Automate and Manage VXLAN EVPN Fabrics Using NDFC

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LTRDCN-2419

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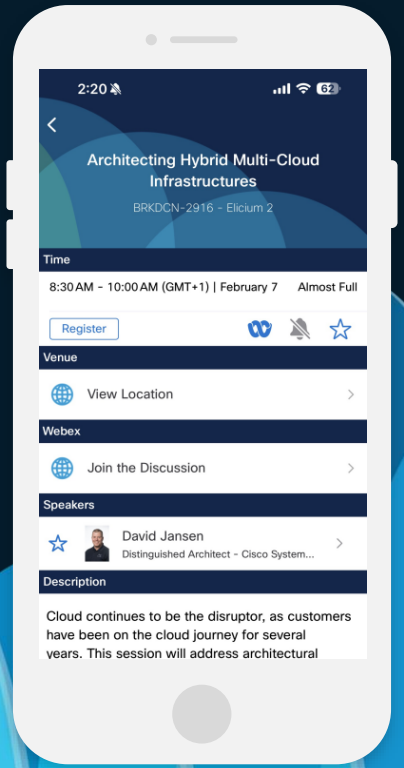


Agenda

- Capabilities and Features
- Why NDFC
- Key Features
- VXLAN EVPN Fabrics
- Lab Overview
- Lab Time

Nexus Dashboard Fabric Controller (NDFC)

A comprehensive data center automation tool

NDFC helps you easily and reliably deploy, operate and maintain
VXLAN-EVPN, LAN, SAN, and Media fabrics
for Cisco NX-OS Nexus and MDS, IOS-XE, IOS-XR infrastructure
and interconnect with public clouds

Day-0

Bootstrap, deploy

Day-1

Provision, maintain, monitor, operate

Day-2 with ND Insights

Troubleshoot, plan, grow

Scale out with ND Orchestrator

Multi-site and cloud acceleration

It addresses challenges by providing comprehensive solution-level control, automation, visibility, monitoring, and integration

New Name, New Architecture from Release 12.0

NDFC Modes

Single Application, Multiple Modes

Make decision at run-time!

Easy switch between modes

Fabric discovery for LAN Deployments

Fabric controller for LAN and IPFM Deployments

SAN controller for MDS Fibre Channel Deployments

Fabric Discovery

Run fabric discovery for LAN deployments:
Enable inventory, discovery, monitoring only

Enable Cisco Nexus Dashboard's Day 2 operations capabilities without deploying fabric controller

TIP

You can switch anytime from Fabric Discovery to Fabric Controller Mode

Benefit

Deep visibility into deployments

Fabric Controller

Provides fabric management for multiple types of LAN solutions, including VXLAN-EVPN, and traditional 3-tier LAN deployments

Compliance management ensures that network is in sync with intended deployments and allows users to deploy any corrections

Benefit

Most configurations are automatically done following Cisco Best Practices

SAN Controller

Completely redesigned web-based zoning interface to drastically reduce the cycle time for common administration tasks. Provides IVR zoning function as well, all on the same page.

SAN Insights provides useful data to the administrators so they can be fully aware about the fabric status

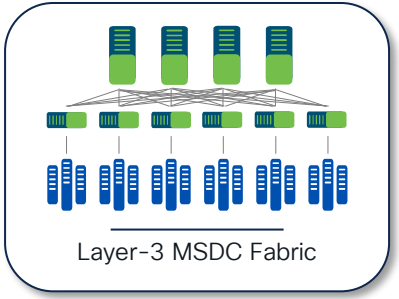
Benefit

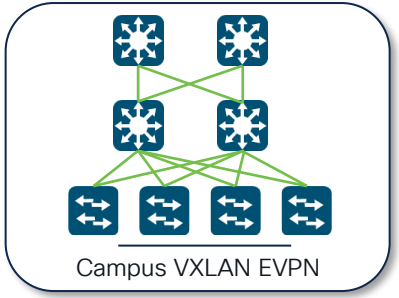
Transition to a web-based configuration method is made easy

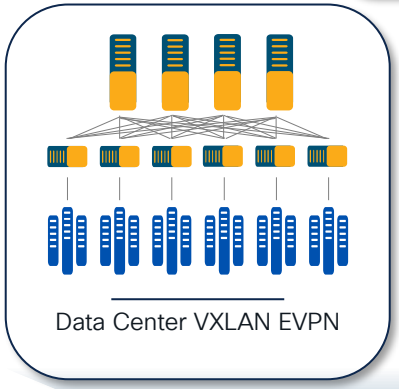
Why NDFC

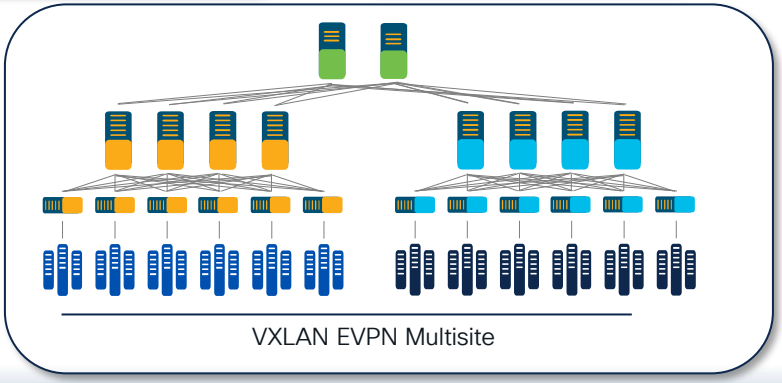
Why NDFC?

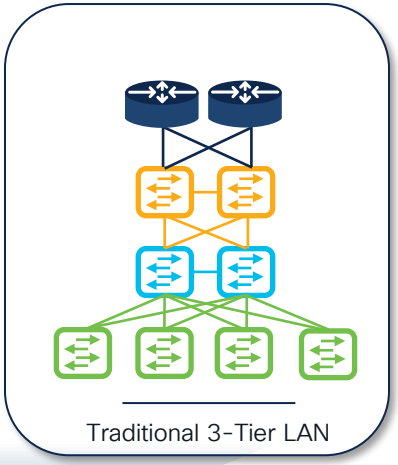
Multi-Architecture







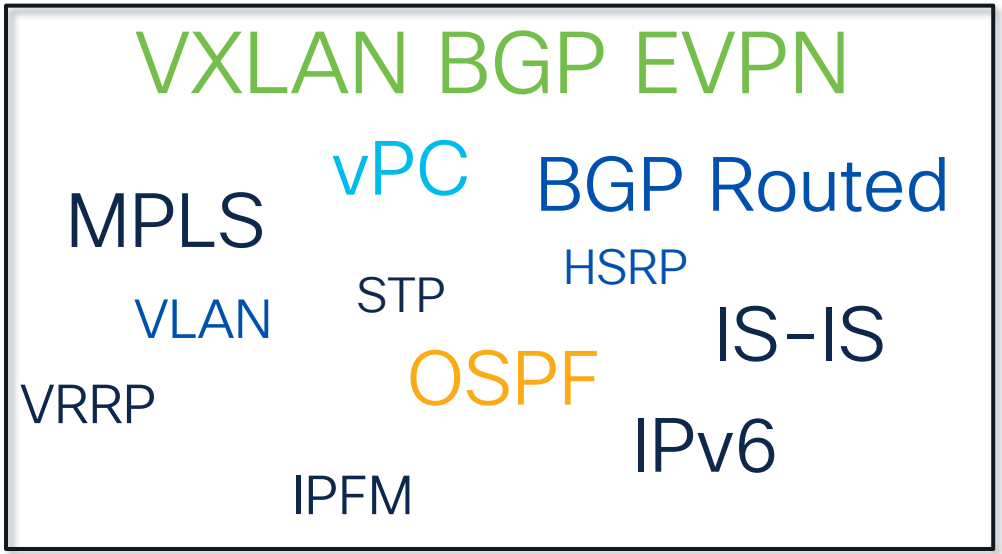




Why NDFC?

Multi-Topology, Multi-Protocol

Rich set of control plane and data plane possibilities available



Why NDFC?

Multi-Domain, Multi-Platform

Sw & Hw Compatibilty Matrix Tool

NX-OS Nexus 9000 and 3000

IOS-XE Catalyst 9000

IOS-XR ASR 9000

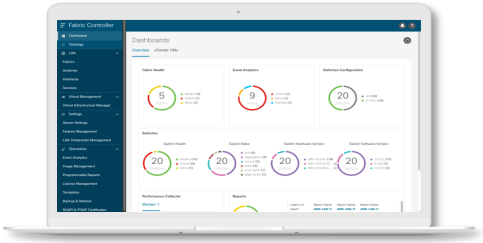
NX-OS Nexus 7000

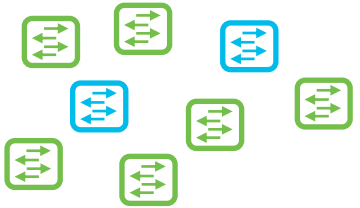
IOS-XE ASR 1000

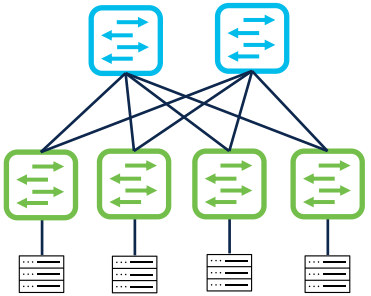
MDS & 3rd Party Devices

Why NDFC?

Intent Based Deployment Model







NDFC generates the configuration based on the Intent defined by Admin and pushes to the devices

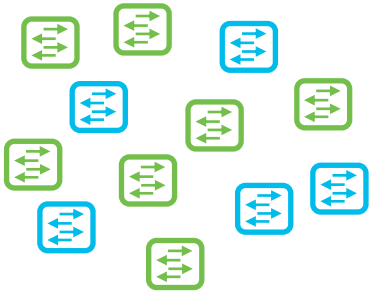
Admin need not to provide configuration of the devices

Fabric is built using Cisco's Best Practices

Why NDFC?

