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The bridge to possible

Migrate from your existing network to VXLAN EVPN

Yianni Thallas, CXPM Architect

BRKDCN-2951

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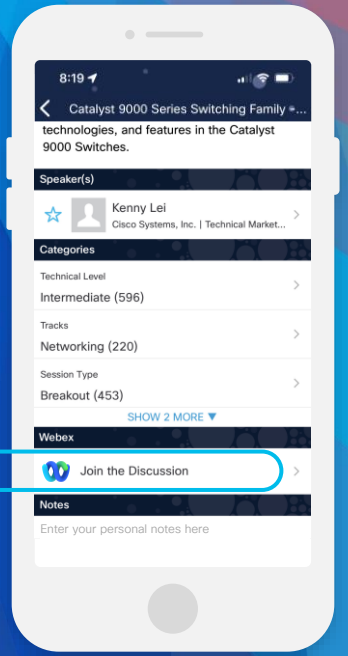

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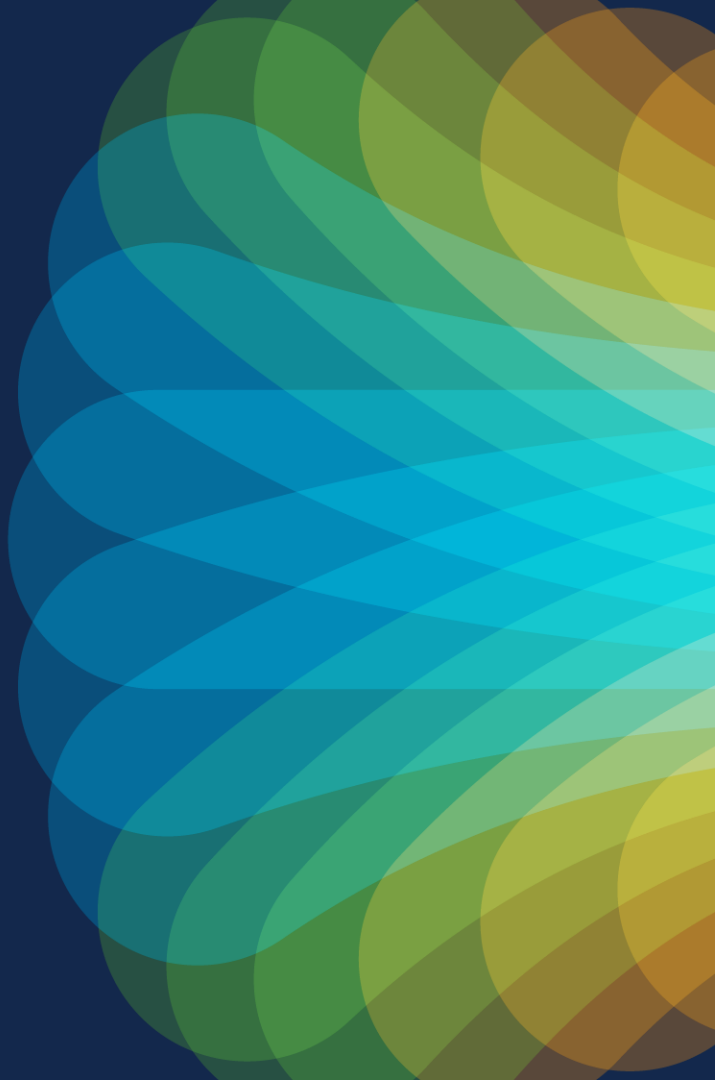
Agenda

- Introduction
- Out with the old
- In with the new
- Old to New
- Migration Walkthrough
- External Connectivity Migration

Introduction



Introduction

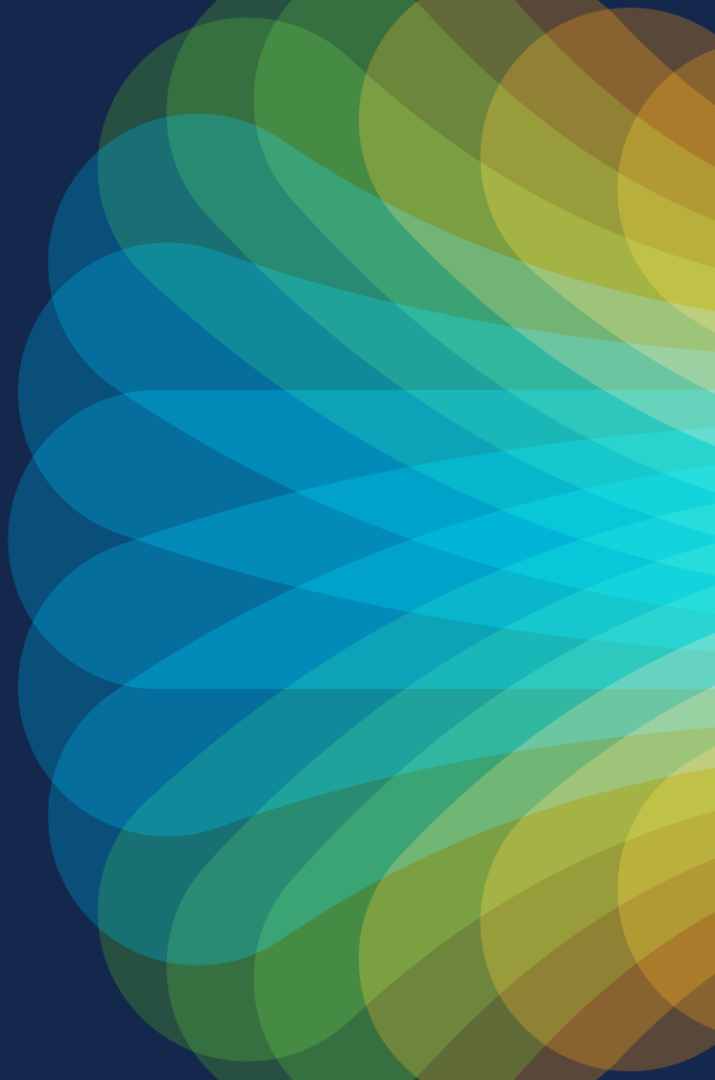
As application requirements change the network needs to change with it. With technologies such as virtualization, edge computing, hybrid clouds, 5G networks, artificial intelligence (AI), and the need for automation, the data center needs to change.

Legacy datacenter designs running classic ethernet/vPC and FabricPath no longer meet the requirements.

Introduction

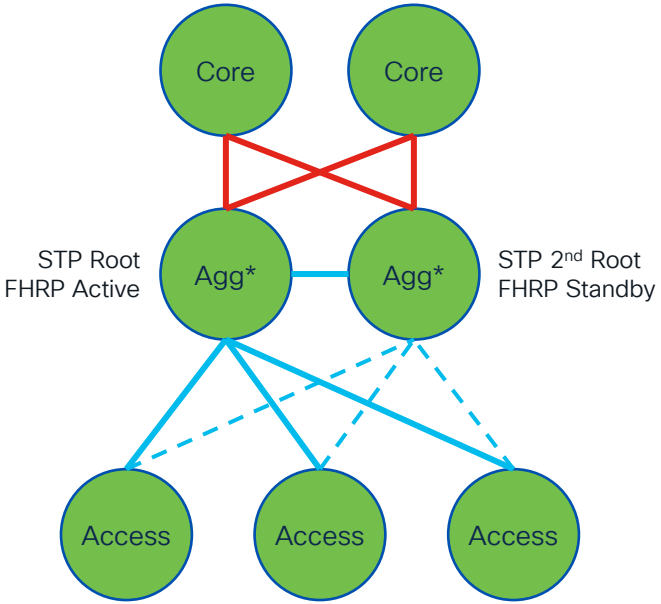
VXLAN EVPN is the de facto technology for NextGen Data Centers. Migrating from legacy DCs running Spanning Tree or FabricPath can be challenging. This session will cover how to migrate from the old to the new.

Out with the old

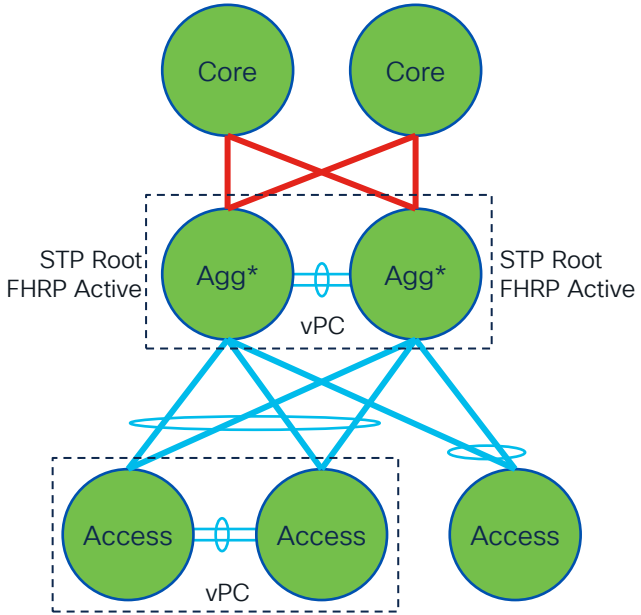


Out with the old

Classic Spanning-Tree

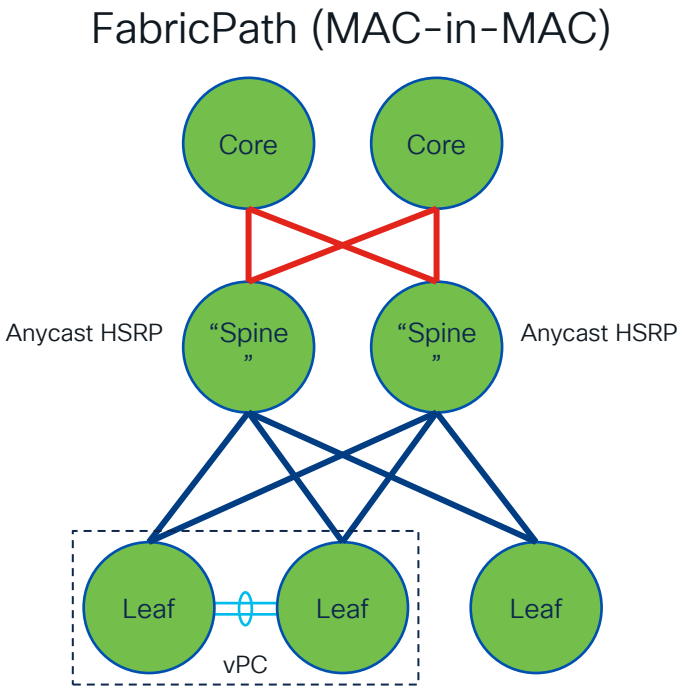


vPC and Spanning-Tree



Agg* = Aggregation

Out with the old



Data Center Network Challenges

Hierarchical Topology

- Scale-Up with Big Centralized Chassis (Agg*)
- STP limits full bandwidth utilization

Hairpining

- Suboptimal performance, traffic forwarding constrained by spanning-tree rules
- Rigid Network Service Placement (L4-L7)
- Limited Endpoint Mobility

Flood&Learn

- Convergence dependent on Single Tree and MAC Flush (TCN)
- Exposed to Large Broadcast Domains (All Access and Agg*)

Agg* = Aggregation

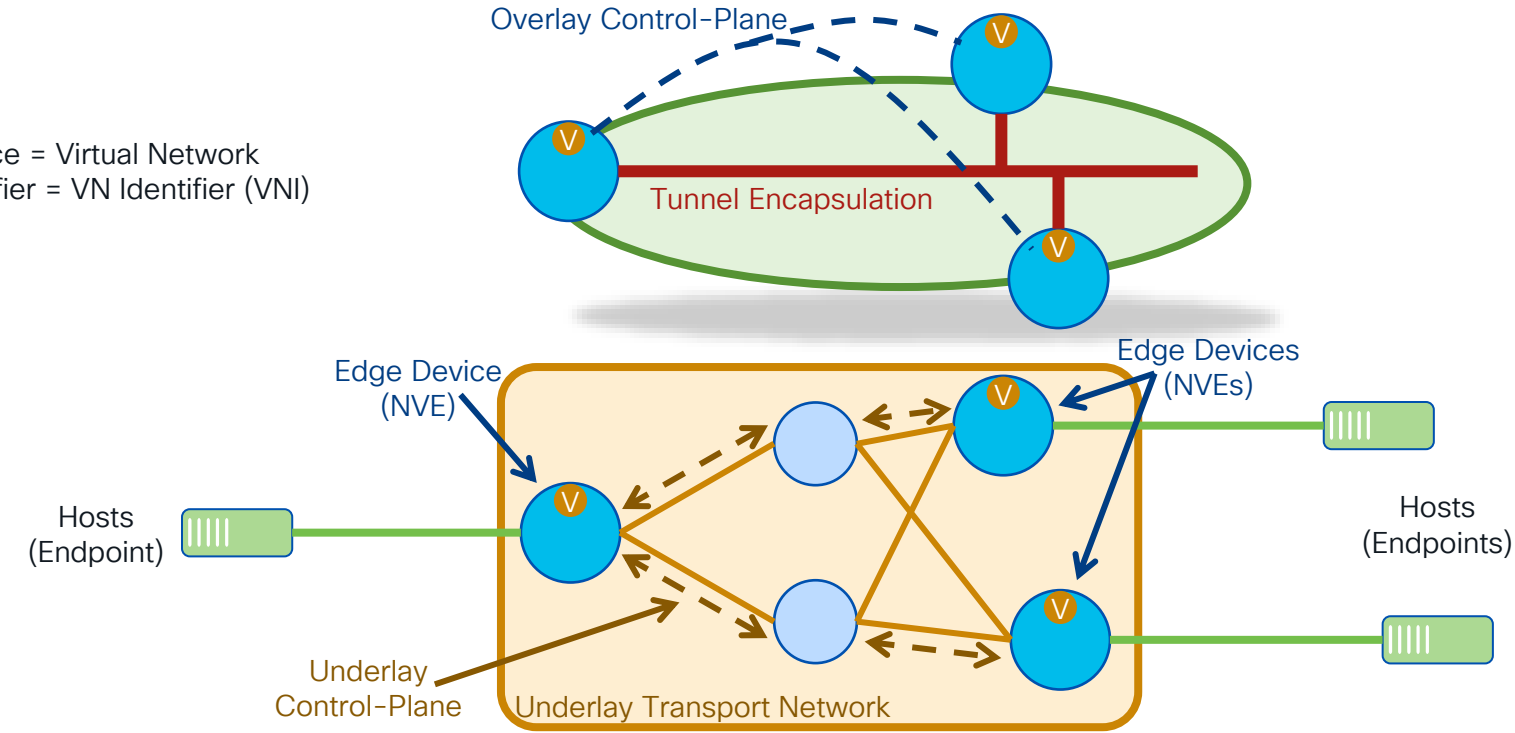
In with the new

What is VXLAN?

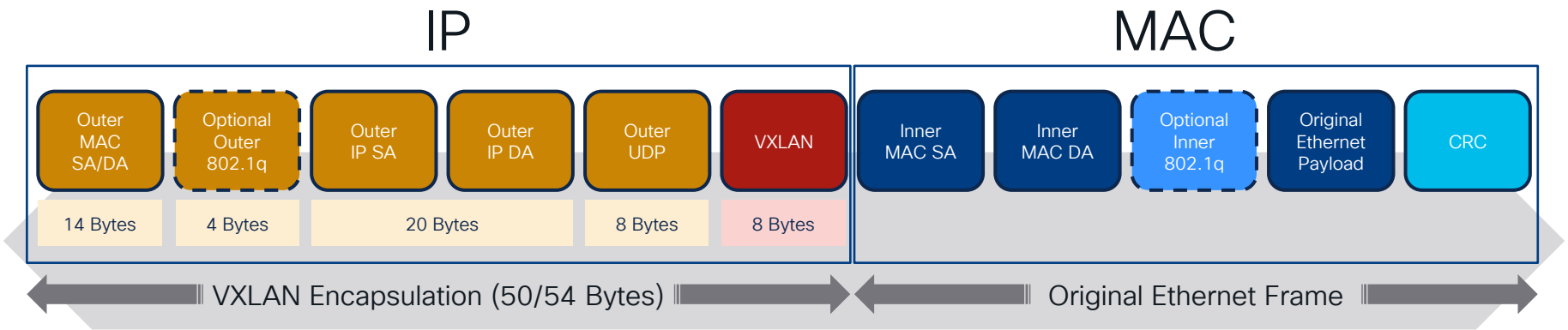
- Standards based Encapsulation
  - RFC 7348
  - MAC-in-IP
- Transport Independent
  - Layer-3 Transport (Underlay)
- Uses UDP-Encapsulation
  - Multipath Capable
  - Uses Per-Flow Entropy
- Flexible Namespace
  - Allows Segmentations

