

Automate, Manage, and Migrate Traditional 3-Tier vPC-Based Deployment using Nexus Dashboard

cisco Live !

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Cisco Webex App

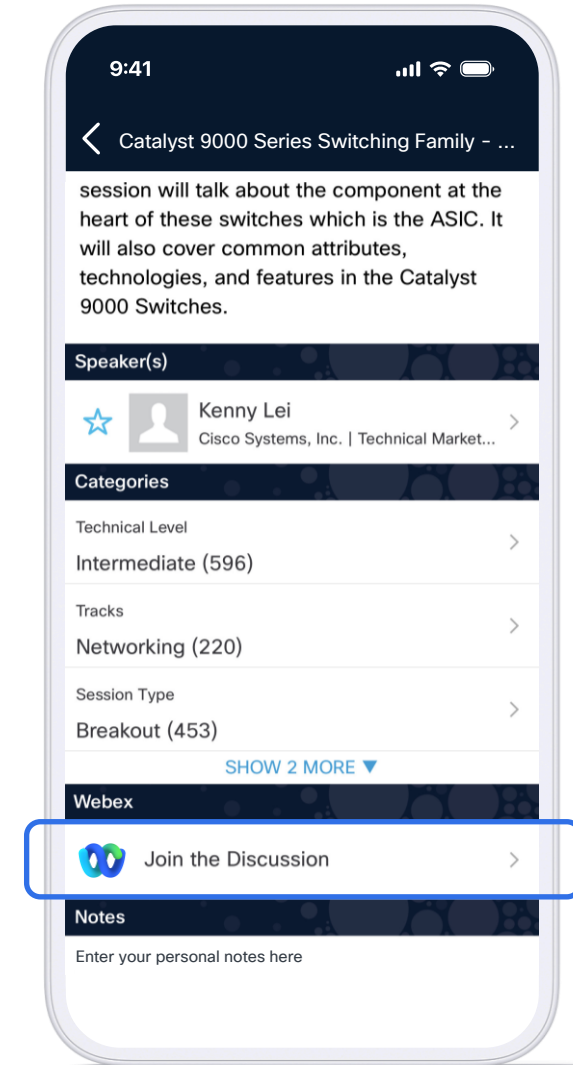
Questions?

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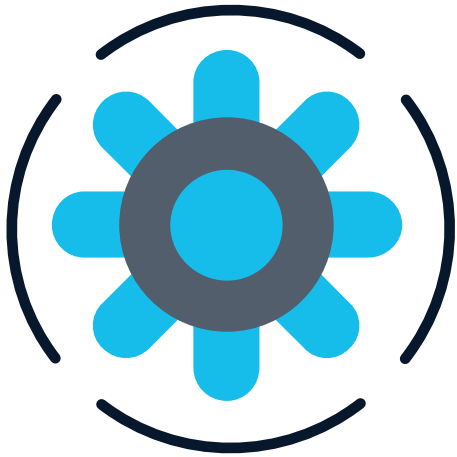
<https://cislive.ciscoevents.com/cislivebot/#BRKDCN-2618>

Agenda

- 01 Nexus Dashboard Overview**
- 02 Enhanced Classic LAN Overview**
- 03 Use-Cases**
- 04 Conclusion**

Introduction to Nexus Dashboard

Cisco Nexus Dashboard



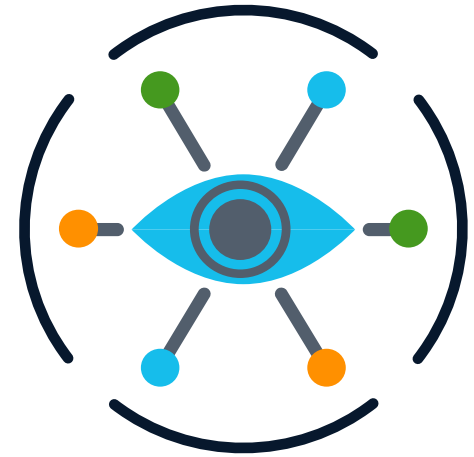
Automation

Accelerate provisioning
and simplify deployments



Management

In depth Management
and control for all
network deployments



Visibility

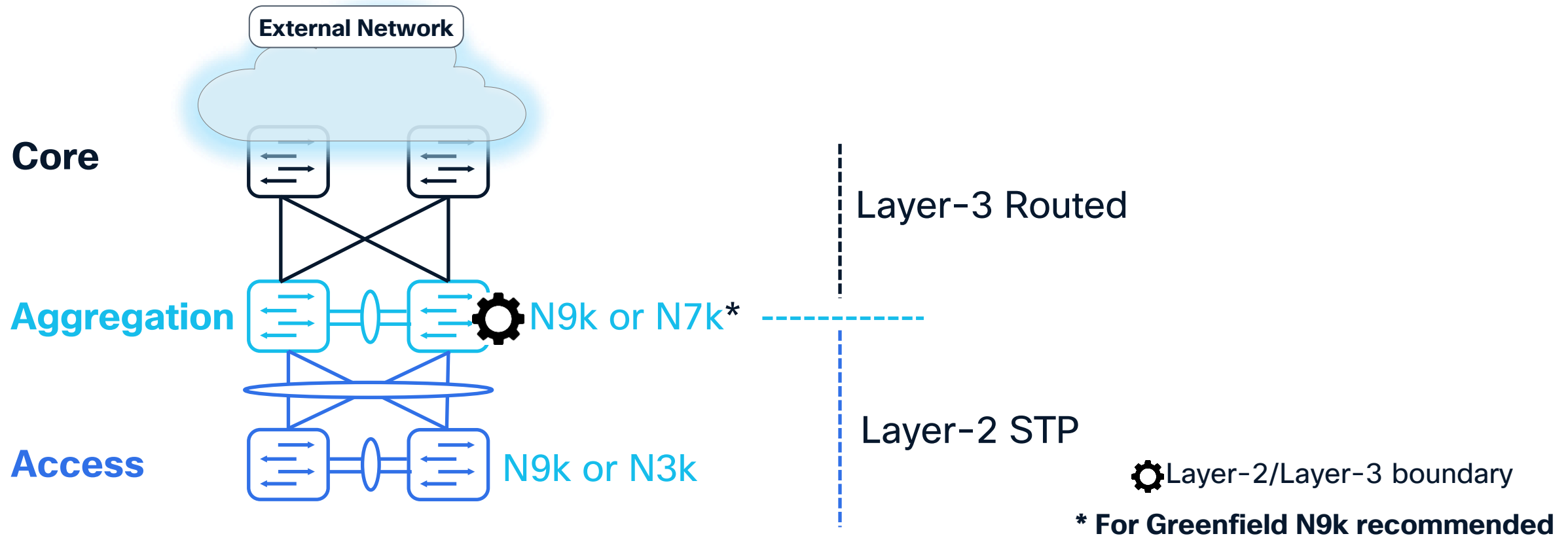
Get Centralized Visibility
and Monitoring views

Enhanced Classic LAN

Traditional 3-Tier Classic Ethernet Networks

Deployment Considerations

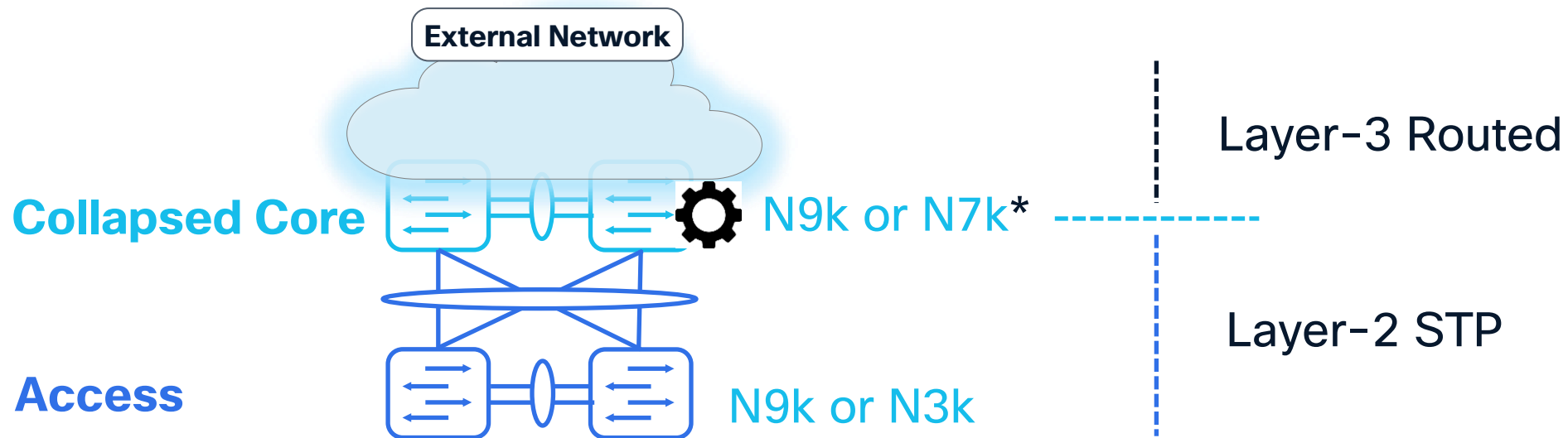
Option-1: 3-Tier with Agg as L2/L3 boundary