Fast and Automated Fabric Deployment

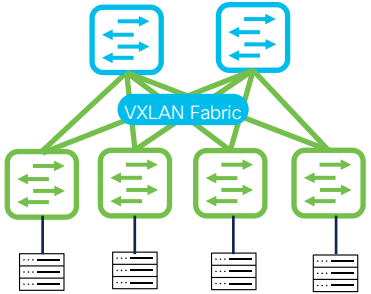
Un-provisioned switches



Select one the fabric templates in NDFC

Fast, automated process

Cisco best practice implemented

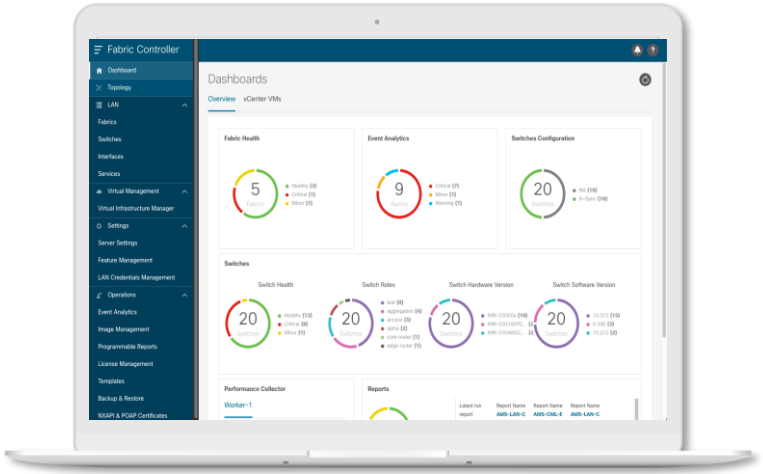


Benefit

Accelerate fabric deployments | Automated consistency | Minimize risk | Support for both Greenfield and Brownfield deployment

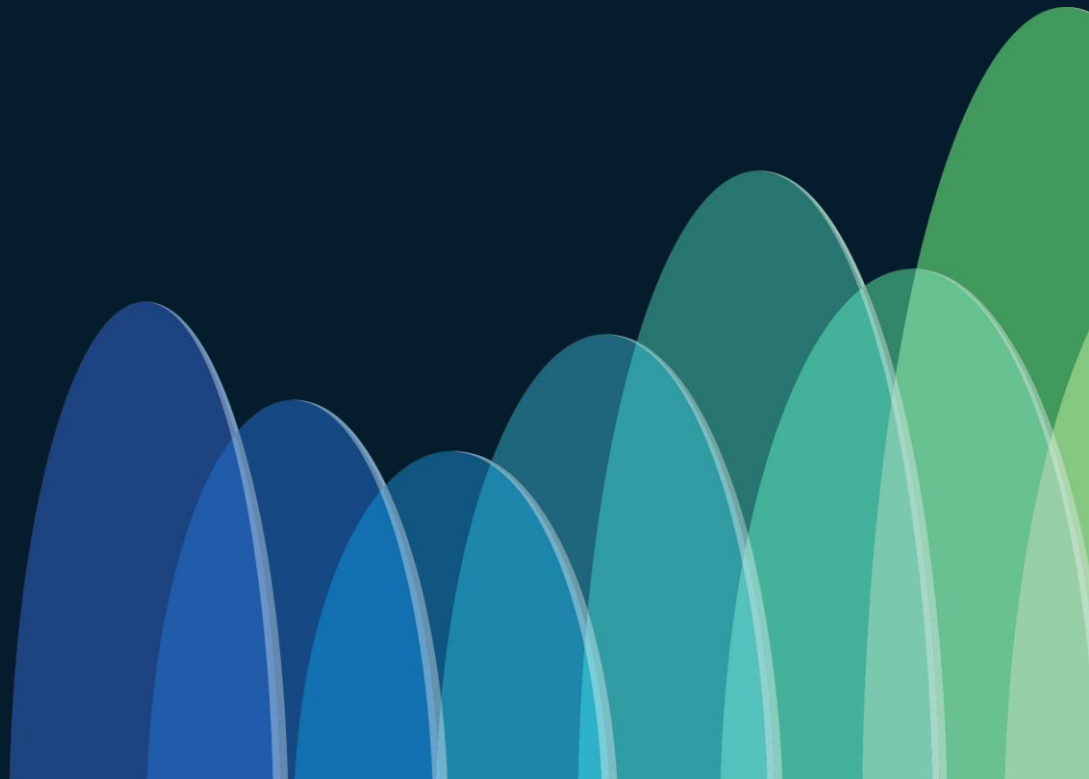
Why NDFC?

Single Application, Many Features



- Adopt Controller based approach
- Complete Day 0-1 Automation & Orchestration
- Multi-Fabric, Multi-Vendor & Multi-Platform
- Intent-based Deployment

Key Features



Configuration Compliance

NDFC periodically checks devices' configuration against the Intent

Any config drift is flagged by NDFC marking device Out-of-Sync

Allowing Network Admin to restore back the Intent just by a single click

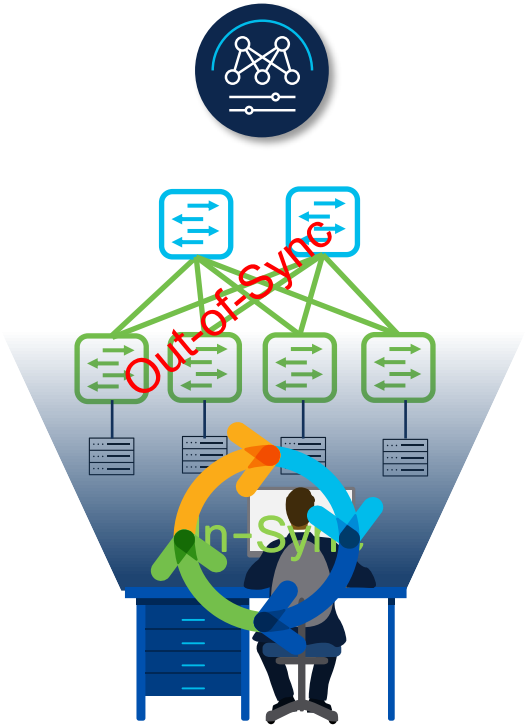
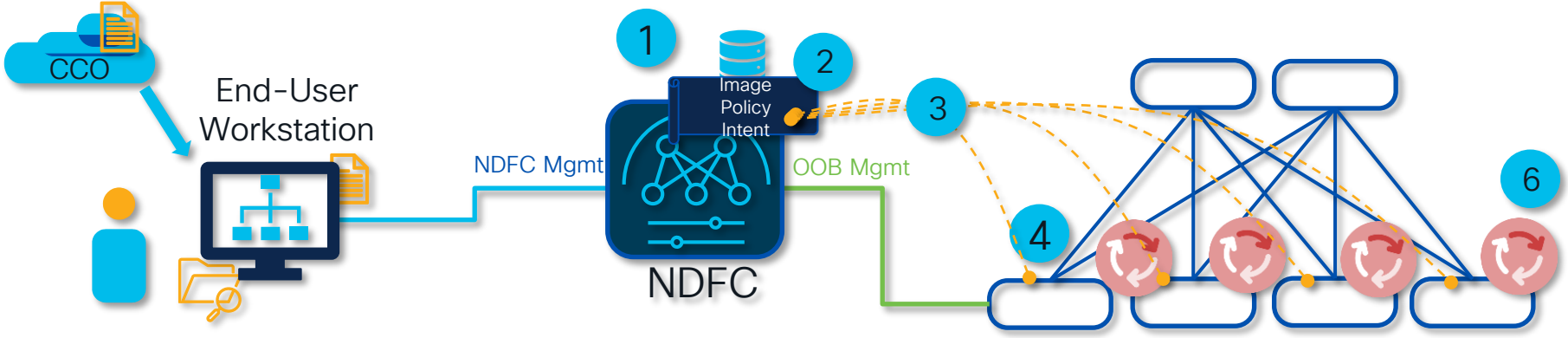


Image and Patch Management with NDFC

Simplify, Speed Up, and Mitigate Risks of Errors

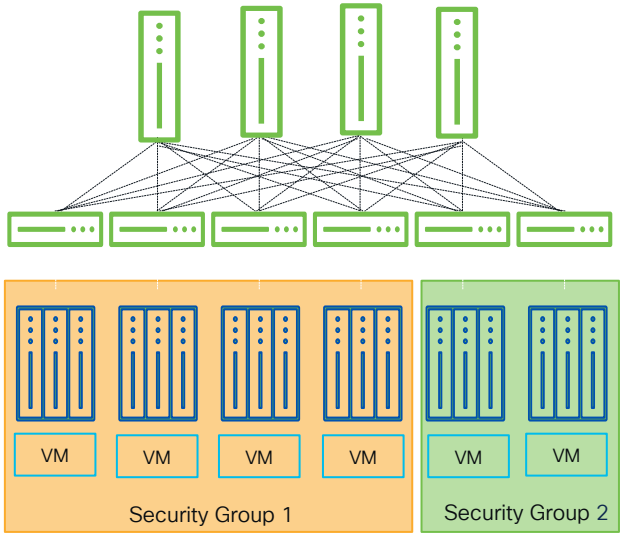
Why	Upgrading manually might take a long time and prone to error
How	Image Management Automates the whole Upgrade process.
What	Automate Software Upgrade for One or a Group of Cisco Nexus switches
When	Scheduled & On-demand

Image and Patch Management Workflow



1. Upload Images
2. Create the Image Policy
3. Attach the Image Policy
4. Stage the Images
5. Validate non-disruptive upgrade
6. Upgrade the switches

VXLAN-GPO based Micro-Segmentation



- ✓ Classify endpoints into security groups
- ✓ Open standards-based solution for VXLAN
- ✓ Match Criteria: IP, VLAN, VM Attributes
- ✓ Scale: 64k Security Group ACLs
- ✓ Automate using NDFC or Open APIs

Virtual Infrastructure Manager

Compute Visibility

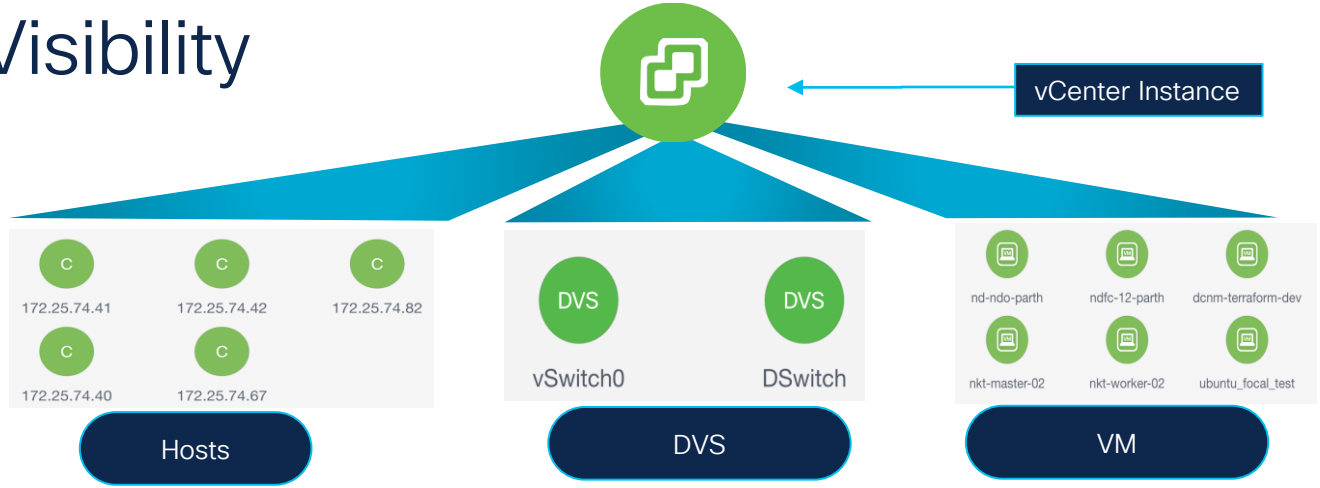
Virtual Management Menu ☞ Virtual Infrastructure Manager Tab