Overlay Taxonomy

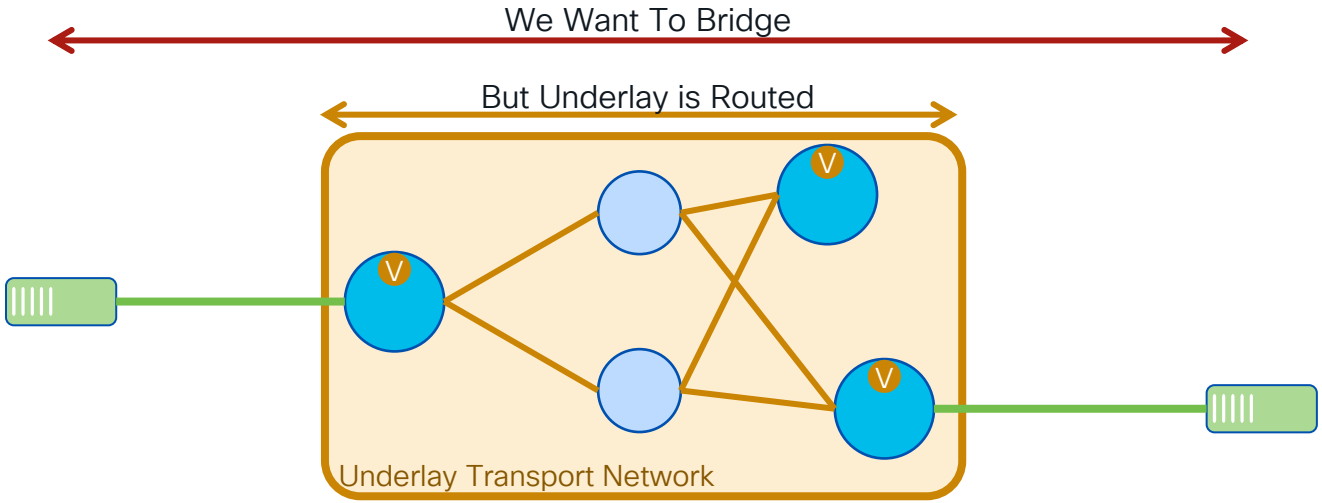
Service = Virtual Network
Identifier = VN Identifier (VNI)



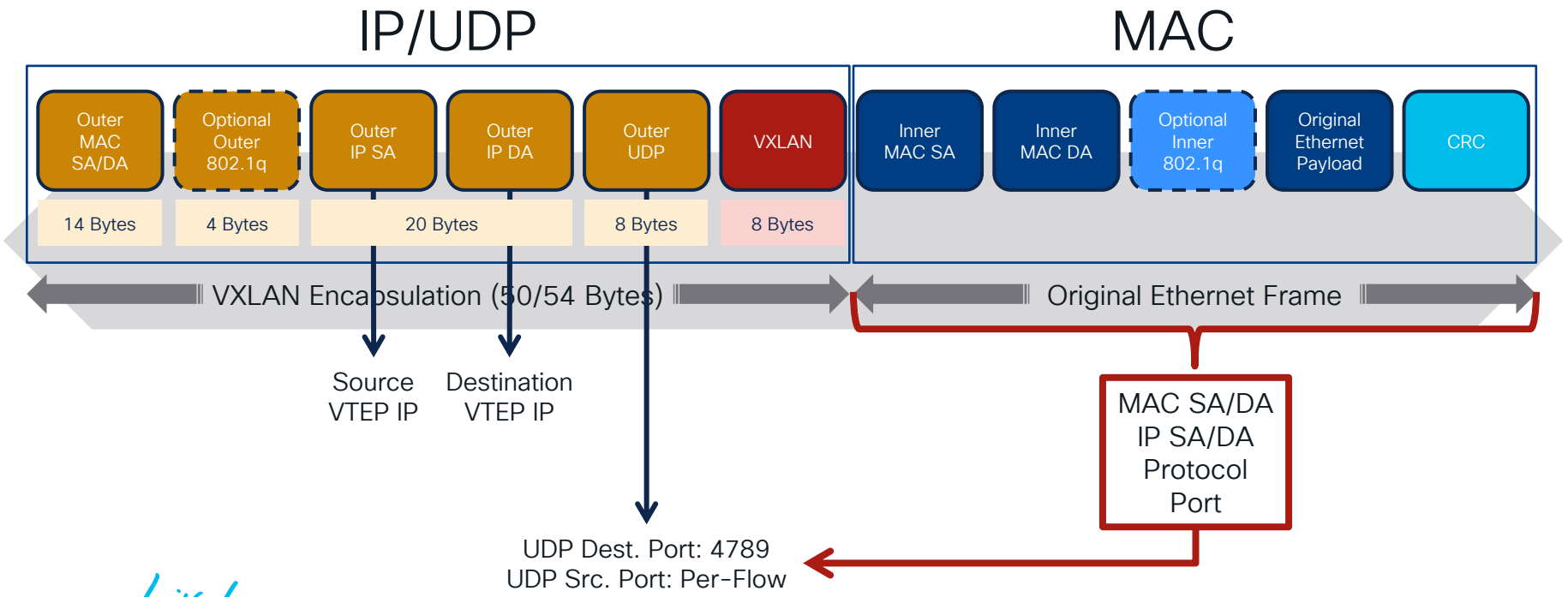
MAC-in-IP Encapsulation



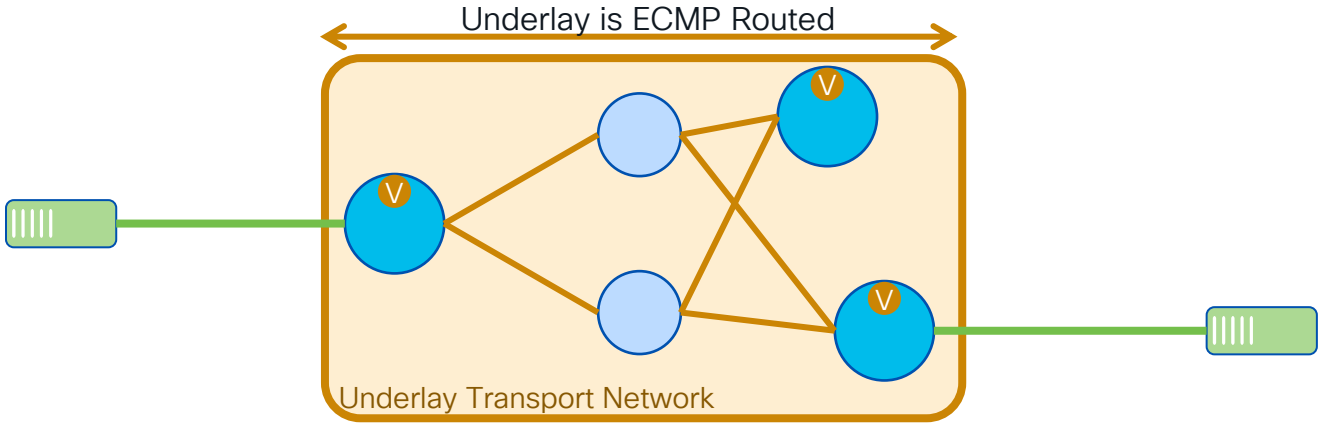
Transport Independence



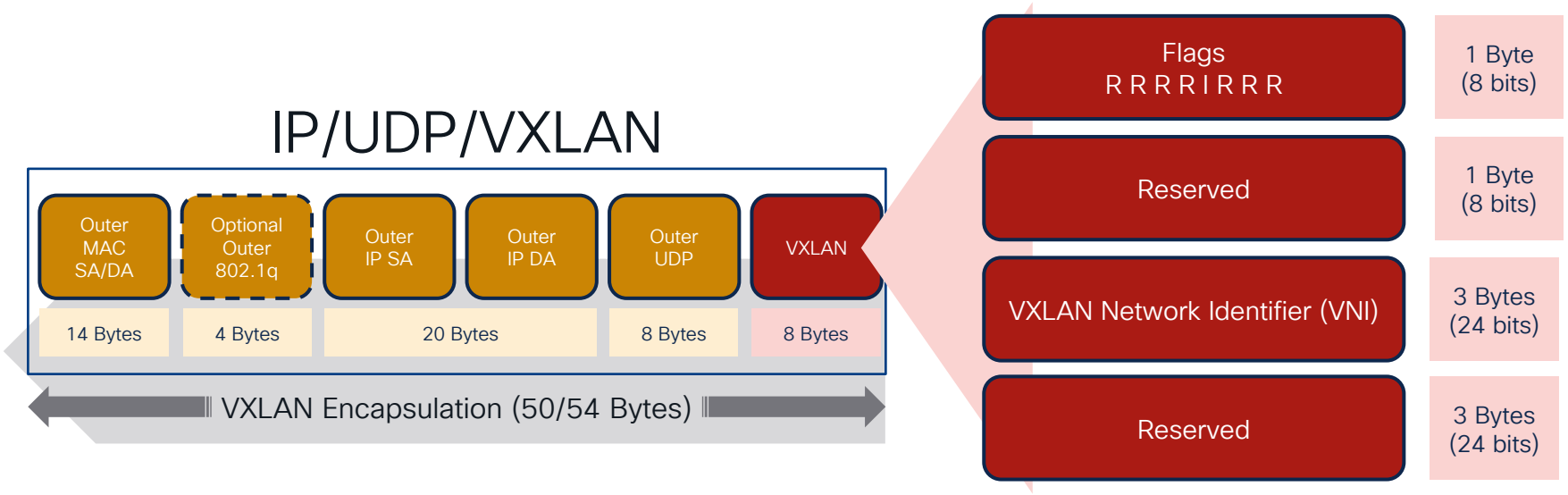
Multipath Capable



Multipath Capable

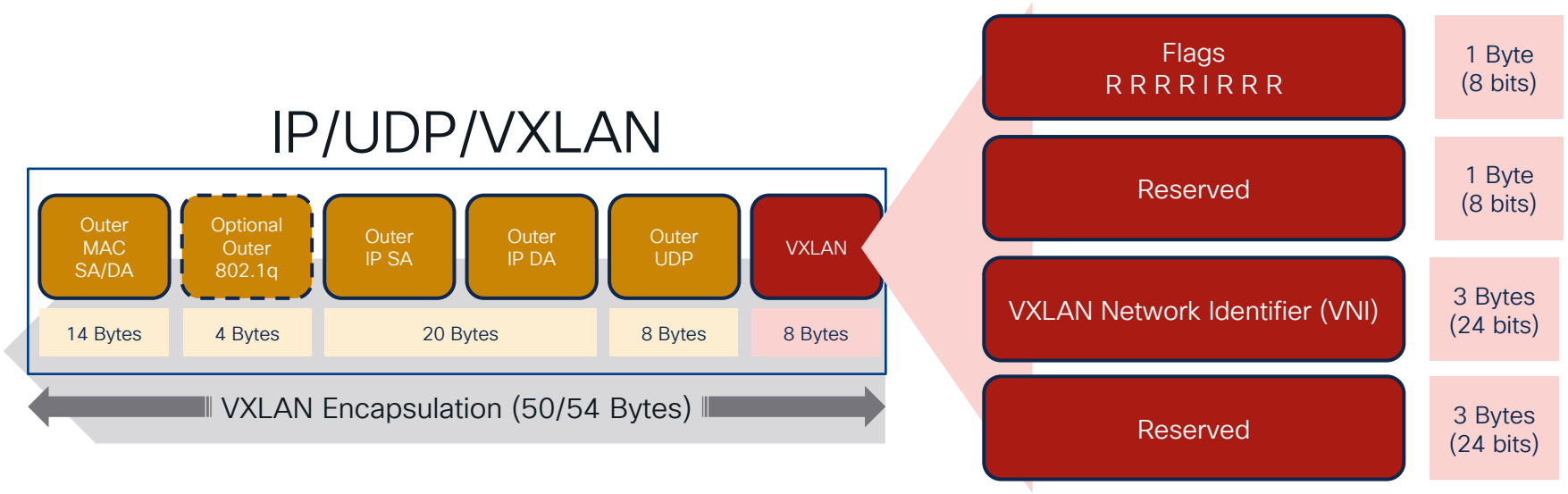


Extended Namespace



- Flags Field: I-flag (set to 1) for valid VNI. Other flags remain as R (set to 0)
- VNI Field: Allows VNI 1-16,777,215 (some implementation only 4096-16,777,215)

Extended Namespace




```
vlan 15
  vn-segment 31234
```

What is EVPN?

- Standards based Control-Plane
  - RFC 8365 (and RFC 7432)
- Uses Multiprotocol BGP
- Uses Various Data-Planes
  - VXLAN (EVPN-Overlay), MPLS, Provider Backbone (PBB)
- Many Use-Cases Covered
  - Bridging, MAC Mobility, First-Hop & Prefix Routing, Multi-Tenancy (VPN)

EVPN Route-Types
BGP EVPN Address-Family

Route-Type 2
MAC/IP Advertisement Route

Mandatory:
MAC Address (/48)
MPLS Label1 (L2VNI)
Route Target for MAC-VRF

Optional:
IP Address (/32 or /128)
MPLS Label2 (L3VNI*)
Route Target for IP-VRF
Router MAC

IP Attributes are learned through ARP/ND

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BGP EVPN Address-Family

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Optional:
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MPLS Label2 (L3VNI*)
Route Target for IP-VRF
Router MAC

IP Attributes are learned through ARP/ND

Route-Type 5
IP Prefix Advertisement

Mandatory:
IP Prefix (Variable Subnet Mask)
MPLS Label (L3VNI)
Route Target for IP-VRF
Router MAC

Optional:
Gateway-IP

IP Attributes are learned through
Redistribution or Routing Protocols

Data Center Network Challenges
Solving the Legacy Methods Challenges

Hierarchical Topology

- Scale-Out
  - Adding Spine for Bandwidth and Redundancy
  - Adding Leaf for Port Capacity
- All Links are used (IP ECMP)

Agg* = Aggregation

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No More Hairpining

- Default Gateway at Every Leaf
  - Distributed Anycast Gateway
- Flexible Network Service Placement (L4-L7)
- Pervasive Subnet and Endpoint Mobility

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No More Hairpining

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- Pervasive Subnet and Endpoint Mobility

Control-Plane Learned

- Active Learning and Distribution with BGP EVPN
- Reduces the Broadcast Domain by configuring VLANs where Needed

Agg* = Aggregation

Migrating from Old to New

Old to New

Migration steps

1. Deploy VXLAN EVPN environment
2. Integrate legacy data network infrastructure and the new VXLAN fabric. L2 and L3 integration is needed for workload migration.
3. Migrate workloads between legacy networks and new fabric. During workload migration communication between migrated and non-migrated devices uses the Layer 2 and Layer 3 connections that were established in step 2.

Old to New

FHRP placement

Newly deployed VLANs and IP subnets default gateway should be placed in the new VXLAN EVPN fabric.

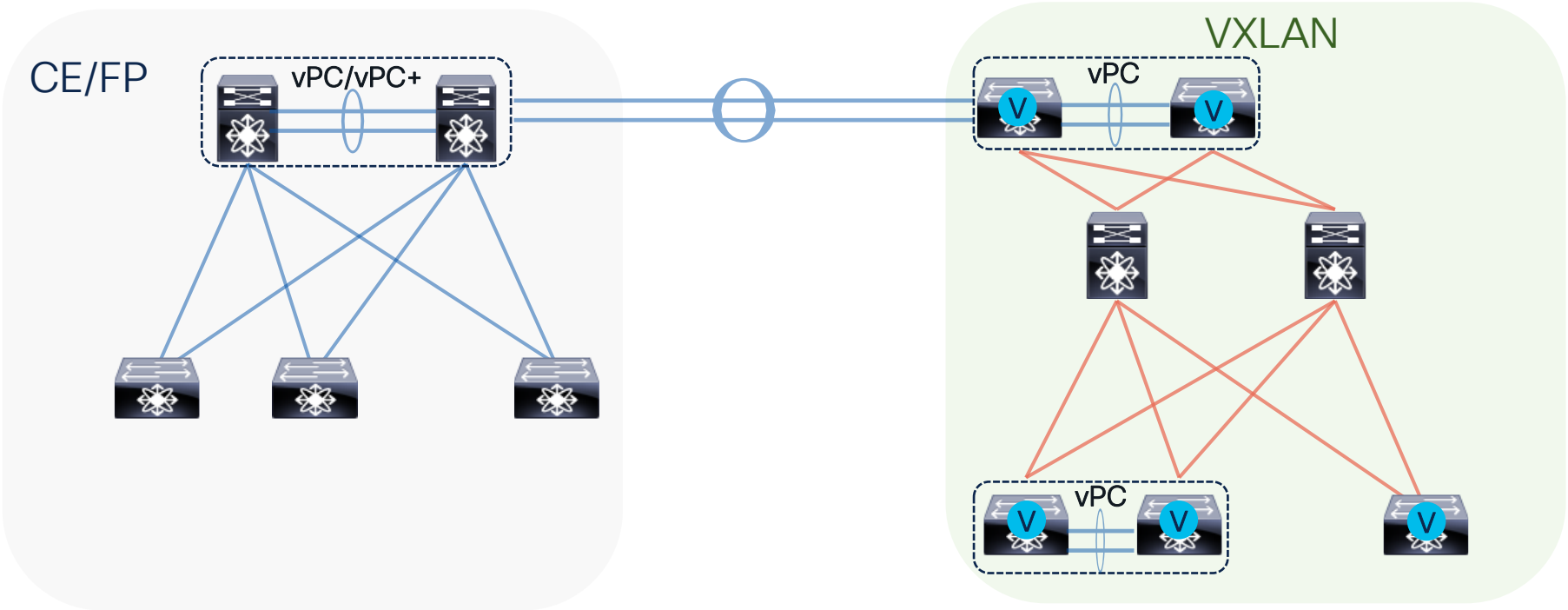
For VLANs that need to be migrated to the new fabric the FHRP migration can be chosen based on the following criteria:

- *Default Gateway Coexistence of HSRP and Anycast Gateway
- When most of the workloads are migrated
- Premigration of the first workload
- Premigration of the last workload

*NX-OS 10.2(3)

