TOMORROW starts here.

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Nexus 7000 F3 or Mx/F2e VDC Migration Use Cases
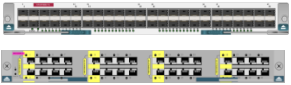
BRKDCT-3407

Anees Mohamed

Network Consulting Engineer

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Session Goal
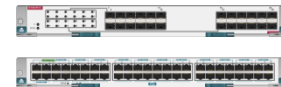

M1 VDC

M1/F1 VDC

F2 VDC

M1/M2 VDC

M1/M2/F2e VDC

M2/F3 VDC

F2/F2e/F3 VDC

F3 VDC

You are here

This Session helps you to migrate here

Recommended Pre-requisites

| Session-ID	Session Name
BRKARC-3470	Cisco Nexus 7000 / 7700 Switch Architecture
BRKDCT-2121	VDC Design and Implementation Considerations with Nexus 7000
BRKDCT-2237	Versatile architecture using Nexus 7000 with a mix of F and M Modules
PSODCT-1407	Building Highly scalable 40/100G Fabrics with Nexus 7700

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Agenda

- Introduction

- M/F2e VDC Migration Use Cases
  - M   VDC to M/F2e VDC Migration (vPC)
  - F2e VDC to M/F2e VDC Migration (FabricPath)

- F3 VDC Migration Use Cases
  - M1   VDC to F3 VDC Migration (vPC)
  - F2e VDC to F3 VDC Migration (FabricPath)

- Summary of VDC Migration Use Cases

- Conclusion

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Introduction

VDC Module Type – New VDC Types in 6.2 Release
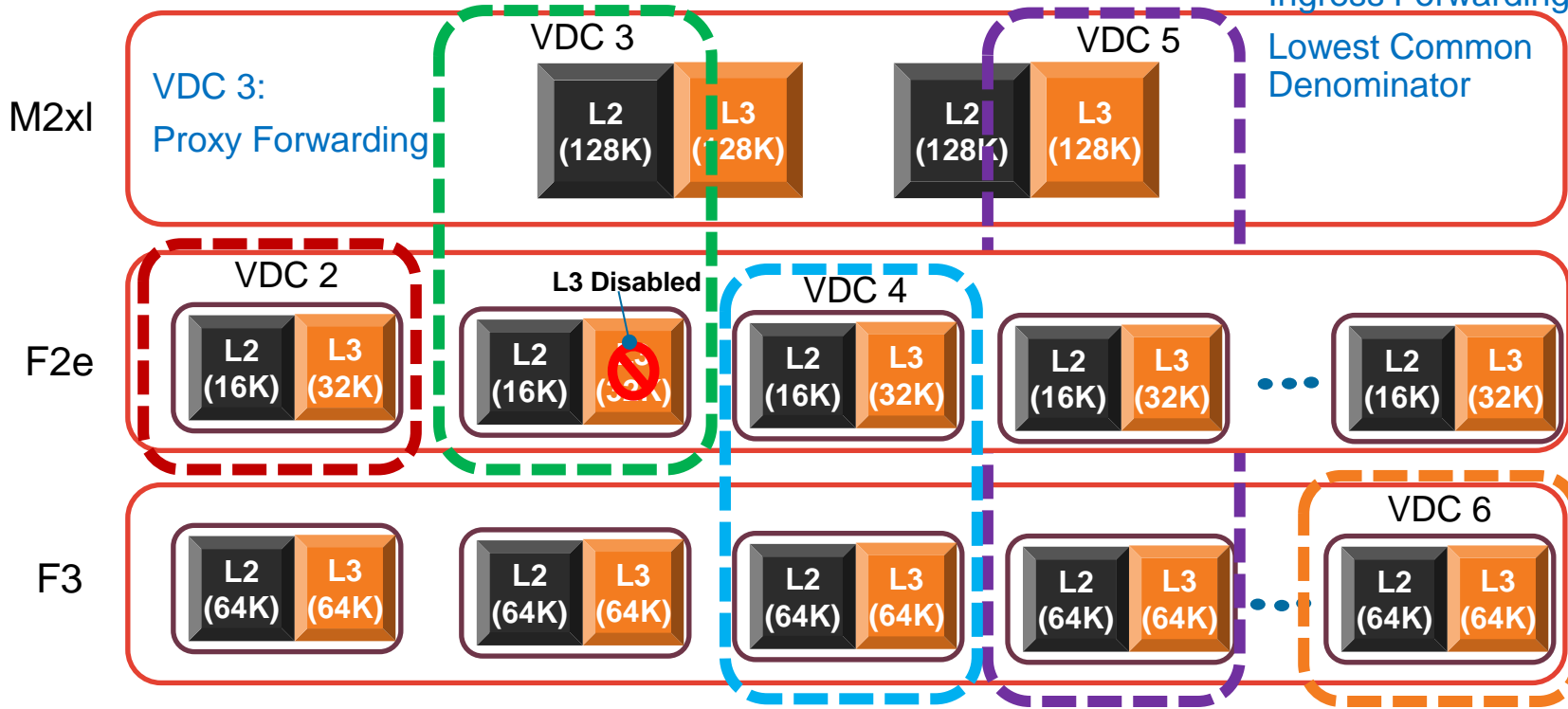
Introduction

VDC Module Type – Features

	vPC	Layer2	Layer3	FEX	FabricPath	DFA	VXLAN	MPLS	OTV	LISP	FCoE	Table Sizes
M2 VDC	✓	✓	✓	✓	✗	✗	✗	✓	✓	✗	✗	M2 size
F2e VDC	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✓	F2E size
M2/F2e VDC	✓	✓	✓	✓	✓	✗	✗	✓	✓	✗	✗	L2-vPC-F2e size L2-FP-M2 size L3-M2 size
F3/M2 VDC	✓	✓	✓	✓	✗	✗	✗	✓	✓	✗	✗	F3 size
F3/F2e VDC	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✓	F2E size
F3 VDC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	F3 size

Use Case 1: M VDC to M/F2e VDC Migration

M VDC to M/F2e VDC Migration
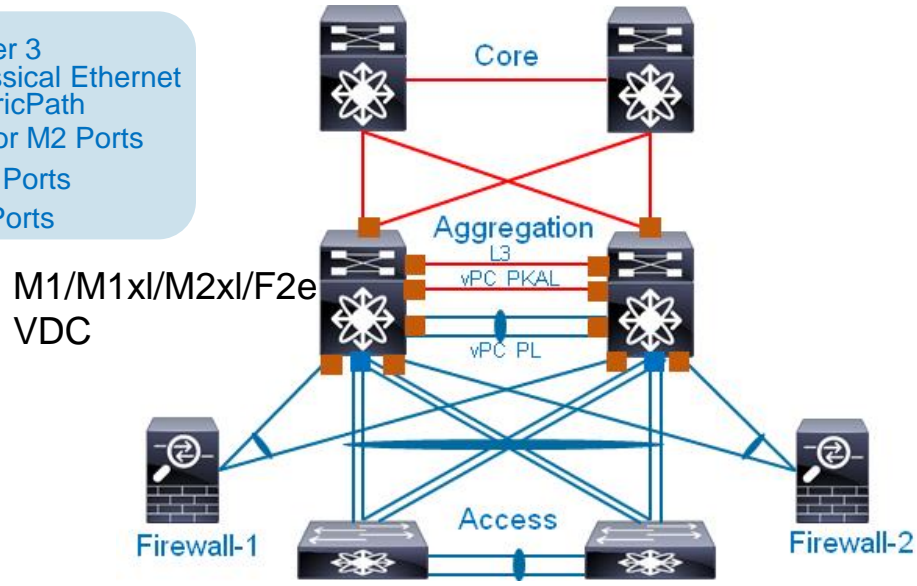
Migration Topology

Current State

Final State

Layer 3
Classical Ethernet
FabricPath
M1 or M2 Ports
F2e Ports
F3 Ports

M1/M1xl/M2xl VDC

M1/M1xl/M2xl/F2e VDC

M VDC to M/F2e VDC Migration

Migration Planning – Preparing for F2e Module Addition

Fabric

F2e – 48 Port 10 GE Card

480 Gbps Fabric Bandwidth

Five FAB-2 provides the required Fabric Bandwidth

5 * 110 = 550Gbps

Routing Capacity

M (Layer 3)

Internal Port Channel (Proxy Routing)

F2e (Layer 2)
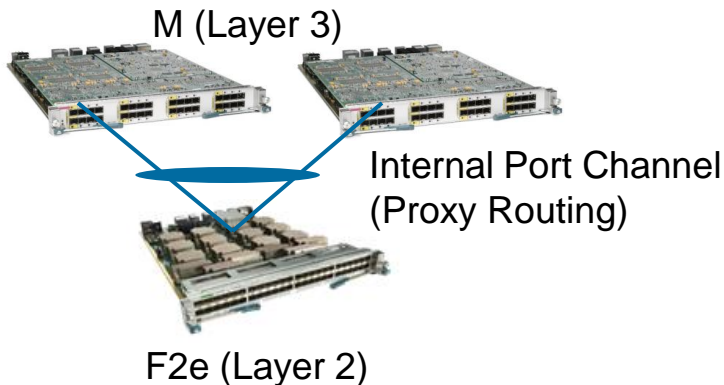
Only the M Ports assigned to M/F2e VDC is available for Proxy Routing.

Routing Capacity = No. of M Ports Assigned to the VDC

Example: If all the ports in one M1 Module is assigned to a M1/F2e VDC, Routing capacity = 80 Gbps

M VDC to M/F2e VDC Migration

Migration Planning – Feature Compatibility Check

- NetFlow Support with M/F2e VDC
  - Only Sampled NetFlow is supported on VLANs, SVIs and port channels
  - Reconfigure Sampled NetFlow on SVIs after Upgrading to 6.2 train.
  - No support for egress NetFlow even on M1/M2 modules
  - For More information
    - N7k NX-OS System Management Config Guide → Configuring NetFlow → Guidelines and Limitations for NetFlow

- WCCP (Supported Design)
  - Refer Cisco Nexus 7000 Series NX-OS Unicast Routing Configuration Guide, Release 6.x
    - IP → Configuring WCCPv2 → Supported Modules for WCCPv2 Redirection

M VDC to M/F2e VDC Migration

Task 1 – NX-OS Upgrade

- Plan
  - Release Notes
    - System Requirements
      - Sup 1 Requires 8 GB before upgrading to 6.2
    - Upgrade/Downgrade Paths and Caveats
    - Changed Software Features
    - Limitations
    - Open Caveats
  - Bug Search Tool

- Upgrade
  - Upgrade NX-OS to 6.2 Train

- Verify

M VDC to M/F2e VDC Migration

Task 2 – Change VDC Type

Current VDC Configuration

```
vdc Nexus-7010-Agg-1 id 2
  limit-resource module-type m1 m1xl m2xl
  allocate interface Ethernet1/1-32
  allocate interface Ethernet2/1-32
```

Change VDC Type

```
Nexus-7010-admin-1(config)# vdc Nexus-7010-Agg-1
Nexus-7010-admin-1(config-vdc)# limit-resource module-type m1 m1xl m2xl f2e
This will cause all ports of unallowed types to be removed from this vdc.
Continue (y/n)? [yes]
Nexus-7010-admin-1(config-vdc)# allocate interface Ethernet9/1-48
Nexus-7010-admin-1(config-vdc)# allocate interface Ethernet10/1-48
Nexus-7010-admin-1(config-vdc)# end
```

Impact: Non Disruptive Change

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M VDC to M/F2e VDC Migration

Task 3 – Upgrading Access Layer Bandwidth

Step 1: Provision
additional Links using
F2e Ports.