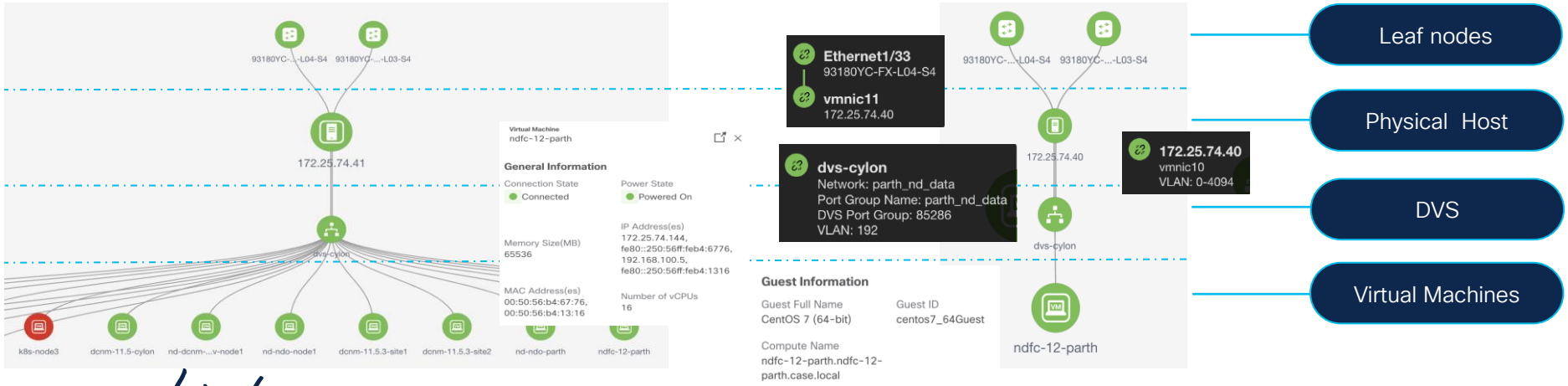
Add the Instance of choice: vCenter, K8s cluster or OpenStack cluster

Expand the view to compute hosts, virtual switches and Virtual Machines. Select any particular VM and get Networks details up to the Leaf node

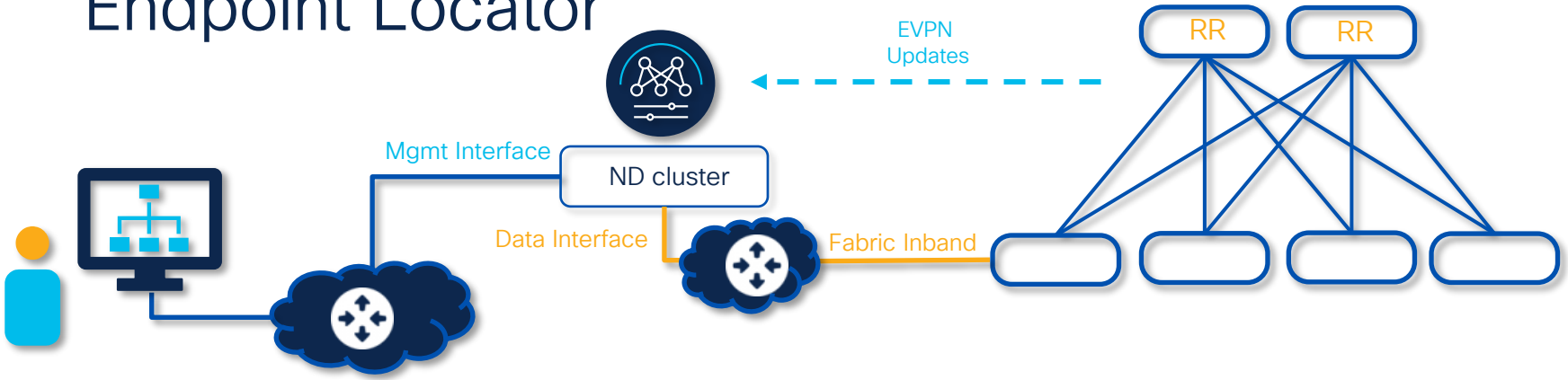
From the topology view, enter into the VMM instance to view the Hosts, virtual Switches and Virtual Machines

VIM Visibility



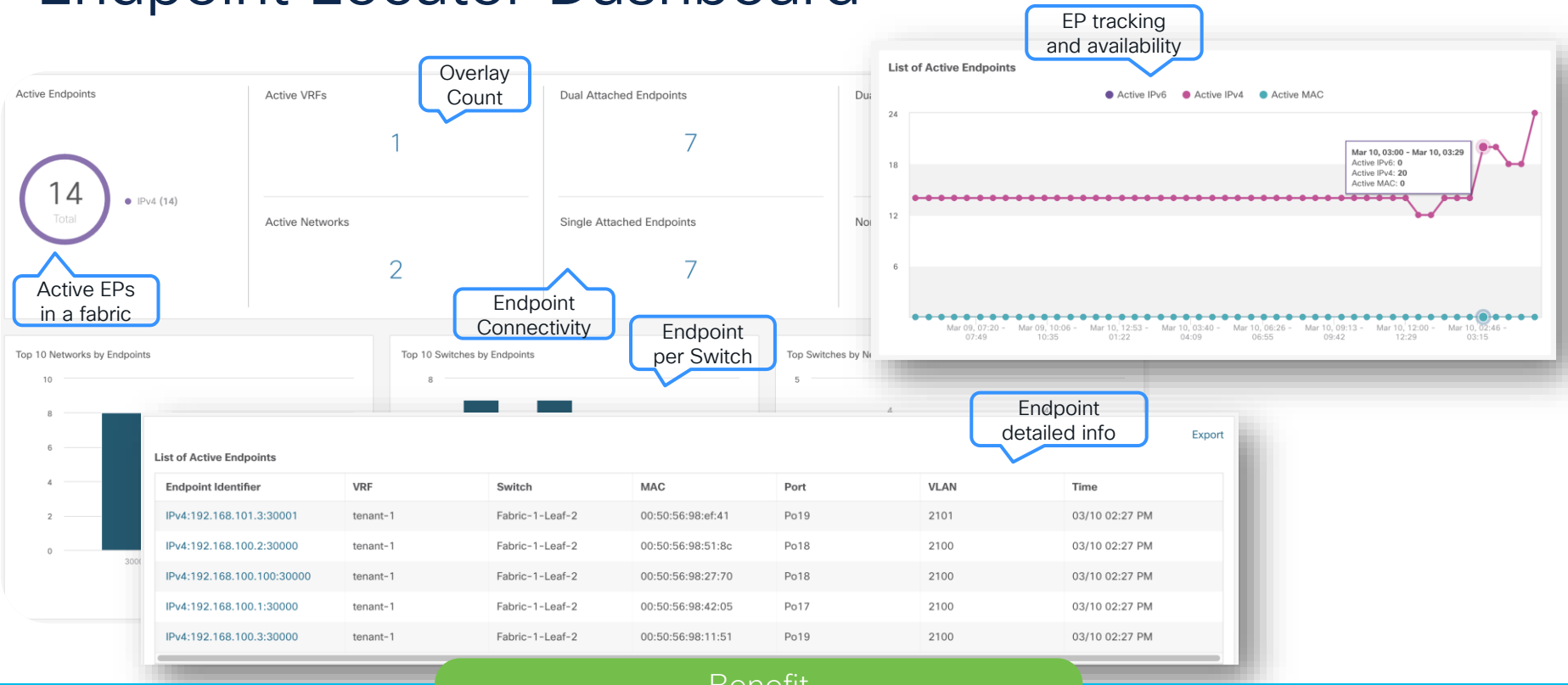


Endpoint Locator



- Real-time Tracking of Endpoints within a Data Center
- Analyze Endpoint trends (additions, removals, moves etc.)
- Tracing the Network Life History of Endpoints

Endpoint Locator Dashboard



Benefit

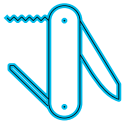
- Almost real-time data on active endpoints
- Single pane of glass for all EP visualization
- Endpoint life and history
- Active VRFs and Networks

NDFC Features

Config Compliance

Compute Visibility

Change Control & Rollback



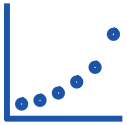
RMA Workflow

Programmability and Orchestration

Image Management

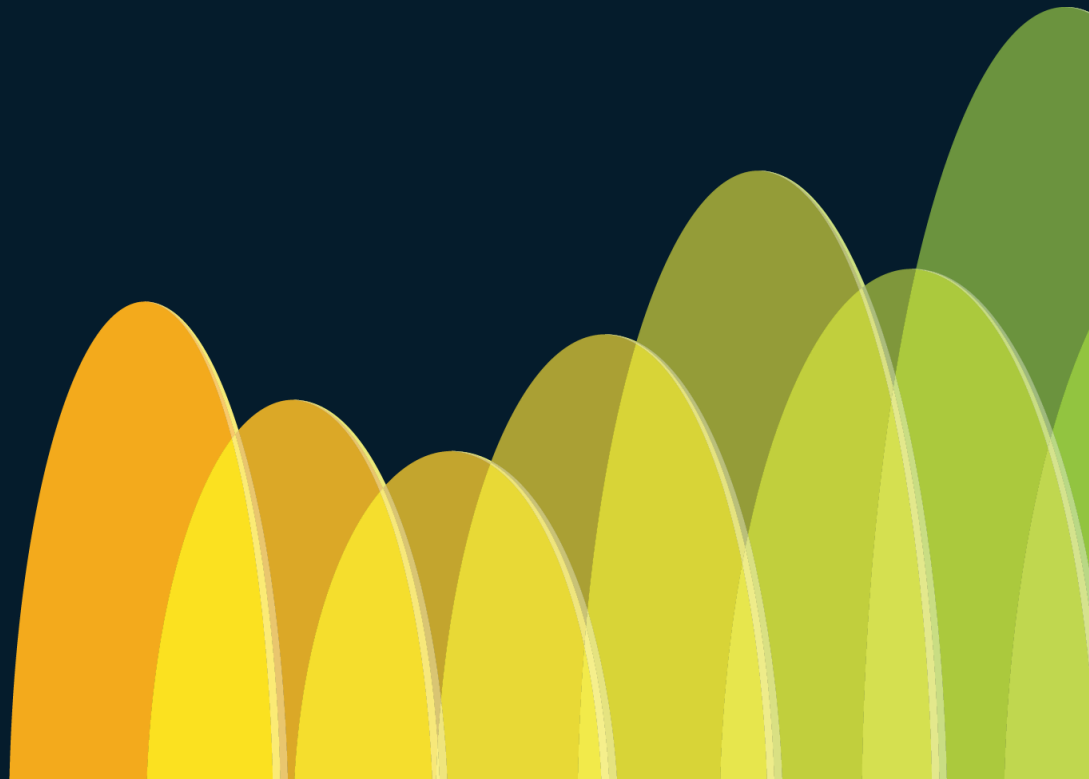
End-Point Locator

L4-L7 Service Insertion and Service Chaining



Performance Monitoring

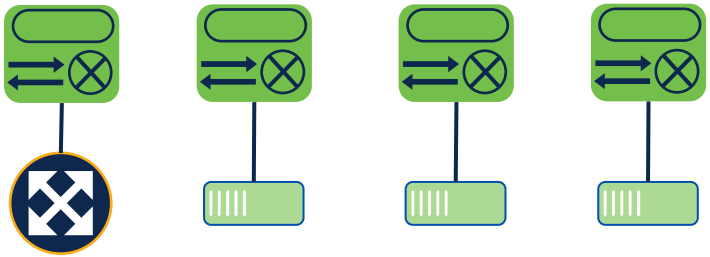
VXLAN EVPN Fabrics



cisco Live!