Old to New

Layer 2 Connection



Old to New

Layer 2 Connection

- Double-sided VPC should be used on a pair of nodes between the FP/CE and VXLAN network. This allows for a loop free topology.
- In the VXLAN fabric any pair of VPC devices with a VTEP (Virtual Tunnel Endpoint) can provide the connectivity.
- In the FP/CE network the interconnection should be connected at the Layer 2 – Layer 3 demarcation point

Old to New

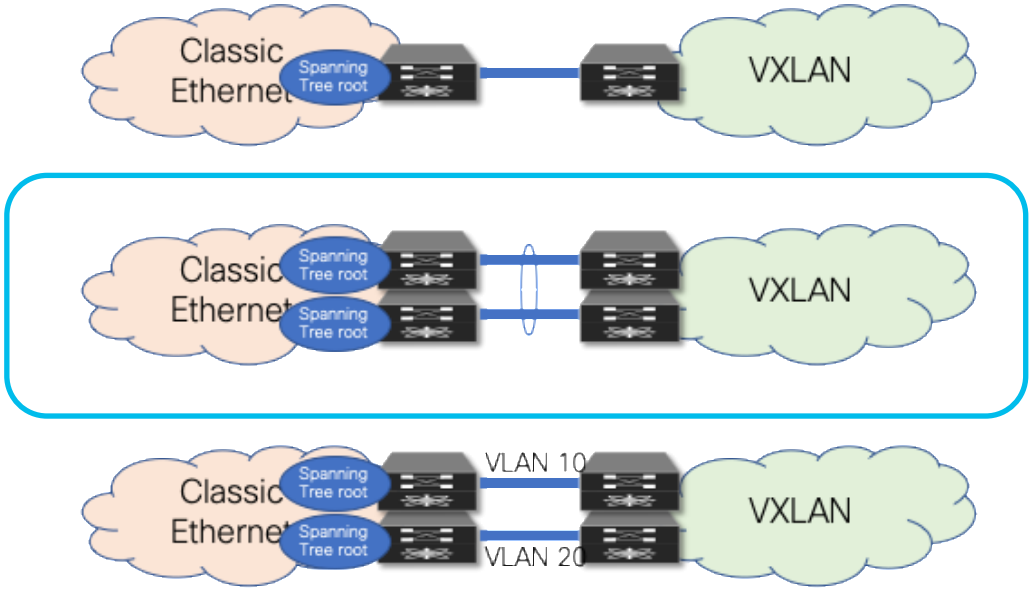
Layer 2 Connection – STP considerations

- VXLAN does not forward BPDUs, nor does it block traffic on a tunnel. Possibility for L2 loop if proper L2 design considerations are not taken.
- On both classic ethernet and FabricPath the root should be on the L2 interconnect switches. The VXLAN border VTEPs should have their root ports towards the FP/CE network.
- It is recommended to have a single logical link for efficient bandwidth utilization or physical L2 connection between the two networks
- Single active connection in both use-cases can be achieved using VPC or VPC+ for FabricPath networks, or manual VLAN distribution

Old to New

Layer 2 Connection – STP considerations
STP loop-free

Cisco Recommended



Old to New

Layer 2 Connection – VLAN Mapping 1:1

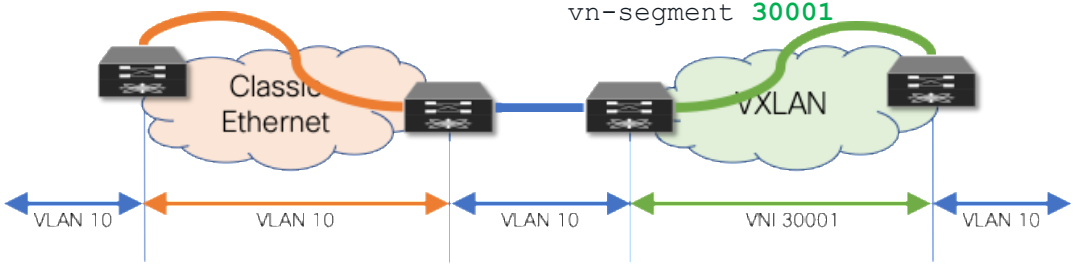
- VLAN in FP/CE and in VXLAN is consistent
- VLAN10 is used up to ingress border, which is mapped to a VNI.
- Egress VTEP is mapped to same original VLAN

VLAN mapping–Ingress VXLAN node

```
vlan 10
  vn-segment 30001
```

VLAN mapping–Egress VXLAN node

```
vlan 10
  vn-segment 30001
```



VLAN mapping–Ingress Classic Ethernet node

```
*vlan 10
```

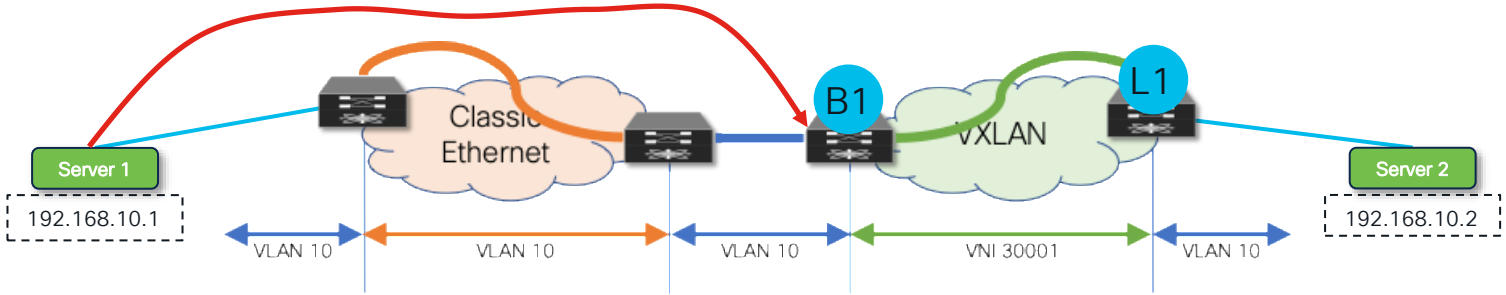
VLAN mapping–Egress Classic Ethernet node

```
*vlan 10
```

*mode fabricpath for FP

Old to New

Layer 2 Connection – VLAN Mapping 1:1

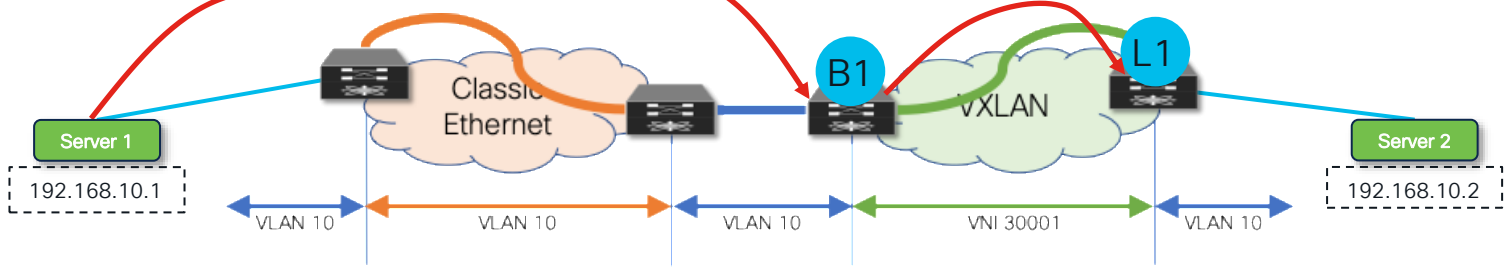


SMAC	DMAC	VLAN	SIP	DIP	Payload
0003.0000.1001	0003.0000.1002	10	192.168.10.1	192.168.10.2	

Old to New

Layer 2 Connection – VLAN Mapping 1:1

SIP	DIP	VNI	SMAC	DMAC	SIP	DIP	Payload
B1-IP	L1-IP	30001	0003.0000.1001	0003.0000.1002	192.168.10.1	192.168.10.2	



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Old to New

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SIP	DIP	VNI	SMAC	DMAC	SIP	DIP	Payload
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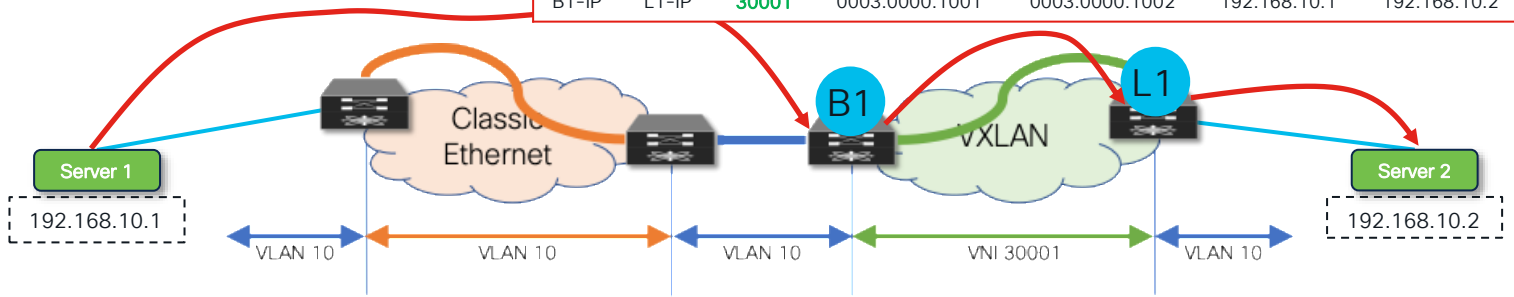

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SMAC	DMAC	VLAN	SIP	DIP	Payload
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Old to New

Layer 2 Connection – Mapping between different VLANs

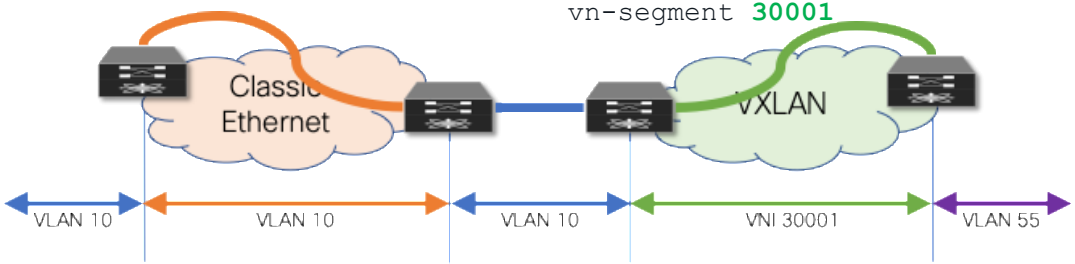
- VLAN in FP/CE and in VXLAN is consistent
- VLAN10 is used up to ingress border, which is mapped to a VNI.
- Egress VTEP is mapped to different VLAN

VLAN mapping–Ingress VXLAN node

```
vlan 10
  vn-segment 30001
```

VLAN mapping–Egress VXLAN node

```
vlan 55
  vn-segment 30001
```



VLAN mapping–Ingress Classic Ethernet node

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*vlan 10
```

VLAN mapping–Egress Classic Ethernet node

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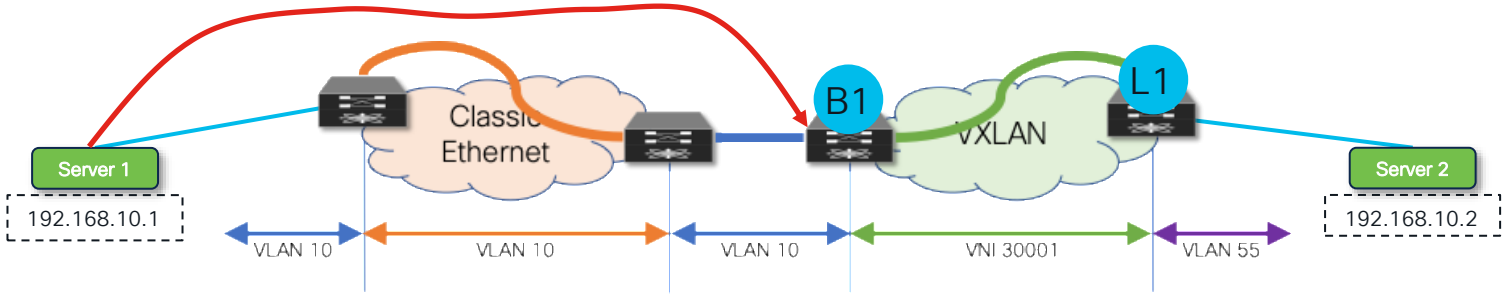
```

*mode fabricpath for FP

Old to New

Layer 2 Connection – Mapping between different VLANs



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Old to New

Layer 2 Connection – Mapping between different VLANs

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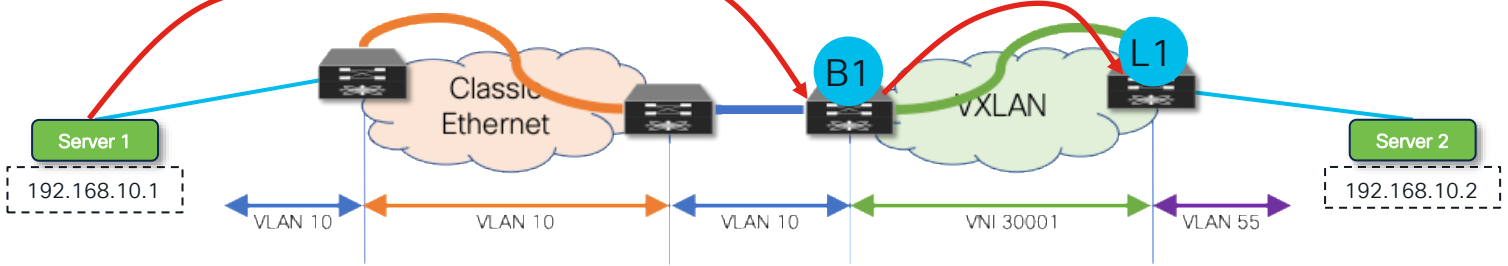

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Old to New

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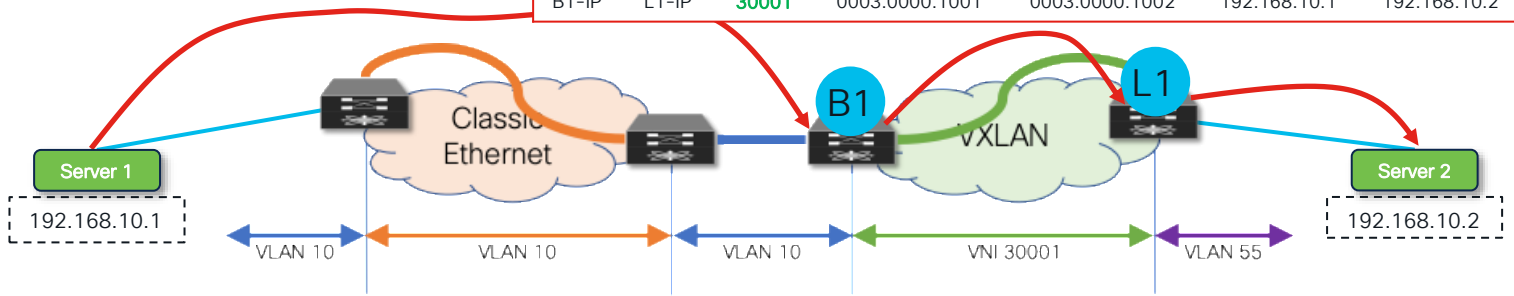

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SMAC	DMAC	VLAN	SIP	DIP	Payload
0003.0000.1001	0003.0000.1002	55	192.168.10.1	192.168.10.2	

Old to New

Layer 2 Connection – Flexible VLAN mapping with port-VLAN translation

- Allows VLAN translation from FP/CE
- VLAN10 is used up to ingress border, which is mapped to different VLAN then transported through VXLAN with VNI
- Egress VTEP is mapped to different VLAN
- Mapping of VLANs at various stages can be operationally complex

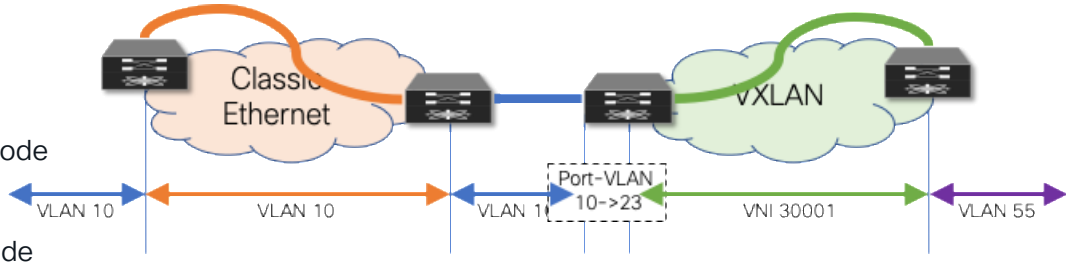
VLAN mapping–Ingress VXLAN node

```
vlan 23
  vn-segment 30001

interface port-channel 10
  switchport vlan mapping enable
  switchport vlan mapping 10 23
  switchport trunk allowed vlan 23
```

