName` string

`displayName` string

`networkId` integer <int32>

`networkTemplate` string

`networkExtensionTemplate` string

`networkTemplateConfig` string

`vrf` string

`tenantName` string

`serviceNetworkTemplate` string

`interfaceGroups` string

Details

Try it Example

Path params

`fabric-name` string required
Name of the selected fabric

Body

`fabric`

`networkName`

`displayName`

`networkId`

`networkTemplate`

`networkExtensionTemplate`

`networkTemplateConfig`

`vrf`

`tenantName`

`serviceNetworkTemplate`

`interfaceGroups`

Run

Body

`fabric` BFL-MSD

`networkName` Net1-APIdocs

`displayName` Net1-APIdocs

`networkId` 301234

`networkTemplate` Default_Network_U

`networkExtensionTemplate` Default_Network_E

`networkTemplateConfig` {"vlandId": "1234", "ga"}

`vrf` Tenant-1

`tenantName` Tenant-1

`serviceNetworkTemplate`

`interfaceGroups`

POST Create Network

1 List networks

2 Create Network

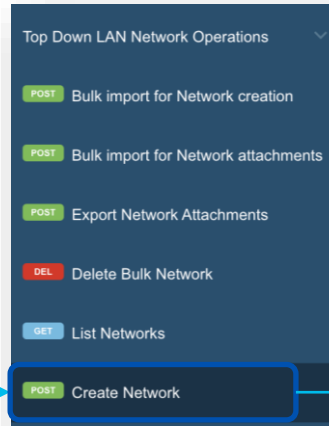
3 Get Networks Attachments

BRKDCN-2929

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NDFC and REST API

NDFC API-Docs



Request Response

Content type
application/json



Leverage NDFC API-Docs

Select the POST operation you want to execute

Typically, given examples provide the JSON script

Copy the example to reuse it by a REST API 3rd party tool

NDFC and Infrastructure as Code

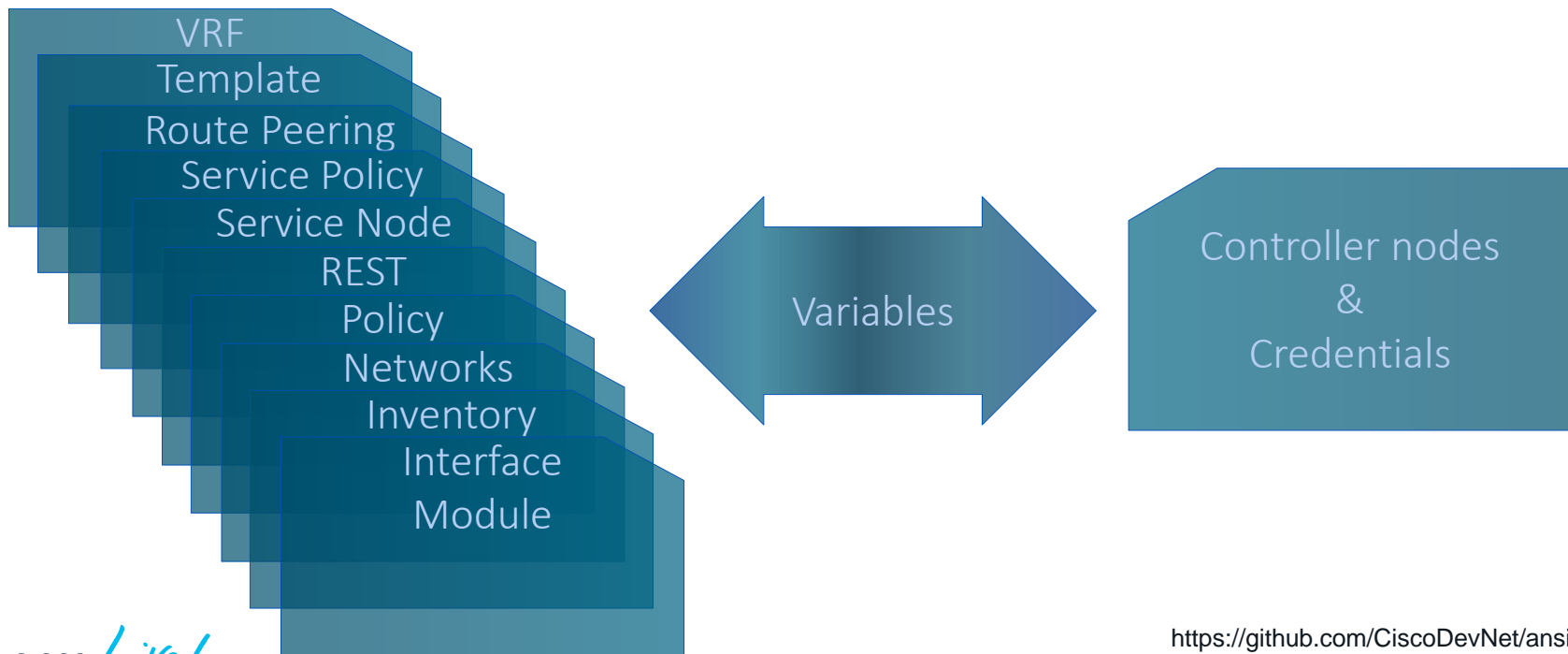
Ansible Collection



Custom Playbooks



Target Hosts Inventory



NDFC and REST API

Demo Using Ansible Playbooks



Use-case: You have been asked to urgently build and deploy about twenty networks across multiple Leaf nodes and interfaces, and you want to use the Ansible collection to speed up deployment while mitigating the risk of errors.



Install Cisco Ansible DCNM Collection *version 2.0.1 for both DCNM & NDFC



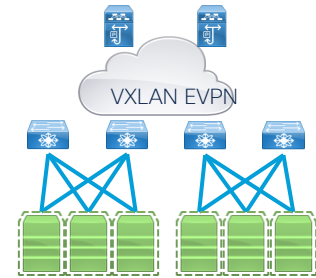
Configure the controller (NDFC) reachability information