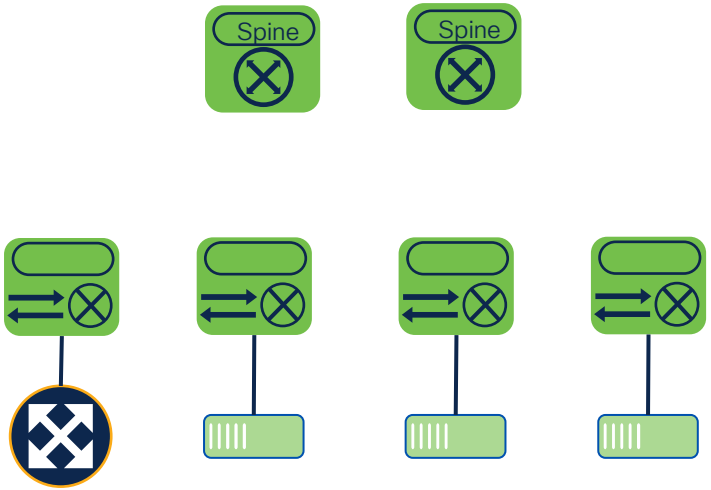
A Modern Data Center Network

- Provide Connectivity To DC Endpoints



VXLAN EVPN is applicable also to other contests, not only DC

A Modern Data Center Network



- Provide Connectivity To DC Endpoints
- Built On Top Of CLOS Topologies

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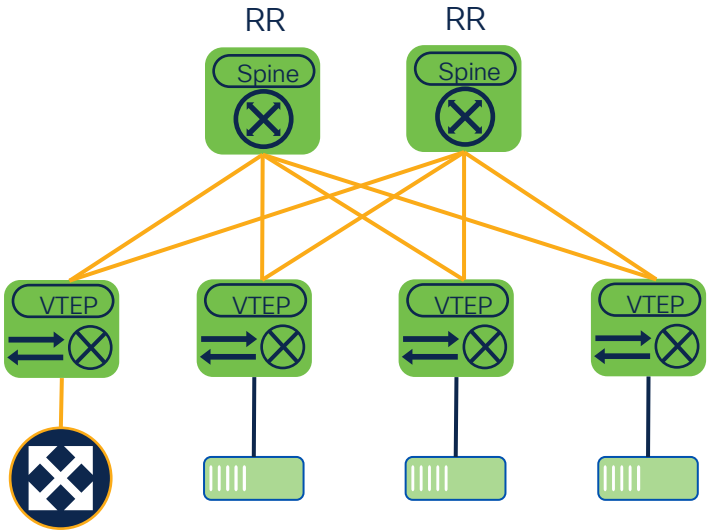
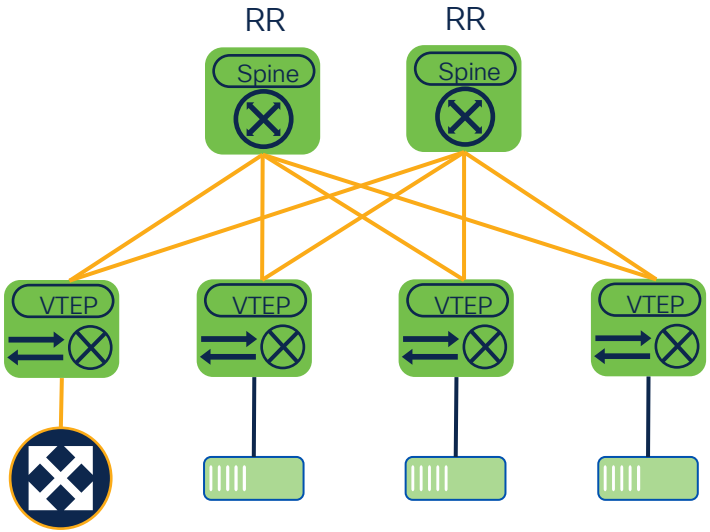
A Modern Data Center Network



- Provide Connectivity To DC Endpoints
- Built On Top Of CLOS Topologies
- Routed

VXLAN EVPN is applicable also to other contests, not only DC

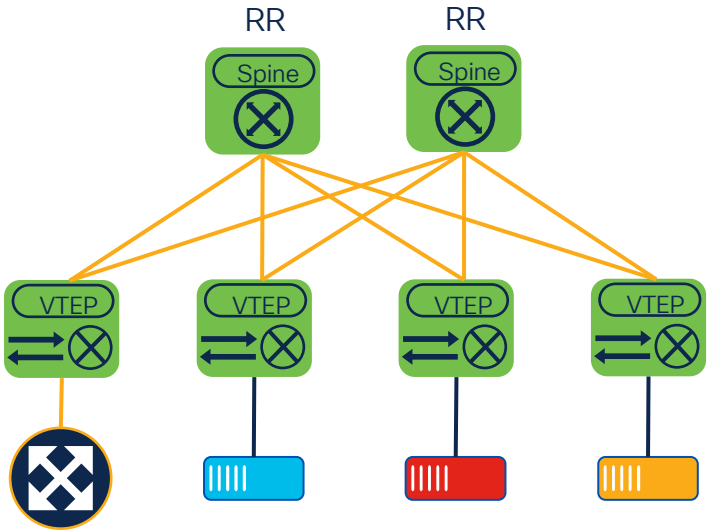
A Modern Data Center Network



- Provide Connectivity To DC Endpoints
- Built On Top Of CLOS Topologies
- Routed
- Standards Based

VXLAN EVPN is applicable also to other contests, not only DC

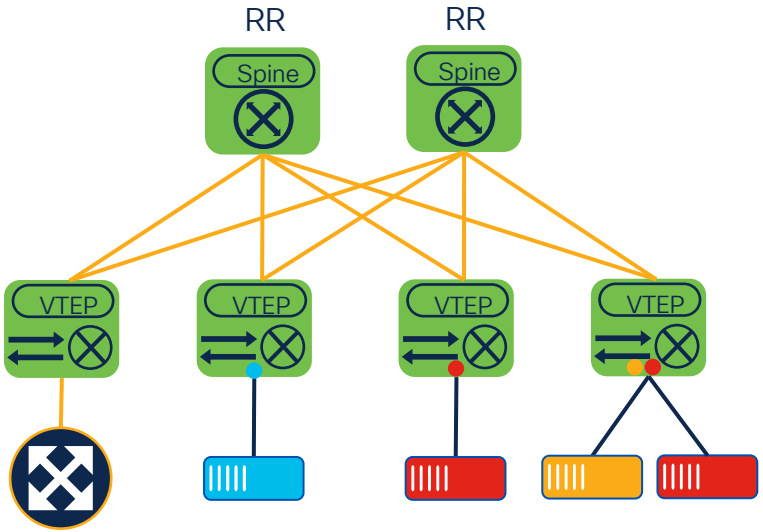
A Modern Data Center Network



- Provide Connectivity To DC Endpoints
- Built On Top Of CLOS Topologies
- Routed
- Standards Based
- Multi-Tenant Ready

VXLAN EVPN is applicable also to other contests, not only DC

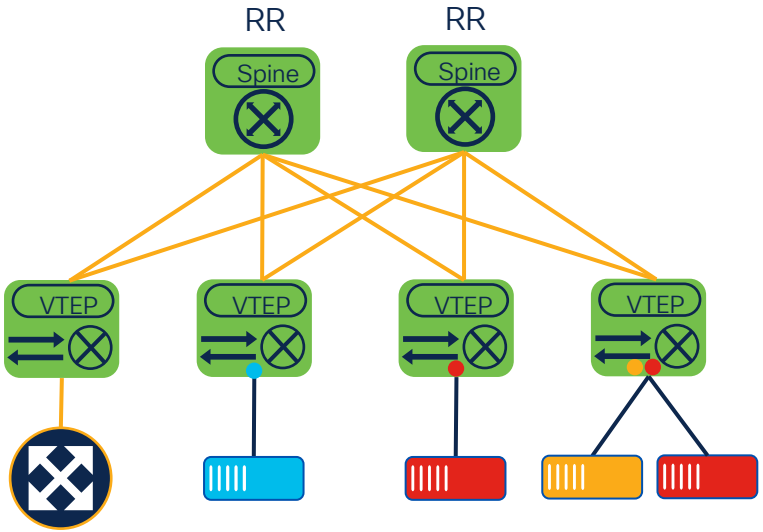
A Modern Data Center Network



- Provide Connectivity To DC Endpoints
- Built On Top Of CLOS Topologies
- Routed
- Standards Based
- Multi-Tenant Ready
- Resource Friendly
- Distributed Anycast Gateway

VXLAN EVPN is applicable also to other contests, not only DC

A Modern Data Center Network



- Provide Connectivity To DC Endpoints
- Built On Top Of CLOS Topologies
- Routed
- Standards Based
- Multi-Tenant Ready
- Resource Friendly
- Distributed Anycast Gateway

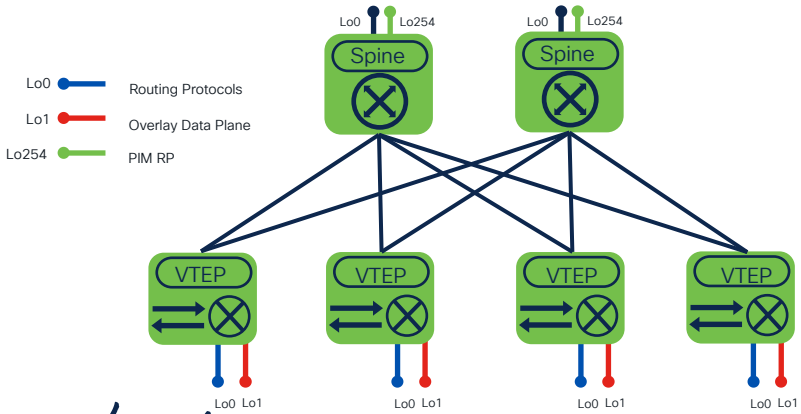
Everything applies to the Multi-Site Architecture!