Traditional 3-Tier Classic Ethernet Networks

Deployment Considerations

Option-2: 2-Tier with Collapsed Core as L2/L3 boundary



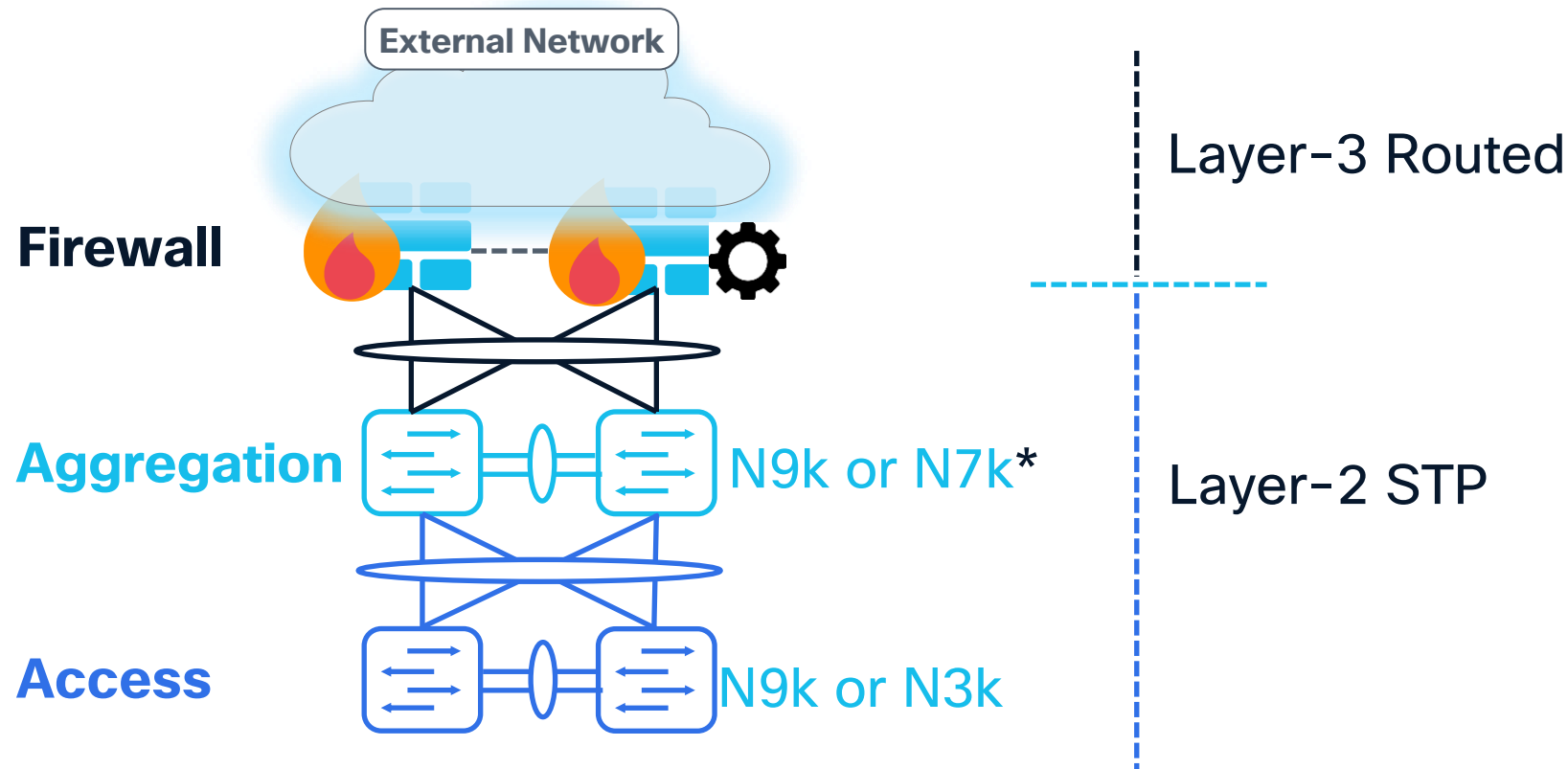
⚙️ Layer-2/Layer-3 boundary

*** For Greenfield N9k recommended**

Traditional 3-Tier Classic Ethernet Networks

Deployment Considerations

Option-3: 3-Tier with Service-Node as L2/L3 boundary



⚙️ Layer-2/Layer-3 boundary

*** For Greenfield N9k recommended**

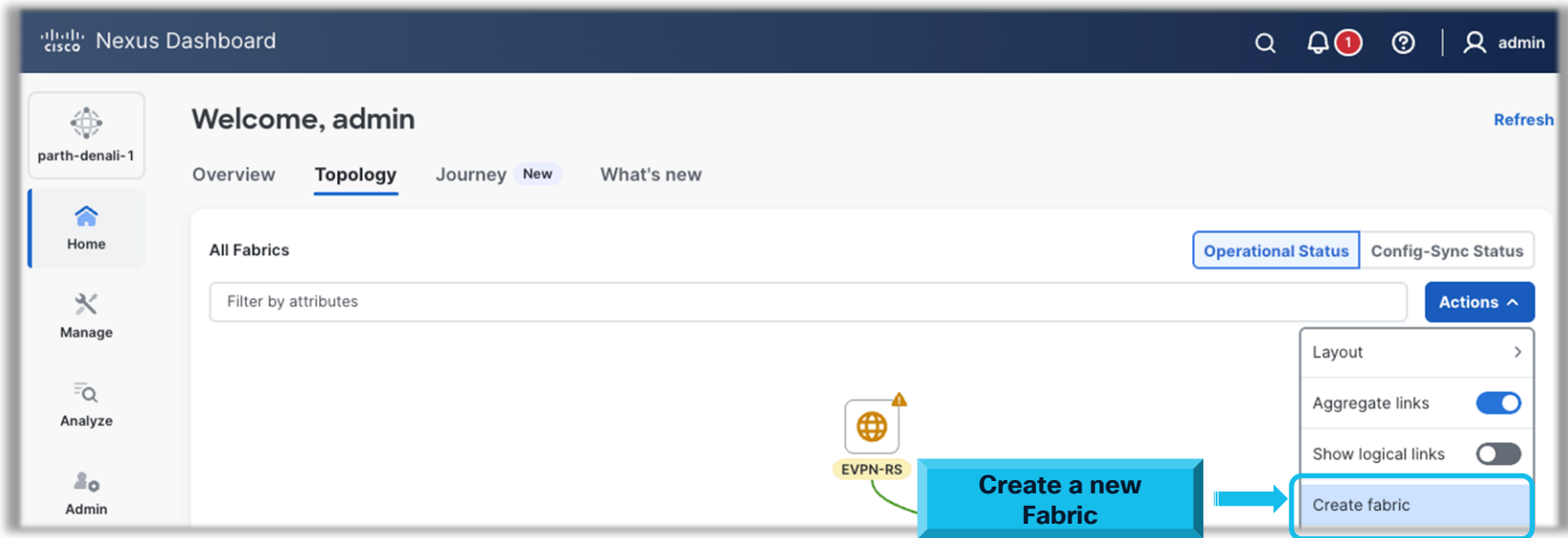
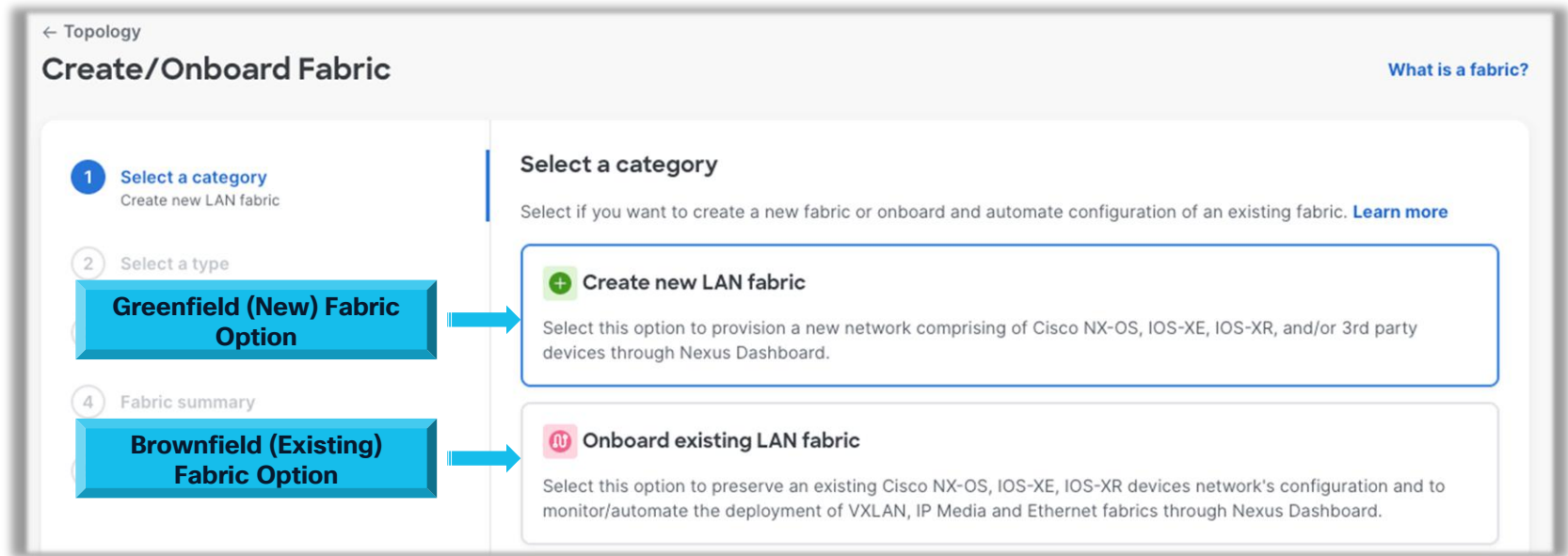
Enhanced Classic LAN

Use-cases

Greenfield Deployment

Enhanced Classic LAN: Day-0

Step 1 -> Create a Fabric



Step 1 -> Create a Fabric

VXLAN

Automate a VXLAN BGP EVPN fabric for Cisco Nexus (NX-OS) and/or switches.

Classic LAN

Automate the provisioning of a 2 or 3-tier Traditional Classical Ethernet Network.

AI/ML

Automate a Nexus (NX-OS) fabric for top performance AI/ML networks using RoCEv2.

External and inter-fabric connectivity

Select a type

Switches in this fabric will be configured automatically based on the option you choose.

Fabric Type: Enhanced Classic LAN

Fabric for Access-Aggregation-Core Classic LAN architectures based on Cisco best practices with Nexus 3000/7000/9000. This fabric type supports roles 'Access' and 'Aggregation'. Switches that serve as Core for such networks must be deployed in 'External and inter-fabric connectivity' fabric type.

Cancel

Back

Next

Settings

These are the recommended settings for configuring the parameters and capabilities of the new fabric.

Configuration mode ⓘ

Default

Advanced

Name *

CE-Site-1

Location *

Buenos Aires, AR

BGP ASN *

65500

1-4294967295 | 1-65535[.0-65535]

License tier for fabric ⓘ

☒ Essentials

☐ Advantage

☐ Premier

Enabled features

☐ Telemetry ⓘ

Cancel

Back

Next

Fabric Type: Enhanced Classic LAN

Auto Select Name, Location, Routing Protocol ASN

Step 1 -> Create a Fabric

Advanced Fields

Settings

These are the recommended settings for configuring the parameters and capabilities of the new fabric.

Configuration mode ⓘ

Default

Advanced

Unlock All Advanced Options

Name *

CE-Site-1

Location *

Buenos Aires, AR

VRF-Lite protocol *

Select IP handoff/VRF-LITE Routing Protocol

EBGP

EBGP ✓

OSPF

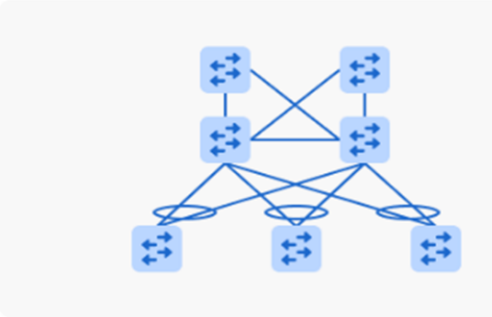
None

License tier for fabric ⓘ

☒ Essentials

☐ Advantage

☐ Premier



Fabric Type: Enhanced Classic LAN

Advanced settings

The following optional settings will be deployed and/or used when deploying this fabric.

General Parameters

Spanning Tree

vPC

Protocols

Security

Advanced

First Hop Redundancy Protocol

hsrp

HSRP or VRRP

none

hsrp ✓

vrrp

vrrpv3

FHRP - HSRP or VRRP

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BRKDCN-2618



Step 1 -> Create a Fabric

Advanced Fields

Advanced settings

The following optional settings will be deployed and/or used when deploying this fabric.