Step 2: Create a new
Port Channel and
assign these new links

Core

Layer 3
Classical Ethernet
FabricPath
M1 or M2 Ports
F2e Ports
F3 Ports

Aggregation
L3
vPC PKAL
vPC PL

Forwarding (Root)
Blocking

Po101
Po102
Access

Firewall-1
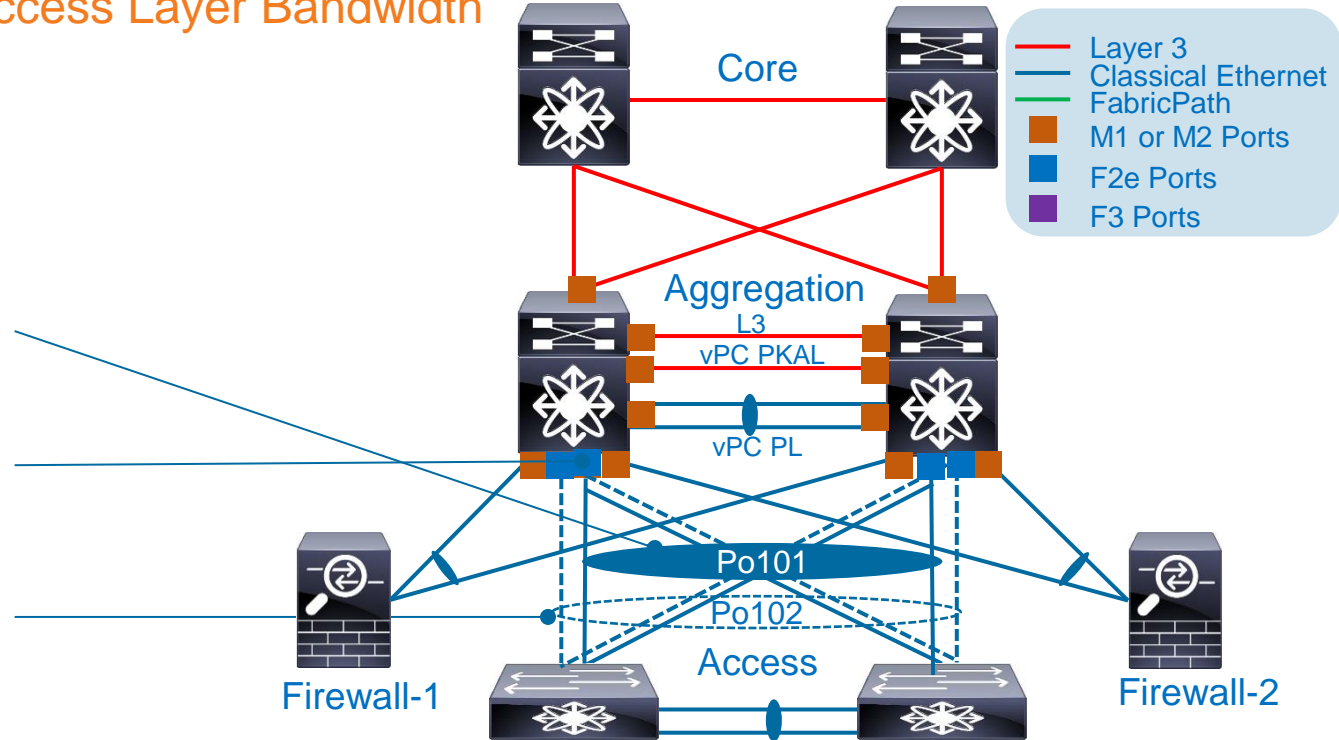Firewall-2

Cisco live!
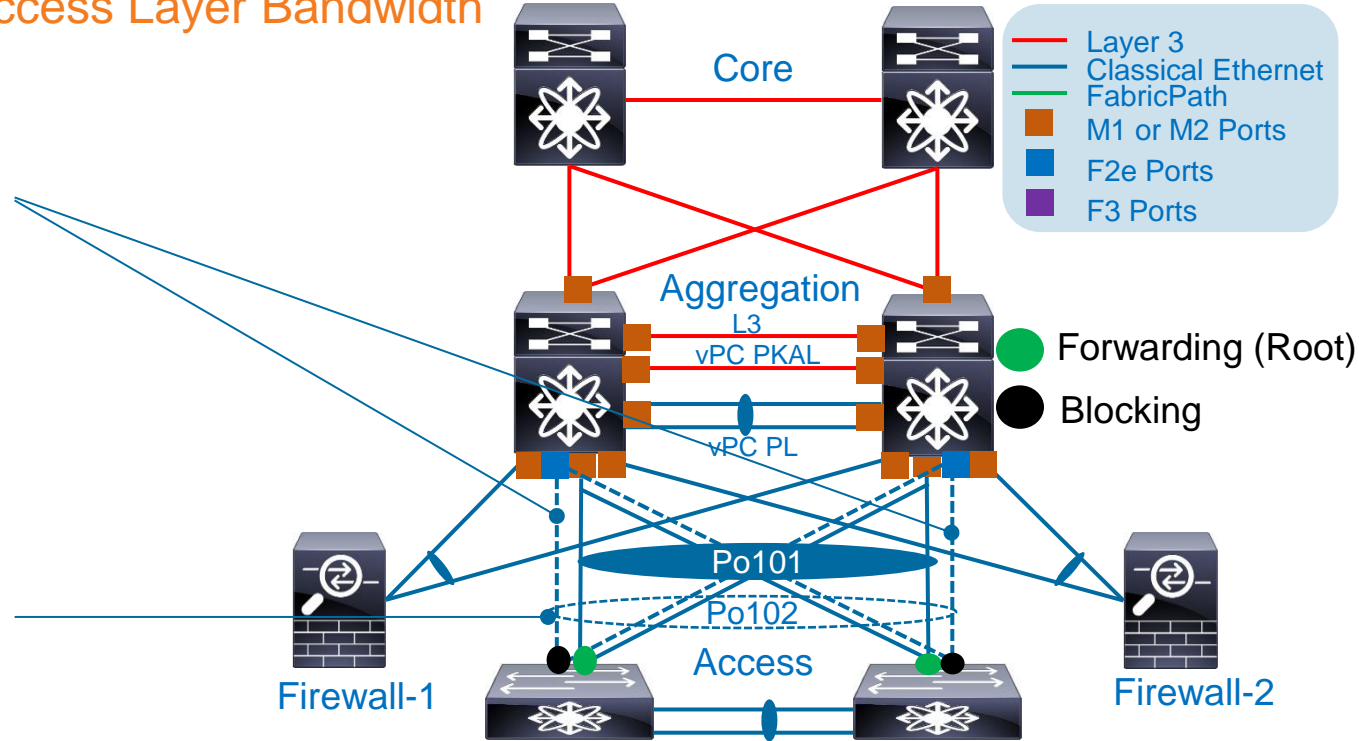
M VDC to M/F2e VDC Migration

Task 3 – Upgrading Access Layer Bandwidth

Step 3: Shutdown Port Channel 101

Step 4: Move these links to F2e ports

Step 6: Add these migrated links to the new port channel

Impact: Minimal impact to traffic flow

M VDC to M/F2e VDC Migration

Verify Available Proxy Forwarding Interfaces

```
F2e-Proxy-VDC# show hardware proxy layer-3 detail

Global Information:
        Layer-2 only Modules: Count: 1, Slot: 8
        Layer-3 Modules supporting proxy layer-3: Count: 1, Slot: 9

        Replication Rebalance Mode:             Manual
        Number of proxy layer-3 forwarders:     6
        Number of proxy layer-3 replicators:    4

Forwarder Interfaces                         Status      Reason
----------------------------------------------------------------------------
Eth9/1                                       up          SUCCESS
Eth9/2                                       up          SUCCESS
Eth9/3                                       up          SUCCESS
Eth9/4                                       up          SUCCESS
Eth9/5                                       up          SUCCESS
Eth9/6                                       up          SUCCESS
```

M VDC to M/F2e VDC Migration

Verify Proxy Forwarding Statistics

```
F2e-Proxy-VDC# show hardware proxy layer-3 counters detail

Note: Multicast packets are not reported in the output below

Proxy packets sent by F-series module: 8
-----------------------------------------------------------------
Router Interfaces1            Tx-Pkts          Tx-Rate (pkts/sec approx.)
-----------------------------------------------------------------
Eth9/1                        92               0
Eth9/2                        0                0
Eth9/3                        0                0
Eth9/4                        92               0
Eth9/5                        0                0
Eth9/6                        608266247        298362
=================================================================
Total                         608266431        298362
=================================================================
```
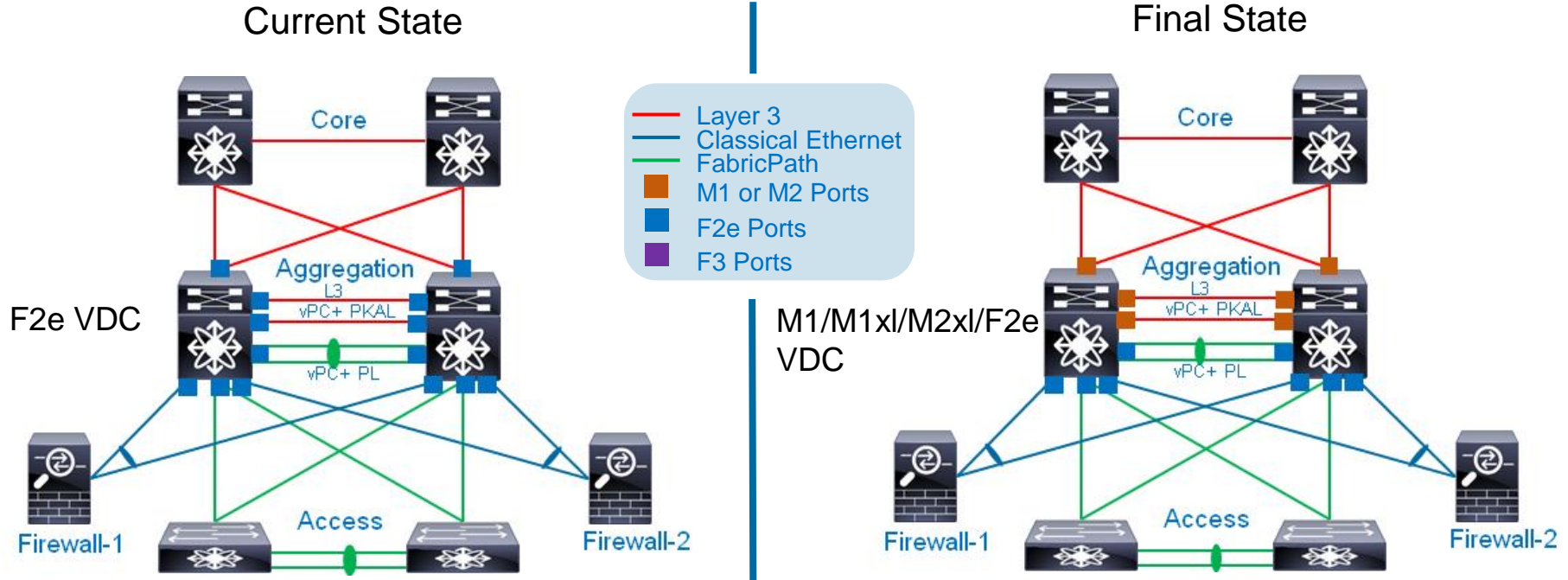
Use Case 2: F2e VDC to M/F2e VDC Migration

F2e VDC to M/F2e VDC Migration

Migration Topology

Current State

Final State

F2e VDC

M1/M1xl/M2xl/F2e VDC

Legend:
- Layer 3 (red)
- Classical Ethernet (blue)
- FabricPath (green)
- M1 or M2 Ports (orange square)
- F2e Ports (blue square)
- F3 Ports (purple square)

F2e VDC to M/F2e VDC Migration

Migration Overview

F2e VDC → VDC Type Change → M1/F2e VDC
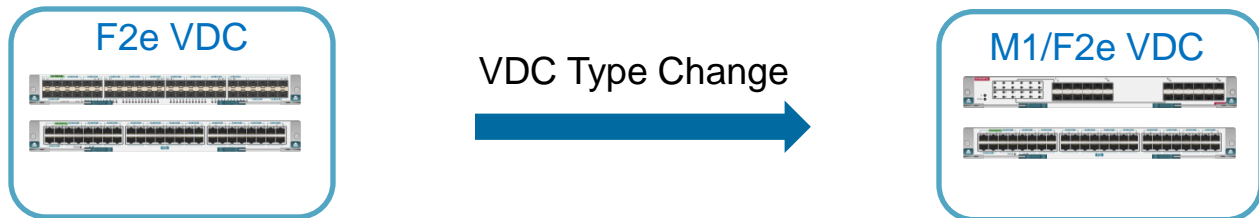
- F2e Port Personality changes from L2/L3 to L2 Only in the M/F2e VDC
- Changing VDC type does not change the personality of F2e Ports on the fly
- Two options to change the personality after VDC type change
    1. Option 1 – Rebind Interface
        - Detach and then Reattach the ports to the VDC
        - The Ports lose the configurations
        - You must manually configure the interfaces
    2. Option 2 – Reload VDC
        - VDC Reloads and the interfaces come back up as per the configured VDC Type
        - Configurations are NOT lost except Layer-3 F2e Port configurations

F2e VDC to M/F2e VDC Migration

Rebind Interface Versus Reload VDC

Rebind Interface

```
Nexus-7010-admin-1(config)# vdc Nexus-7010-Agg-1
Nexus-7010-admin-1(config-vdc)# limit-resource module-type m1 m1xl m2xl f2e
Nexus-7010-admin-1(config-vdc)# rebind interfaces
All interfaces' configurations of the current vdc will be lost during interface rebind.
Please back up the configurations of the current vdc. Do you want to proceed (y/n)? [no] yes
```

Reload VDC

```
Nexus-7010-admin-1(config)# vdc Nexus-7010-Agg-1
Nexus-7010-admin-1(config-vdc)# limit-resource module-type m1 m1xl m2xl f2e
Nexus-7010-admin-1(config-vdc)# end
Nexus-7010-admin-1# copy running start vdc-all
Nexus-7010-admin-1# reload vdc Nexus-7010-Agg-1
```

This presentation uses Reload VDC throughout this document where rebind interfaces are required.