VXLAN EVPN is applicable also to other contests, not only DC

Key Components

Underlay:

- Interfaces, tunnels, and IPs for overlay packet transport
- Routing protocols for advertising tunnel endpoints
- Multicast for overlay BUM replication
- Common entities for any overlay tenant
- Configured in the default VRF



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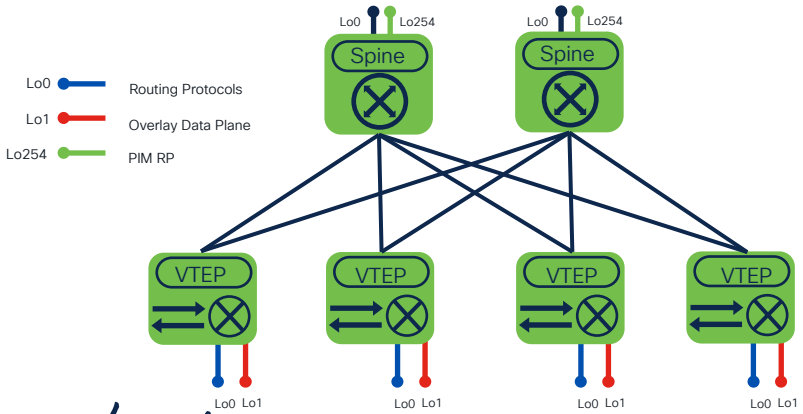
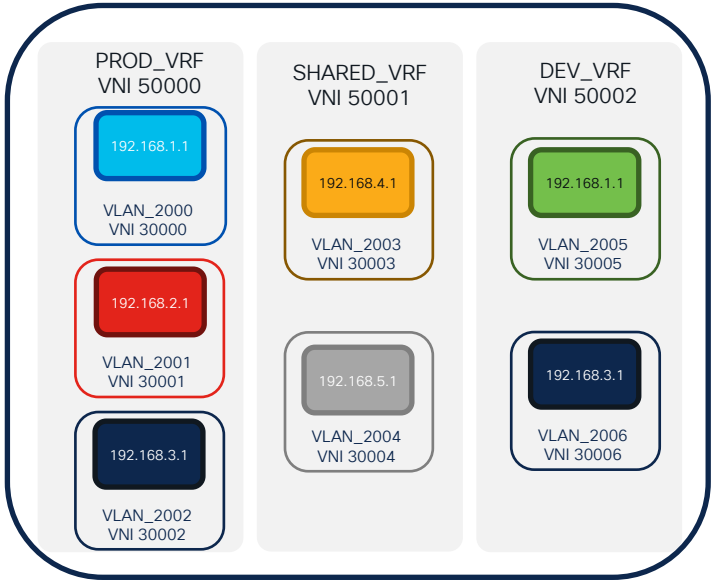


Overlay:

- Virtual Private Networks
- Can be stretched everywhere in the fabric
- Reachability provided by MP-BGP EVPN
- Real traffic is encapsulated in VXLAN packets
- VRF or Network Segment identified by VNIs



Device Roles

Refresh

Leaves: Access switches that provide connectivity to end-hosts. They initiate and terminate the VXLAN overlay tunnels

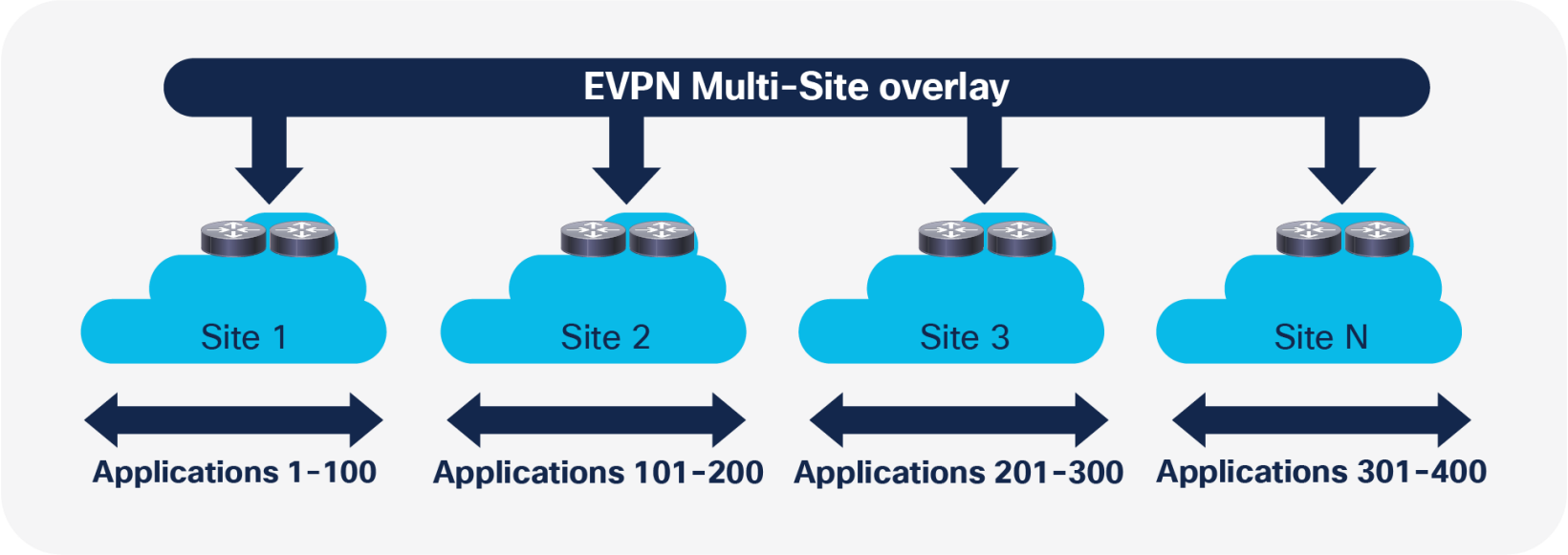
Border Leaves: Same as Leaves, the only difference here is that they provide routed access to external networks interconnecting with routers and/or firewalls etc.

Spines: Interconnect all the different leaves via routed links. They can run additional function like BGP Route Reflector, PIM RP

Border GateWays: Handle control and data plane functionalities to extend layer2 and layer3 networks across the Multi-Site