General Parameters

Spanning Tree

vPC

Protocols

Security

Advanced

Freeform

Resources

Spanning Tree Root Bridge Protocol

rpvst+

Spanning Tree Protocol - RPVST, MST

ed for configuring Root Bridge:
-VLAN Spanning Tree, mst:
g Tree, unmanaged (default):
aged by NDFC. Note: Spanning
Bridge Configs are applicable
at Aggregation layer only

Spanning Tree VLAN Range*

1-3967

VLAN range

Vlan range, Example: 1,3-5,7,9-11, Default is 1-3967 (Applicable only for Aggregation devices)

MST Instance Range

MST instance range, Example: 0-3,5,7-9, Default is 0 (Applicable only for Aggregation devices)

Spanning Tree Bridge Priority

0

STP Bridge Priority

y for the spanning tree in increments
licable only for Aggregation devices)

General Parameters

Spanning Tree

vPC

Protocols

Security

Advanced

Freeform

vPC Auto Recovery Time (In Seconds)

360

(Min:240, Max:3600)

vPC Delay Restore Time (In Seconds)

150

Cisco's Best Practice VPC parameters

vPC Peer Link Port Channel ID

500

(Min:1, Max:1000)

vPC IPv6 ND Synchronize

☒

Enable IPv6 ND synchronization between vPC peers

vPC Domain Id Range

1-1000

vPC Domain Id range to use for new pairings

Step 1 -> Create a Fabric

Advanced Fields

ProtocolsSecurityAdvancedFreeformResourcesManageabilityBootstrap

Network VLAN Range

2300-2999

Network VLAN Range

Per Switch Network VLAN Range (Min:2, Max:4094)

Aggregation-Core/Aggregation-Edge Connectivity

auto

VRF Lite Aggregation-Core and Aggregation-Edge Router Inter-Fabric Connection Options

VRF Lite Subinterface dot1q Range

2-511

Per Aggregation dot1q Range for VRF Lite Connectivity (Min:2, Max:4093)

Auto Generate VRF Lite Configuration on Aggregation and Core/Edge

☒

Auto Generate VRF-Lite Config

Flag that controls auto generation of VRF Lite sub-interface and peering configuration on Aggregation & Core/Edge devices. If set, auto

VRF Lite IP Version*

ipv4

VRF-Lite IP Version - v4, v6 or both

IPv4 or both

IPv4 VRF Subnet IP Range*

10.33.0.0/16

IPv4 address range to assign P2P Aggregation-Core connections, and peering between vPC Aggregation switches

IPv4 VRF Lite Subnet Mask Length*

30

VRF-Lite Route peering range

IPv6 VRF Subnet IP Range

2001::10:33:0:0/112

Aggregation-between vPC

IPv6 VRF Lite Subnet Mask Length*

126

Aggregation switches

VRF Lite VLAN Range

2000-2299

Used for Per VRF SVI Peering between Aggregation pairs (Min:2, Max:4094)

Step 2 -> Add Switches

Create/Onboard Fabric



All done!

The fabric CE-Site-1, has successfully been created/onboarded to Nexus Dashboard.

You can modify any of these settings from Manage > Fabrics > Actions by clicking 'Edit Fabric Settings'

View fabric details

Add switches to fabric

Add Switches - Fabric: CE-Site-1

Switch Addition Mechanism*

Discover

Seed Switch Details

Seed IP*

192.168.100.10-13

Ex: "2.2.2.20" or "10.10.10.40-60" or "2.2.2.20, 2.2.2.21"

Authentication / Privacy*

MD5

Username*

parth

Max Hops*

0

Password*

.....

Set as individual device write credential

Close

Discover Switches

Switch Mgmt0 IP

Switch Discovery Credentials

Switch Hops based on CDP

Step 2 -> Add Switches

Add Switches - Fabric: CE-Site-1

Seed Switch Details

Fabric

CE-Site-1

Switch

192.168.100.10-13

Authentication Protocol

md5

Username

parth

Password

☐ Set as individual device write credential

Max Hops

0

Preserve config

Disabled

← Back

Discovery Results

Filter by attributes

☒	Switch Name	Serial Number	IP Address	Model	Version	Status	Progress
☒	access-02	91FWZ0NDHTB	192.168.100.11	N9K-C9300v	10.4(1)	Manageable	
☒	access-01	9F2A579ESEO	192.168.100.10	N9K-C9300v	10.4(1)	Manageable	
☒	aggregation-02	9RUZV3J7M9P	192.168.100.13	N9K-C9300v	10.4(1)	Manageable	
☒	aggregation-01	9ZS0LGRYMZM	192.168.100.12	N9K-C9300v	10.4(1)	Manageable	

Close

Add Switches

Switch Inventory Management

Step 3 -> Set Role

The screenshot displays the Cisco SD-WAN management interface. At the top, a 'Welcome, admin' message is followed by navigation tabs: Overview, **Topology**, Journey, New, and What's new. A 'Refresh' button is in the top right. Below the tabs, the breadcrumb 'All Fabrics > CE-Site-1' is shown. A search bar labeled 'Filter by attributes' is present. On the right, there are buttons for 'Operational Status', 'Config-Sync Status', and an 'Actions' dropdown menu. The main area shows a topology diagram with four switch icons labeled 'access-01', 'access-02', 'aggregation-01', and 'aggregation-02' connected in a line. Above the topology, there are summary cards for 'Net' (0 Networks), 'VRF' (1 VRFs), and 'Virtual Machines' (0 Virtual Machines). A context menu is open over the 'access-01' switch, listing actions: Drill-down, View details, **Set role** (highlighted), Configuration, Discovery, Maintenance, VPC pairing, and Delete switch. To the right of the menu, a 'Select Role' dialog is open, featuring a search bar and two options: 'Access (current)' and 'Aggregation'.

Welcome, admin Refresh

Overview **Topology** Journey New What's new

All Fabrics > CE-Site-1

Filter by attributes

Operational Status **Config-Sync Status**

Actions ▾

Drill-down
View details
Set role
Configuration >
Discovery >
Maintenance >
VPC pairing
Delete switch

Select Role

Search Role

Access (current)

Aggregation

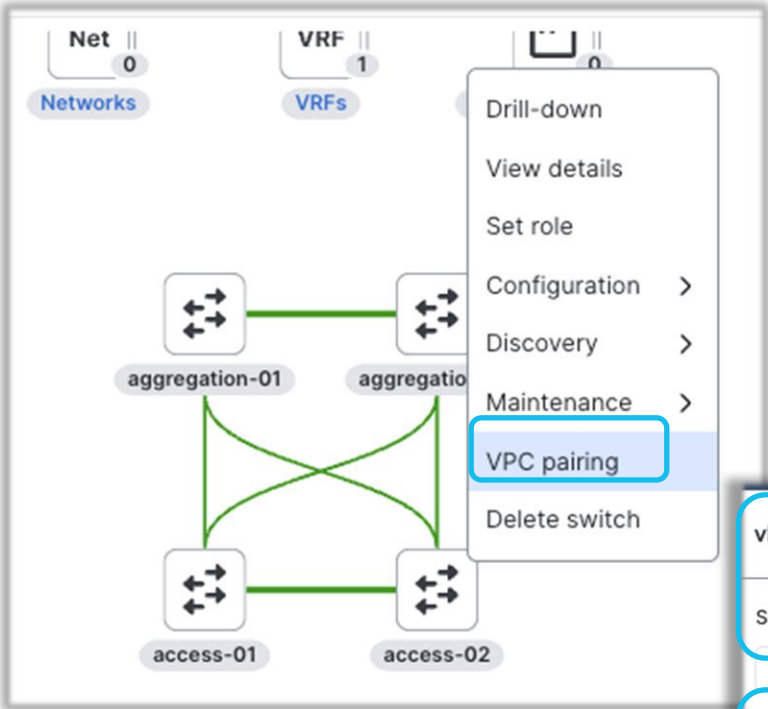
Net 0
Networks

VRF 1
VRFs

Virtual Machines 0
Virtual Machines

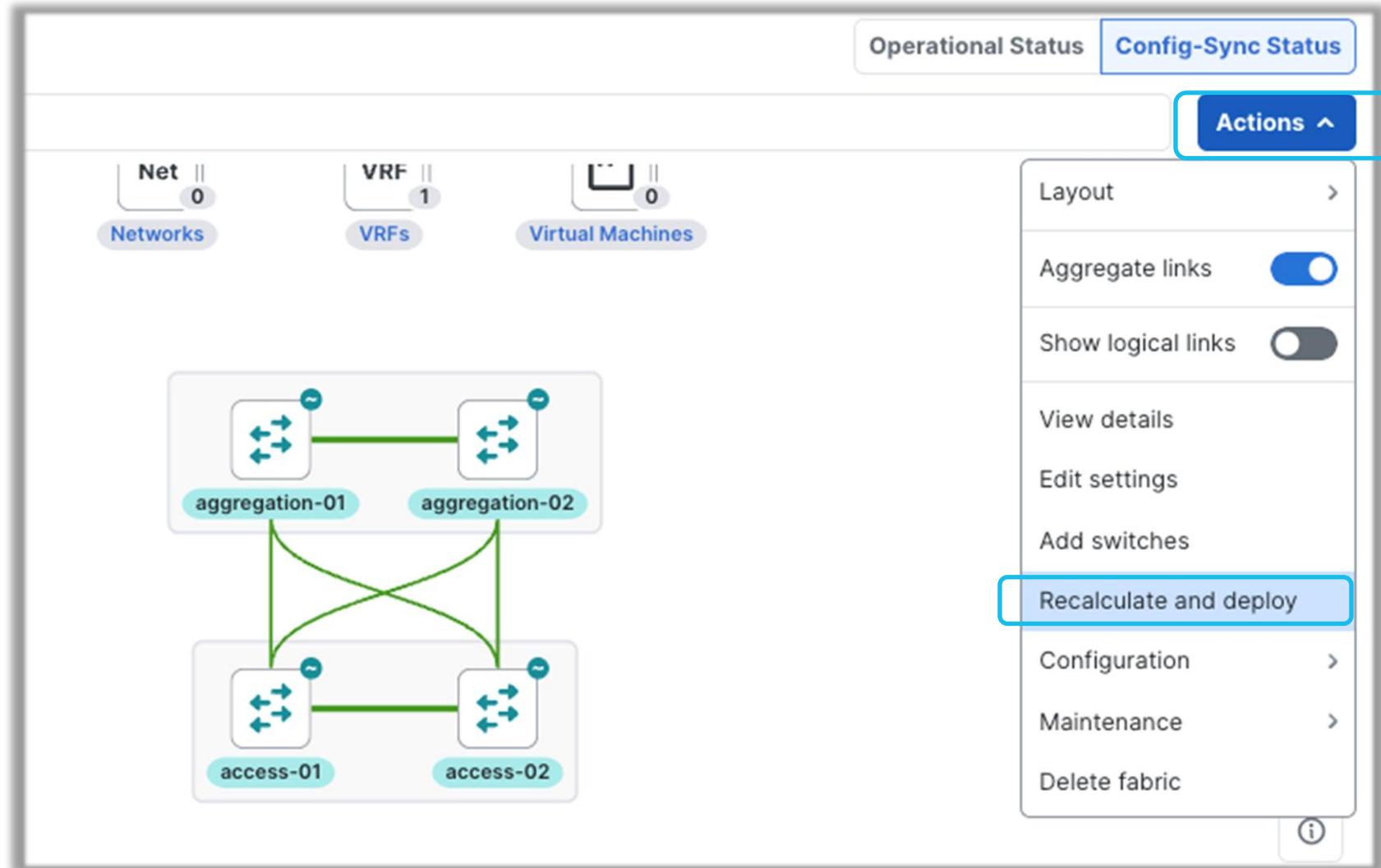
access-01 access-02 aggregation-01 aggregation-02

Step 4 -> VPC Pairing



vPC Pairing				
Select vPC Peer for access-02				
Filter by attributes				
Device	Recommended	Reason	Serial Number	IP Address
☒ access-01	True	Switches are connected and have same role	9F2A579ESEO	192.168.100.10
☐ aggregation-01	False	Switches have different roles	9ZS0LGRYMZM	192.168.100.12
☐ aggregation-02	False	Switches have different roles	9RUZV3J7M9P	192.168.100.13

Step 5 -> Recalculate and Deploy



Step 5 -> Recalculate and Deploy

Deploy Configuration - CE-Site-1

Filter by attributes

Resync All

Switch Name	IP Address	Role	Serial Number	Fabric Status	Pending Config	Status Description	Progress	Resync Switch	
access-01	192.168.100.10	Fabric Configuration status		Out-Of-Syn	526 Lines	Out-of-Sync		Resync	
aggregation-01	192.168.100.12		9ZS0LGRYMZM	Out-Of-Syn	483 Lines	Out-of-Sync		Resync	
access-02	192.168.100.11	access	91FWZ0NDHTB	Out-Of-Syn	526 Lines	Out-of-Sync		Resync	Pending Configuration
aggregation-02	192.168.100.13	aggregation	9RUZV3J7M9P	Out-Of-Syn	483 Lines	Out-of-Sync		Resync	