F2e VDC to M/F2e VDC Migration
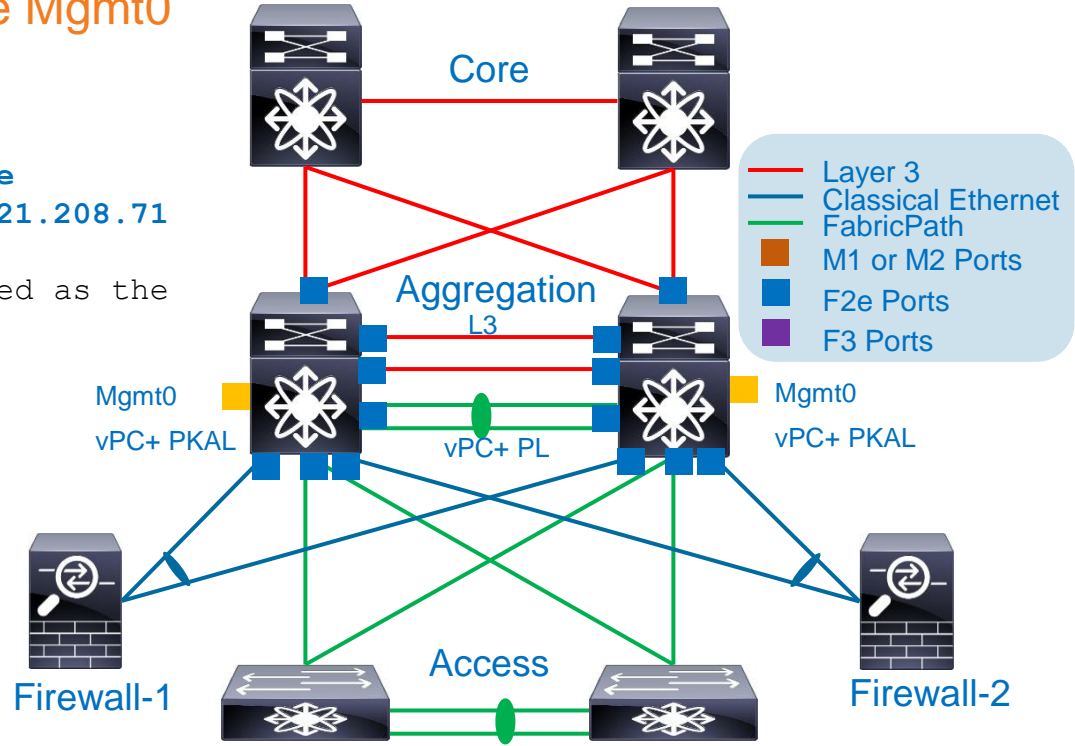
Task 1 – NX-OS Upgrade

- Plan
  - Release Notes
    - System Requirements
      - Sup 1 Requires 8 GB before upgrading to 6.2
    - Upgrade/Downgrade Paths and Caveats
    - Changed Software Features
    - Limitations
    - Open Caveats
  - Bug Search Tool

- Upgrade
  - Upgrade NX-OS to 6.2 Train

- Verify

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F2e VDC to M/F2e VDC Migration

Task 2 – Config vPC+ PKAL to use Mgmt0

```
N7K(config)# vpc domain 10
N7k(config-vpc-domain)# peer-keepalive
destination 172.21.208.75 source 172.21.208.71
Note:
  --------:: Management VRF will be used as the
default VRF ::--------
```


Core

Layer 3
Classical Ethernet
FabricPath
M1 or M2 Ports
F2e Ports
F3 Ports

Aggregation
L3

Mgmt0
vPC+ PKAL

vPC+ PL

Mgmt0
vPC+ PKAL

Firewall-1

Access

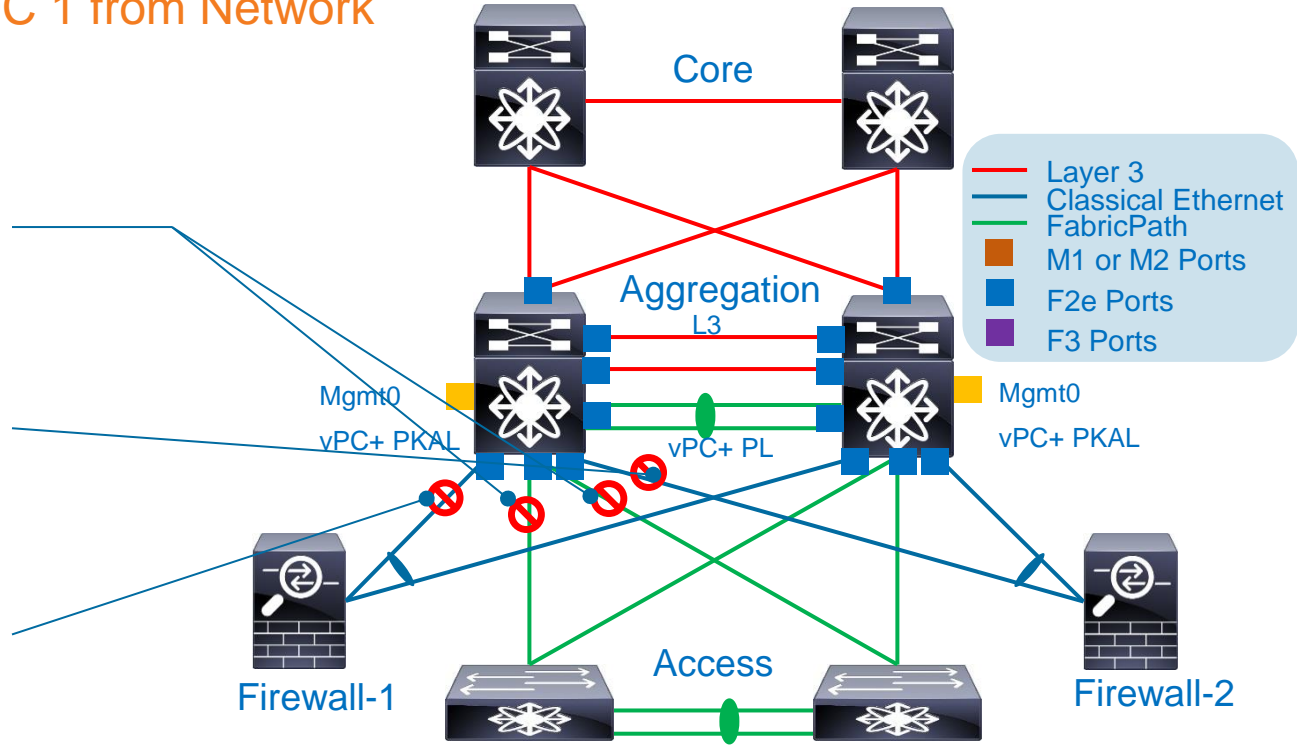Firewall-2

Impact: Non Disruptive Change

F2e VDC to M/F2e VDC Migration

Task 3 – Isolate F2e VDC 1 from Network

Step 1: Shutdown the Links to Access Layer

Step 2: Shutdown the Link to Firewall-2 (Standby)

Step 3: Shutdown the Link to Firewall-1 (Active)

Core

Aggregation
L3

Mgmt0
vPC+ PKAL

vPC+ PL

Mgmt0
vPC+ PKAL

Firewall-1

Access

Firewall-2

Legend:
- Layer 3
- Classical Ethernet
- FabricPath
- M1 or M2 Ports
- F2e Ports
- F3 Ports

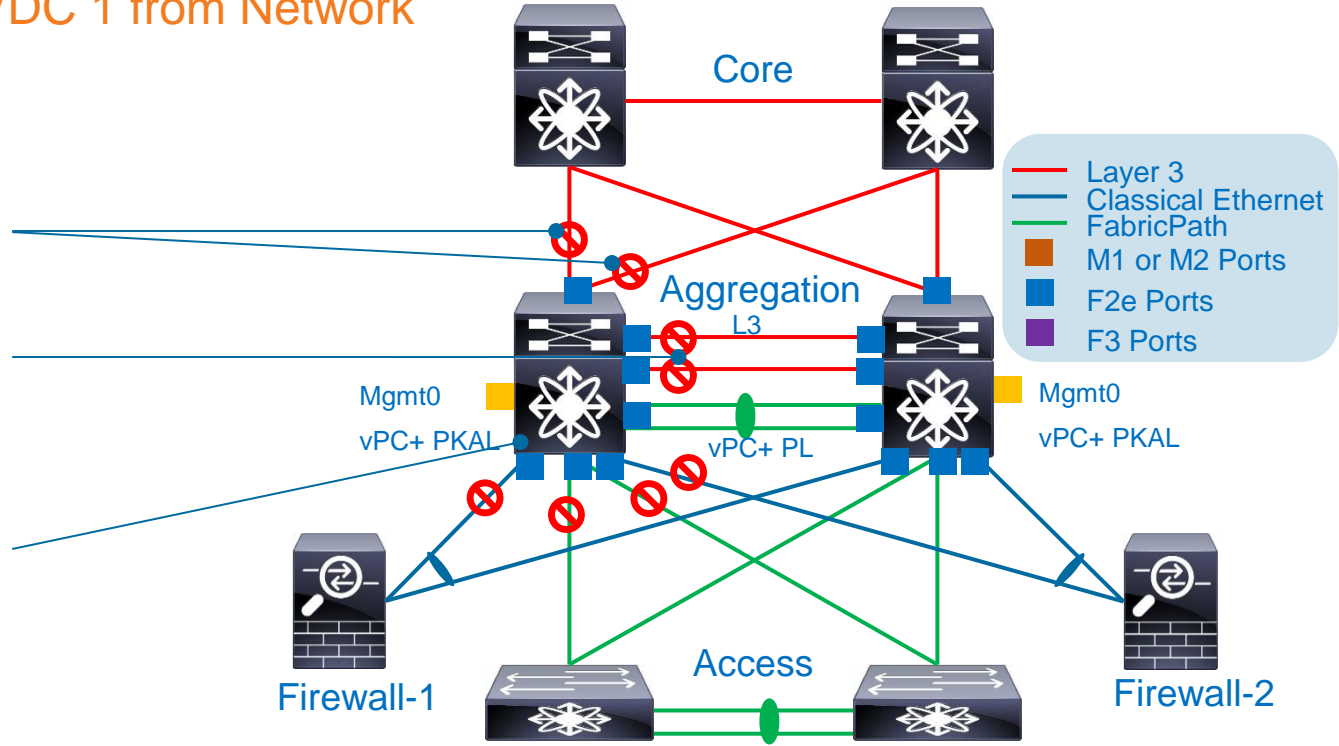Impact: Minimal impact to traffic flow

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F2e VDC to M/F2e VDC Migration

Task 3 – Isolate F2e VDC 1 from Network

Step 4: Shutdown the Layer 3 Links to Core

Step 5: Shutdown the Interconnect Layer 3 Links

Step 6: Save the config and Reload the VDC so that this VDC comes back up as vPC Secondary.

Legend:
- Layer 3
- Classical Ethernet
- FabricPath
- M1 or M2 Ports
- F2e Ports
- F3 Ports

Core

Aggregation

L3

Mgmt0

vPC+ PKAL

vPC+ PL

Mgmt0

vPC+ PKAL

Firewall-1

Firewall-2

Access

Impact: Minimal impact to traffic flow

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F2e VDC to M/F2e VDC Migration

Task 4 – Change VDC Type & Reload VDC

```
vdc Nexus-7010-Agg-1 id 2
  limit-resource module-type f2 f2e
    allocate interface Ethernet9/1-48
    allocate interface Ethernet10/1-48
```

Current VDC Configuration

Change VDC Type

```
Nexus-7010-admin-1(config)# vdc Nexus-7010-Agg-1
Nexus-7010-admin-1(config-vdc)# limit-resource module-type m1 m1xl m2xl f2e
This will cause all ports of unallowed types to be removed from this vdc. Continue (y/n)? [yes]
Note: Warning (vdc 6): rebind interface is needed for proper system operation.
 Please backup the running-configuration for interface by redirecting the output of "show running-config
interface all".
 Reapply the interface configuration after the "rebind interface" command

Nexus-7010-admin-1(config-vdc)# allocate interface Ethernet1/1-24
Nexus-7010-admin-1(config-vdc)# allocate interface Ethernet2/1-24
Nexus-7010-admin-1(config-vdc)# end

Nexus-7010-admin-1# copy running start vdc-all
Nexus-7010-admin-1# reload vdc Nexus-7010-Agg-1
```
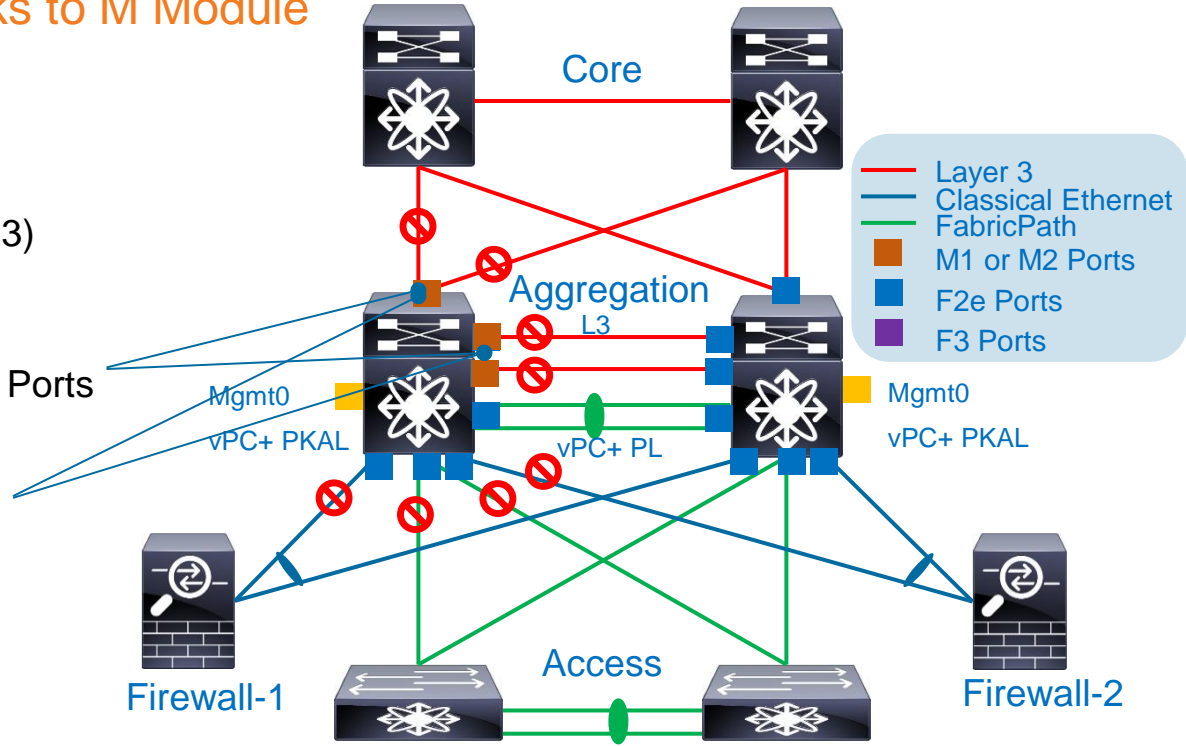
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F2e VDC to M/F2e VDC Migration