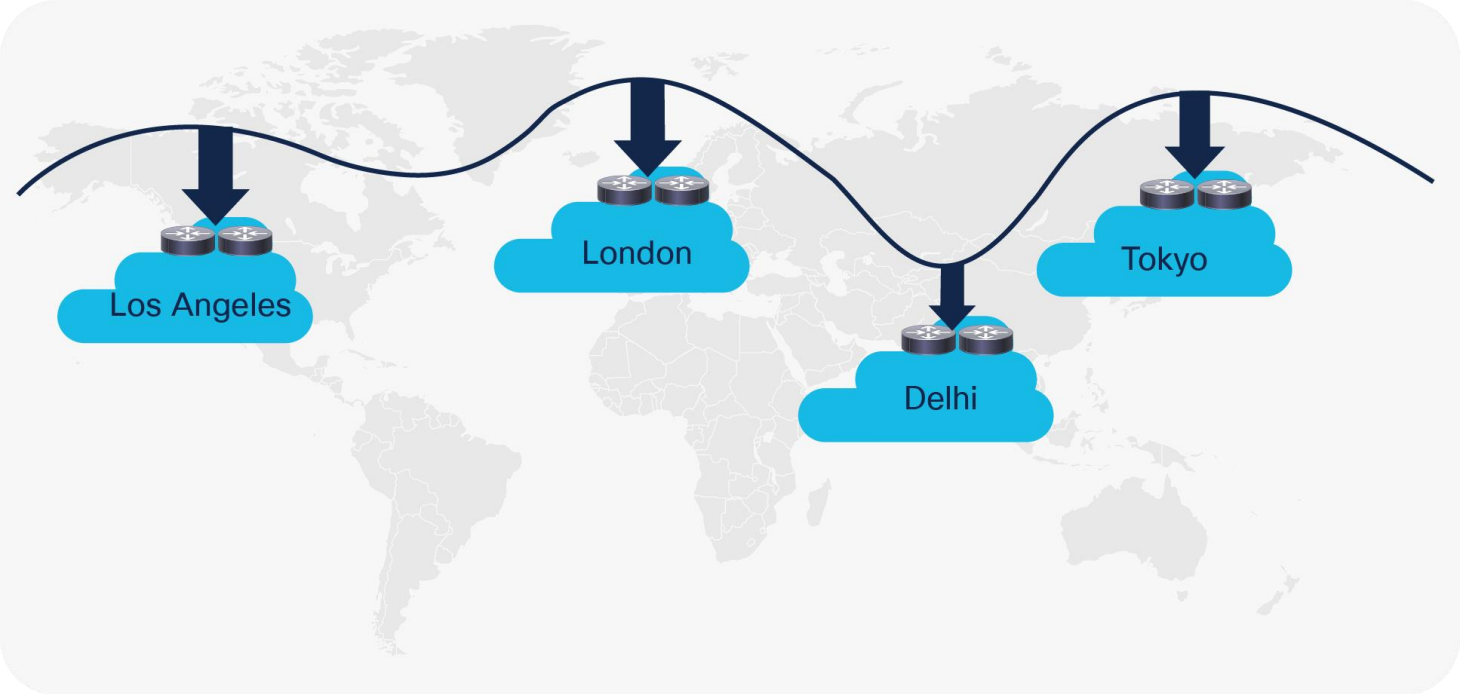
Multi-Site Use Cases

Data Center Compartmentalization



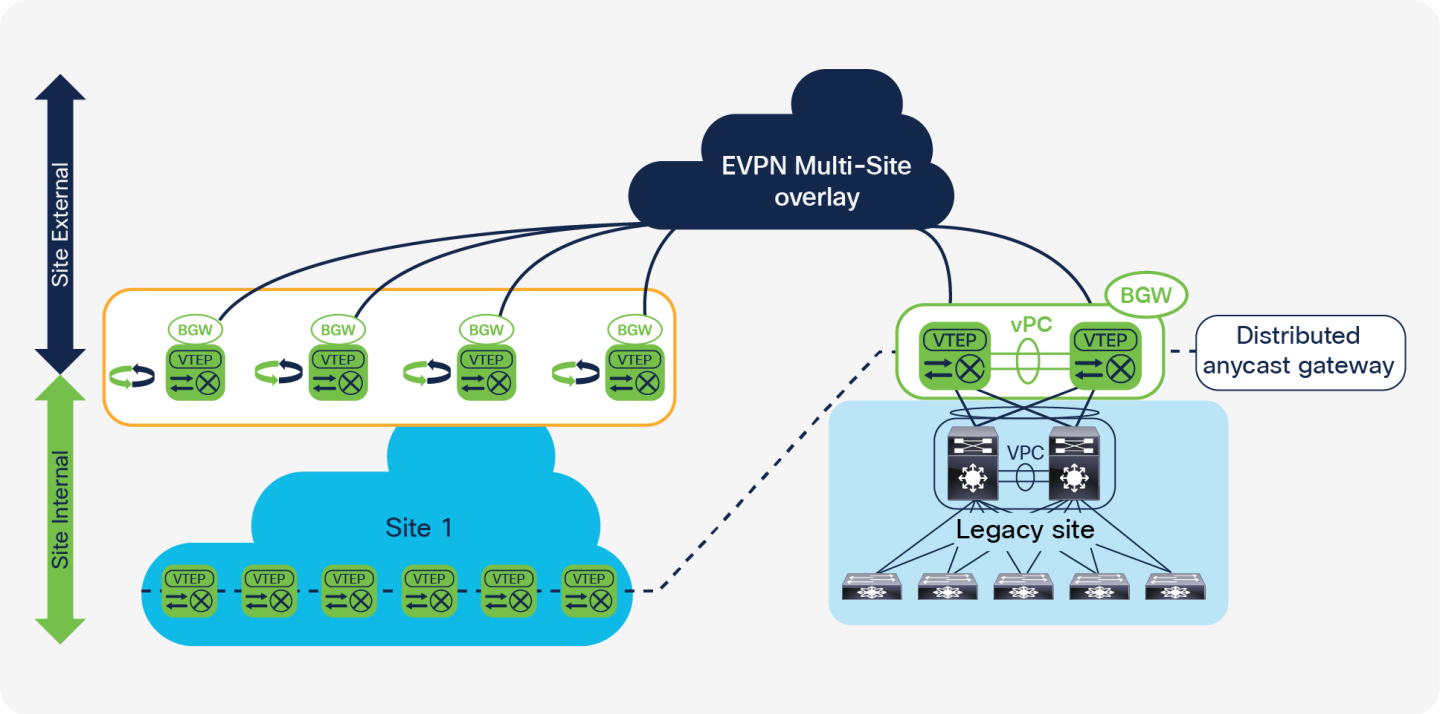
Multi-Site Use Cases

Data Center Interconnect



Multi-Site Use Cases

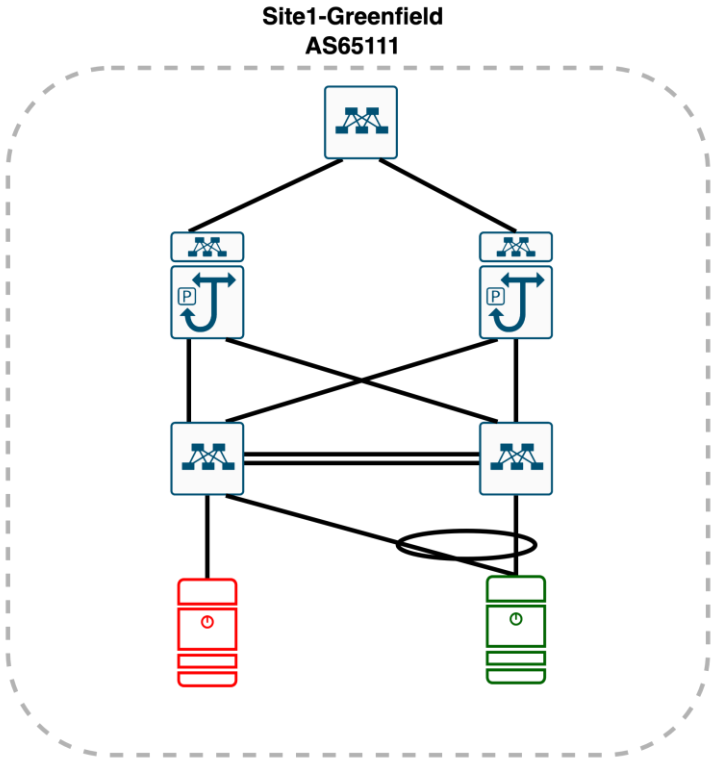
Legacy Data Center Integration



Lab Overview

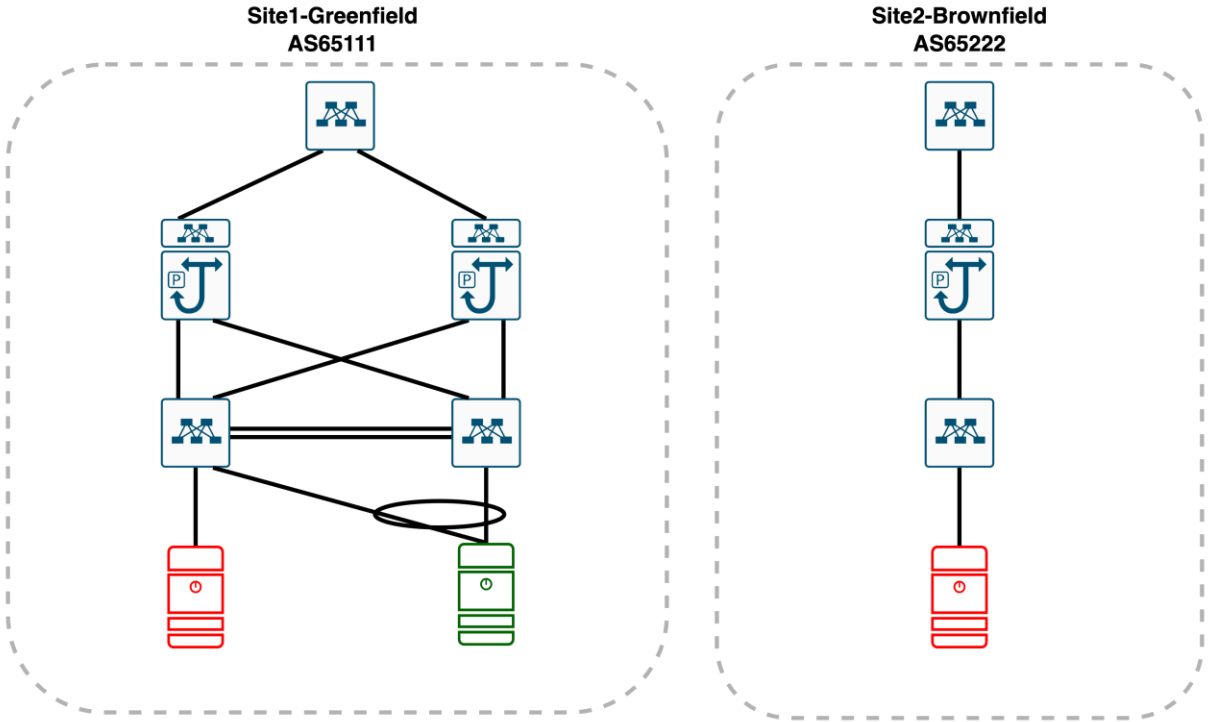
Task – 1

Deploy VXLAN EVPN Greenfield Fabric



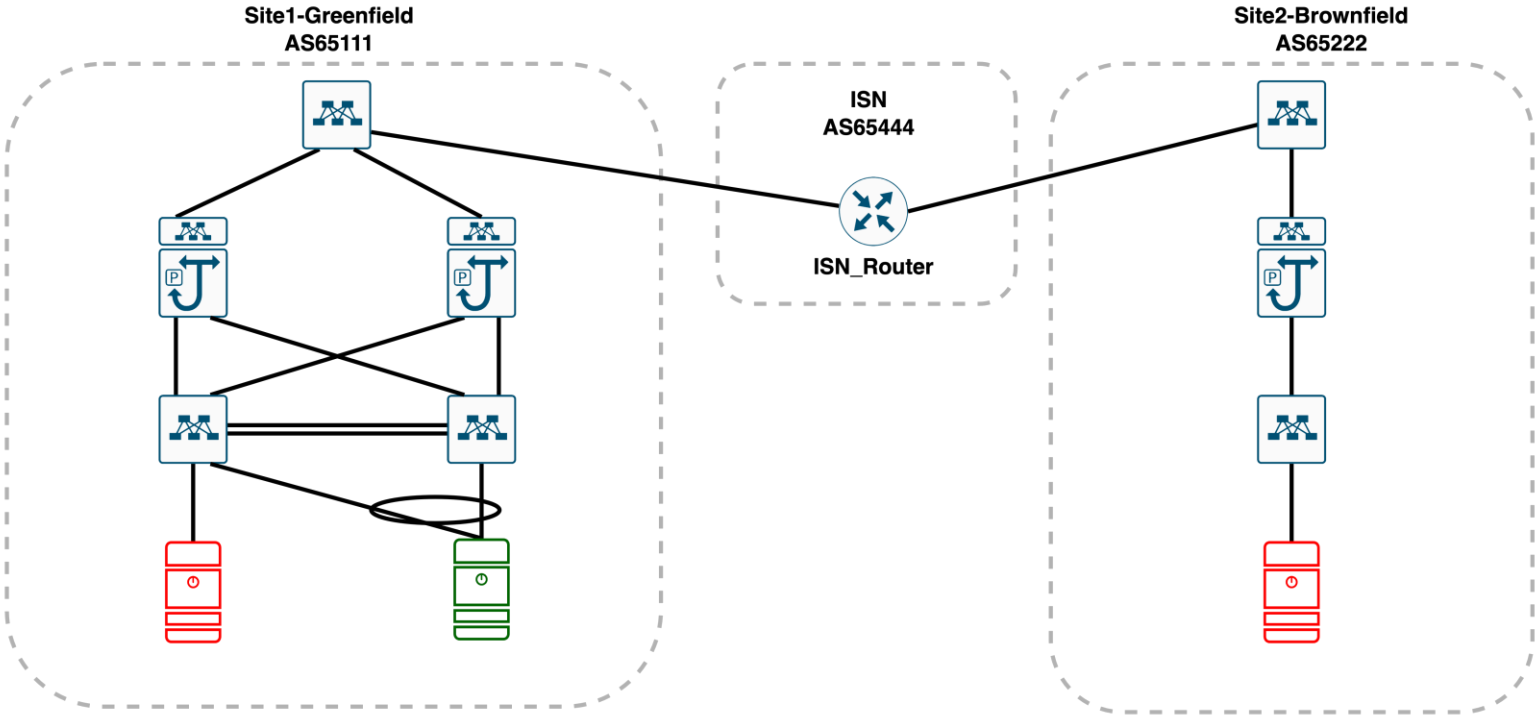
Task – 2

Import Brownfield Fabric



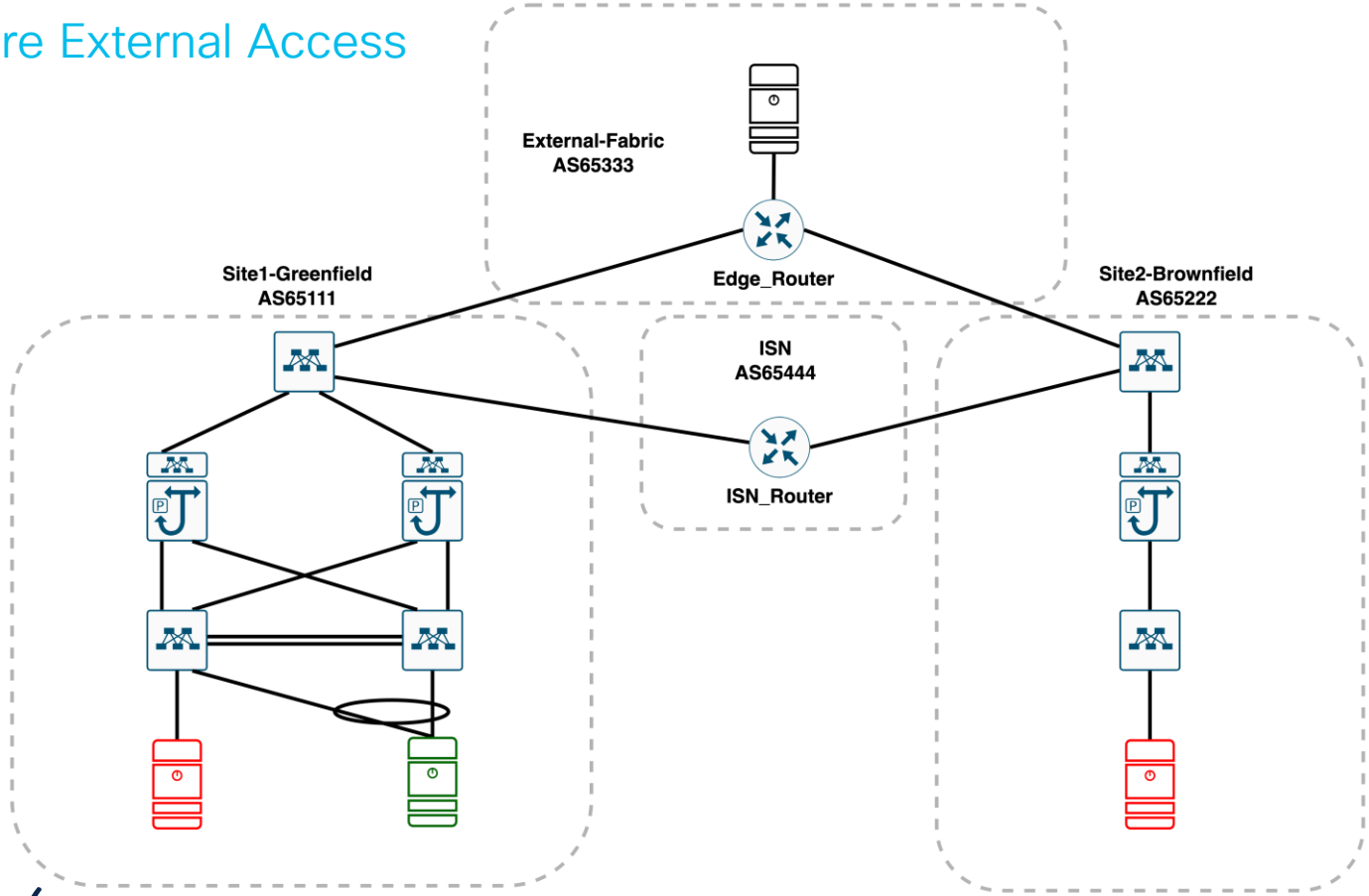
Task – 3

Create a Multi Site Domain



Task – 4

Configure External Access



Task – 5

Automation

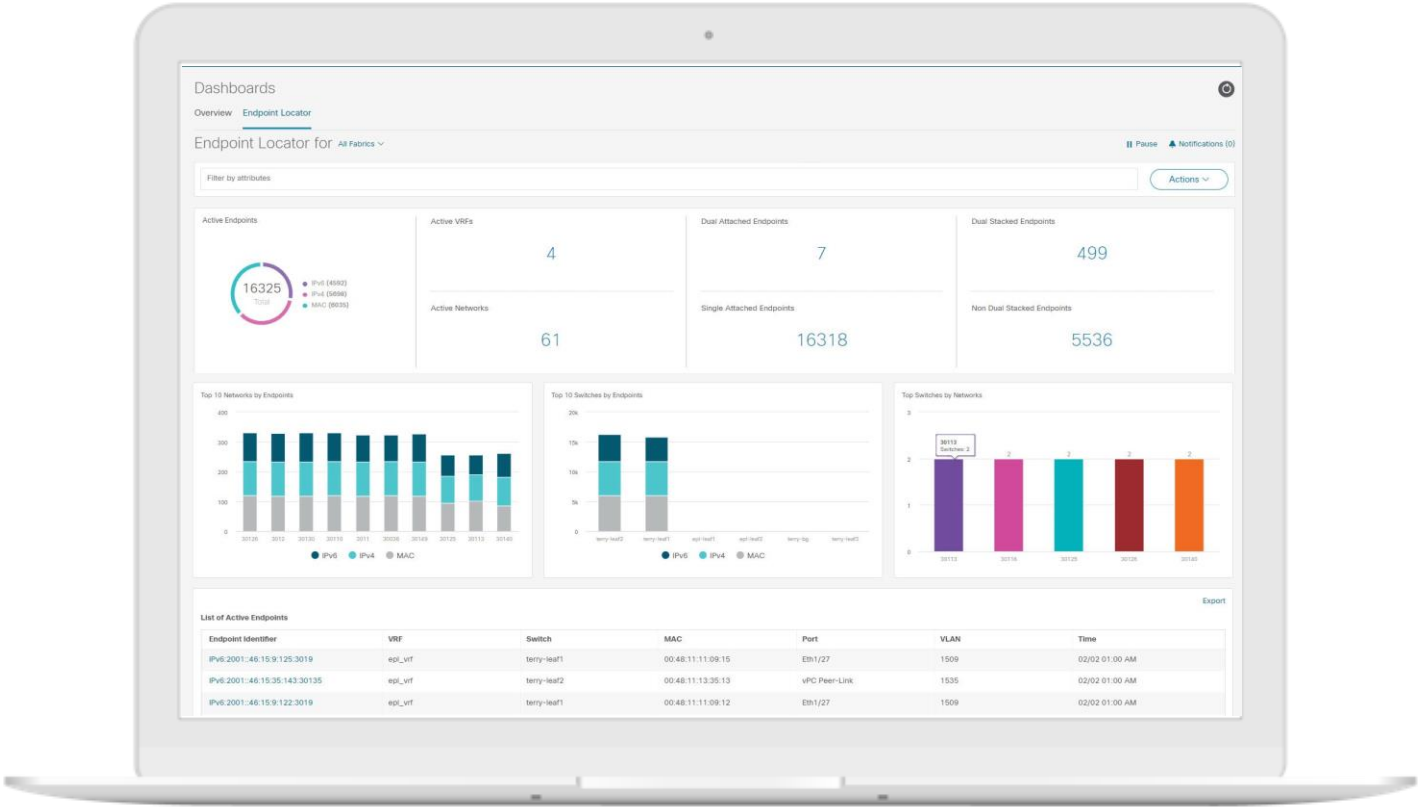
Netbox
IPAM

Ansible

NDFC

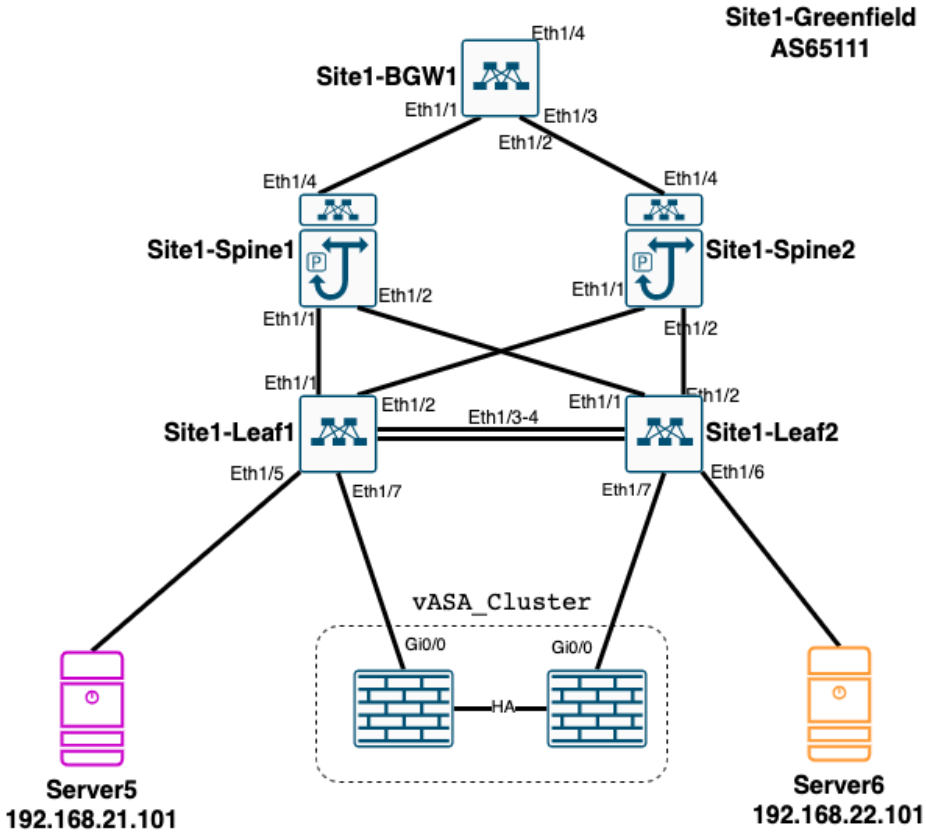
Task – 6

End Point Locator

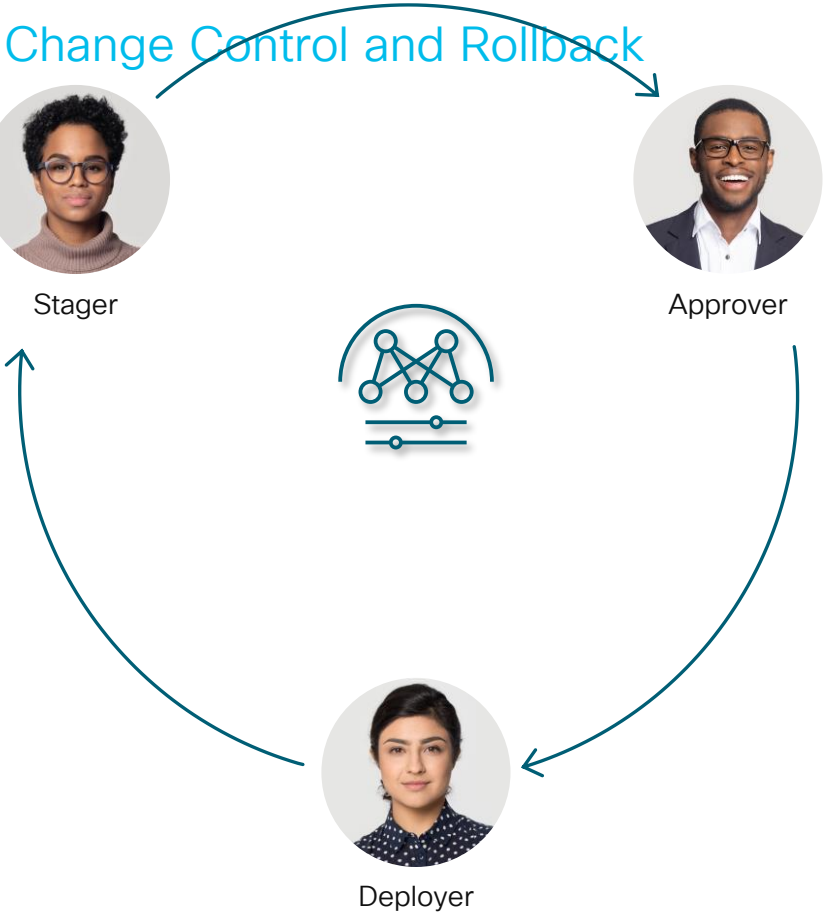


Task – 7

Service Insertion



Task – 8



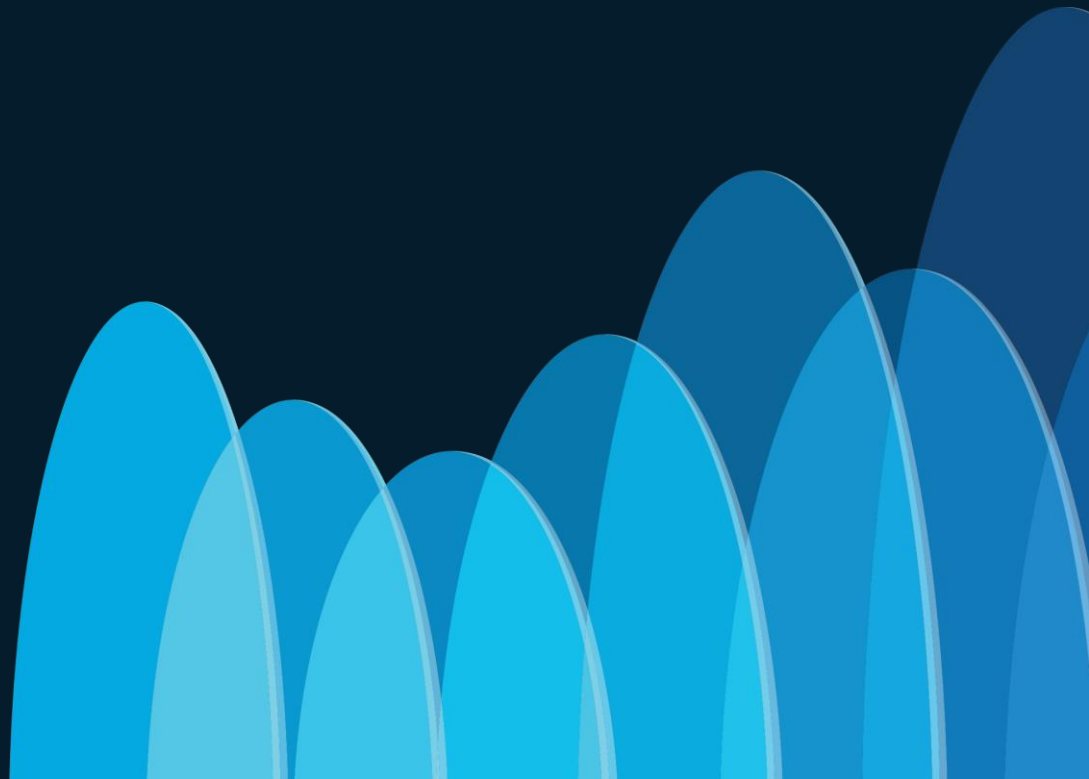
Tell Me How To Start

Open The Lab Guide

http://cs.co/ltrdcn-2419-ams-25

Case Sensitive!!