4 items found

Rows per page 10 < 1 >

Close

Deploy All

Step 5 -> Recalculate and Deploy

Pending Config - CE-Site-1 - aggregation-01

Pending Config Side-by-Side Comparison

```
cfs eth distribute
feature bgp
feature dhcp
feature hsrp
feature interface-vlan
feature lacp
feature nxapi
feature vpc
nxapi http port 80
nxapi https port 443
service dhcp
snmp-server host 172.25.74.136 traps version 2c public udp-port 2162
ip dhcp relay
route-map FABRIC-RMAP-REDIST-SUBNET permit 10
  match tag 12345
router bgp 65500
  router-id 10.2.0.1
configure terminal
ip dhcp relay information option
ip dhcp relay information option vpn
ipv6 dhcp relay
```

**Aggregation
role related
features**

Pending Config Side-by-Side Comparison

```
vpc domain 1
ip arp synchronize
peer-gateway
peer-switch
delay restore 150
peer-keepalive destination 192.168.100.13 source 192.168.100.12
auto-recovery reload-delay 360
ipv6 nd synchronize
interface port-channel500
  switchport
  switchport mode trunk
  spanning-tree port type network
  description "vpc-peer-link aggregation-01--aggregation-02"
  no shutdown
  vpc peer-link
interface ethernet1/1
  channel-group 500 force mode active
  description "P0 500 (vpc-peer-link) member aggregation-01-Ethernet1/1 to aggregation-02-Ethernet1/1"
  no shutdown
interface ethernet1/5
  channel-group 500 force mode active
  description "P0 500 (vpc-peer-link) member aggregation-01-Ethernet1/5 to aggregation-02-Ethernet1/5"
```

**VPC domain
towards Agg02**

**VPC peer-link
towards Agg02**

Step 5 -> Recalculate and Deploy

Pending Config - CE-Site-1 - aggregation-01

Pending Config Side-by-Side Comparison

```
interface port-channel1
  switchport
  switchport mode trunk
  mtu 9216
  vpc 1
  spanning-tree bpduguard disable
  spanning-tree guard root
  description vPC-aggregation-connected-to-vPC-access:access-01~access-02-vPC1
  negotiate auto
  no shutdown
  switchport trunk allowed vlan none
interface ethernet1/10
  switchport
  switchport mode trunk
  mtu 9216
  negotiate auto
  no shutdown
  switchport trunk allowed vlan none
```

VPC PO towards Access01-02
switches

Aggregation default port-
type

STP Root on
Aggregation

```
switchport trunk allowed vlan none
interface ethernet1/9
  switchport
  switchport mode trunk
  mtu 9216
  negotiate auto
  no shutdown
  switchport trunk allowed vlan none
spanning-tree vlan 1-3967 priority 0
configure terminal
```

Step 5 -> Recalculate and Deploy

Pending Config - CE-Site-1 - access-01

Pending Config Side-by-Side Comparison

```
cfs eth distribute
feature lacp
feature lldp
feature nxapi
feature vpc
nxapi http port 80
nxapi https port 443
snmp-server host 172.25.74.136 traps version 2c public udp-port 2162
vpc domain 2
  peer-keepalive destination 192.168.100.11 source 192.168.100.10 hold-timeout 3
  peer-switch
  auto-recovery reload-delay 360
interface port-channel500
  switchport
  switchport mode trunk
  description "vpc-peer-link access-01--access-02"
  no shutdown
  spanning-tree port type network
  switchport trunk allowed vlan 1-4094
  vpc peer-link
interface ethernet1/1
  description "P0 500 (vpc-peer-link) member access-01-Ethernet1/1 to access-02-Etherne
  channel-group 500 force mode active
  no shutdown
```

**Access role
related features**

**VPC domain towards
Access02**

**VPC peer-link towards
Access02**

Pending Config Side-by-Side Comparison

```
interface port-channel1
  switchport
  switchport mode trunk
  mtu 9216
  vpc 1
  spanning-tree bpduguard disable
  spanning-tree guard loop
  description vPC-access-connected-to-vPC-aggregation:aggregation-02~aggregation-01-vPC1
  negotiate auto
  no shutdown
  switchport trunk allowed vlan none
interface ethernet1/10
  switchport
  switchport mode trunk
  mtu 9216
  spanning-tree port type edge trunk
  negotiate auto
  no shutdown
  switchport trunk allowed vlan none
interface ethernet1/11
  switchport
  switchport mode trunk
  mtu 9216
  spanning-tree port type edge trunk
  negotiate auto
```

**VPC PO towards Agg01-02
switches**

Access default port-type

Enhanced Classic LAN:

Day-1

Step 1 -> Create Network and VRF

Net0

Networks

VR

VRF

Filter by attributes

Act

Network

Create Network

Create

Edit

Multi-Attach

Multi-Detach

Deploy

Import

Export

Delete

Create Network

CSV Option

Create Network

Network Name*

MyNetwork_30000

Layer 2 Only

☐

L2 or L3 Network

VRF Name*

MyVRF_50001

Create VRF

VRF

VLAN ID*

2300

Propose VLAN

Auto Generated VLAN ID

Network Template*

Network_Classic >

General Parameters

Advanced

IPv4 Gateway/NetMask

10.188.10.1/24

Default Gateway SVI

Interface IPv4 addr on active*

10.188.10.2

Interface IPv4 addr on standby*

10.188.10.3

FHRP Active/Backup

Step 2 -> Attach Network and VRF

Network Overview - MyNetwork_30000

Actions Refresh

Overview

Network Attachments

VRF

Note: Access switches are not directly displayed, but are configured via aggregation switches.

Filter by attributes

Actions

☒	Network Name	VLAN ID	Switch	Ports	Status	Attachment	Switch Role	
☒	MyNetwork_30000		aggregation-01	NA	NA	Detached	aggregation	<div>History</div> <div>Edit</div> <div>Preview</div> <div>Deploy</div> <div>Import</div> <div>Export</div> <div>Quick Attach</div> <div>Quick Detach</div>
☒	MyNetwork_30000		aggregation-02	NA	NA	Detached	aggregation	

Step 2 -> Attach Network and VRF

aggregation-01 (9ZS0LGRYMZM) - aggregation-02 (9RUZV3J7M9P)

Detach ☒ Attach

Network Auto Attached to Agg

VLAN 2300

VLAN ID

FHRP Active

☐ aggregation-02 (9RUZV3J7M9P)

☒ aggregation-01 (9ZS0LGRYMZM)

Select FHRP Active per Network

Available Interfaces for this device

Interface/Ports == Ethernet1/8

Modify Interfaces

Edit Clear All

Port Attachment

Interface/Ports	Switch	Status	Port Type	Port Description	Neighbor Info	Policy Name	
☒ Ethernet1/8	access-01		trunk			int_trunk_host	
☒ Ethernet1/8	access-02		trunk			int_trunk_host	
☐ Ethernet1/8	aggregation-01	false	trunk			int_trunk_host	
☐ Ethernet1/8	aggregation-02	false	trunk			int_trunk_host	

Switches

Network and VRF Configs

Pending Config - CE-Site-1 - aggregation-01

```
vlan 2000
vrf context MyVRF_50001
  address-family ipv4 unicast
  address-family ipv6 unicast
exit
interface Vlan2000
  vrf member MyVRF_50001
  ip address 10.33.0.1/30
  ipv6 address 2001::10:33:0:1/126
  mtu 9216
  no ip redirects
  no ipv6 redirects
  no shutdown
```

**VRF and BGP
Configs**

VLAN definition

```
router bgp 65500
  vrf MyVRF_50001
    address-family ipv4 unicast
      redistribute direct route-map FABRIC-RMAP-REDIST-SUBNET
    exit
    address-family ipv6 unicast
      redistribute direct route-map FABRIC-RMAP-REDIST-SUBNET
    exit
  neighbor 10.33.0.2
    remote-as 65500
    address-family ipv4 unicast
      send-community both
    exit
  exit
```

Pending Config - CE-Site-1 - access-01

Pending Config

```
vlan 2300
configure terminal
interface ethernet1/8
  switchport trunk allowed vlan add 2300
interface port-channel1
  switchport trunk allowed vlan add 2300
```

**VLAN
definition**

**Allow VLAN towards
Aggregation (uplink) and
Compute-Host
(downlink)**

```
interface Vlan2300
  vrf member MyVRF_50001
  ip address 10.188.10.2/24
  no ip redirects
  no ipv6 redirects
  no shutdown
  hsrp version 2
  hsrp 1
    ip 10.188.10.1
    priority 120
    preempt
```

**SVI Configs with Active
FHRP**

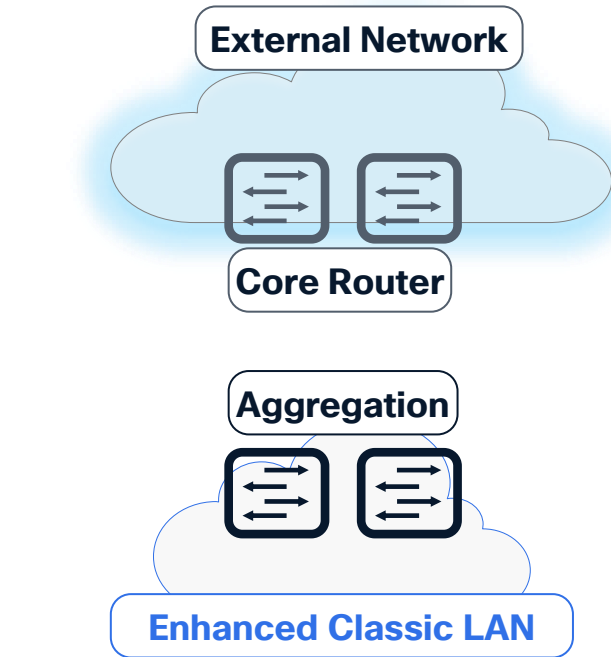
**Allow VLAN towards
Access devices**

```
exit
configure terminal
interface port-channel1
  switchport trunk allowed vlan add 2300
```