Task 5 – Migrate Layer 3 Links to M Module

Step 1: Configure new M ports (Layer 3)

Step 2: Move the Links from F2e to M Ports

Step 3: Bring up these interfaces

Core

Layer 3
Classical Ethernet
FabricPath
M1 or M2 Ports
F2e Ports
F3 Ports

Aggregation
L3

Mgmt0
vPC+ PKAL

vPC+ PL

Mgmt0
vPC+ PKAL

Firewall-1

Access

Firewall-2

F2e VDC to M/F2e VDC Migration

Task 6 – Bring up Layer 2 Links in VDC 1

Step 1: Bring Up the
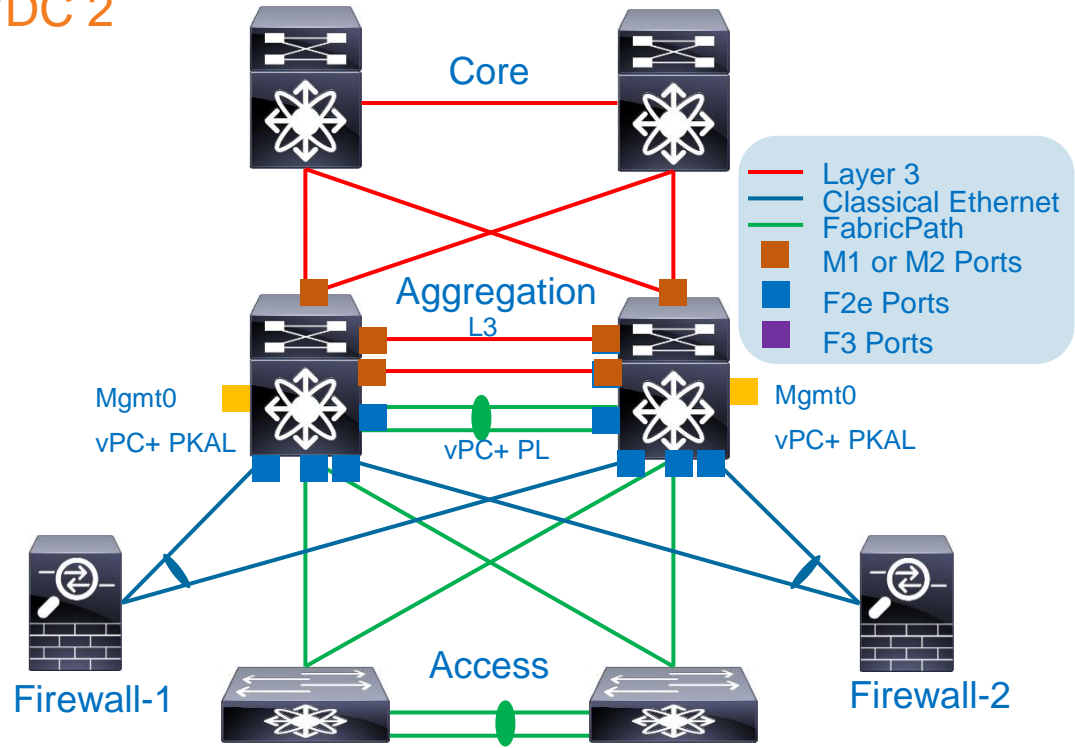Links to Access Layer

Step 2: Bring up the
Link to Firewall-1

Step 3: Bring up the
Link to Firewall-2
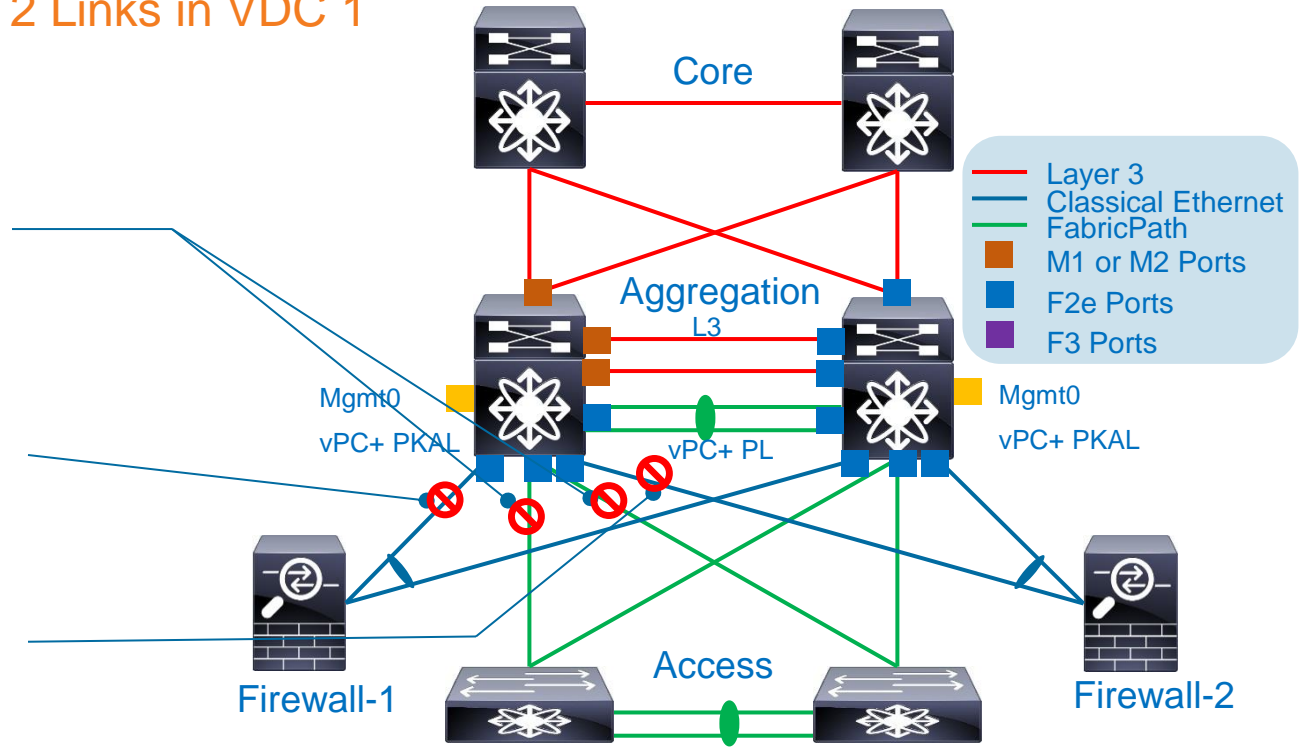
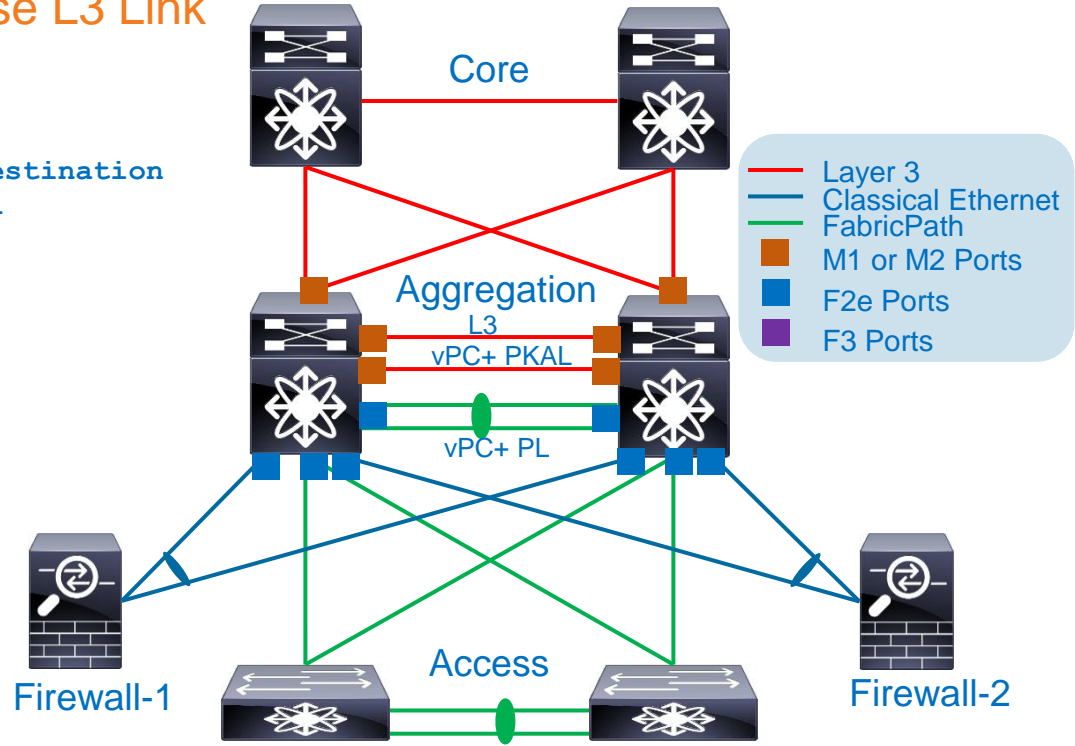Impact: Minimal impact to traffic flow

F2e VDC to M/F2e VDC Migration

Task 7-9 – Repeat Task 3 to 6 in VDC 2

F2e VDC to M/F2e VDC Migration

Task 10 – Config vPC+ PKAL to use L3 Link

```
N7K(config)# vpc domain 10
N7k(config-vpc-domain)# peer-keepalive destination
10.1.14.2 source 10.1.14.254 vrf vpc-pkal
```


Core

Aggregation
L3
vPC+ PKAL
vPC+ PL

Firewall-1

Firewall-2

Access

Legend:
- Layer 3
- Classical Ethernet
- FabricPath
- M1 or M2 Ports
- F2e Ports
- F3 Ports

Impact: Non Disruptive Change

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F2e VDC to M/F2e VDC Migration

Task 11 – Configure Proxy MAC Learning on both Chassis

- ## M/F2e Aggregation VDC Configuration

```
Nexus-7010-Agg-1(config)# no mac address-table fabricpath remote-learning
Modifying remote mac learning will have an impact on MAC table scale. Continue (yes/no)? [no] yes
Please review NXOS config guide on network impact when using this command.
```

- ## Default VDC Configuration

```
Nexus-7010-admin-1(config)# no hardware fabricpath mac-learning module 9 port-group 1-4 5-8 9-12 13-16 17-20
Warning: Disabled hardware MAC learning on requested port-group(s): ensure all ports in these port-groups are
FabricPath core ports (or are shutdown/unused)

Nexus-7010-admin-1(config)# no hardware fabricpath mac-learning module 10 port-group 1-4 5-8 9-12 13-16 17-20
Warning: Disabled hardware MAC learning on requested port-group(s): ensure all ports in these port-groups are
FabricPath core ports (or are shutdown/unused)
```

F2e VDC to M/F2e VDC Migration

Verify Layer 2 & Layer 3 Table Utilization (M Module)

```
F2e-Proxy-VDC# show hardware capacity forwarding

L2 Forwarding Resources
-----------------------
  L2 entries: Module inst    total    used    mcast    ucast    lines    lines_full
              9        1    131072     123      91       32     8192              0
              9        2    131072     123      91       32     8192              0

Module 9 usage:
-----------------------------------------------------------------------------
Entry                   Logical       Physical        %Total
Type                    Entries       Entries         TCAM Capacity
-----------------------------------------------------------------------------

Single-Width Entries:      49            49            0
   IPv4 Unicast            49            49            0     <<< Route tables in M Module
   L2VPN Peer               0             0            0
   MPLS                     0             0            0
```

F2e VDC to M/F2e VDC Migration

Verify Layer 2 & Layer 3 Table Utilization (F2e Module)

```
F2e-Proxy-VDC# show hardware capacity forwarding
L2 Forwarding Resources
--------------------------
  L2 entries: Module inst   total     used    mcast    ucast    lines    lines_full
-----------------------------------------------------------------------------------
                  8       0   16384       32        0       32      512               0
                  8       1   16384       19        0       19      512               0
<<< No mac addresses installed in F2e instances when proxy mac learning is enabled >>>


TCAM usage statistics for instance :0

Total capacity : 32768 (Single-Width Entries)
Note: Algorithmic TCAM utilization may not reach theoretical maximum.
----------------------------------------------------------------------------
Entry                           Logical         Physical        %Total
Type                            Entries         Entries          TCAM Capacity
----------------------------------------------------------------------------
Single-Width Entries:           1               1               0
   IPV4 unicast                 1               1               0 <<< No Routes in F2e instance
```

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Use Case 3: M1 VDC to F3 VDC Migration

M1 VDC to F3 VDC Migration

Migration Topology

Current State

Final State

M1/M1xl VDC

F3 VDC

Legend:
- Layer 3
- Classical Ethernet
- FabricPath
- M1 or M2 Ports
- F2e Ports
- F3 Ports