Configure the Network Playbook to merge new Networks & VRF



Run the Ansible Playbook command associated with the Environment



NDFC Demos



NDFC Demo

NDFC Dashboard Walkthrough

NDFC VXLAN Multisite

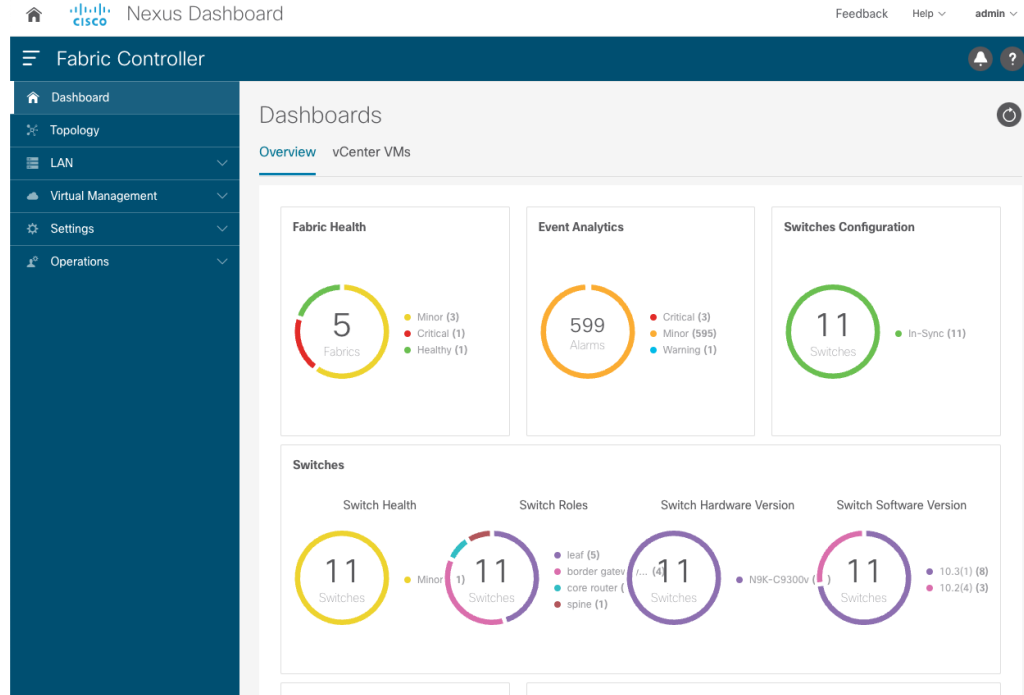
Bonus – NDFC N9K and Cat9k VXLAN Fabric

NDFC Dashboard Walkthrough

New Redesign

Enhanced End Point Capabilities

24-hour Snapshots



The intent of the **Dashboard** is to enable network and storage administrators to focus on areas of concern around the health and performance of data center switching.

Enhanced End Point Capabilities

Viewing vCenter VMs

Dashboards

Overview vCenter VMs Kubernetes Pods

Filter by attributes

VM Name	IP Address	MAC Address	VLAN	Physical NIC	Host	Fabric	vSwitch	Switch	Switch Interface	VPC ID	Port Channel	State
vlan1-VM2				vmnic5	vinci-ucs117.cisco	corefab	DVS2	L6-FXP	Ethernet1/47	0		CONNECTED
vlan1-VM2				vmnic4	vinci-ucs117.cisco	corefab	DVS2	L5-FXP	Ethernet1/47	0		CONNECTED
11.5-2-S29	192.168.89.1 fe80::250:56f	00:50:56:b5:c	99	vmnic2	172.28.8.134	bgfab	vSwitch2	L3-FX2	Ethernet1/52	0		CONNECTED
11.5-1-S29	192.168.89.1 fe80::250:56f	00:50:56:b5:c	99	vmnic2	172.28.8.134	bgfab	vSwitch2	L3-FX2	Ethernet1/52	0		CONNECTED
centos7_K8s	192.168.126. fe80::d0fa61	00:50:56:b5:f	126	vmnic7	172.28.8.231	corefab	vSwitch3	L6-FXP	Ethernet1/1	0		CONNECTED
centos7_K8s	192.168.126. fe80::d0fa61	00:50:56:b5:f	126	vmnic6	172.28.8.231	corefab	vSwitch3	L5-FXP	Ethernet1/1	0		CONNECTED