Enhanced Classic LAN

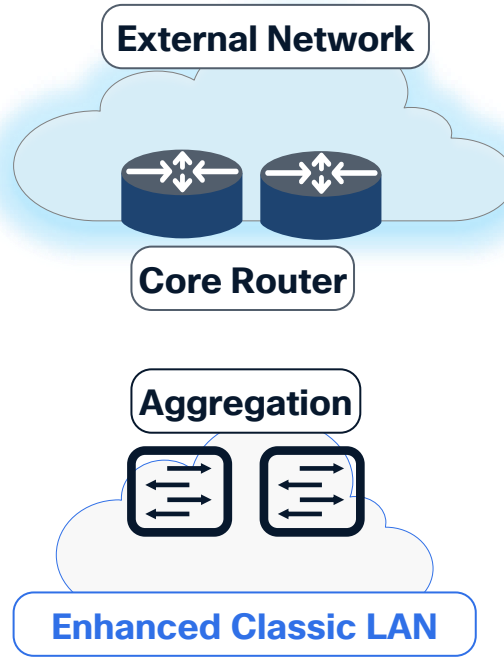
External IP Handoff

Core or Edge Router Placement Option



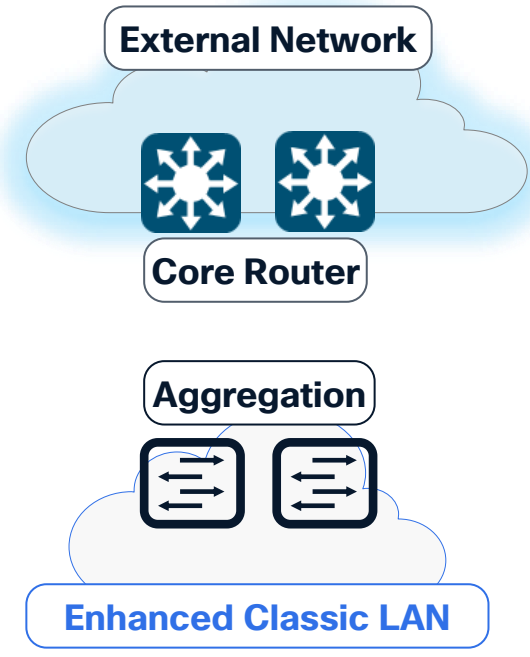
Managed NX-OS

- ✓ - Nexus 9000
- ✓ - Nexus 7000



Managed IOS-XR

- ✓ - Cisco 8000
- ✓ - ASR 9000
- ✓ - NCS 5500



Managed IOS-XE

- ✓ - Catalyst 9000
- ✓ - Catalyst 8000
- ✓ - ASR 1000
- ✓ - CSR 1000

Managing Core/Edge Devices

Part of ‘External Connectivity Network’ Fabric

Create Fabric, Discover Switches, Set Role, Recalculate & Deploy

Edit External-Network Settings

General

Fabric Management

Name *

External-Network

Type

Multisite & External Connectivity

Location *

Buenos Aires, AR

BGP ASN for spines *

65000

Seed Switch Details

Fabric

External-Network

Switch

192.168.100.14

Authentication Protocol

md5

Username

parth

Password

Max Hops

0

Preserve config

Enabled

☐ Set as individual device write credential

[Back](#)

Discovery Results

Filter by attributes

☒	Switch Name	Serial Number	IP Address	Model	Version	Status
☒	core-router	94MIKF4Z8A1	192.168.100.14	N9K-C9300v	10.4(1)	Manageable

External-Network

Overview

Inventory

Connectivity

Switches

vPC Pairs

Filter by attributes

☒ Name

☒ core-router

Select Role

Search Role

Border Spine

Border Gateway

Border Gateway Spine

Super Spine

Border Super Spine

Border Gateway Super Spine

Access

Aggregation

Edge Router

Core Router

VRF-LITE: Aggregation to Nexus Core

Defining IFC Link on physical interface

- IFC link has been defined
 - Policy should be **ext_fabric_setup**
 - IPs auto selected from **VRF-Lite Subnet IP Range**

Connectivity

Segmentation and security

Configuration Policies

Anomalies

Advisories

Integrations

History

Interface Groups

Links

Inter-Fabric

L3 Neighbors

Endpoints

Routes

Flows

Virtual Infrastructure

Fabric Name == External-Network↔CE-Site-1

Edit

Clear All

Active

Fabric Name	Name	Policy	Info	Admin State	Oper
External-Network↔CE-Site-1	core-router~Ethernet1/2---aggregation-02~Ethernet1/4	ext_fabric_setup	Link Present	↑ Up	↑
External-Network↔CE-Site-1	core-router~Ethernet1/1---aggregation-01~Ethernet1/4	ext_fabric_setup	Link Present	↑ Up	↑

VRF-LITE: Aggregation to Nexus Core

Defining VRF extensions on Aggregation

Attach VRF to Aggregation and extend through **VRF-Lite**

Overview

VRF Attachments

Networks

Note: Access switches are not directly displayed, but are configured via aggregation switches.

Filter by attributes

Actions ^

☒	VRF Name	VLAN ID	Switch	Status	Attachment	Switch Role	History
☒	MyVRF_50001	2000	aggregation-01	<div>PENDING</div>	Attached	aggregation	<div>Edit</div>
☒	MyVRF_50001	2000	aggregation-02	<div>PENDING</div>	Attached	aggregation	<div>Preview</div> <div>Deploy</div>

VRF-LITE: Aggregation to Nexus Core

Defining VRF extensions on Aggregation

aggregation-01(9ZSOLGRYMZM) - aggregation-02(9RUZV3J7M9P)

Detach

Attach

Extend*

VRF_LITE

aggregation-01(9ZSOLGRYMZM)

CLI Freeform Config

Edit >

All configs should strictly match the 'show run' output, including cases and new line
Any mismatches will yield unexpected diffs during deploy

VLAN

2000

VLAN Name

SVI IPv4 Address/Netmask

10.33.0.1/30

vPC Peer SVI IPv4 Address

10.33.0.2

SVI IPv6 Address/Netmask

2001::10:33:0:1/126

vPC Peer SVI IPv6 Address

2001::10:33:0:2

aggregation-02(9RUZV3J7M9P)

CLI Freeform Config

Edit >

All configs should strictly match the 'show run' output, including cases and new line
Any mismatches will yield unexpected diffs during deploy

VLAN

2000

VLAN Name

SVI IPv4 Address/Netmask

10.33.0.2/30

vPC Peer SVI IPv4 Address

10.33.0.1

SVI IPv6 Address/Netmask

Extension Type

Auto Generate Configuration for Peer

☒

Peer VRF Name*

MyVRF_50001

Subinterface VRF name

IPv4 Inbound Route Map

No route-map if blank

IPv4 Outbound Route Map

IPv6 Inbound Route Map

No route-map if blank

IPv6 Outbound Route Map

If blank, use 'EXTCON-RMAP-FILTER-V6' or
'EXTCON-RMAP-FILTER-V6-ALLOW-HOST'

Provide VRF name for External Core. By default, NDFC uses the same name as Agg VRF

Extension

Filter by attributes

Attach-All

Detach-All

Action	Attached	Source Switch	Type	IF NAME	Dest. Switch	Dest. Interface	Encapsul... Dot1q VLAN ID	IPv4 Prefix/Ma...	IP Tag	Neighbor IPv4 Address	Ne AS
Edit	Attached	aggregation-01	VRF_LITE	Ethernet1/4	core-router	Ethernet1/1	2	10.33.0.2/30		10.33.0.1	65
Edit	Attached	aggregation-02	VRF_LITE	Ethernet1/4	core-router	Ethernet1/2	2	10.33.0.6/30		10.33.0.5	65

Attach VRF

VRF-LITE: Aggregation to Nexus Core

Preview and Deploy VRF extensions on Aggregation

Pending Config - CE-Site-1 - aggregation-01

Pending Config

```
vrf context MyVRF_50001
  ip route 0.0.0.0/0 10.33.0.1
exit
router bgp 65500
  vrf MyVRF_50001
    neighbor 10.33.0.1
      remote-as 65000
      address-family ipv4 unicast
        send-community both
configure terminal
interface ethernet1/4.2
  encapsulation dot1q 2
  mtu 9216
  vrf member MyVRF_50001
  ip address 10.33.0.2/30
  no shutdown
configure terminal
```

Pending Config - CE-Site-1 - aggregation-02

Pending Config

```
vrf context MyVRF_50001
  ip route 0.0.0.0/0 10.33.0.5
exit
router bgp 65500
  vrf MyVRF_50001
    neighbor 10.33.0.5
      remote-as 65000
      address-family ipv4 unicast
        send-community both
configure terminal
interface ethernet1/4.2
  encapsulation dot1q 2
  mtu 9216
  vrf member MyVRF_50001
  ip address 10.33.0.6/30
  no shutdown
```

VRF-LITE: Aggregation to Nexus Core

Preview and Deploy VRF extensions on External Core

Pending Config - External-Network - core-router

Pending Config Side-by-Side Comparison

```
vrf context myvrf_50001
  address-family ipv4 unicast
exit
router bgp 65000
  vrf myvrf_50001
    address-family ipv4 unicast
    neighbor 10.33.0.2
      remote-as 65500
      address-family ipv4 unicast
        send-community both
    exit
  exit
  neighbor 10.33.0.6
    remote-as 65500
    address-family ipv4 unicast
      send-community both
configure terminal
interface ethernet1/1
  mtu 9216
  description connected-to-aggregation-01-Ethernet1/4
  no switchport
  negotiate auto
  no shutdown
```

```
no shutdown
interface ethernet1/2
  mtu 9216
  description connected-to-aggregation-02-Ethernet1/4
  no switchport
  negotiate auto
  no shutdown
interface ethernet1/1.2
  mtu 9216
  vrf member myvrf_50001
  encapsulation dot1q 2
  ip address 10.33.0.1/30
  no shutdown
interface ethernet1/2.2
  mtu 9216
  vrf member myvrf_50001
  encapsulation dot1q 2
  ip address 10.33.0.5/30
  no shutdown
```

Enhanced Classic LAN

Use-cases

Brownfield Deployment

Enhanced Classic LAN Brownfield

Existing Networks and VRFs are learnt on a Brownfield import

Fabric Overview - Bf-Fab

Overview Switches Links Interfaces Interface Groups Policies **Networks** VRFs Event Analytics History Resources Virtual Infrastructure Metrics

Filter by attributes

☐	Network Name	VRF Name	IPv4 Gateway/Suffix	IPv6 Gateway/Prefix	Network Status	VLAN ID	Interface Group
☐	Auto_Net_VLAN301	default	192.168.31.1/24		DEPLOYED	301	
☐	Auto_Net_VLAN300	NA			DEPLOYED	300	
☐	Auto_Net_VLAN2303	NA			DEPLOYED	2303	
☐	Auto_Net_VLAN2302	myvrf_50002	192.168.11/24				
☐	Auto_Net_VLAN2304	NA					
☐	Auto_Net_VLAN32	vrf-prod	192.168.32.1/24				
☐	Auto_Net_VLAN34	vrf-prod		2001::192:168:34:1/120			
☐	Auto_Net_VLAN2301	NA					
☐	Auto_Net_VLAN2300	nonprod	1.1.1.1/24	2001::1:1:1/112			

Fabric Overview - Bf-Fab

Overview Switches Links Interfaces Interface Groups Policies **Networks** **VRFs** Event Analytics History Resources Virtual Infrastructure Metrics

Filter by attributes

☐	VRF Name	VRF Status
☐	default	DEPLOYED
☐	vrf-prod	DEPLOYED
☐	myvrf_50002	DEPLOYED
☐	nonprod	DEPLOYED