VLAN mapping–Egress VXLAN node

```
vlan 55
  vn-segment 30001
```



VLAN mapping–Ingress Classic Ethernet node

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*vlan 10
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VLAN mapping–Egress Classic Ethernet node

```
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*mode fabricpath for FP

Old to New

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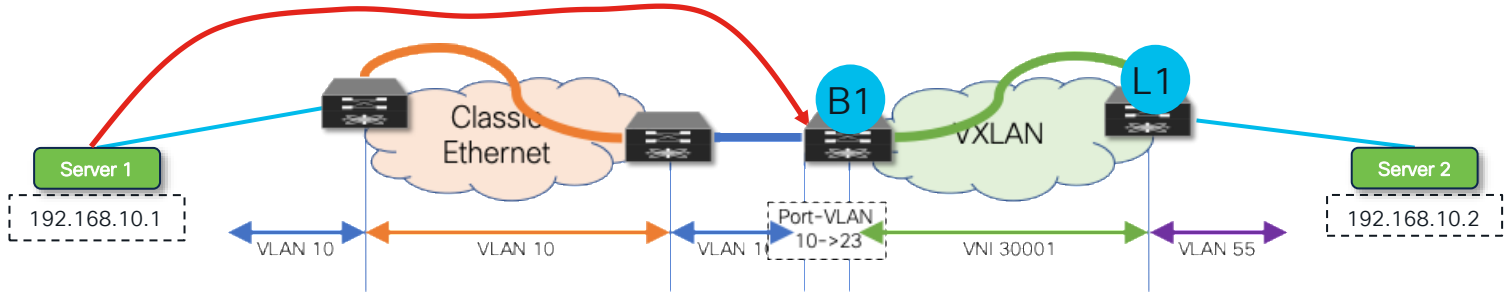

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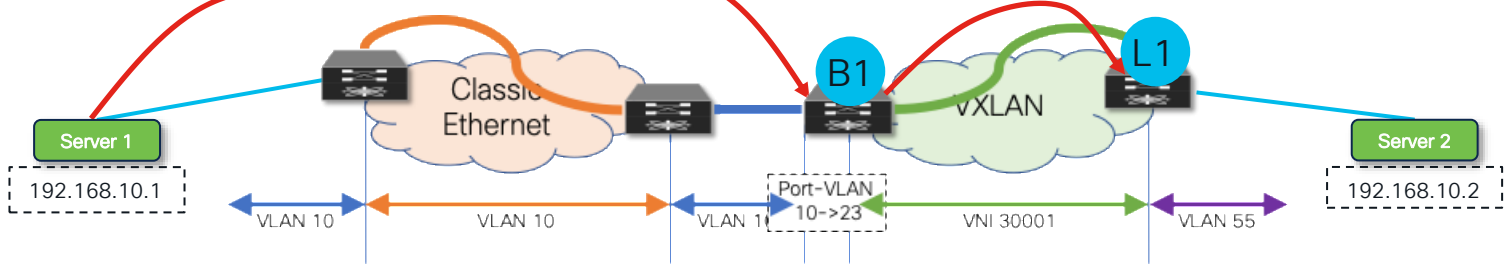

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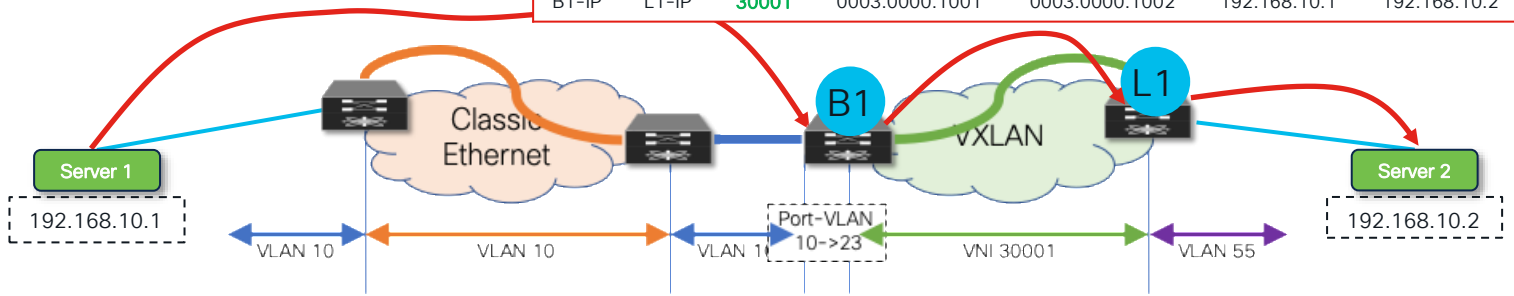


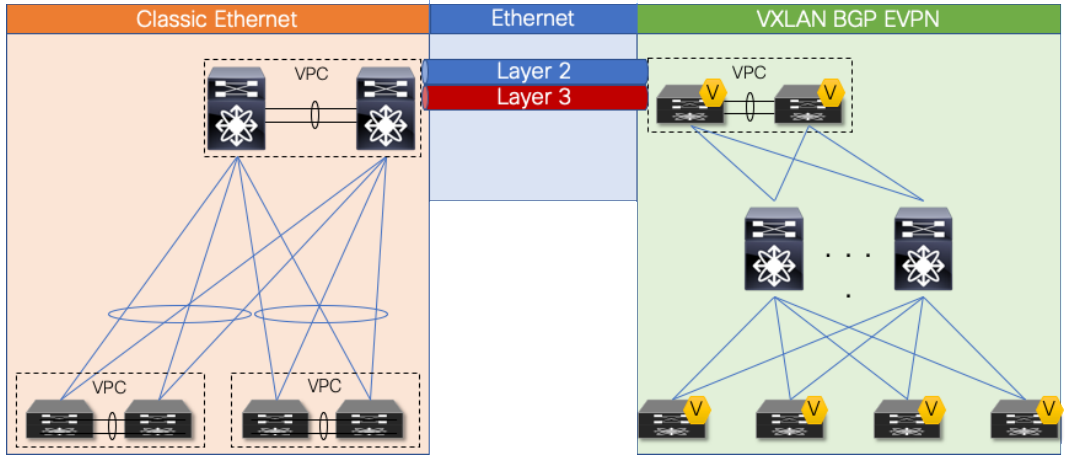
SMAC	DMAC	VLAN	SIP	DIP	Payload
0003.0000.1001	0003.0000.1002	10	192.168.10.1	192.168.10.2	

SMAC	DMAC	VLAN	SIP	DIP	Payload
0003.0000.1001	0003.0000.1002	55	192.168.10.1	192.168.10.2	

Old to New

Layer 3 Connection – Classic Ethernet

- Layer 3 connectivity between old and new is needed
- Allows communication between endpoints at various migration stages
- Allows communication of migrated endpoints to old external core
- In CE network this should be done at the aggregation layer where the L2/L3 demarcation exists
- In the VXLAN network this could be any switch that provides a VTEP



Old to New

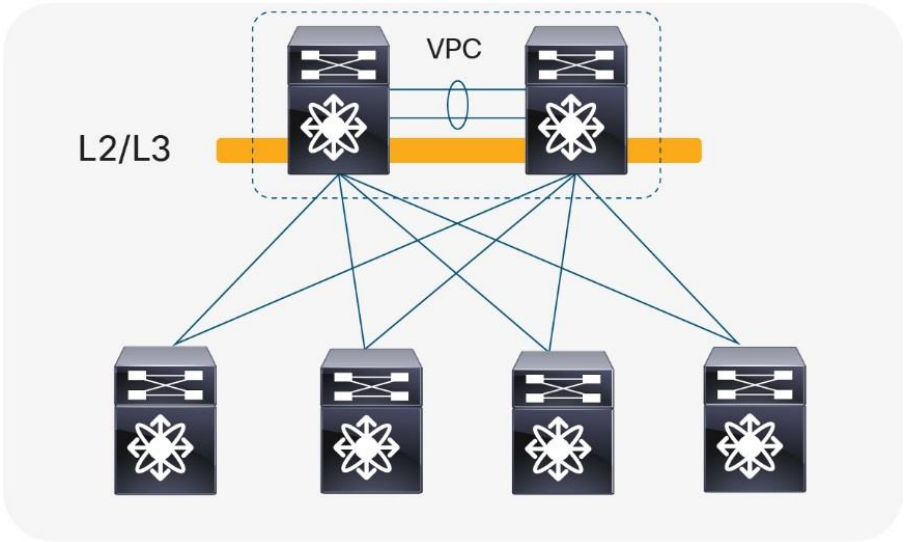
Layer 3 Connection – FabricPath

- Access-Aggregation using VPC active/active with HSRP
- Leaf-and-Spine with active/active HSRP at a leaf pair using VPC
- Leaf-and-Spine with anycast HSRP at spine

Old to New

Layer 3 Connection – FabricPath Access-Aggregation using VPC

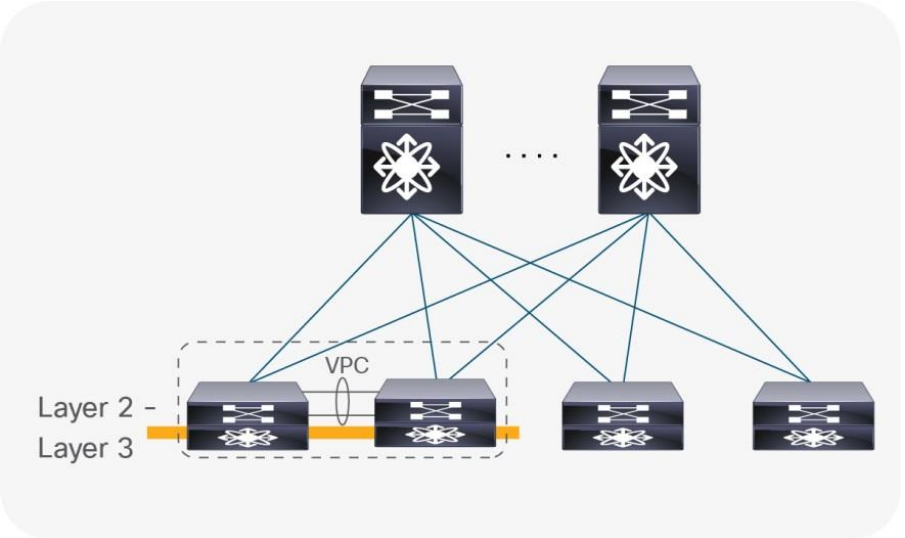
- Similar to VPC aggregation with active/active HSRP, difference is FP encapsulation
- L2/L3 interconnect will be placed at the aggregation layer



Old to New

Layer 3 Connection – FabricPath
Leaf-and-Spine with First-Hop Gateway at Leaf

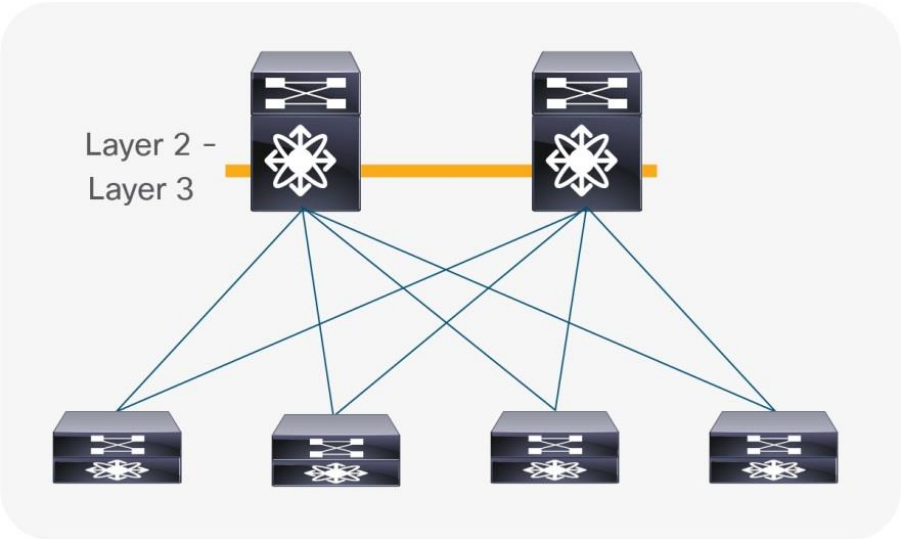
- Similar to access-aggregation with active/active HSRP
- FHRP is at the leaf layer
- External connectivity is also hosted at leaf (border leaf)
- Spine layer is free of endpoints and external connectivity
- L2/L3 interconnect will be placed at the leaf layer



Old to New

Layer 3 Connection – FabricPath
Leaf-and-Spine with First-Hop Gateway at Leaf

- Anycast HSRP at the spine layer
- In FabricPath up to four all-active nodes can exist
- L3 interconnect must be at the spine where the FHRP is
- L2 interconnect can be anywhere with VPC+



Old to New

Layer 3 Connection – Routing Protocol Considerations

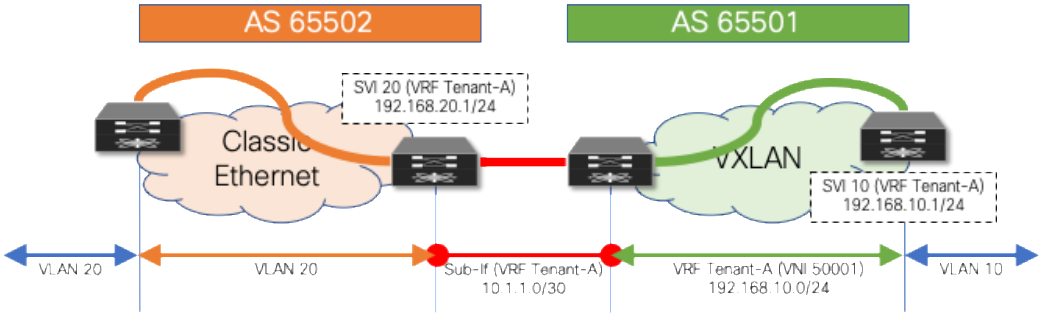
- VXLAN fabric already runs BGP
- Routing domain separation
- Routing policy capability
- VRF awareness
- Scalability

- Other protocols such as IGPs introduce complexity needing mutual redistribution
- Policy enforcement is lacking
- No scalability

Old to New

Layer 3 Connection – VRF Mapping 1:1

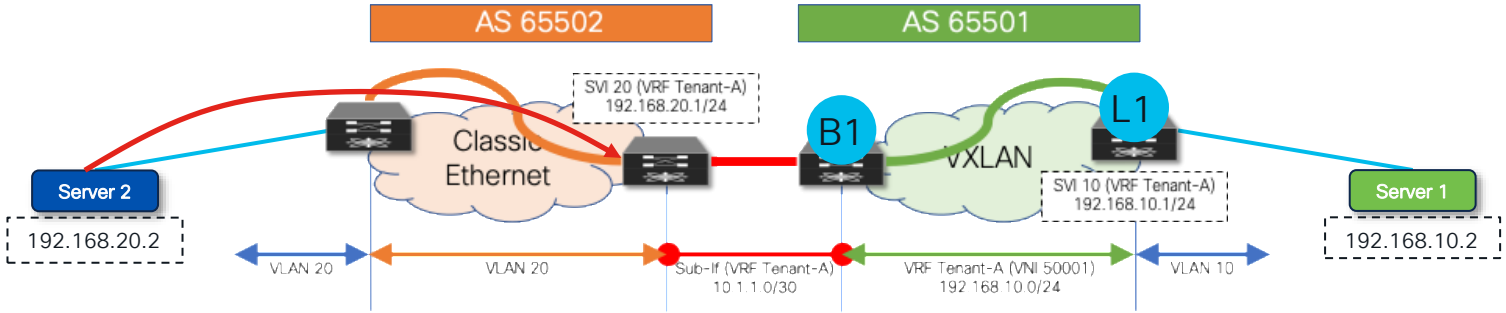
- VRFs from CE/FP are mapped to same VRF in the VXLAN fabric
- VRF-lite used between the fabrics
- Per-vrf eBGP peering using subinterfaces
- Peering is done between CE/FP L2/L3 demarcation and VXLAN border device



Old to New

Layer 3 Connection – VRF Mapping 1:1
Packet Walk

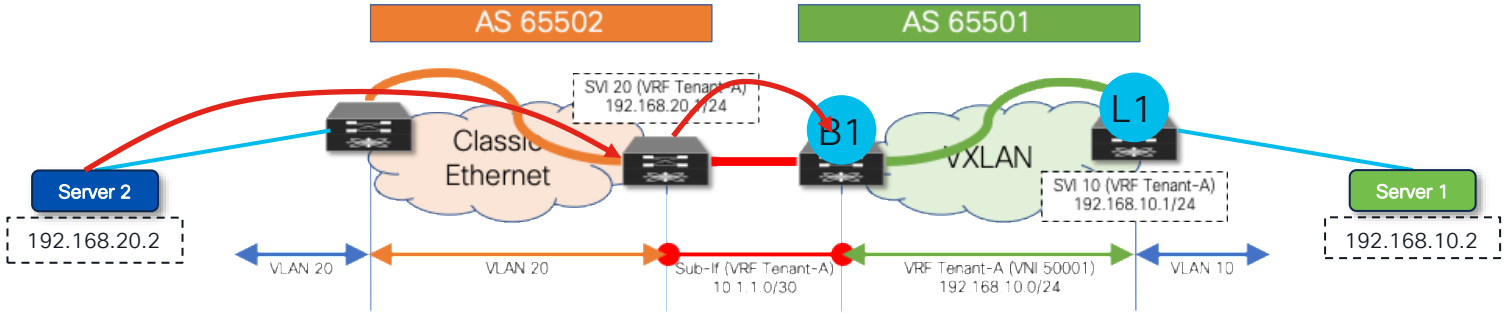
SMAC	DMAC	VLAN	SIP	DIP	Payload
0003.0000.1001	HSRP VIP	20	192.168.20.2	192.168.10.2	



Old to New

Layer 3 Connection – VRF Mapping 1:1
Packet Walk

SMAC	DMAC	VLAN	SIP	DIP	Payload
0003.0000.1001	HSRP VIP	20	192.168.20.2	192.168.10.2	



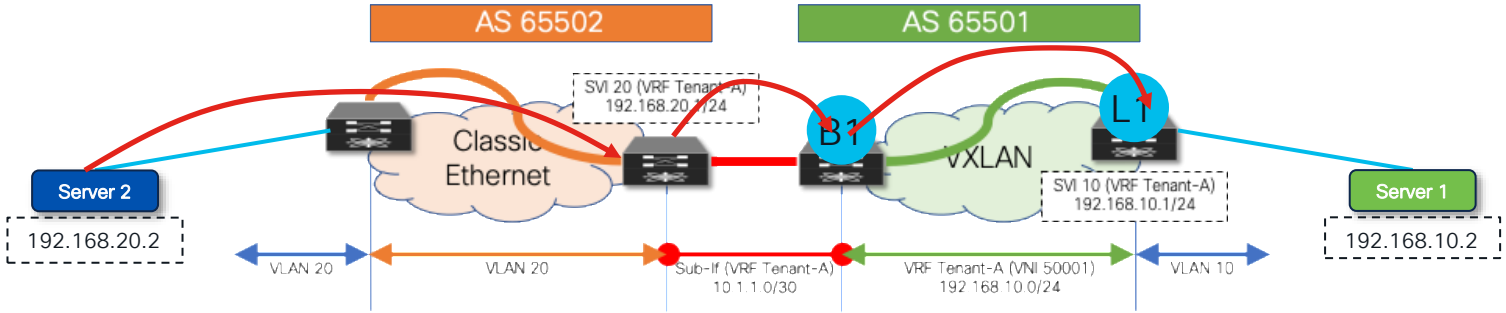
SMAC	DMAC	VLAN	SIP	DIP	Payload
P2P MAC	P2P MAC	20	192.168.20.2	192.168.10.2	

Old to New

Layer 3 Connection – VRF Mapping 1:1
Packet Walk

SIP	DIP	VNI	SMAC	DMAC	SIP	DIP	Payload
B1-IP	L1-IP	50001	B1 RMAC	L1 RMAC	192.168.20.2	192.168.10.2	

SMAC	DMAC	VLAN	SIP	DIP	Payload
0003.0000.1001	HSRP VIP	20	192.168.20.2	192.168.10.2	



SMAC	DMAC	VLAN	SIP	DIP	Payload
P2P MAC	P2P MAC	20	192.168.20.2	192.168.10.2	

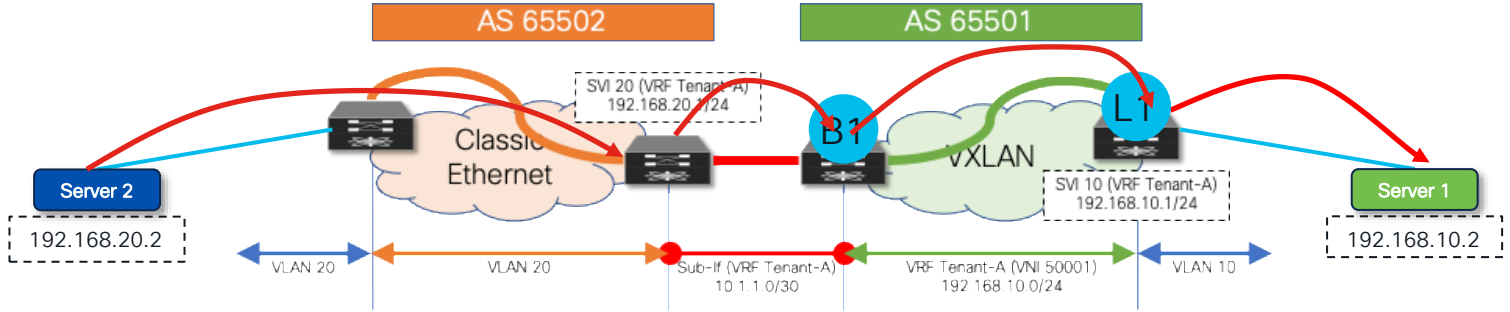
Old to New

Layer 3 Connection – VRF Mapping 1:1
Packet Walk

SIP	DIP	VNI	SMAC	DMAC	SIP	DIP	Payload
B1-IP	L1-IP	50001	B1 RMAC	L1 RMAC	192.168.20.2	192.168.10.2	

SMAC	DMAC	VLAN	SIP	DIP	Payload
0003.0000.1001	HSRP VIP	20	192.168.20.2	192.168.10.2	

SMAC	DMAC	VLAN	SIP	DIP	Payload
DAG MAC	0003.0000.1002	10	192.168.20.2	192.168.10.2	

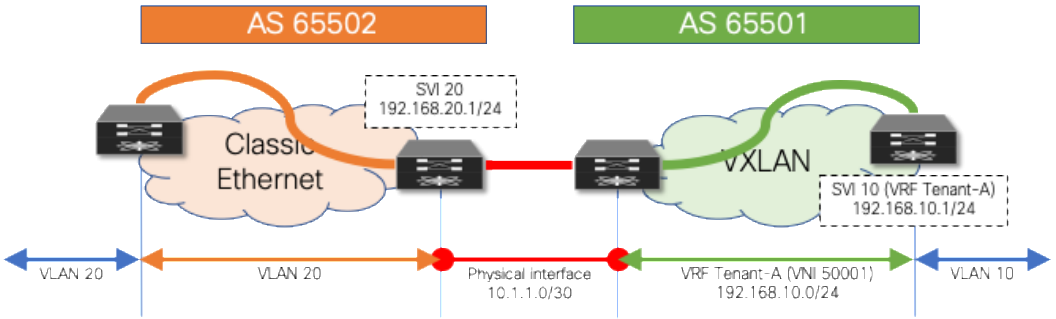


SMAC	DMAC	VLAN	SIP	DIP	Payload
P2P MAC	P2P MAC	20	192.168.20.2	192.168.10.2	

Old to New

Layer 3 Connection – Mapping from default VRF

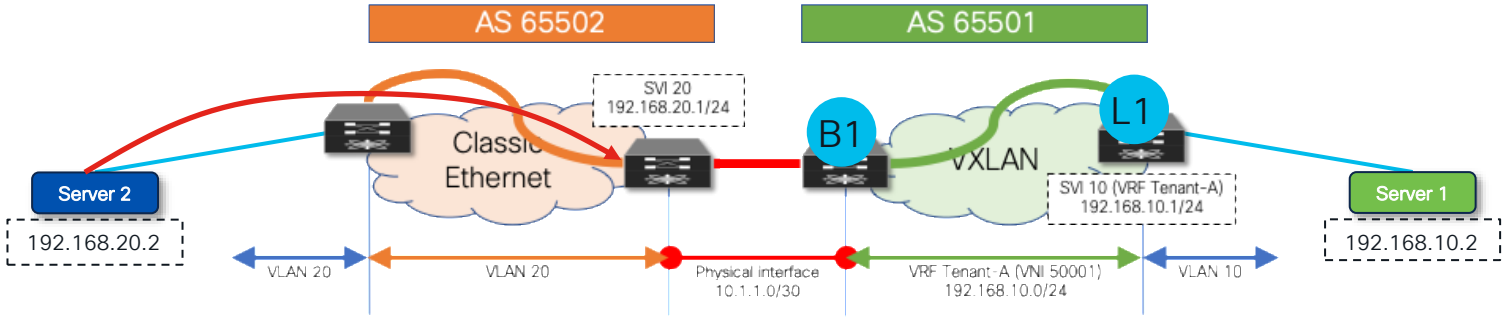
- Default VRF from CE/FP is mapped to different VRF in the VXLAN fabric
- VRF-lite used between the fabrics
- Per-vrf eBGP peering on VXLAN network and default VRF on CE/FP network using physical or subinterfaces
- Peering is done between CE/FP L2/L3 demarcation and VXLAN border device



Old to New

Layer 3 Connection – Mapping from default VRF Packet Walk

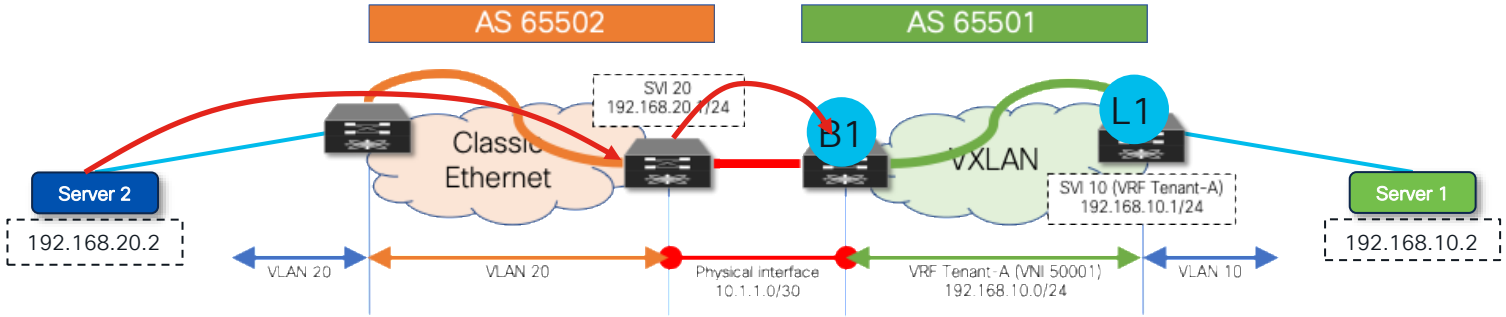
SMAC	DMAC	VLAN	SIP	DIP	Payload
0003.0000.1001	HSRP VIP	20	192.168.20.2	192.168.10.2	



Old to New

Layer 3 Connection – Mapping from default VRF Packet Walk

SMAC	DMAC	VLAN	SIP	DIP	Payload
0003.0000.1001	HSRP VIP	20	192.168.20.2	192.168.10.2	



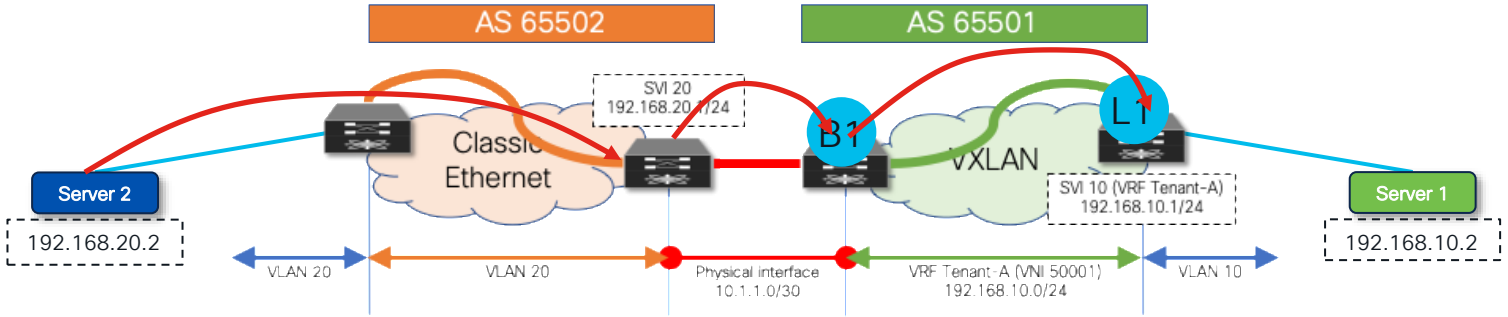
SMAC	DMAC	SIP	DIP	Payload
P2P MAC	P2P MAC	192.168.20.2	192.168.10.2	

Old to New

Layer 3 Connection – Mapping from default VRF Packet Walk

SIP	DIP	VNI	SMAC	DMAC	SIP	DIP	Payload
B1-IP	L1-IP	50001	B1 RMAC	L1 RMAC	192.168.20.2	192.168.10.2	

SMAC	DMAC	VLAN	SIP	DIP	Payload
0003.0000.1001	HSRP VIP	20	192.168.20.2	192.168.10.2	



SMAC	DMAC	SIP	DIP	Payload
P2P MAC	P2P MAC	192.168.20.2	192.168.10.2	

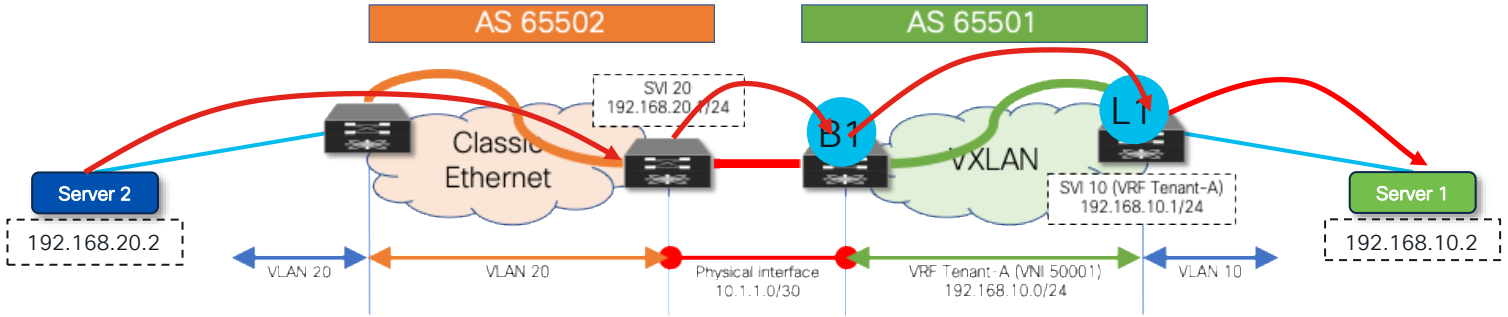
Old to New

Layer 3 Connection – Mapping from default VRF Packet Walk

SIP	DIP	VNI	SMAC	DMAC	SIP	DIP	Payload
B1-IP	L1-IP	50001	B1 RMAC	L1 RMAC	192.168.10.1	192.168.10.2	

SMAC	DMAC	VLAN	SIP	DIP	Payload
0003.0000.1001	HSRP VIP	20	192.168.20.1	192.168.10.2	

SMAC	DMAC	VLAN	SIP	DIP	Payload
DAG MAC	0003.0000.1002	10	192.168.20.2	192.168.10.2	

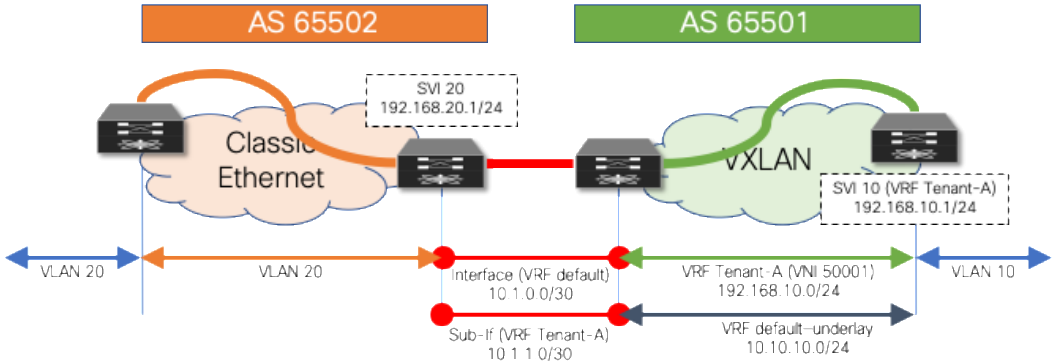


SMAC	DMAC	VLAN	SIP	DIP	Payload
P2P MAC	P2P MAC	20	192.168.20.1	192.168.10.2	

Old to New

Layer 3 Connection – VXLAN EVPN underlay to CE/FP

- If VXLAN underlay network needs to be reachable from CE network extra eBGP peering is needed
- Per-VRF and global VRF eBGP peering using subinterfaces or physical interfaces
- Peering is done between CE/FP L2/L3 demarcation and VXLAN border device



Old to New

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
- 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

Old to New

First Hop Gateway Premigration Steps

- Endpoints typically learn the gateway MAC dynamically using ARP
- 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

- Endpoints in CE/FP store the HSRP IP-to-MAC binding in their ARP cache
- Eventually the MAC needs to be aligned to use the global DAG MAC to help make migration as seamless as possible

Old to New

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
```