Lab Time



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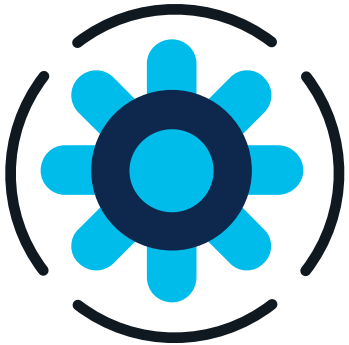
Nexus Dashboard Fabric Controller

Will Make Your Life Easy as Network Admin!



Automation

Accelerate provisioning from days to minutes and simplify deployments.

Management

In depth Management and control for all network deployments

Visibility

Get Centralized Visibility and Monitoring views

What's Next

Nexus Dashboard Capacity Planning

Nexus Dashboard and Services Compatibility Matrix

NDFC Software and Hardware Compatibility Matrix

Nexus Dashboard Fabric Controller Deployment Guide

Nexus Dashboard Fabric Controller, User Content for LAN

Nexus Dashboard Fabric Controller Release Notes

What's Next

VXLAN Network with MP-BGP EVPN Control Plane Design Guide

VXLAN Design with Cisco Nexus 9300 Platform Switches

VXLAN EVPN Multi-Site Design and Deployment White Paper

NextGen DCI with VXLAN EVPN Multi-Site Using vPC Border Gateways White Paper