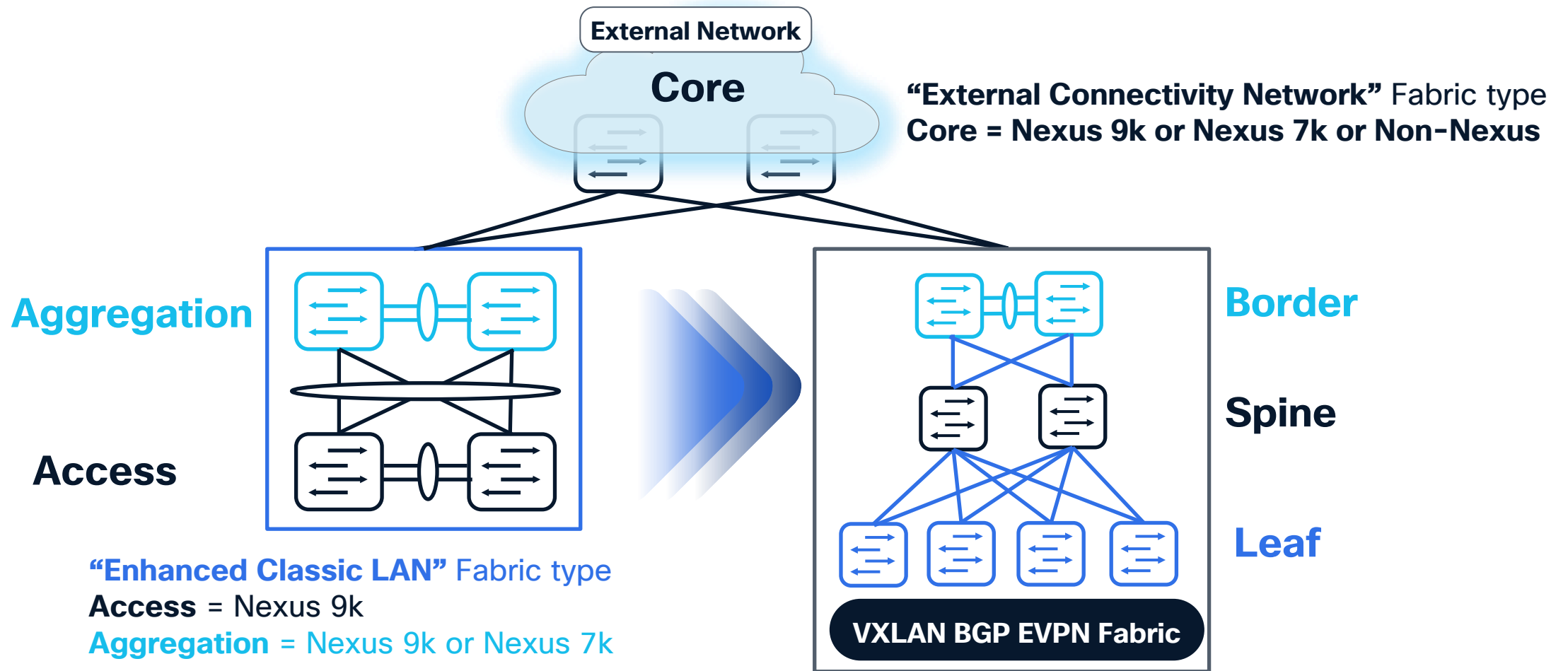
Enhanced Classic LAN

Use-cases

Migration to VXLAN EVPN

Building VXLAN BGP EVPN DC with Nexus 9000

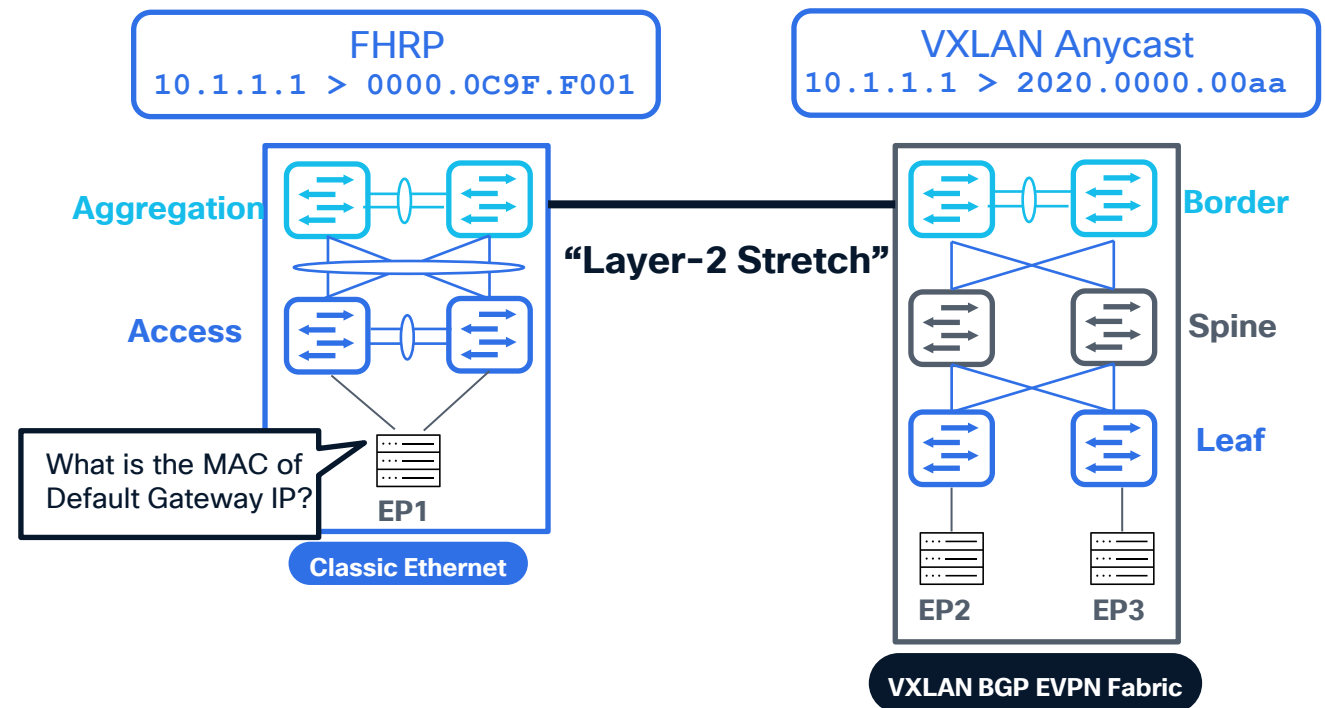
Co-existence or Migration from ECL to VXLAN BGP EVPN Fabric



Classic Ethernet to VXLAN Migration

Default Gateway Placement Considerations

- **Prior to NX-OS 10.2(3) FHRP and Distributed Anycast Gateway (DAG) cannot co-exist**
- FHRP and DAG run in different modes. CE/FP uses HSRP/VRRP while VXLAN uses anycast gateway
- **They cannot be active simultaneously**
- With HSRP the MAC is derived from the HSRP version and the group.
- In VXLAN EVPN the DAG virtual MAC is configured globally, that means all VLANs have the same MAC for the default gateway
- **Two options:** Keep default gateway in the CE/FP network until migration is finished or migrate gateways to the VXLAN EVPN fabric prior to workload migration
- MAC alignment needs to be done in either mode



Classic Ethernet to VXLAN Migration

First Hop Gateway Premigration Steps – MAC alignment

- Manually updating ARP cache isn't feasible
- Prior to any migration HSRP VMAC needs to be changed to the DAG MAC
- Hosts need to be updated by changing the standby HSRP member to active to force a GARP*

HSRP VMAC configuration on Aggregation

```
interface vlan 20
  vrf member Tenant-A
  ip address 192.168.20.201/24
  hsrp 10
    ip 192.168.20.1
    mac-address 2020.0000.00aa
```

HSRP VMAC configuration on Aggregation

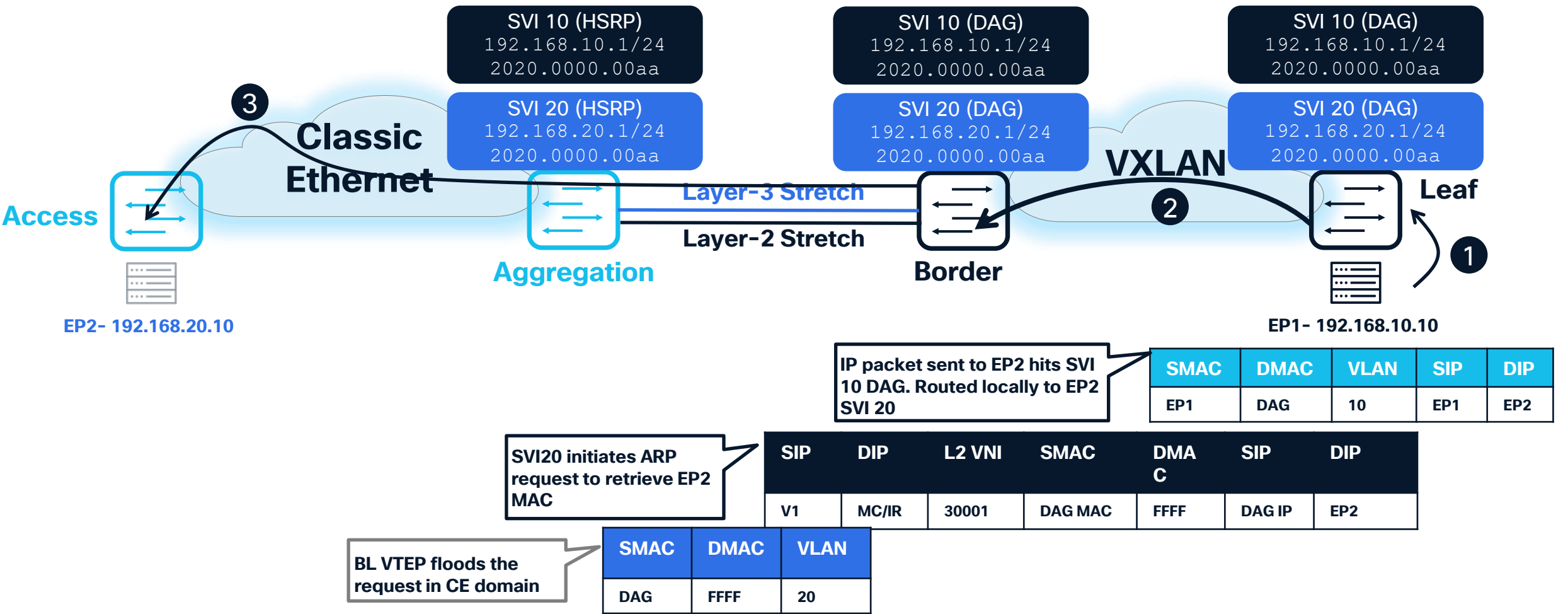
```
interface vlan 20
  vrf member Tenant-A
  ip address 192.168.20.201/24
  hsrp 10
    ip 192.168.20.1
    mac-address 2020.0000.00aa
    priority 120
    preempt
```

*There's a possibility that not all hosts ARP cache gets updated

**All pre-migration steps should be performed during a maintenance window

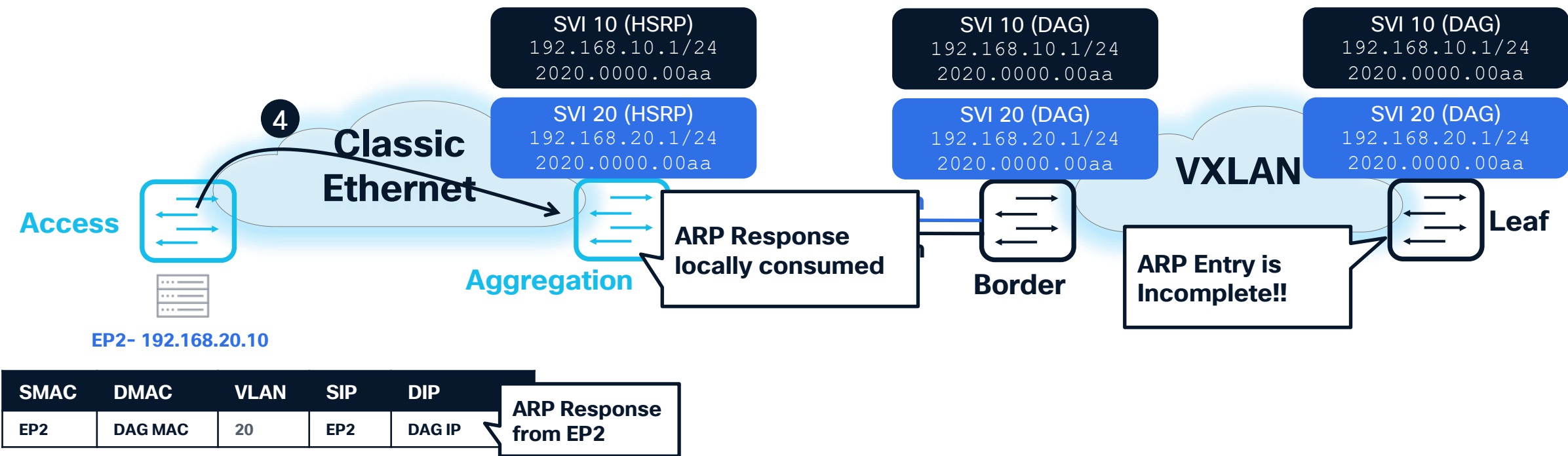
Classic Ethernet to VXLAN Migration

What's the problem before NXOS- 10.2(3)