ubuntu20_K8s	192.168.126. fe80::250:56f	00:50:56:b5:f	126	vmnic7	172.28.8.231	corefab	vSwitch3	L6-FXP	Ethernet1/1	0		CONNECTED

Viewing Kubernetes Pods

Dashboards

Overview vCenter VMs Kubernetes Pods

Filter by attributes

Pod Name	Pod IP	Phase	Reason	Application	Namespa...	Node Name	Node IP	Cluster Type	Physical NIC	Physical Switch	Switch Interface	Cluster Name	Port Channel	VLAN	Fabric
vespa-net-dm1	192.168.126.1	Running			kube-system	centos7-k8s-w1	192.168.126.1	Kubernetes	vmnic7	L6-FXP	Ethernet1/1	192.168.126.1		126	corefab
etcd-vm-k8s-master	192.168.126.1	Running			kube-system	vm-k8s-master	192.168.126.1	Kubernetes	vmnic7	L6-FXP	Ethernet1/1	192.168.126.1		126	corefab
kube-proxy-b0w6	192.168.126.1	Running		kube-proxy	kube-system	centos7-k8s-w2	192.168.126.1	Kubernetes	vmnic7	L6-FXP	Ethernet1/1	192.168.126.1		126	corefab
kube-proxy-stu1	192.168.126.1	Running		kube-proxy	kube-system	centos7-k8s-w1	192.168.126.1	Kubernetes	vmnic7	L6-FXP	Ethernet1/1	192.168.126.1		126	corefab
coredns-666f46719-bpnd	10.32.0.3	Running		kube-dns	kube-system	vm-k8s-master	192.168.126.1	Kubernetes	vmnic7	L6-FXP	Ethernet1/1	192.168.126.1		126	corefab
kube-scheduler-vm-k8s-master	192.168.126.1	Running			kube-system	vm-k8s-master	192.168.126.1	Kubernetes	vmnic7	L6-FXP	Ethernet1/1	192.168.126.1		126	corefab
kube-proxy-pgm48	192.168.126.1	Running		kube-proxy	kube-system	vm-k8s-master	192.168.126.1	Kubernetes	vmnic7	L6-FXP	Ethernet1/1	192.168.126.1		126	corefab