Migrating Classic Ethernet Environments to VXLAN BGP EVPN

Webex App

Questions?

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

How

1. Find this session in the Cisco Events mobile app
2. Click “Join the Discussion”
3. Install the Webex app or go directly to the Webex space
4. Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until February 28, 2025.

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

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

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Content Catalog

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- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs
- Visit the On-Demand Library for more sessions at ciscolive.com/on-demand. Sessions from this event will be available from March 3.


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Thank you
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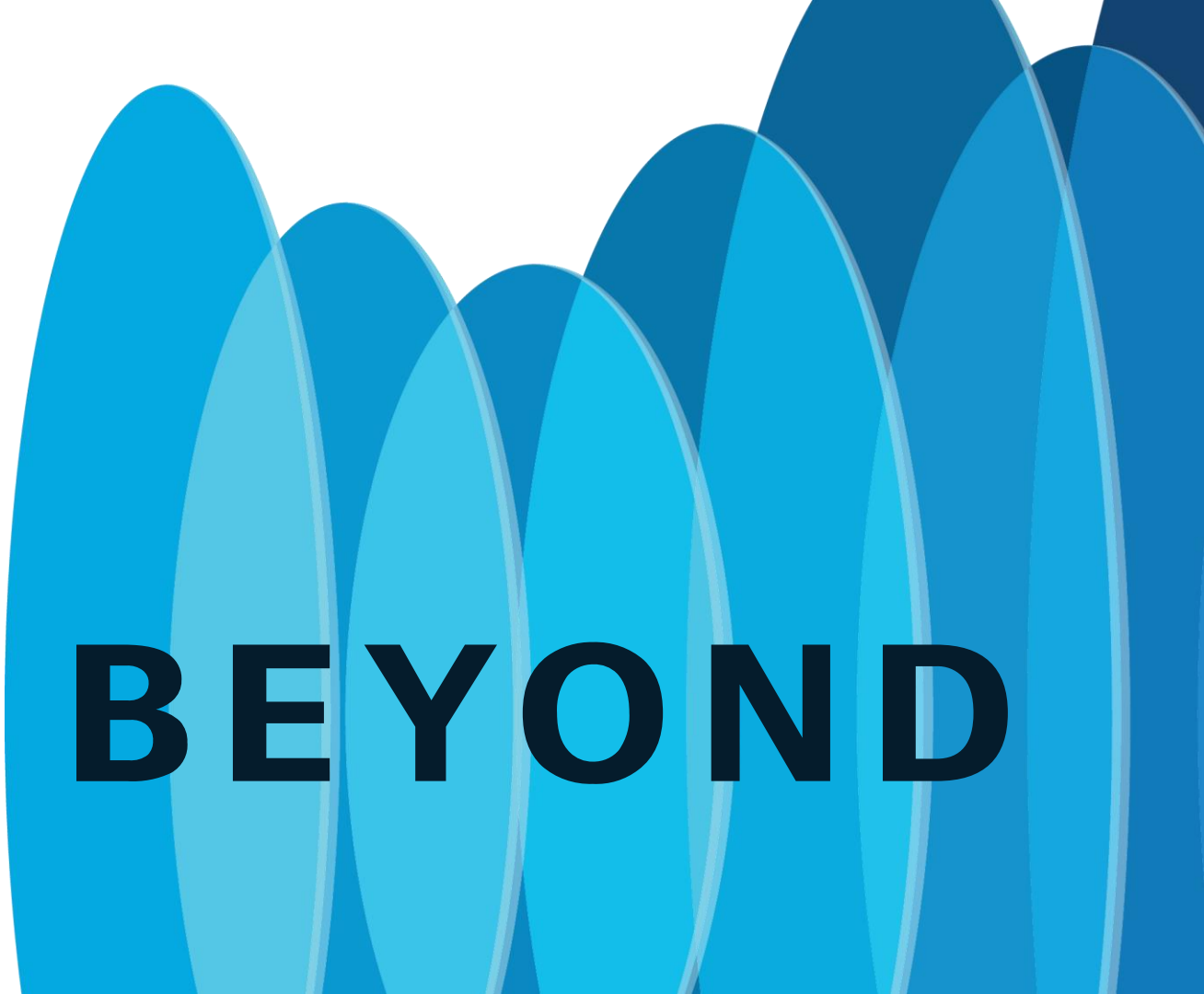

GO BEYOND