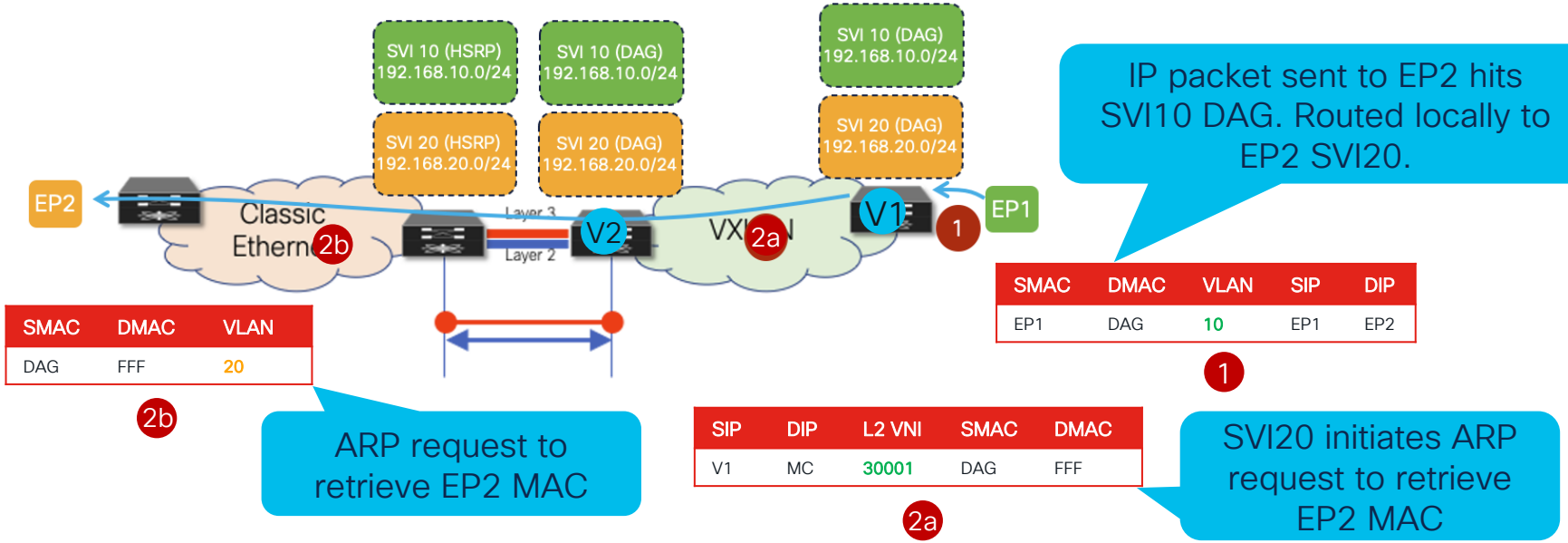
HSRP VMAC configuration on Aggregation

```
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

Old to New

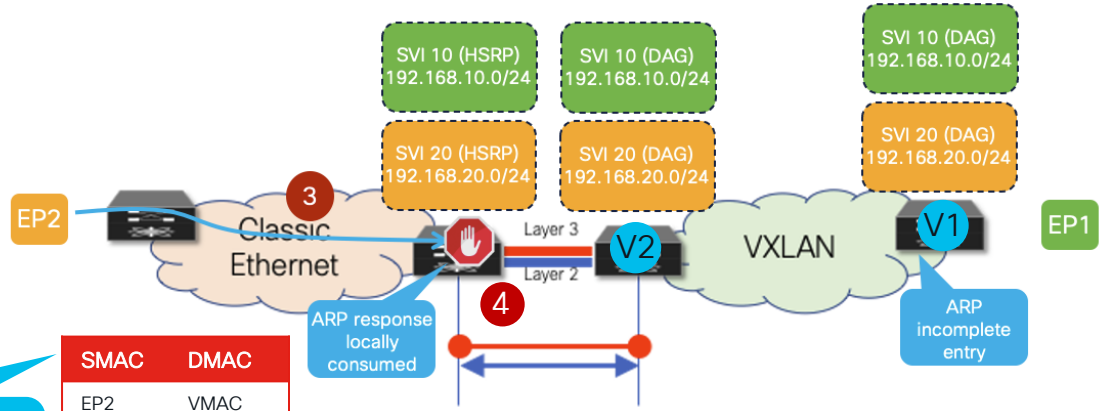
Default Gateway Coexistence of HSRP and Anycast Gateway - 10.2(3)
What's the problem without it?



Note: DAG=SVI/HSRP=VMAC

Old to New

Default Gateway Coexistence of HSRP and Anycast Gateway - 10.2(3)
What's the problem without it?

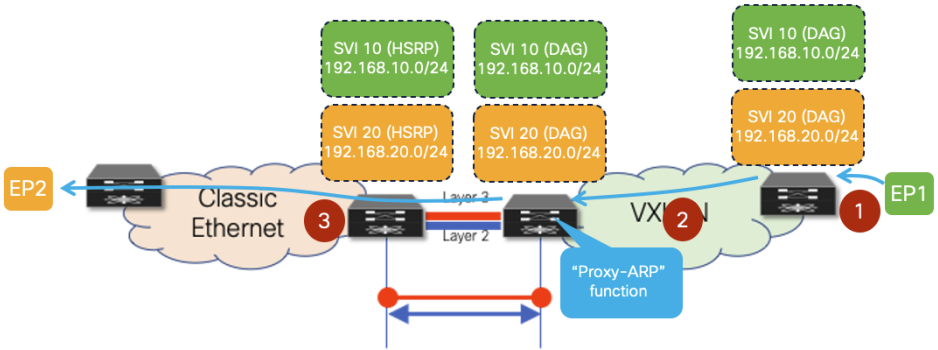


Note: DAG=SVI/HSRP=VMAC

Old to New

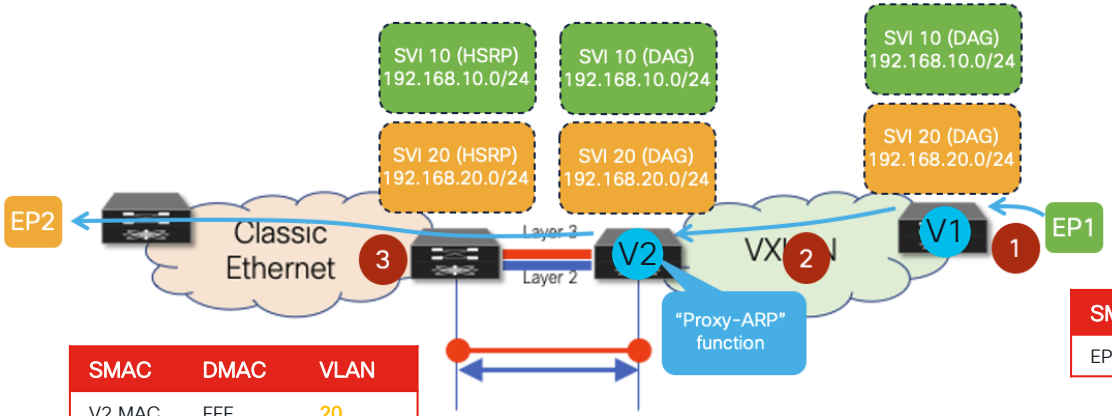
Default Gateway Coexistence of HSRP and Anycast Gateway - 10.2(3)
How to resolve the problem

1. EP1 sends data packet to EP2 hits SVI 10 DAG.
2. Local leaf routes the packet and assuming EP2 MAC/IP is not in the fabric control plane, the leaf sends an ARP request for EP2
3. A “Proxy-ARP” function is now performed on the border leaf node, allowing to change the payload of the ARP request before forwarding it toward the Classic Ethernet network. Border leaf system MAC is replacing the DAG VMAC as Sender MAC, whereas a border leaf specific IP address (secondary IP) is replacing the DAG IP as Sender IP.



Old to New

Default Gateway Coexistence of HSRP and Anycast Gateway - 10.2(3)
How to resolve the problem



IP packet sent to EP2 hits SVI10 DAG. Routed locally to EP2 SVI20.

SMAC	DMAC	VLAN	SIP	DIP
EP1	DAG	10	EP1	EP2

1

SIP	DIP	L2 VNI	SMAC	DMAC
V1	MC	30001	DAG	FFF

2

SVI20 initiates ARP request to retrieve EP2 MAC

SMAC	DMAC	VLAN
V2 MAC	FFF	20

3

ARP request for EP2 is sourced from V2 BIA MAC

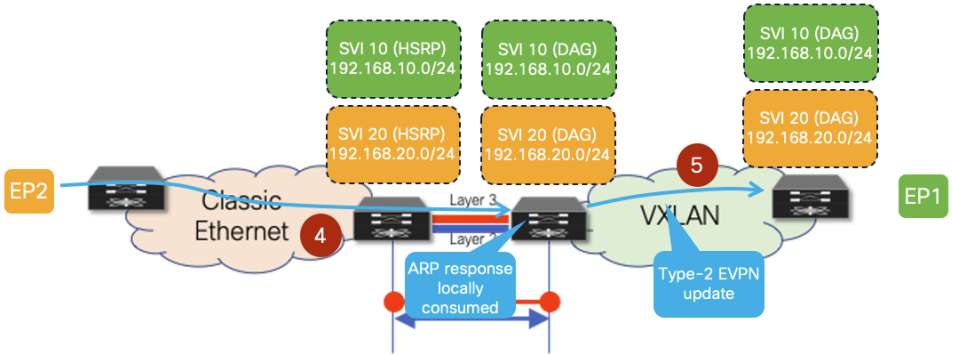
Note: DAG=SVI/HSRP=VMAC

Old to New

Default Gateway Coexistence of HSRP and Anycast Gateway - 10.2(3)
How to resolve the problem

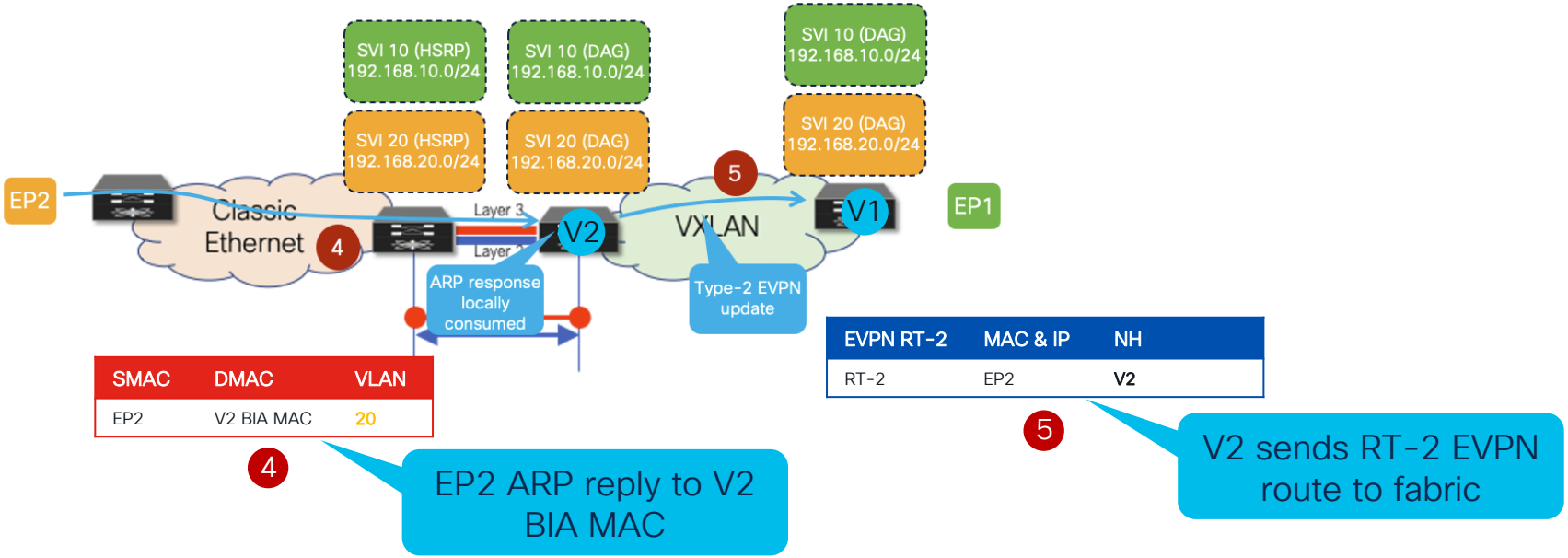
4. EP2 replies to the ARP request with a destination of the border node system MAC bridges through the aggregation switches using the L2 interconnect. The border node consumes the ARP reply. EP2 is shown as an endpoint

5. Border node generates a Type-2 EVPN route. Now the local leaf where EP1 is will have the MAC and IP information of EP2.



Old to New

Default Gateway Coexistence of HSRP and Anycast Gateway - 10.2(3)
How to resolve the problem



Note: DAG=SVI/HSRP=VMAC

Old to New

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

- Configure secondary IP addresses on border node SVIs and use the system MAC. IPv6 can also be configured