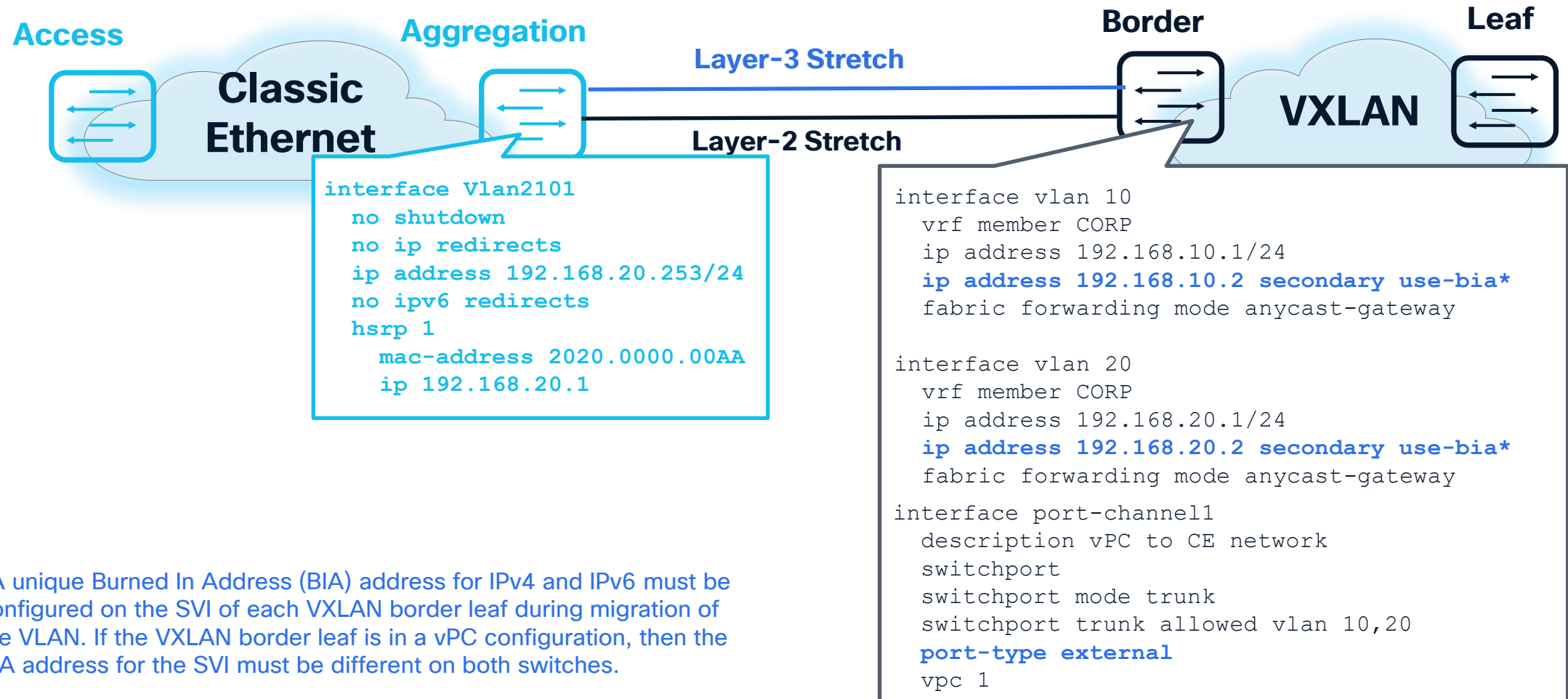
Classic Ethernet to VXLAN Migration

What's the problem before NXOS- 10.2(3)



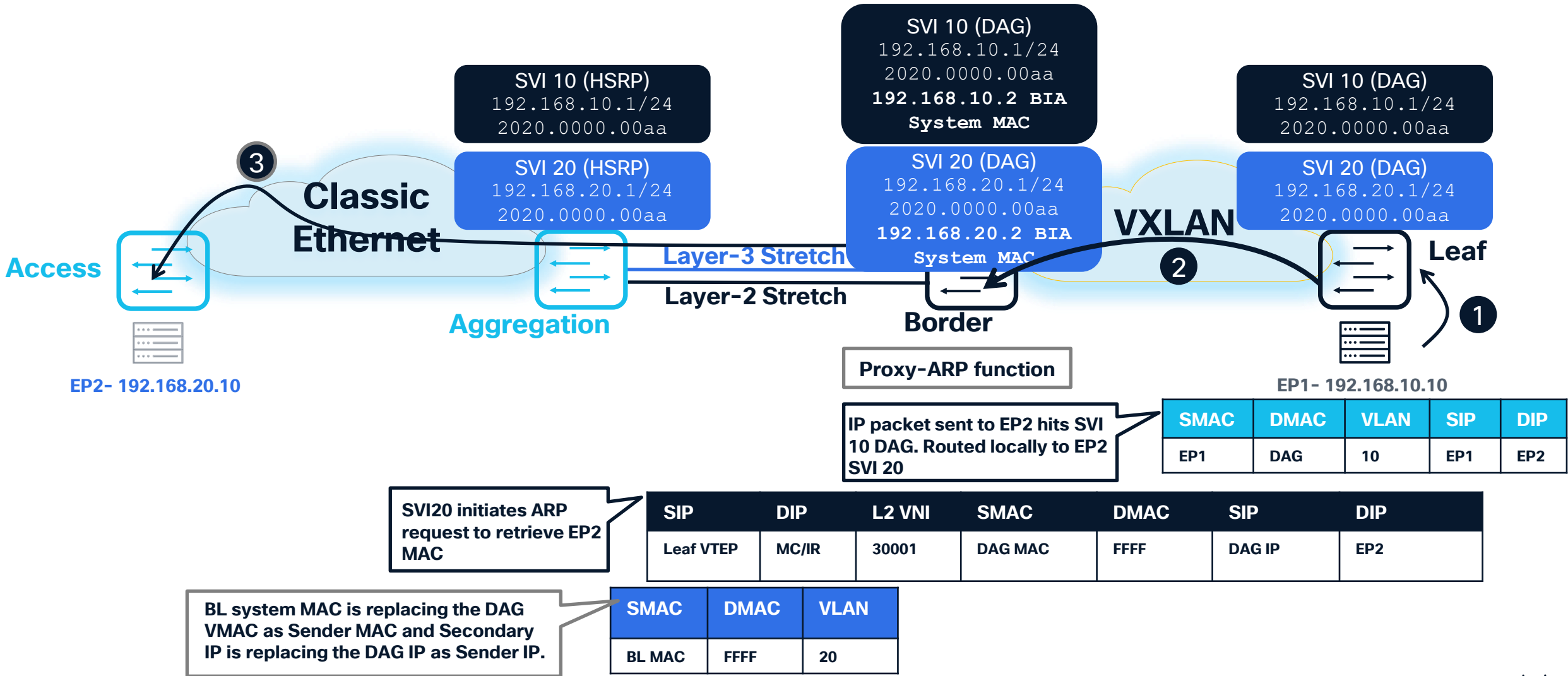
Classic Ethernet to VXLAN Migration

Default Gateway Coexistence of HSRP and Anycast Gateway - 10.2(3)

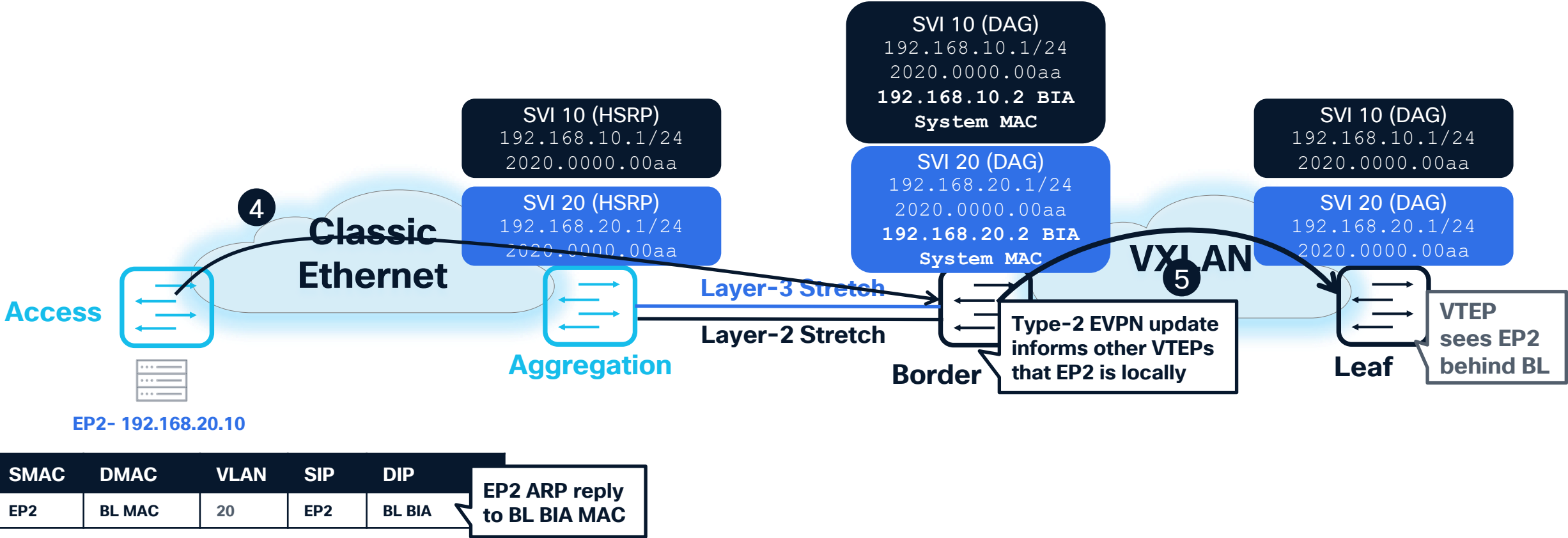


*A unique Burned In Address (BIA) address for IPv4 and IPv6 must be configured on the SVI of each VXLAN border leaf during migration of the VLAN. If the VXLAN border leaf is in a vPC configuration, then the BIA address for the SVI must be different on both switches.