Core — Aggregation (L3, vPC PKAL, vPC PL) — Access — Firewall-1 — Firewall-2
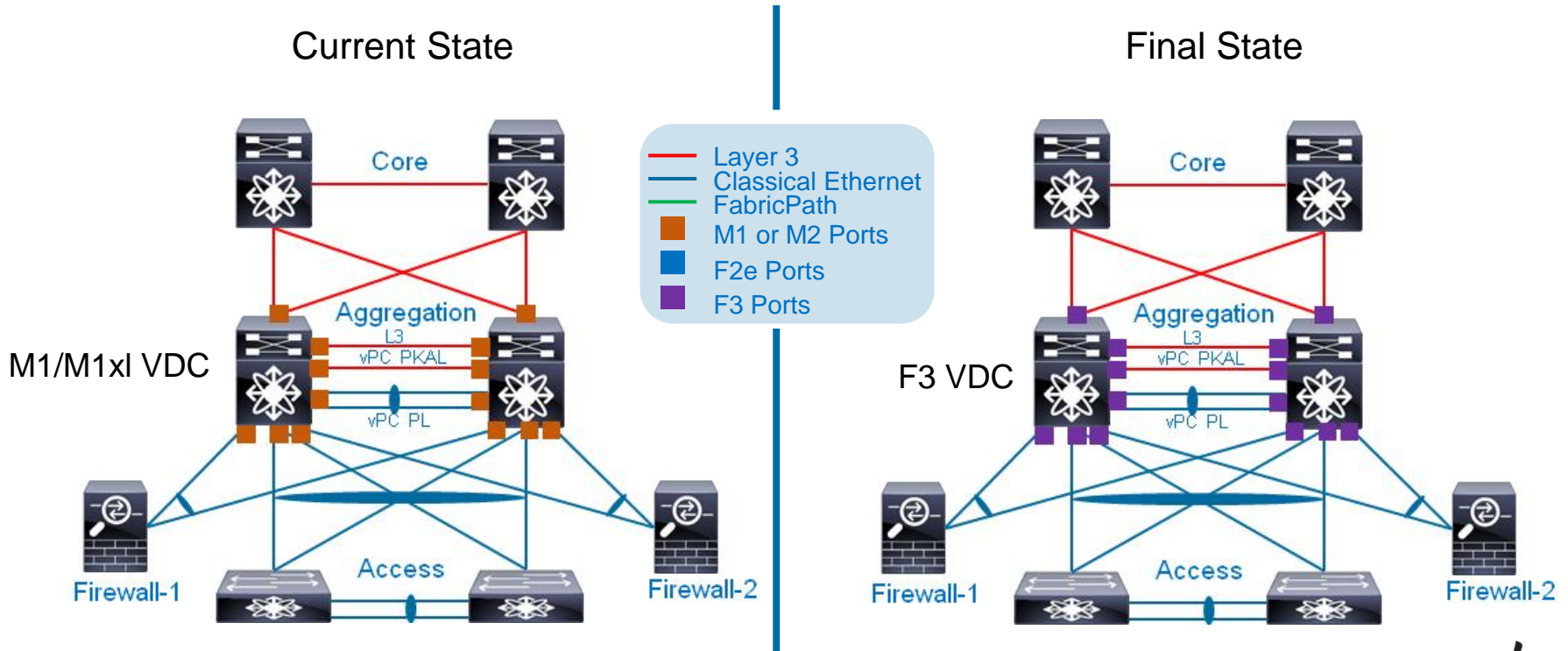
M1 VDC to F3 VDC Migration

Migration Planning for Nexus 7000 Chassis

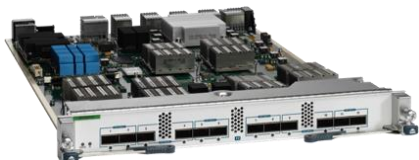**Supervisor**

F3 for Nexus 7000

- More Features
- Increased L2/L3 Scale
- High Port Density (40GE/100GE)

Requires High Performance Supervisor
- Supervisor 2 (Quad Core/12 GB) or
- Supervisor 2E (2*Quad Core/32GB)

Fabric

F3 – 12 Port 40 GE Card
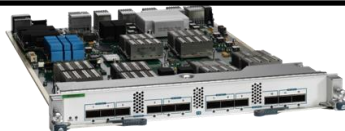
480 Gbps Fabric Bandwidth (40GE Line Card)

Five FAB-2 provides the required Fabric Bandwidth

5 * 110 = 550Gbps

VDC

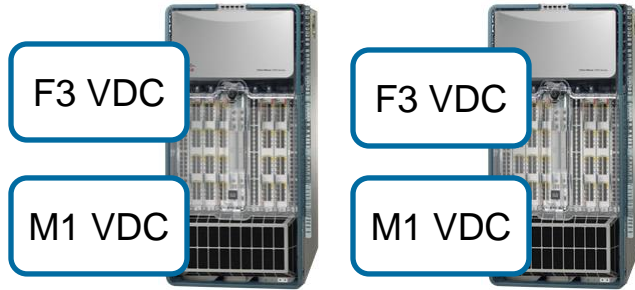M1 – 1st Generation Line Card   F3 – 3rd Generation Line Card

Not Compatible in the same VDC

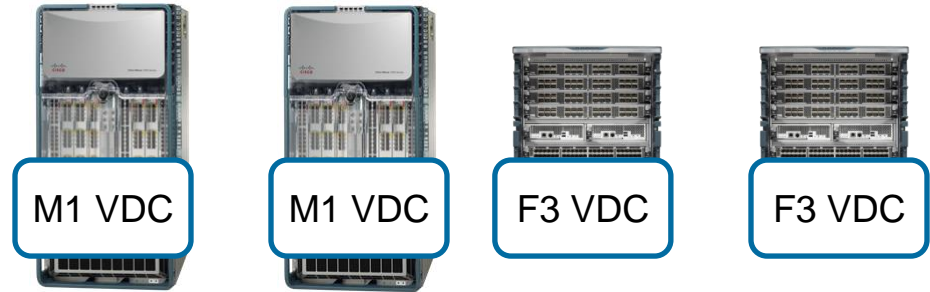Cisco*live!*

M1 VDC to F3 VDC Migration

Migration Options

Nexus 7000 - VDC Option

F3 VDC

F3 VDC

M1 VDC

M1 VDC

Nexus 7000

- Existing Nexus 7000 Chassis
- Supervisor 2 or Supervisor 2E
- 5 * FAB-2 Modules (5 * 110 = 550Gbps)
- Create new F3 only VDC and Migrate

Nexus 7700 - Chassis Option

M1 VDC

M1 VDC

F3 VDC

F3 VDC

Nexus 7000

Nexus 7700

- New Nexus 7700 Chassis
- Supervisor 2E
- 6 * FAB-2 Modules (6 * 220 Gbps = 1.2Tbps)
- Migrate to the New Nexus 7700 Chassis

This presentation primarily focusses on Nexus 7000 VDC option.

Overall Migration methodology is same for both options.

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M1 VDC to F3 VDC Migration

Task 1 – NX-OS Upgrade - Plan

- Plan
  - Hardware Requirement for F3 Module
    - Sup 2 or Sup 2E
  - Release Notes
    - System Requirements
      - Supported Device Hardware ●
    - Upgrade/Downgrade Paths and Caveats
    - Changed Software Features
    - Limitations
    - Open Caveats
  - Bug Search Tool

- NX-OS Requirement for F3 Module
  - NX-OS to 6.2(6) or above Train
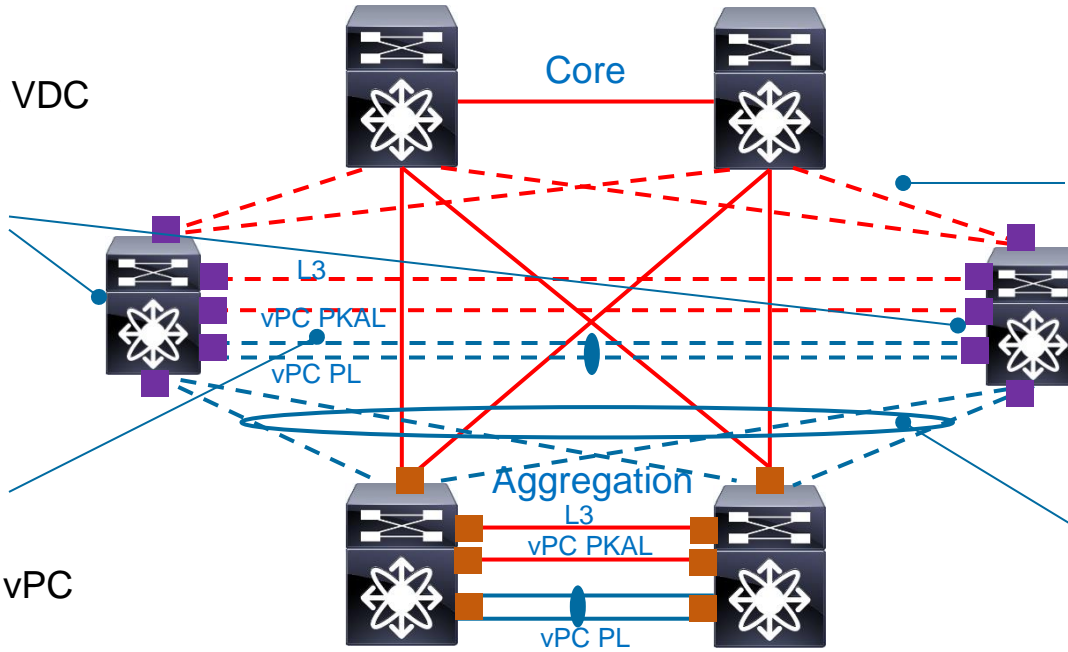
NX-OS Version, Supported FEX Modules and Transceivers including break out cables.

M1 VDC to F3 VDC Migration

Task 2 – Create New F3 only VDC

Step 1:
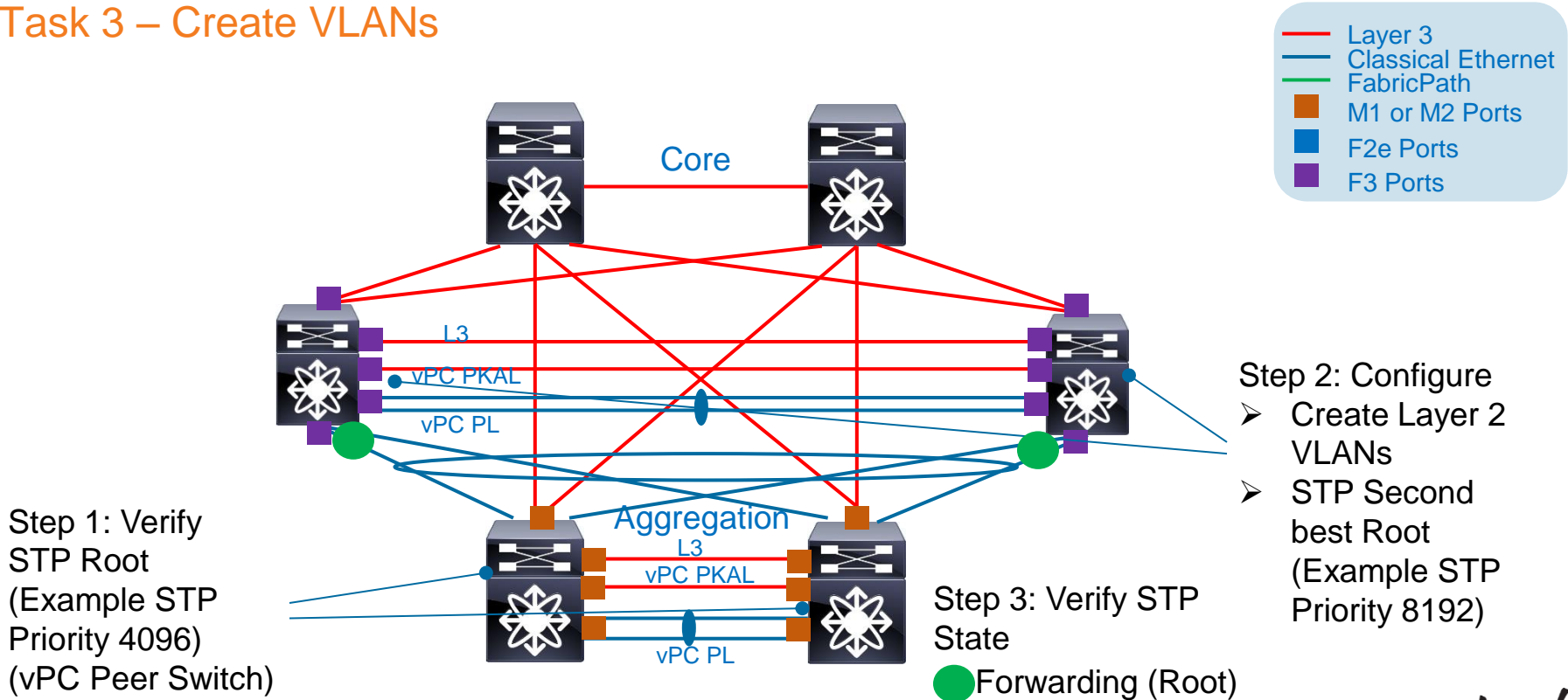Create New F3 VDC
and allocate
interfaces

Step 2:
Configure new vPC
Domain

Step 3:
L3 (/30) Links to Core.
Routing Protocol Peering.

Step 4:
Double Sided vPC to
M1 VDCs to support
Migration

Core

Aggregation

L3
vPC PKAL
vPC PL

L3
vPC PKAL
vPC PL

Legend:
- Layer 3
- Classical Ethernet
- FabricPath
- M1 or M2 Ports
- F2e Ports
- F3 Ports

M1 VDC to F3 VDC Migration

Task 3 – Create VLANs

Legend:
- Layer 3
- Classical Ethernet
- FabricPath
- M1 or M2 Ports
- F2e Ports
- F3 Ports

Core

L3
vPC PKAL
vPC PL

Aggregation
L3
vPC PKAL
vPC PL

Step 1: Verify STP Root (Example STP Priority 4096) (vPC Peer Switch)

Step 2: Configure
➢ Create Layer 2 VLANs
➢ STP Second best Root (Example STP Priority 8192)

Step 3: Verify STP State

⬤ Forwarding (Root)

Cisco live!