```
interface vlan 10
  vrf member Tenant-A
  ip address 192.168.10.1/24
  ip address 192.168.10.10 secondary use-bia
  fabric forwarding mode anycast-gateway

interface vlan 20
  vrf member Tenant-A
  ip address 192.168.20.1/24
  ip address 192.168.20.10 secondary use-bia
  fabric forwarding mode anycast-gateway
```

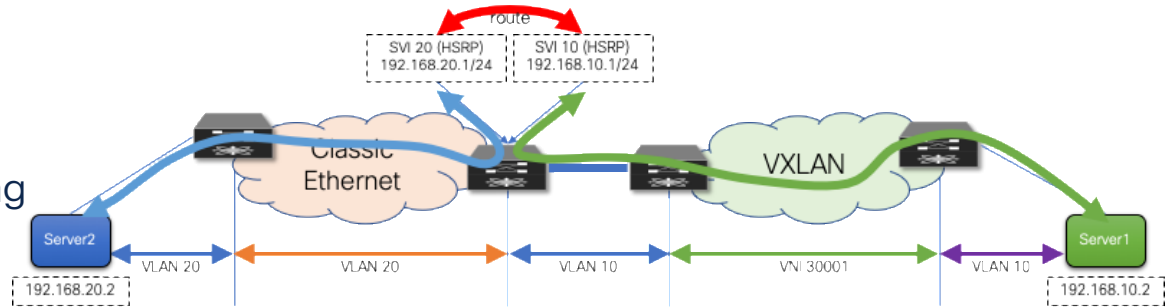
- Identify the VPC port-channel for the L2 interconnect and configure it to perform the “proxy-arp” function