NDFC Provides Superior Visibility to the End Points

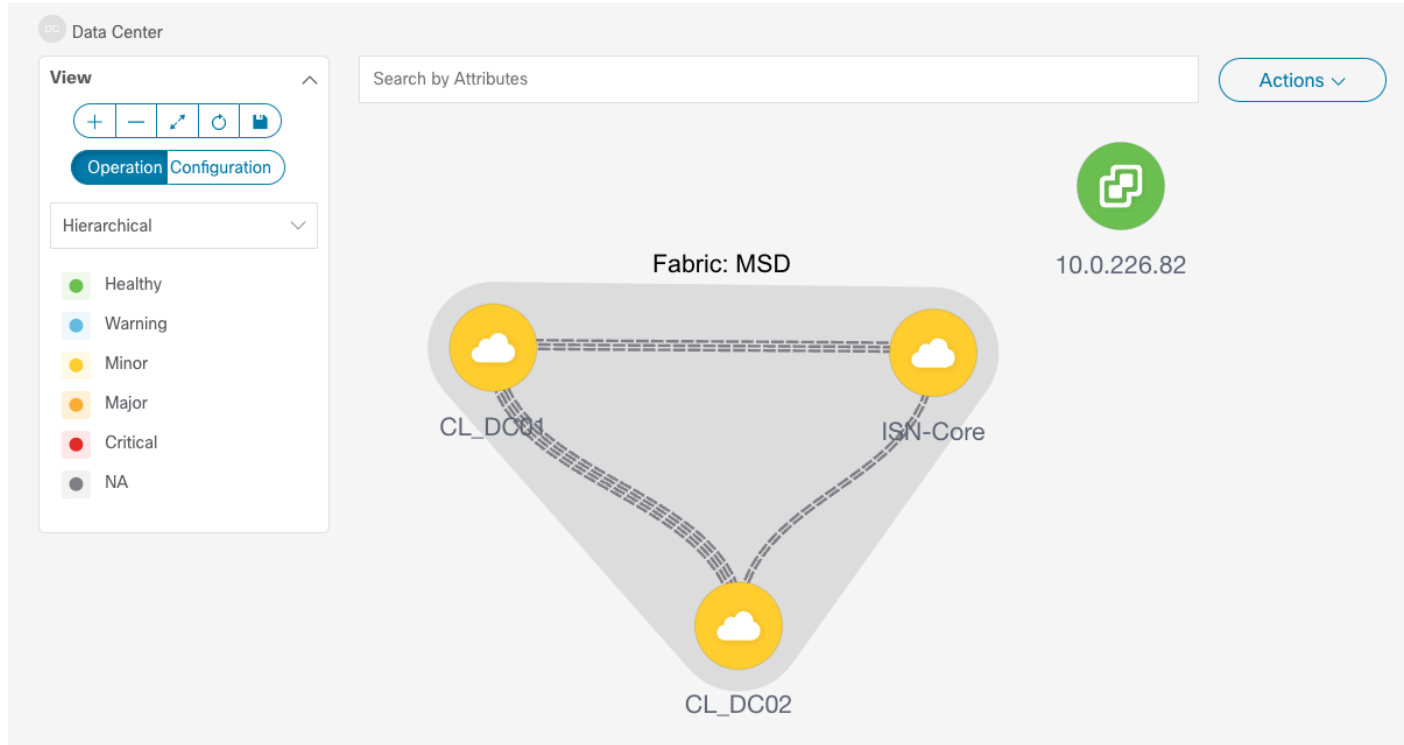
NDFC VXLAN Multisite

Two N9K VXLAN Fabrics

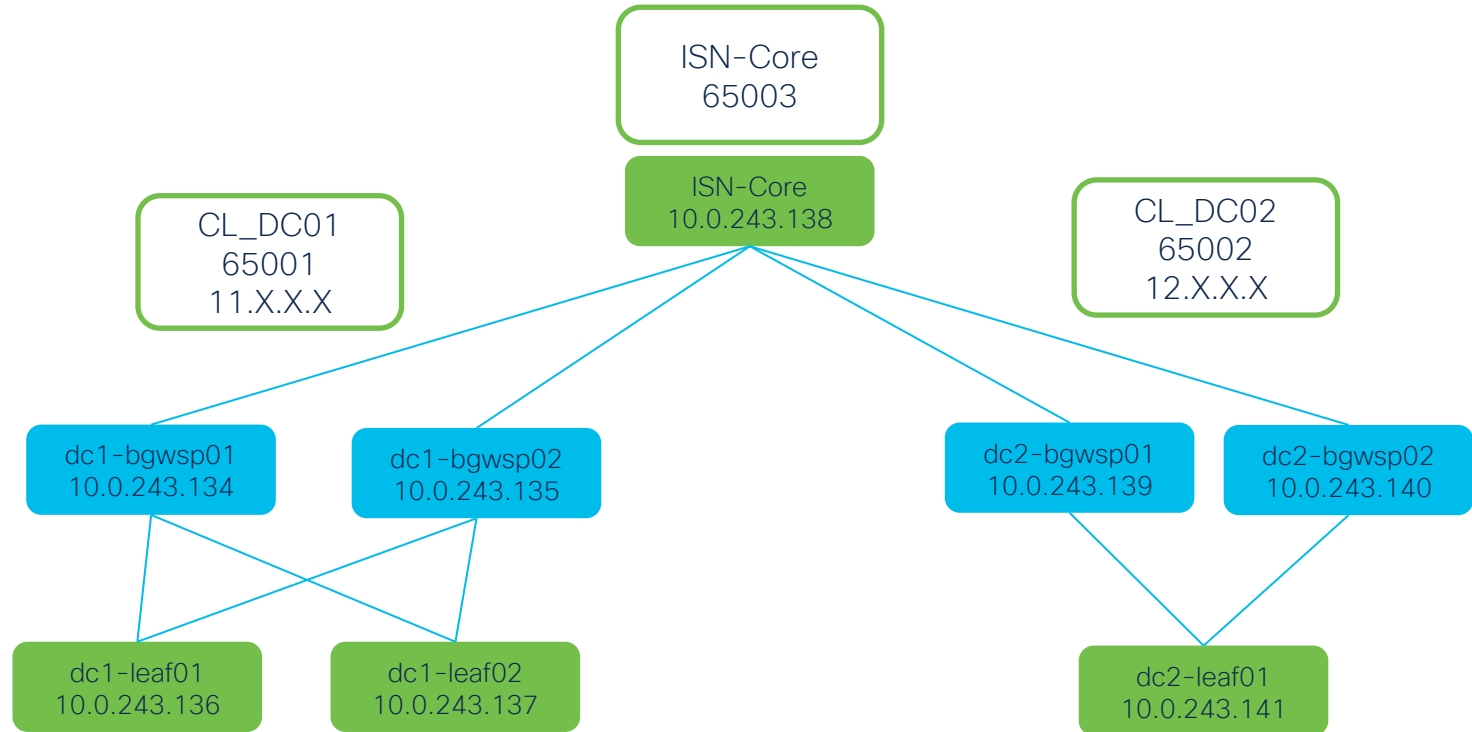
Easy to Implement

End-to-End Visibility

NDFC VXLAN Multisite



Physical Topology



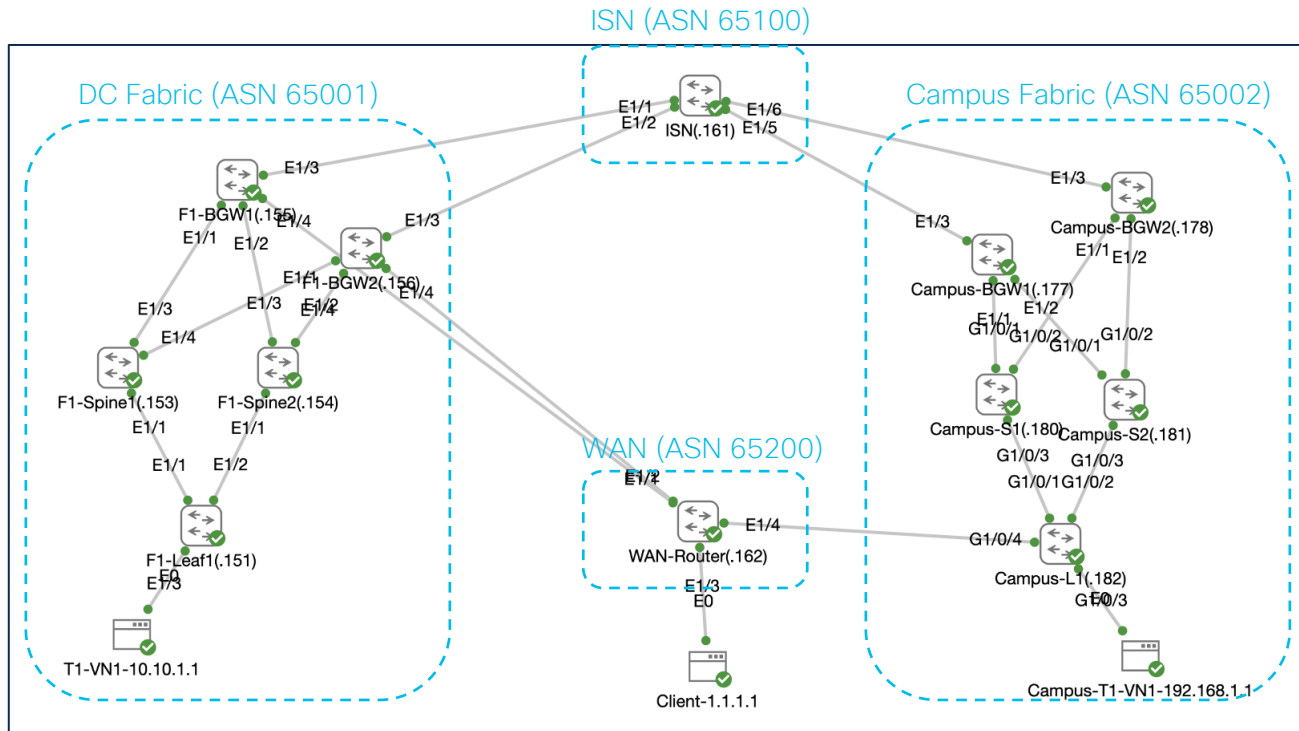
Bonus – NDFC N9K and Cat9k VXLAN Fabric

N9K and Cat9K VXLAN Fabrics

Easy to Implement

Single Pane of Glass

Bonus – NDFC N9K and Cat9k VXLAN Fabric



NDFC Summary



Streamlined
lifecycle
management



Automate and
configure your
networks with ease



Maintain
compliance and
detect errors



Extensive visibility,
monitoring and
modernized
topology views



Expand your
network with
integrations with
NDO and NDI

Complete your Session Survey

- Please complete your session survey after each session. Your feedback is important.
- Complete a minimum of 4 session surveys and the Overall Conference survey (open from Thursday) to receive your Cisco Live t-shirt.
- All surveys can be taken in the Cisco Events Mobile App or by logging in to the Session Catalog and clicking the "Attendee Dashboard" at <https://www.ciscolive.com/emea/learn/sessions/session-catalog.html>



Continue Your Education



Visit the Cisco Showcase for related demos.



Book your one-on-one Meet the Engineer meeting.



Attend any of the related sessions at the DevNet, Capture the Flag, and Walk-in Labs zones.



Visit the On-Demand Library for more sessions at ciscolive.com/on-demand.



The bridge to possible

Thank you

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CISCO *Live!*

ALL IN