M1 VDC to F3 VDC Migration

Task 4 – Migrate Access Layer

Core

Aggregation
L3
vPC PKAL
vPC PL

Access

Legend:
- Layer 3
- Classical Ethernet
- FabricPath
- M1 or M2 Ports
- F2e Ports
- F3 Ports

Step 1:
Build a Double Sided vPC between Access layer and F3 VDC

Step 2:
Allow the VLANs on this trunk

Step 3:
Verify STP State
- Forwarding (Root)
- Blocking
- Forwarding (Designated)

Step 4:
Shutdown the Port Channel to M1 VDC

Impact: Minimal impact to traffic flow

Cisco live!

M1 VDC to F3 VDC Migration

Task 5 – Migrate Firewall

Core

Layer 3
Classical Ethernet
FabricPath
M1 or M2 Ports
F2e Ports
F3 Ports

Aggregation
L3
vPC PKAL
vPC PL

Aggregation
L3
vPC PKAL
vPC PL

Migration
Layer 2

Migration
Layer 2

Step 4:
Shutdown the
links to Firewall-1
(Standby)

Step 1:
Shutdown the links
to Firewall-2
(Standby)

Step 5:
Migrate the links to
F3 VDC

Step 3:
Failover
Firewall-1 to
Firewall-2

Step 2:
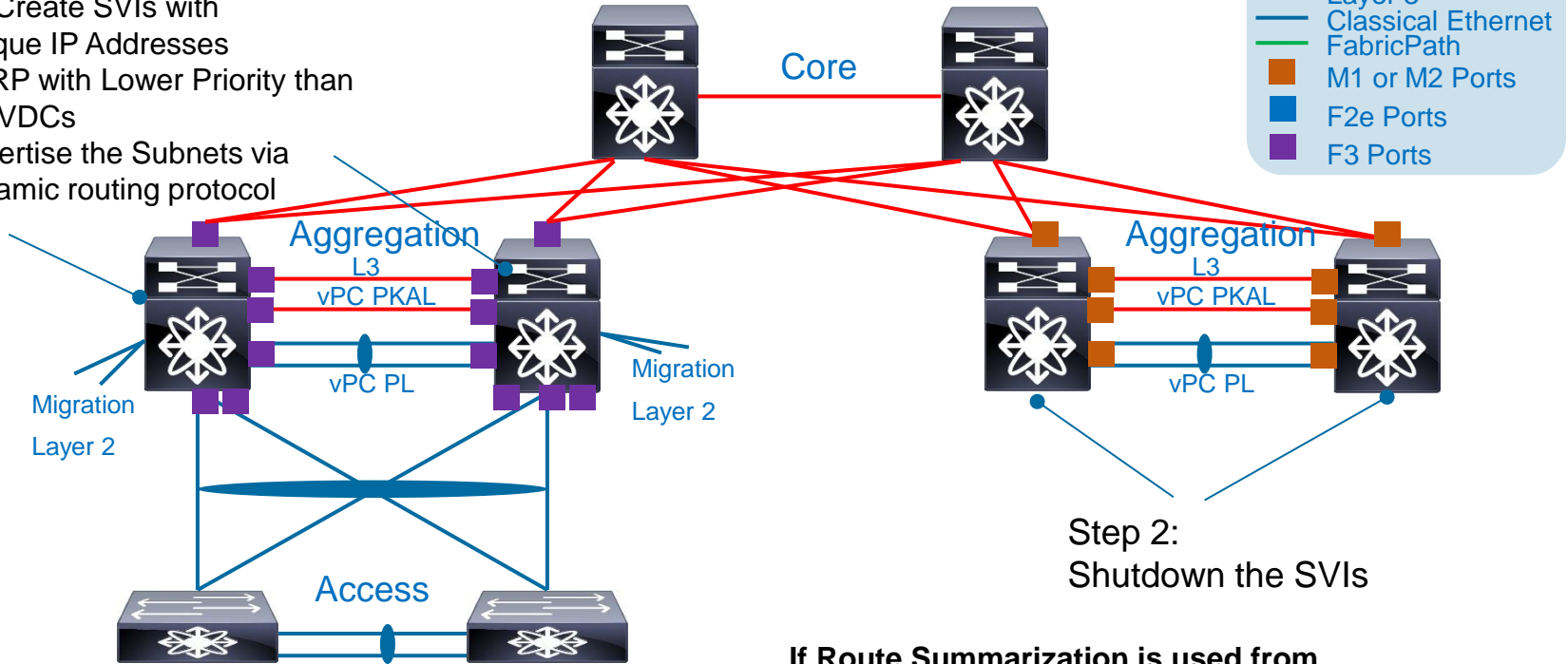Migrate the links to
F3 VDC

Firewall-1   Firewall-2
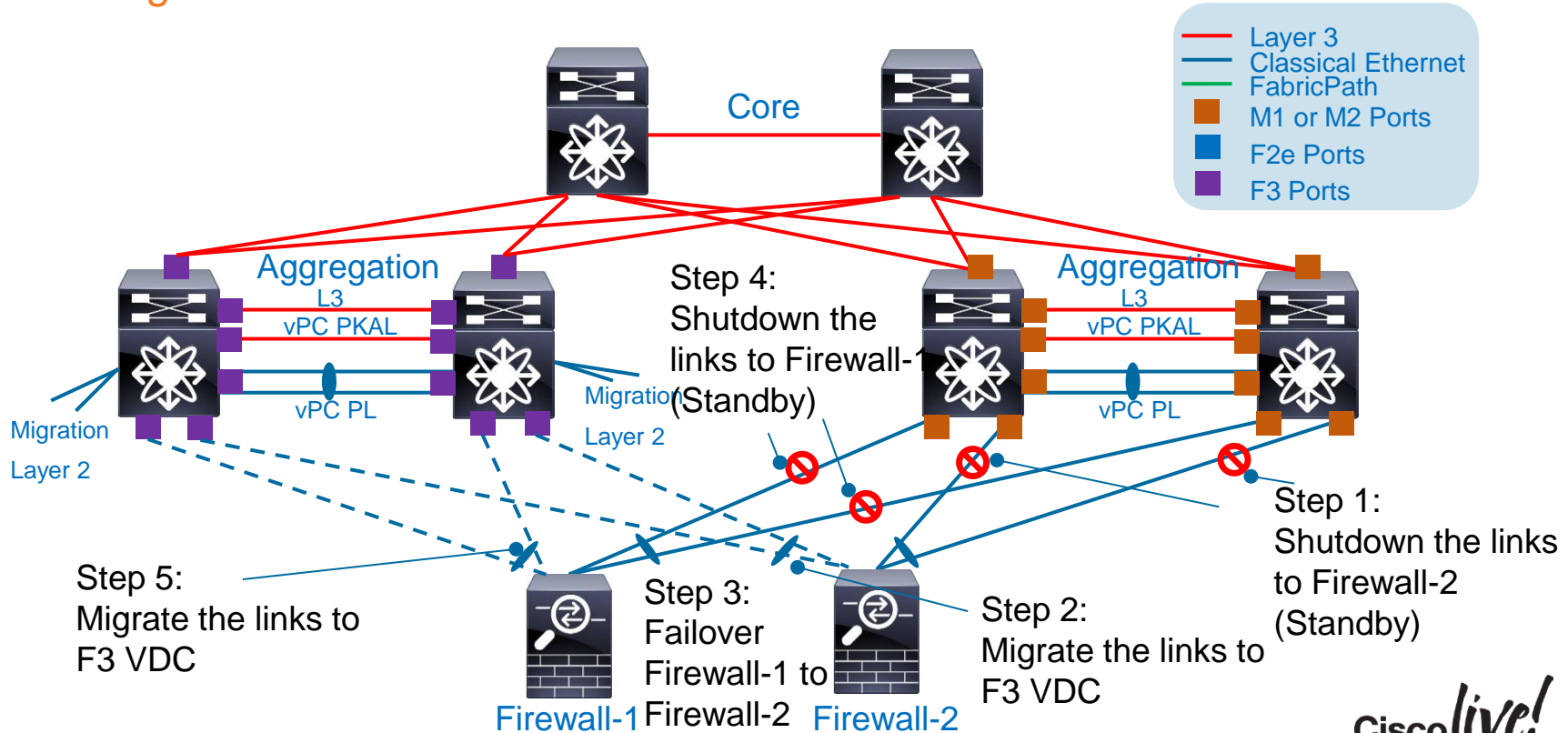
M1 VDC to F3 VDC Migration

Task 6 – SVI & Routing Migration (Server VLANs)

Step 1: Create SVIs with
- Unique IP Addresses
- HSRP with Lower Priority than M1 VDCs
- Advertise the Subnets via dynamic routing protocol

Core

Aggregation

L3

vPC PKAL

vPC PL

Migration Layer 2

Migration Layer 2

Aggregation

L3

vPC PKAL

vPC PL

Access

Legend:
- Layer 3
- Classical Ethernet
- FabricPath
- M1 or M2 Ports
- F2e Ports
- F3 Ports

Step 2:
Shutdown the SVIs

Impact: Minimal impact to traffic flow

If Route Summarization is used from Aggregation to core, summarize from the F3 VDC after all SVIs are migrated.

M1 VDC to F3 VDC Migration

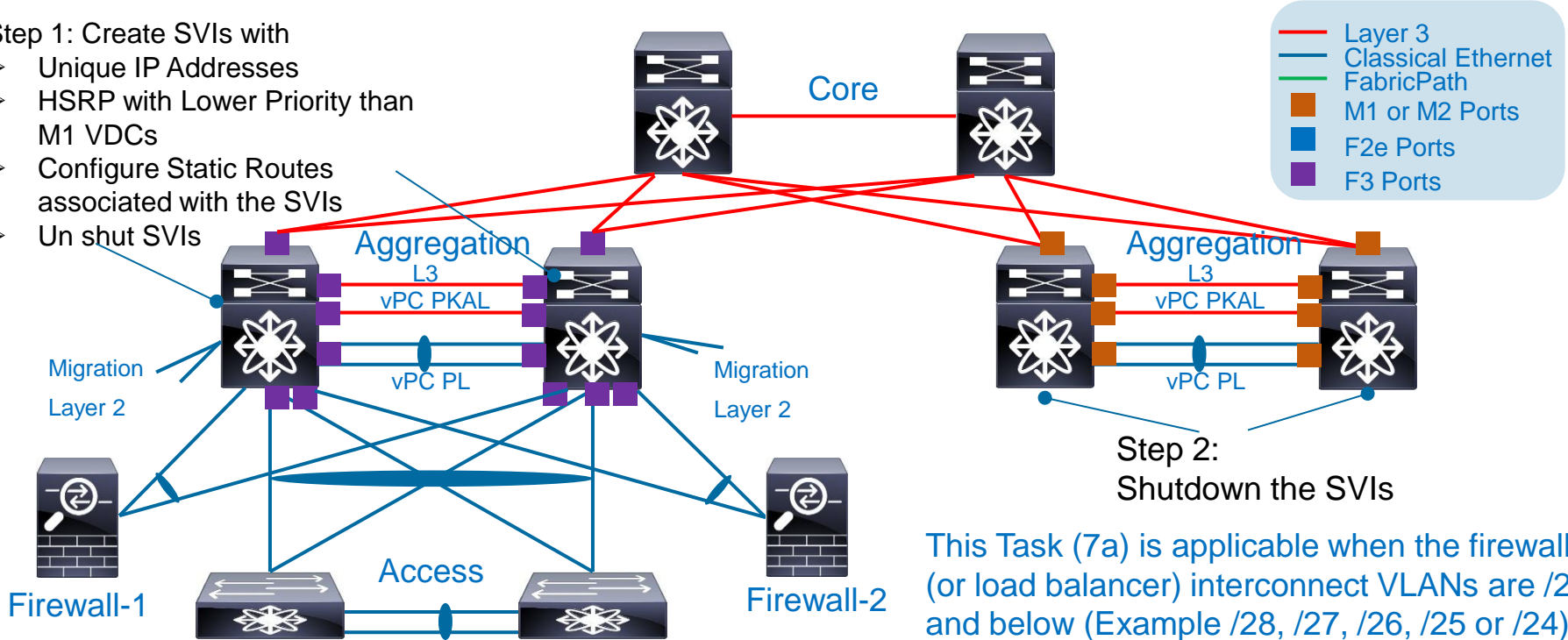## Task 6 – SVI & Routing Migration (Server VLANs) – Improve Convergence

- HSRP Timers (Optional)
  - For Fast Failover, aggressive HSRP timers can be configured.
  - HSRP timers can be changed back to default timer after migration.
  - Otherwise, hsrp timers extended-hold needs to be configured to avoid HSRP state changes during ISSU.