```
interface port-channel1
  description vPC to CE network
  switchport
  switchport mode trunk
  switchport trunk allowed vlan 10,20
  port-type external
  vpc 1
```

Old to New

Default Gateway in CE/FP network

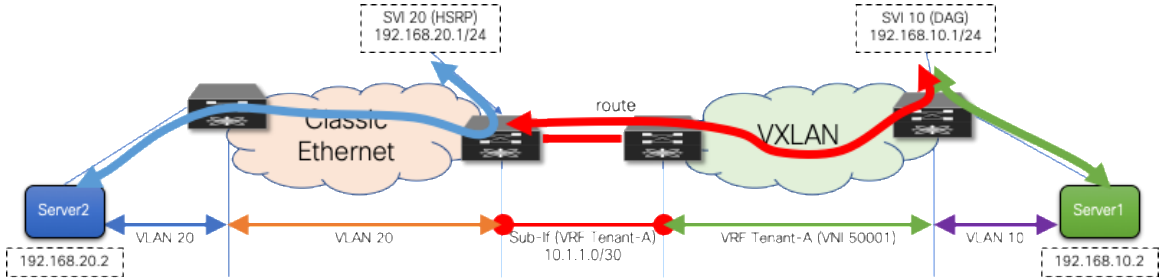
- Since migration starts from CE/FP network FHRP can remain there during migration
- VXLAN network initially provides L2 bridging
- Migrated hosts go out the fabric using the L2 interconnect to be routed



Old to New

Default Gateway in CE/FP network

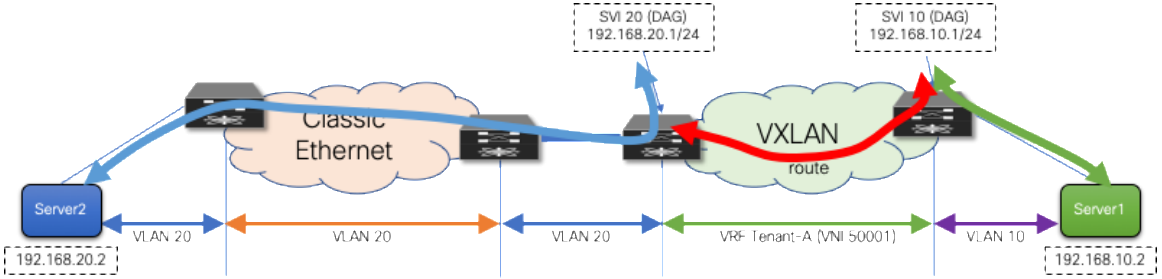
- After all workloads have been migrated in a subnet the gateway can be moved to the VXLAN EVPN fabric
- Migration is done by configuring the DAG on the leafs and decommissioning the SVI in the CE/FP network
- Border nodes do not need the DAG unless there's hosts connected to it
- Routing between the two is done via the L3 interconnect



Old to New

Anycast Gateway in VXLAN

- The gateway is immediately migrated from old to new
- This eliminates the need for post migration gateway movement
- DAG is configured on border nodes which serves as the gateway for the CE/FP network
- As workloads are migrated, the directly attached leaf becomes the gateway



Migration Walkthrough

Migration Walkthrough

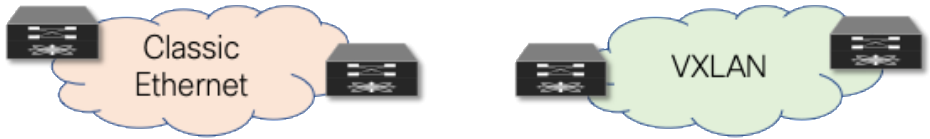
Let's put everything together

1. Locate CE/FP switches performing the L2/L3 demarcation
2. Build the Layer 3 interconnect
3. Build the Layer 2 interconnect
4. Define FHRP approach
5. Align gateway MAC address
6. Perform workload migration
7. Decommission L2/L3 interconnect and FHRP if needed

Migration Walkthrough

Locate CE/FP switches performing the L2/L3 demarcation

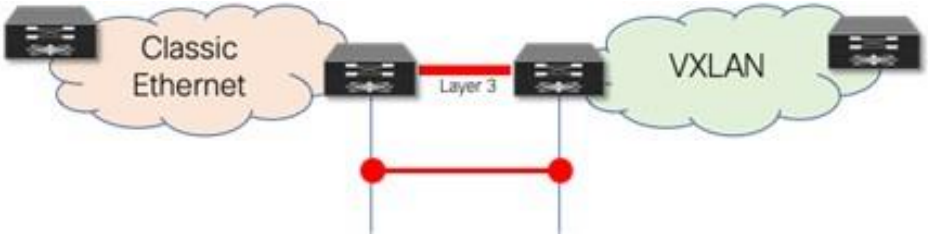
- Locate where the L2/L3 demarcation exists in CE/FP network
- In the VXLAN EVPN fabric any pair of border devices can be used that can do the bridging and routing requirements



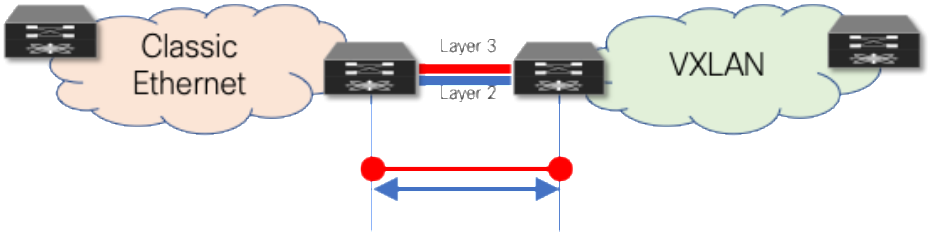
Migration Walkthrough

Build the Layer 3 and Layer 2 interconnect

- Recommended to use eBGP
- Make sure to advertise subnets local to each network



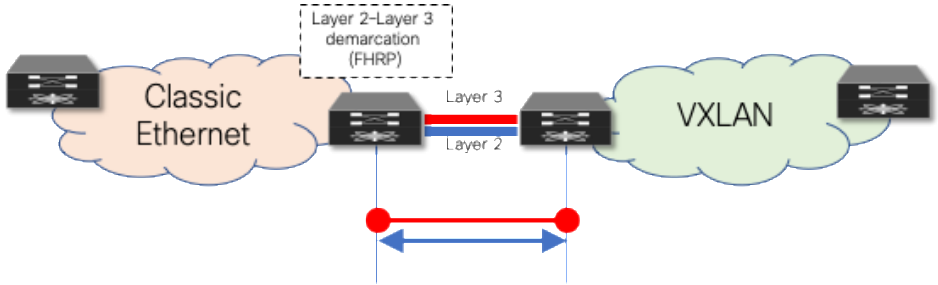
- Eliminate STP
- Back-to-Back vPC. vPC best practices apply

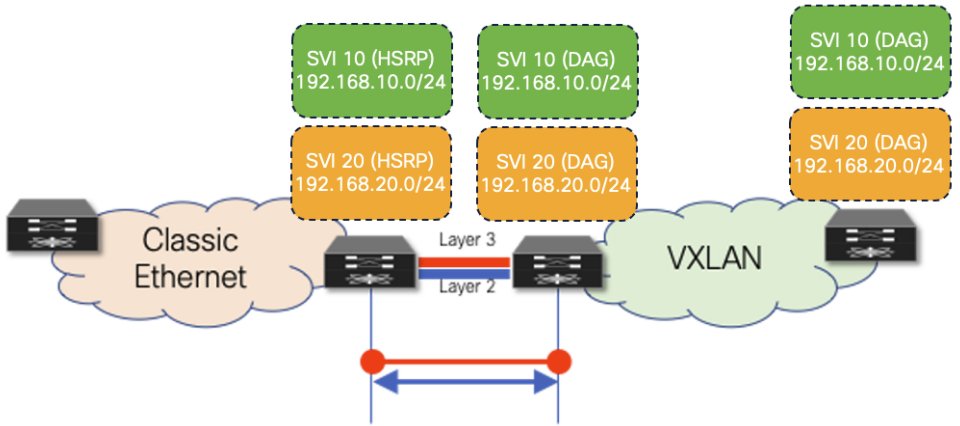


Migration Walkthrough

Define FHRP approach

- Decide if CE/FP network provides the FHRP during migration or if VXLAN network takes over prior to migrating
- Before 10.2(3) both HSRP and DAG could not coexist
- From 10.2(3) and later both HSRP and DAG can coexist for same subnet





Migration Walkthrough

Align gateway MAC address

- Align gateway MAC of the FHRP to facilitate seamless migration
- A state change of the gateways is needed in the CE/FP network
- This MAC will be the distributed anycast gateway

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
```

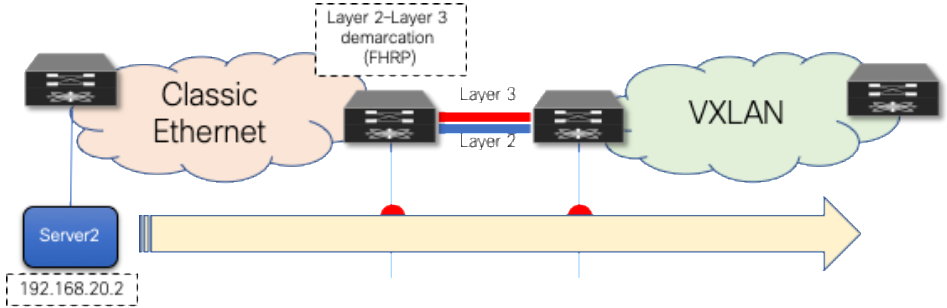
HSRP VMAC configuration on Aggregation

```
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
```

Migration Walkthrough

Perform workload migration

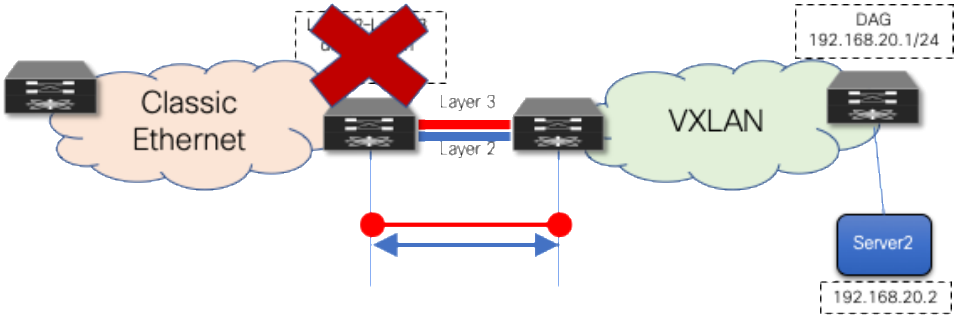
- After the L2/L3 interconnect has been established, and FHRP aligned, workloads can be migrated
- This can be performed using virtual machine mobility or by recabling servers physically to the VXLAN network



Migration Walkthrough

Decommissioning First-Hop Gateway

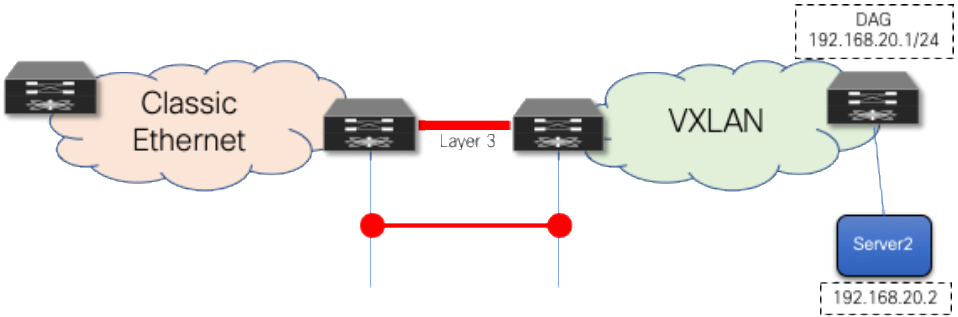
- After workloads have been migrated to VXLAN the CE/FP FHRP can be migrated to the Distributed Anycast Gateway
- If using HSRP and DAG coexistence FHRP in CE/FP can be kept enabled
- If FHRP was migrated to DAG first, this step is unnecessary or optionally decommissioned from border device



Migration Walkthrough

Decommissioning L2/L3 interconnect

- Once workload migration and FHRP decommission is complete the L2 interconnect can be removed.
- Layer 3 interconnect may still be needed for external connectivity if it has not been migrated to VXLAN

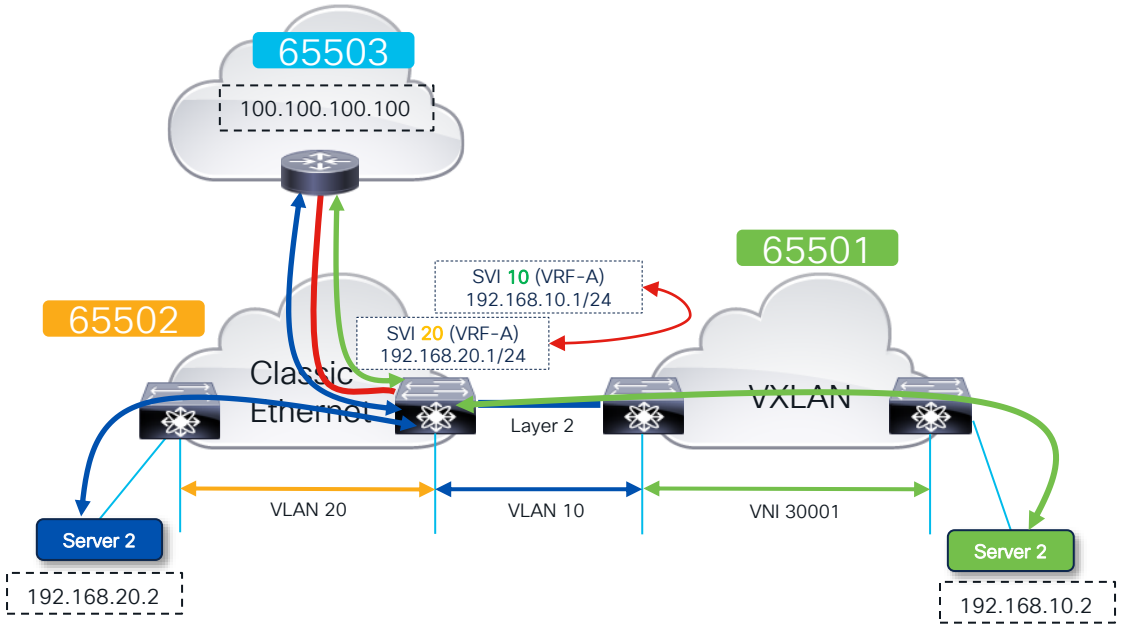


External Connectivity Migration

L3 External Migration

Default Gateway in CE/FP

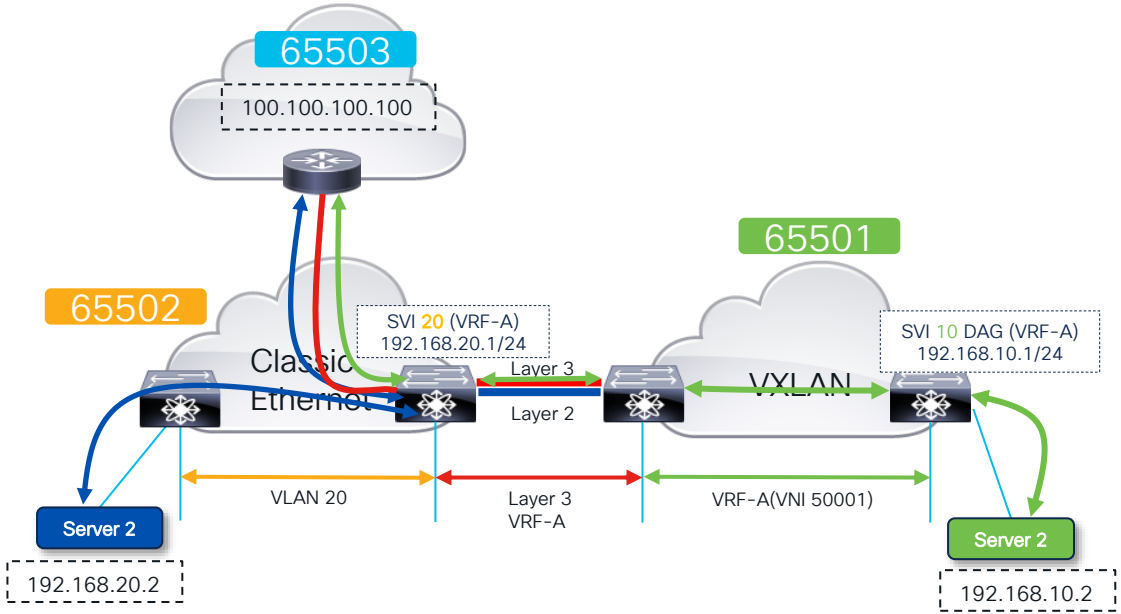
- Traffic flows to core in CE/FP network to external
- VXLAN networks bridge to CE/FP network then route using core
- After migration connection can be moved to VXLAN network border devices



L3 External Migration

Default Gateway in CE/FP

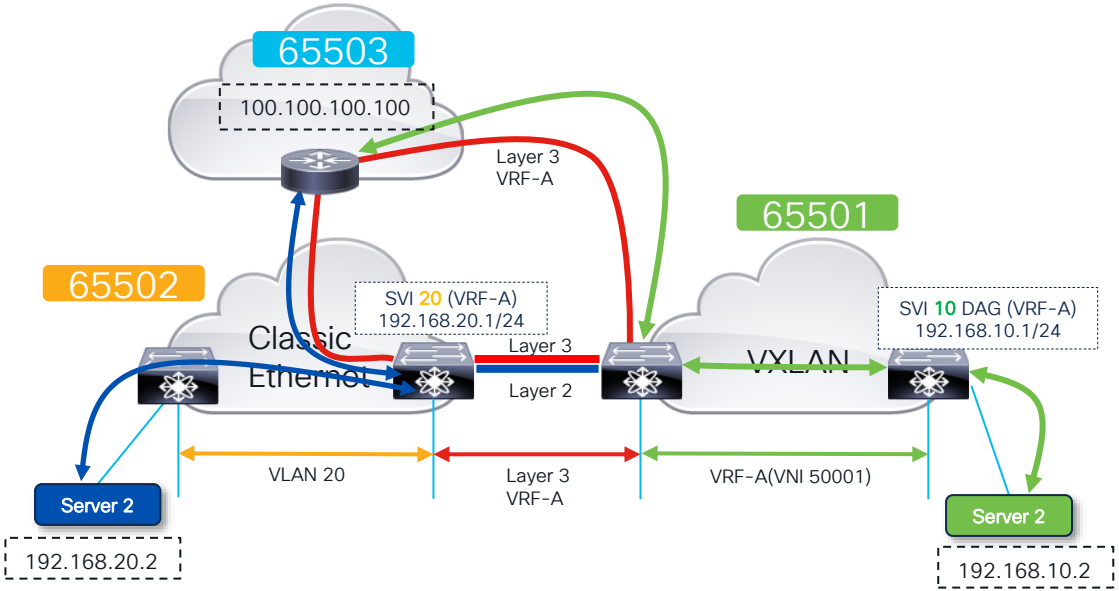
- As workloads and gateways move to VXLAN, subnets use the L3 interconnect to route out
- VXLAN networks bridge to CE/FP network then route using core
- After migration connection can be moved to VXLAN network border devices



L3 External Migration

Default Gateway in CE/FP

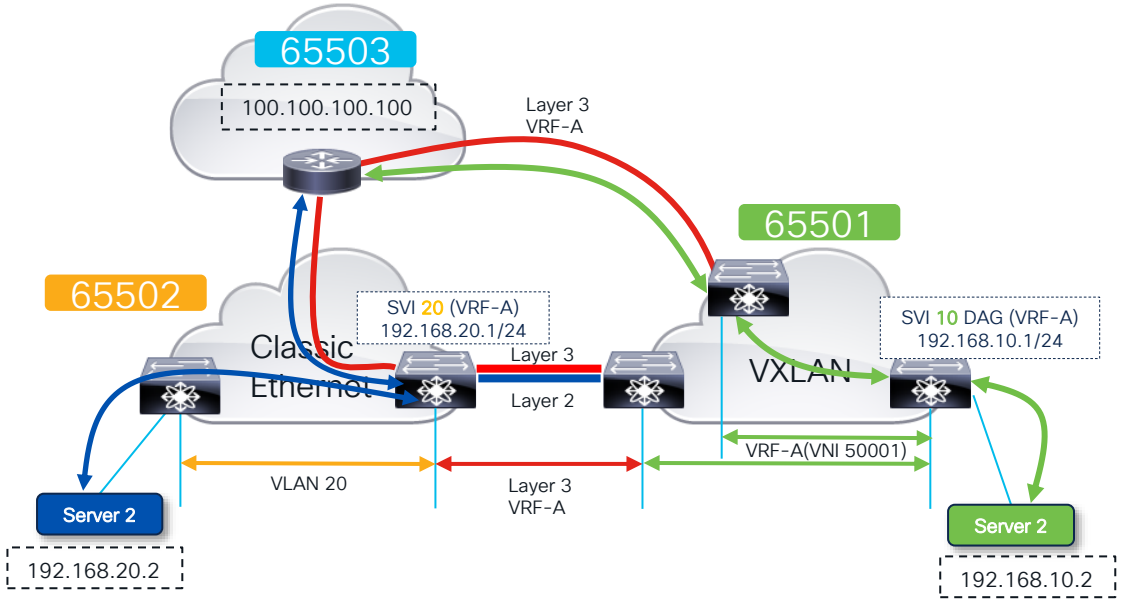
- As workloads and gateways move to VXLAN, subnets use the L3 interconnect to route out
- Core device can connect to VXLAN border used for interconnect
- Longer AS path through L3 interconnect and can be used for backup