Classic Ethernet to VXLAN Migration

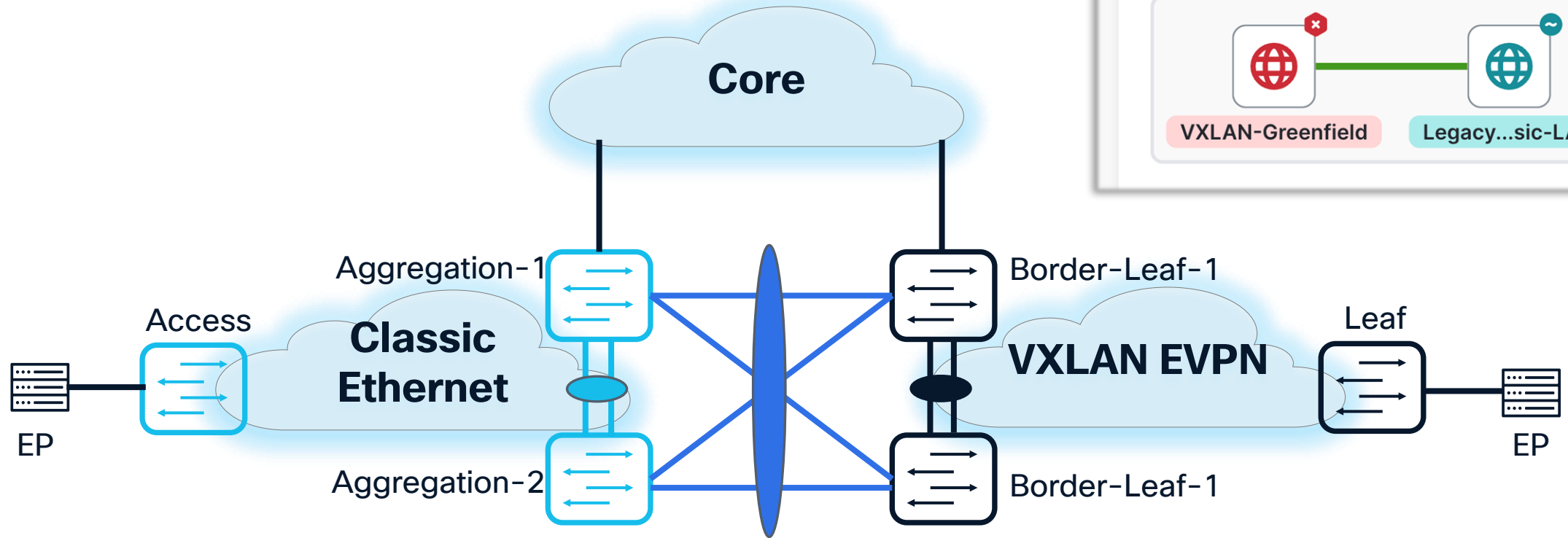
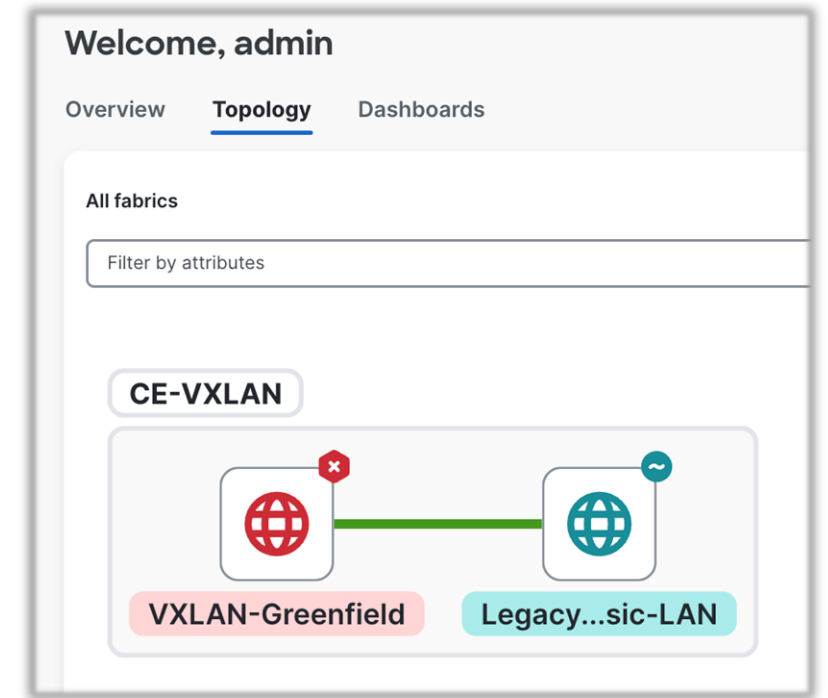


Classic Ethernet to VXLAN Migration



Migration to VXLAN BGP EVPN Fabric

Using Nexus Dashboard High Level Steps



Migration to VXLAN BGP EVPN Fabric

Using Nexus Dashboard High Level Steps

Legacy-Classical-LAN

OverviewInventoryConnectivitySegmentation and securityConfiguration policiesAnomaliesAdvisoriesIntegrationsHistory

VRFsNetworks

Filter by attributes

Network name	VRF name	IPv4 gateway/prefix	IPv6 gateway/prefix	Network status	VLAN ID	VLAN name
☒ vlan10	CORP	192.168.10.1/24		NA	10	

On the Classic Ethernet side- Create back-to-back vPC PO between Classic Ethernet Aggregations and VXLAN VTEPs alongside matching the VXLAN GW MAC for the HSRP networks

Note: This shows examples of sample configurations but for production migration the workflow and exact steps MUST be followed based on the Cisco’s config documentation and White paper.

General ParametersAdvanced

First Hop Redundancy Protocol

hsrp

Read-only, from Fabric Settings

☐ Ignore FHRP priority

No FHRP priority will be set for the network

Active/master Switch Priority

120

Priority is 120 if blank

Standby/backup Switch Priority

100

Priority is 100 if blank

☒ Enable Preempt

Overthrow lower priority Active routers

Preempt delay minimum time

0

Delay time at least this long

Preempt delay time after reload

0

Delay time after reload

Preempt delay sync time

0

Delay wait time for IP redundancy clients

HSRP/VRRP Group #

1

0-255 for HSRPv1, 0-4095 for HSRPv2, 1-255 for VRRP

HSRP/VRRP Group # for IPv6 if different from IPv4

0-4095 for HSRP, 1-255 for VRRP. If unspecified, same group number will be used for IPv4 and IPv6

Virtual MAC Address

2020.0000.00aa

Migration to VXLAN BGP EVPN Fabric

Using Nexus Dashboard High Level Steps

Pending Config - Legacy-Classic-LAN - aggregation-01

Pending Config Side-by-Side Comparison

```
interface port-channel20
  switchport
  switchport mode trunk
  mtu 9216
  vpc 20
  description virtual port-channel to vxlan greenfield
  storm-control broadcast level 5.00
  storm-control multicast level 5.00
  negotiate auto
  spanning-tree port type normal
  spanning-tree guard root
  no shutdown
  switchport trunk allowed vlan 10
interface ethernet1/6
  channel-group 20 force mode active
  description virtual port-channel to vxlan greenfield
  no shutdown
interface ethernet1/7
  channel-group 20 force mode active
  description virtual port-channel to vxlan greenfield
  no shutdown
vlan 2001
```

**vPC PO between
VXLAN VTEPs and CE
Agg**

```
vlan 10
interface Vlan10
  vrf member CORP
  ip address 192.168.10.2/24 tag 12345
  no ip redirects
  no ipv6 redirects
  no shutdown
  hsrp version 2
  hsrp 1
    ip 192.168.10.1
    priority 120
    preempt
    mac-address 2020.0000.00aa
```

**Custom MAC for HSRP
network to match with VXLAN
GW MAC**

Migration to VXLAN BGP EVPN Fabric

Using Nexus Dashboard High Level Steps

VXLAN-Greenfield

Overview Inventory **Connectivity** Segmentation and security Configuration policies Anomalies Advisories Integrations History

Interfaces Interface groups Links Routing policies Inter-fabric L3 neighbors Endpoints Routes Flows Virtual Infrastructure

Filter by attributes

Interface	Switch	Admin status	Operational status	Configuration	Interface group
☐ mgmt0	border1-vxlan	↑ Up	↑ Up	ok	int_mgmt
☐ Vlan1	border1-vxlan	↓ Down	↓ Down	Administratively down	NA
☐ Loopback0	border1-vxlan	↑ Up	↑ Up	ok	int_fabric_loopback_11_1
☐ Loopback1	border1-vxlan	↑ Up	↑ Up	ok	int_fabric_loopback_11_1

Create vPC PO between VXLAN VTEPs and CE Agg

Actions ^

- Create Interface
- Edit configuration
- Configuration >
- Interface group >
- Maintenance >
- Bulk Actions >
- Delete

On the VXLAN EVPN Fabric - Create back-to-back vPC PO between VXLAN VTEPs and Classic Ethernet Aggregations alongside port-type external and Distributed Anycast Gateway Secondary-BIA for the Proxy ARP function on the VTEPs

Note: This shows examples of sample configurations but for production migration the workflow and exact steps MUST be followed based on the Cisco's config documentation and White paper.

Create Interface

Type*
virtual Port Channel (vPC) ▼

Select a vPC pair*
border2-vxlan---border1-vxlan ▼

vPC ID*
10

Policy*
[int_vpc_trunk_host >](#)

Policy Options

General Parameters Storm Control

Peer-1 Port-Channel ID*
10
Peer-1 VPC port-channel number (Min:1, Max:4096)

Peer-2 Port-Channel ID*
10
Peer-2 VPC port-channel number (Min:1, Max:4096)

☒ **Enable Config Mirroring**
If enabled, Peer-1 config will be copied to Peer-2

Migration to VXLAN BGP EVPN Fabric

Using Nexus Dashboard High Level Steps

Pending Config - VXLAN-Greenfield - border1-vxlan

Pending Config

Side-by-Side Comparison

```
interface port-channel10
  switchport
  switchport mode trunk
  mtu 9216
  vpc 10
  spanning-tree bpduguard disable
  description virtual port-channel to legacy-classic-lan
  storm-control broadcast level 5.00
  storm-control multicast level 5.00
  negotiate auto
  spanning-tree port type normal
  port-type external
  no shutdown
  switchport trunk allowed vlan 10
interface ethernet1/2
  channel-group 10 force mode active
  description virtual port-channel to legacy-classic-lan
  no shutdown
interface ethernet1/3
  channel-group 10 force mode active
  description virtual port-channel to legacy-classic-lan
  no shutdown
```

**vPC PO between
VXLAN VTEPs and CE
Agg**

**VXLAN Anycast GW w/
secondary BIA for the
migration**

```
vlan 10
  vn-segment 1000
  configure terminal
  interface Vlan10
    vrf member corp
    no ip redirects
    no ipv6 redirects
    ip address 192.168.10.1/24 tag 12345
    fabric forwarding mode anycast-gateway
    no shutdown
    ip address 192.168.10.2 secondary use-bia
```

References

Deep dive demo - [Management of Data Center Architectures using NDFC - YouTube](#)

Installation of Nexus Dashboard - <https://www.cisco.com/c/en/us/support/data-center-analytics/nexus-dashboard/products-installation-guides-list.html>

Nexus Dashboard capacity planning tool -
<https://www.cisco.com/c/dam/en/us/td/docs/dcn/tools/nd-sizing/index.html>

NDFC user guide - <https://www.cisco.com/c/en/us/support/cloud-systems-management/prime-data-center-network-manager/products-installation-and-configuration-guides-list.html>

Whitepaper on ECL - <https://www.cisco.com/c/en/us/td/docs/dcn/whitepapers/enhanced-classic-lan-in-cisco-ndfc-1213.html>

Migration from Classic LAN to VXLAN -
<https://www.cisco.com/c/en/us/td/docs/dcn/whitepapers/migrating-classic-ethernet-to-vxlan-bgp-evpn-white-paper.html#CiscoNexusDashboardFabricController>

Conclusion

Key points to remember

- 1** Investment protection for Nexus 7000 and Nexus 9000 for Classic Ethernet Networks. Support for Brownfield and Greenfield.
- 2** Simplified Day-0 and Day-1 configuration provision using Cisco's best practices including FHRP, STP, VPC, IP routing, and more!
- 3** Extended Day-2 support using intuitive Image management, Performance monitoring, and VMM visualization



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