- Populate ARP Entry (Optional)
  - Enable SVIs on the F3 only VDCs with higher routing metric (Less Prefer)
  - Connect a host on the F3 only VDC and run a Ping Sweep on all hosts
  - ARP Entries are populated on F3 only VDC(Improving Convergence)
  - Shutdown SVIs on the M1 VDCs
  - Change the routing metric to default value in F3 only VDC

M1 VDC to F3 VDC Migration

Task 7a – SVI & Routing Migration (Firewall or Load balancer /28 VLANs)

Step 1: Create SVIs with
- ➤ Unique IP Addresses
- ➤ HSRP with Lower Priority than M1 VDCs
- ➤ Configure Static Routes associated with the SVIs
- ➤ Un shut SVIs

Core

Aggregation
L3
vPC PKAL
vPC PL

Migration
Layer 2

Firewall-1

Access

Firewall-2

Aggregation
L3
vPC PKAL
vPC PL

Legend:
- Layer 3 (red)
- Classical Ethernet (blue)
- FabricPath (green)
- M1 or M2 Ports (orange)
- F2e Ports (blue)
- F3 Ports (purple)

Step 2:
Shutdown the SVIs

This Task (7a) is applicable when the firewall (or load balancer) interconnect VLANs are /28 and below (Example /28, /27, /26, /25 or /24)
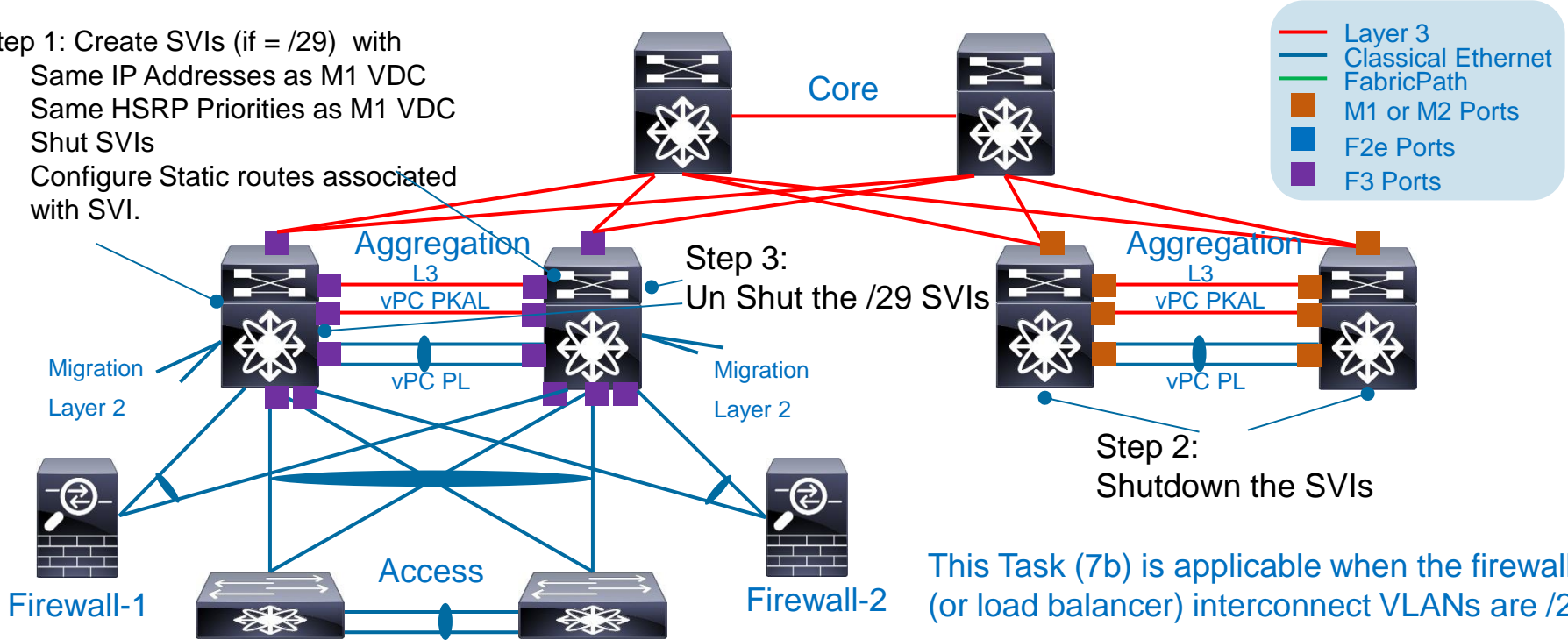
Impact: Minimal impact to traffic flow

Cisco live!

M1 VDC to F3 VDC Migration

Task 7b – SVI & Routing Migration (Firewall or Load balancer /29 VLANs)

Step 1: Create SVIs (if = /29) with
- Same IP Addresses as M1 VDC
- Same HSRP Priorities as M1 VDC
- Shut SVIs
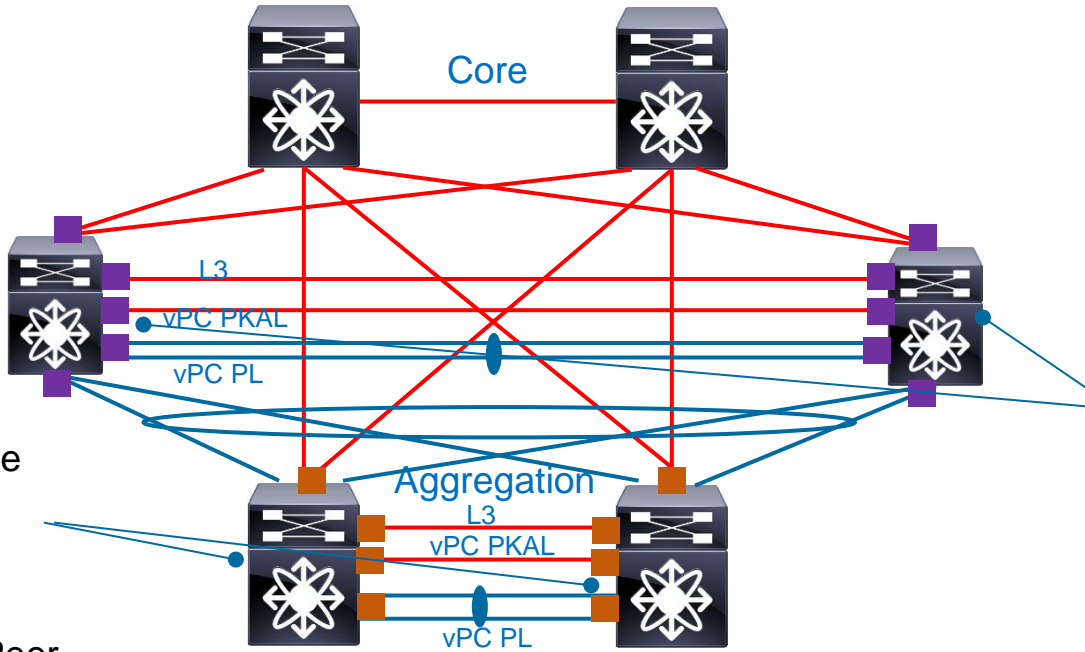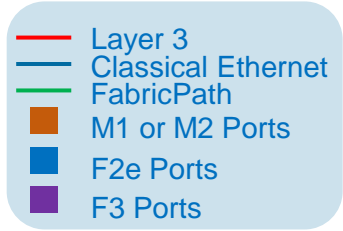- Configure Static routes associated with SVI.

Legend:
- Layer 3 (red)
- Classical Ethernet (blue)
- FabricPath (green)
- M1 or M2 Ports (orange)
- F2e Ports (blue)
- F3 Ports (purple)

Core

Aggregation — L3, vPC PKAL, vPC PL

Step 3:
Un Shut the /29 SVIs

Step 2:
Shutdown the SVIs

Migration Layer 2

Firewall-1

Access

Firewall-2

This Task (7b) is applicable when the firewall (or load balancer) interconnect VLANs are /29.

Impact: Disruptive Change

M1 VDC to F3 VDC Migration

Task 8 – Migrate STP Root

Legend:
- Layer 3
- Classical Ethernet
- FabricPath
- M1 or M2 Ports
- F2e Ports
- F3 Ports

Core

L3
vPC PKAL
vPC PL

Aggregation
L3
vPC PKAL
vPC PL

Step 1: Configure
➤ Default STP Root Priority

Step 2: Configure
➤ STP Primary Root (Example STP Priority 4096)

Step 3: Remove vPC Peer Switch

Step 4: Configure vPC Peer Switch

Impact: Minimal impact to traffic flow

Use Case 3a: M1 VDC to F3 VDC Migration (OTV VDC)

M1 VDC to F3 VDC Migration (OTV VDC)

Migration Topology
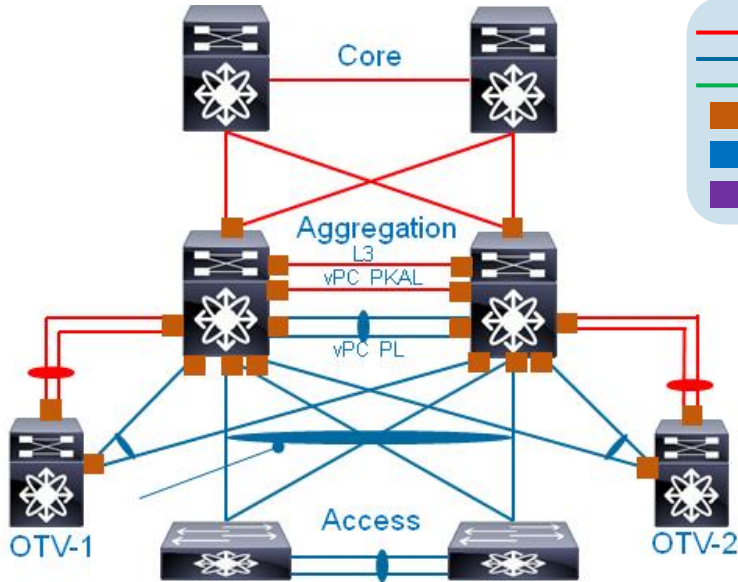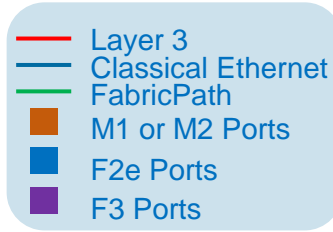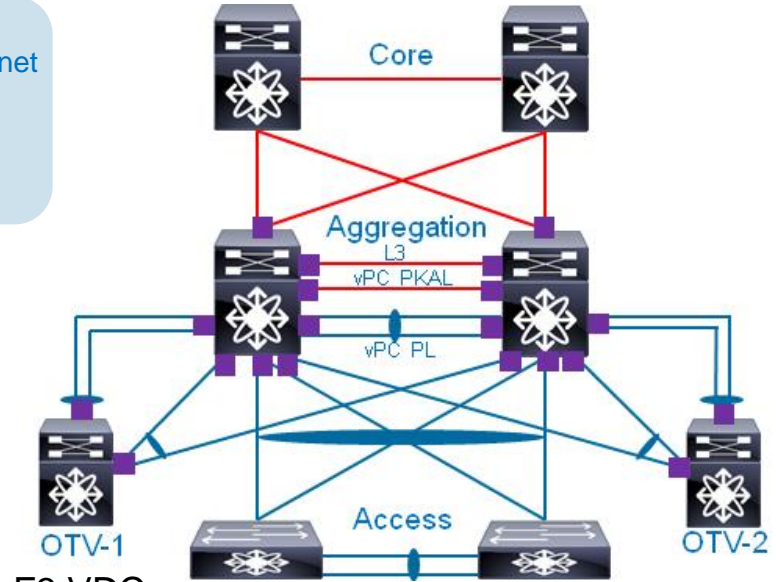
Current State

Final State

Legend:
- Layer 3
- Classical Ethernet
- FabricPath
- M1 or M2 Ports
- F2e Ports
- F3 Ports

M1/M1xl VDC

F3 VDC

M1 VDC to F3 VDC Migration (OTV VDC)

Task 1 – NX-OS Upgrade - Chassis 1

NX-OS Prior to 6.2

NX-OS Prior to 6.2

Aggregation
L3
vPC PKAL
vPC PL

Step 1:
Shut Overlay and Internal interfaces.

Step 2:
Verify OTV-2 is AED for all VLANs

OTV-1

OTV-2

Step 4:
Un Shut Overlay and Internal interfaces.
OTV -1 will not be AED for any VLANs (Version Mismatch)
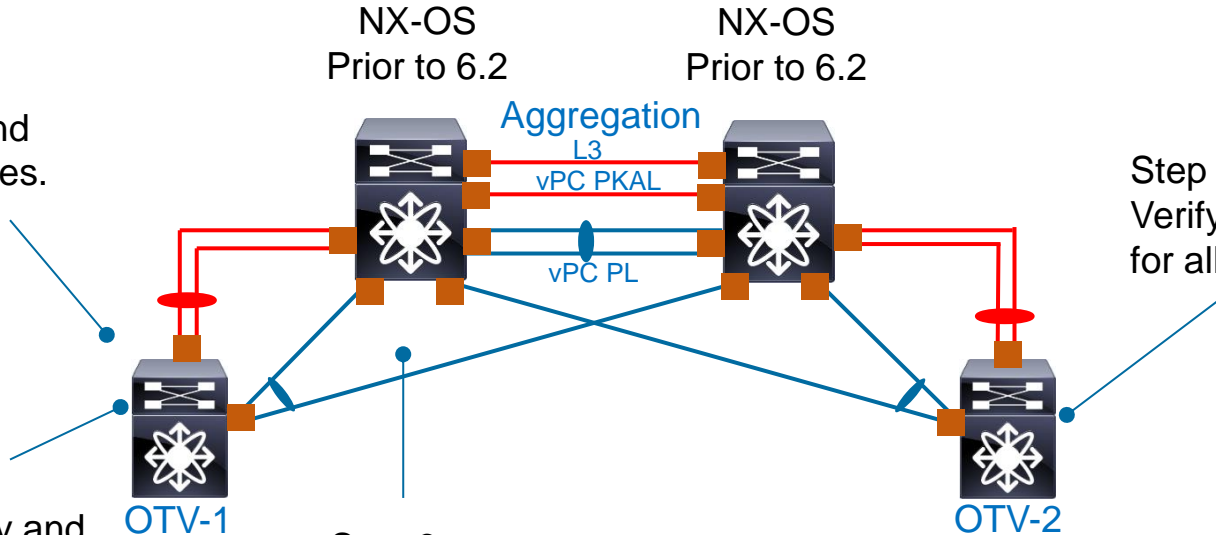
Step 3:
ISSU Chassis 1 to 6.2(6) or above

Upgrade from an image earlier than 6.2(2) to an image 6.2(2) or later in an OTV network is disruptive.