L3 External Migration

Default Gateway in CE/FP

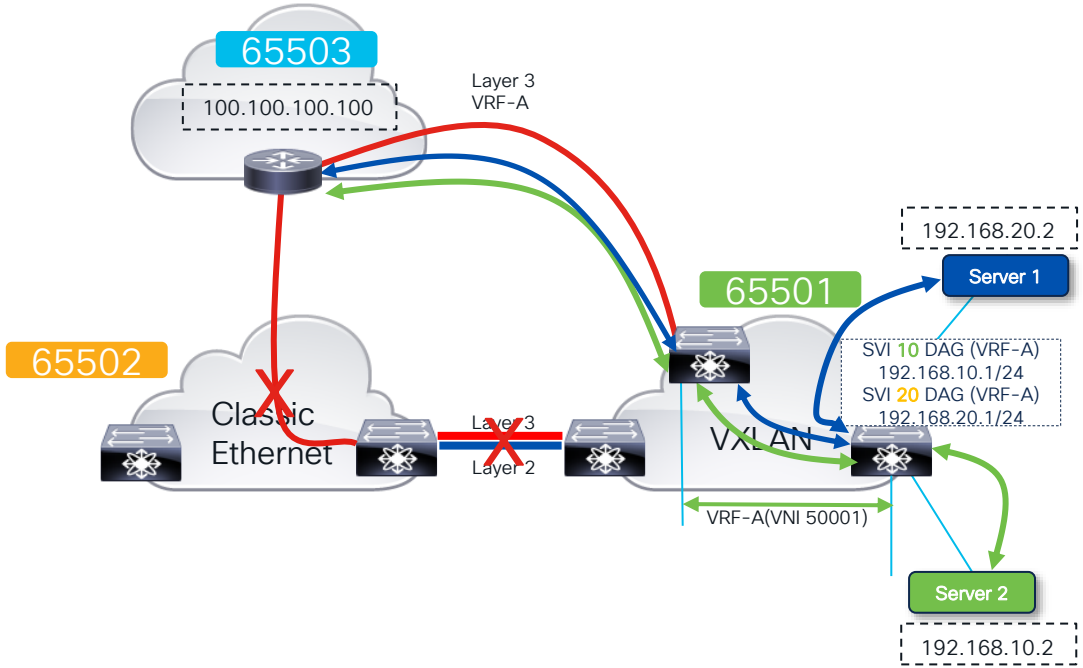
- As workloads and gateways move to VXLAN, subnets use the L3 interconnect to route out
- Core device can connect to dedicated VXLAN border devices
- L3 interconnect will have longer AS path and can be used for backup



L3 External Migration

Default Gateway in CE/FP

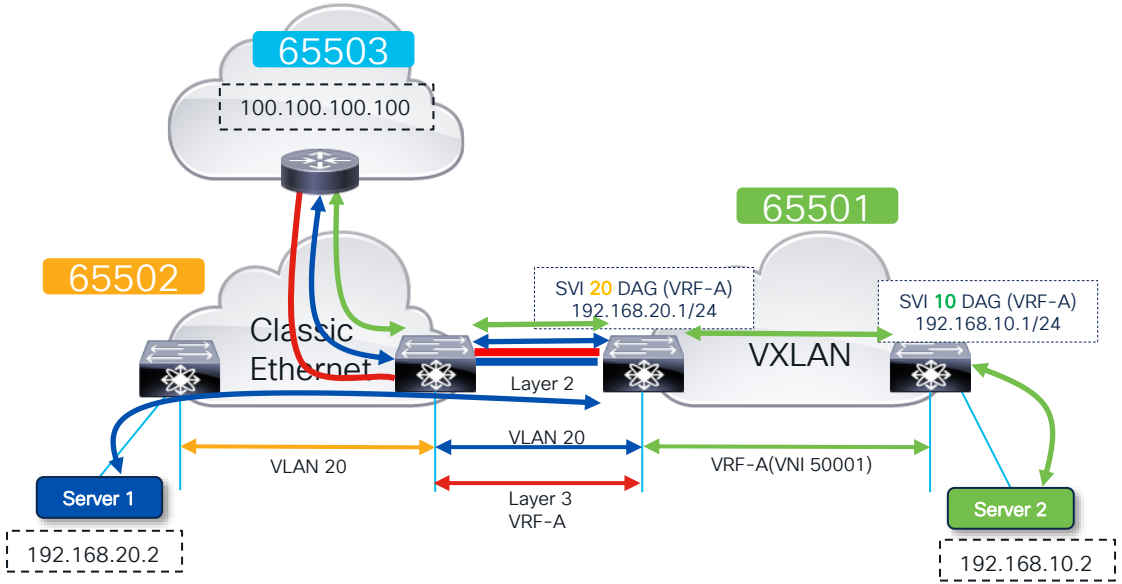
- Once all subnets have been migrated, decommission L3 interconnect and peering to core
- All traffic now flows through VXLAN



L3 External Migration

Default Gateway in VXLAN

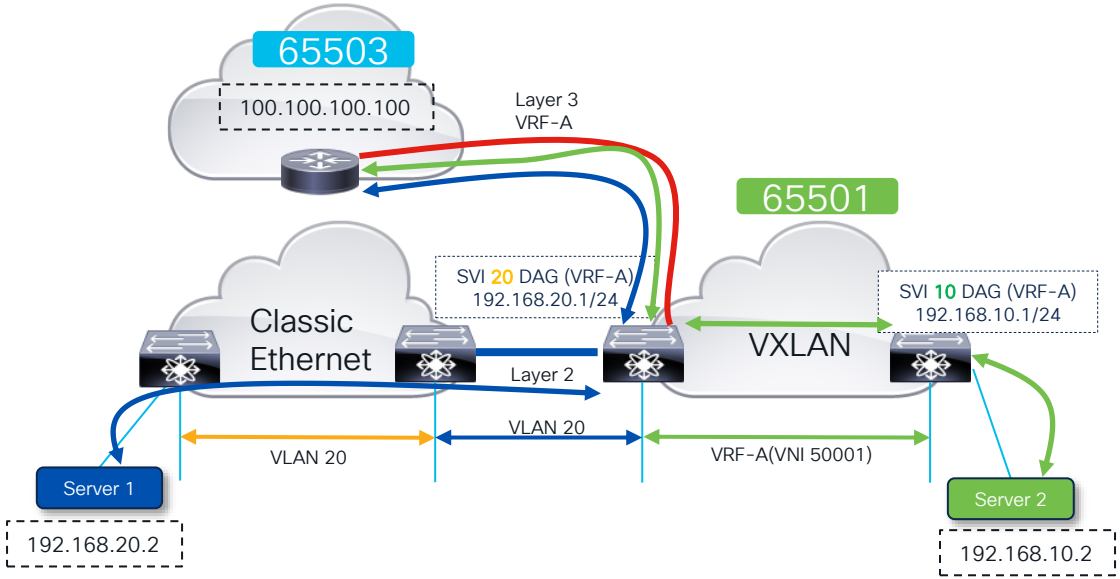
- Traffic flows to core in CE/FP network to external
- CE/FP networks bridge to VXLAN network then route through L3 interconnect
- Migrated subnets use L3 VNI to route to VXLAN border across L3 interconnect



L3 External Migration

Default Gateway in VXLAN

- Core device can connect to VXLAN border used for interconnect
- *No L3 interconnect needed

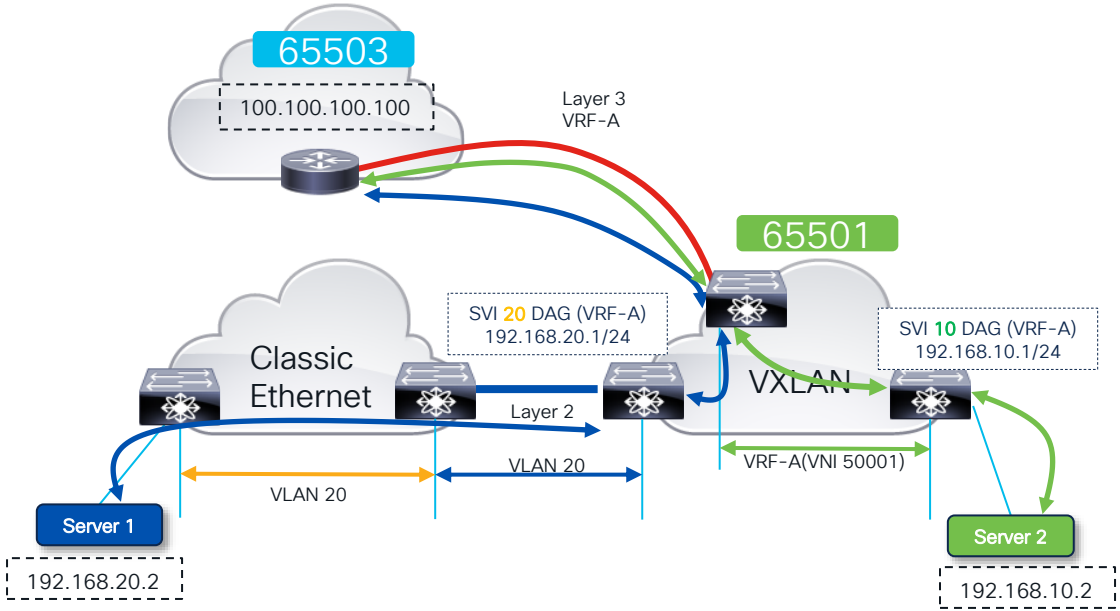


*Assuming all DG have moved to VXLAN

L3 External Migration

Default Gateway in VXLAN

- Core device can connect to VXLAN dedicated border
- *No L3 interconnect needed

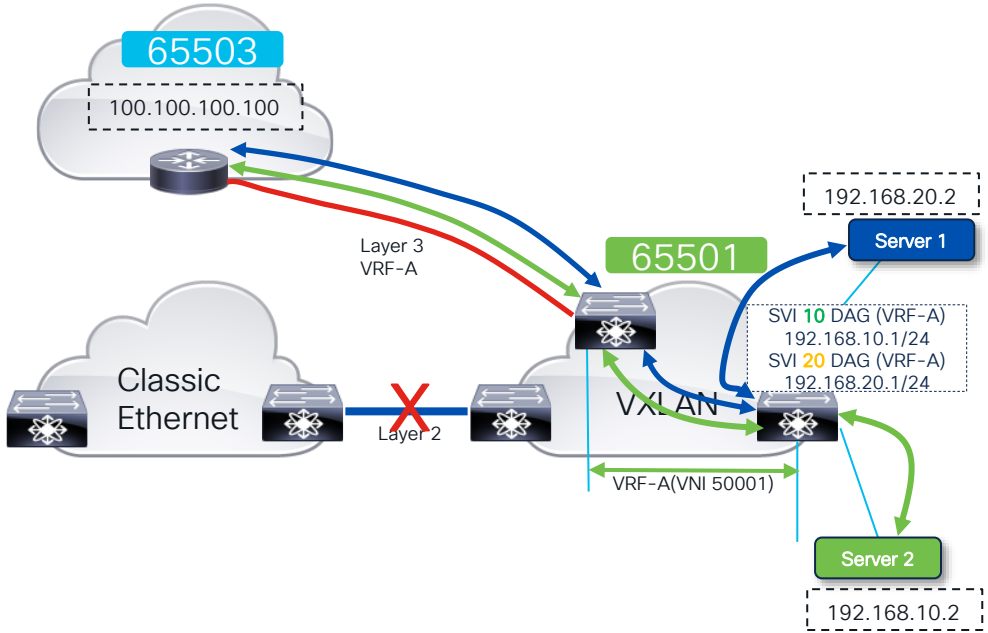


*Assuming all DG have moved to VXLAN

L3 External Migration

Default Gateway in VXLAN

- Once all subnets have been migrated, decommission L2 interconnect
- All traffic now flows through VXLAN



References

References

- Migrating Cisco FabricPath Environments to VXLAN BGP EVPN
- Migrating Classic Ethernet Environments to VXLAN BGP EVPN

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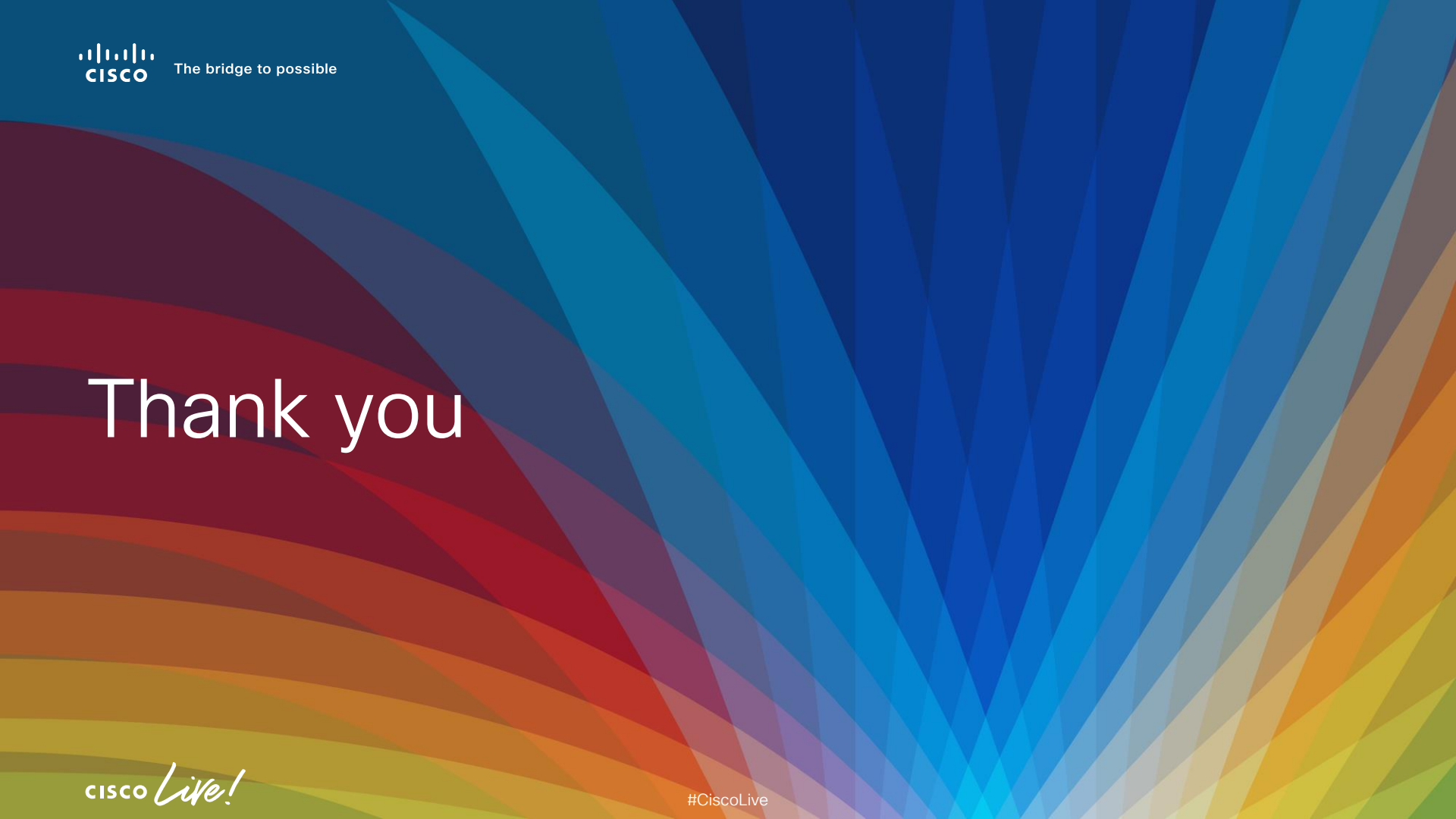
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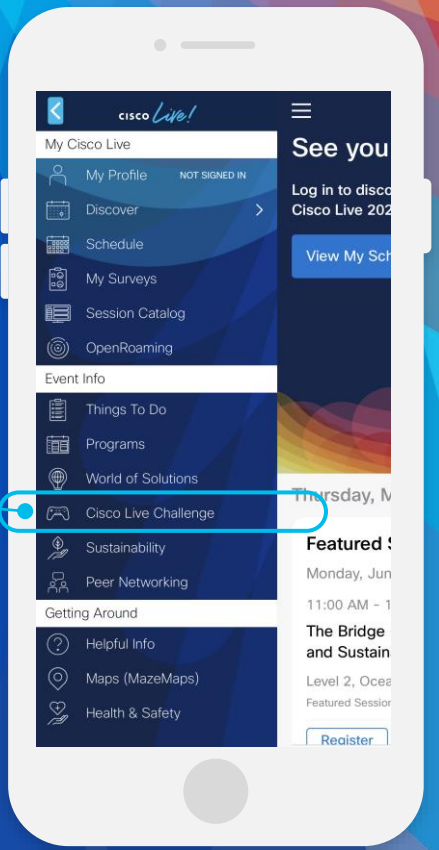


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