Impact: Disruptive Change

M1 VDC to F3 VDC Migration (OTV VDC)

Task 1 – NX-OS Upgrade - Chassis 1 – OTV Verification

```
OTV-1# show otv

OTV Overlay Information
Site Identifier 0000.0000.0001

Overlay interface Overlay100
 VPN name            : Overlay100
 VPN state           : UP
 Extended vlans      : 501-502 (Total:2)
 Join interface(s)   : Eth1/17 (11.1.17.2)
 Site vlan           : 100 (up)
 AED-Capable         : No (Version Mismatch)
 Capability          : Unicast-Only
 Is Adjacency Server : Yes
 Adjacency Server(s) : 11.1.17.2 / 12.1.17.2
```

```
OTV-2# show otv

OTV Overlay Information
Site Identifier 0000.0000.0001

Overlay interface Overlay100
 VPN name            : Overlay100
 VPN state           : UP
 Extended vlans      : 501-502 (Total:2)
 Join interface(s)   : Eth1/17 (11.1.16.2)
 Site vlan           : 100 (up)
 AED-Capable         : Yes
 Capability          : Unicast-Only
 Is Adjacency Server : Yes
 Adjacency Server(s) : 11.1.17.2 / 12.1.17.2
```

M1 VDC to F3 VDC Migration (OTV VDC)

Task 1 – NX-OS Upgrade - Chassis 1 – OTV Verification

```
OTV-1# show otv vlan


VLAN    Auth. Edge Device                     Vlan State              Overlay
----    ----------------------------------    ----------------------   -------

 501                                          inactive(NA)            Overlay100
 502                                          inactive(NA)            Overlay100
```
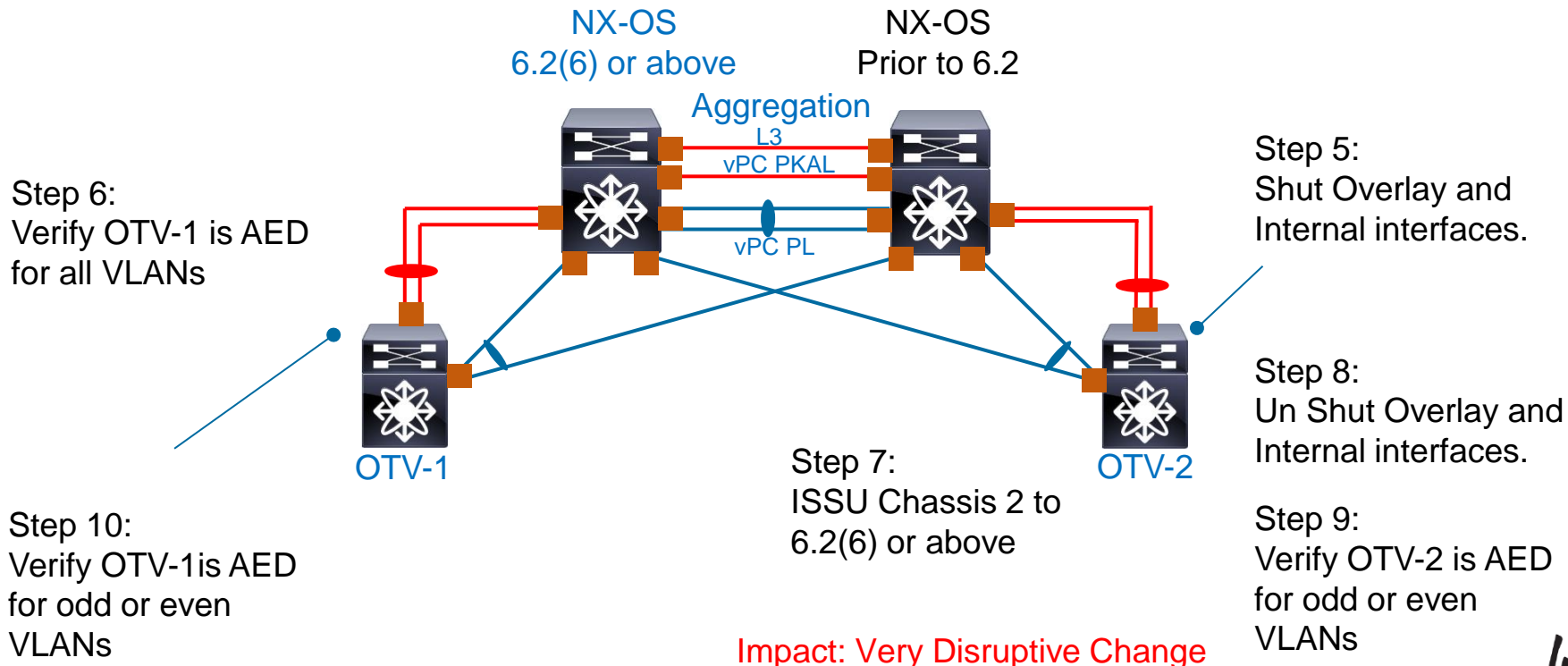
```
OTV-2# show otv vlan

VLAN    Auth. Edge Device                     Vlan State     Overlay
----    ----------------------------------    ----------     -------
 501*   SJDC1SWAG02-OTV                       active                  Overlay100
 502*   SJDC1SWAG02-OTV                       active                  Overlay100
```
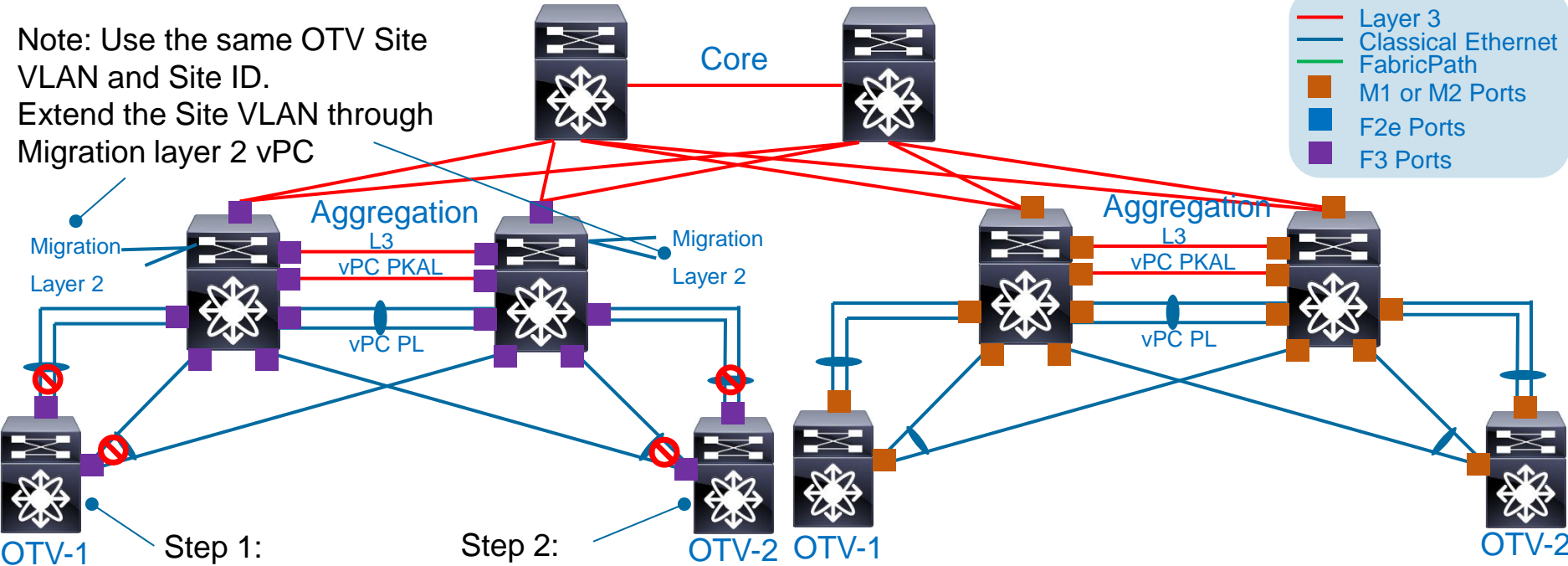
Cisco live!

M1 VDC to F3 VDC Migration (OTV VDC)

Task 1 – NX-OS Upgrade – Chassis 2

NX-OS
6.2(6) or above

NX-OS
Prior to 6.2

Aggregation
L3
vPC PKAL
vPC PL

OTV-1

OTV-2

Step 6:
Verify OTV-1 is AED
for all VLANs

Step 5:
Shut Overlay and
Internal interfaces.

Step 8:
Un Shut Overlay and
Internal interfaces.

Step 7:
ISSU Chassis 2 to
6.2(6) or above

Step 9:
Verify OTV-2 is AED
for odd or even
VLANs

Step 10:
Verify OTV-1is AED
for odd or even
VLANs

Impact: Very Disruptive Change

Cisco *live!*

M1 VDC to F3 VDC Migration (OTV VDC)

Task 2 – OTV Migration – Create OTV VDCs

Note: Use the same OTV Site VLAN and Site ID.
Extend the Site VLAN through Migration layer 2 vPC

Core

Migration Layer 2

Aggregation
L3
vPC PKAL
vPC PL

Aggregation
L3
vPC PKAL
vPC PL

Migration Layer 2

Layer 3
Classical Ethernet
FabricPath
M1 or M2 Ports
F2e Ports
F3 Ports

OTV-1

OTV-2

OTV-1

OTV-2

Step 1: Create New OTV VDC.

Step 2: Create New OTV VDC.

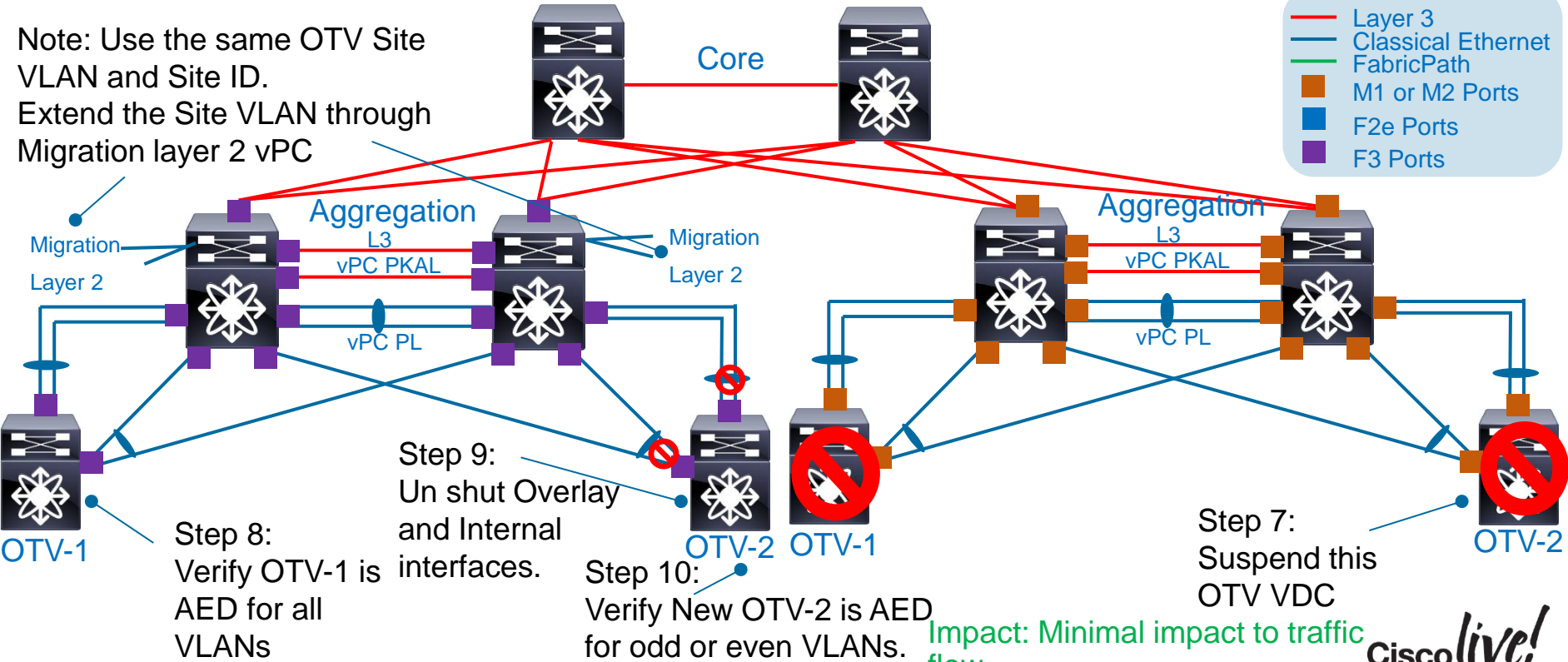Keep the Overlay and Internal interface Shutdown

M1 VDC to F3 VDC Migration (OTV VDC)

Task 2 – OTV Migration – OTV VDC 1

Note: Use the same OTV Site VLAN and Site ID.
Extend the Site VLAN through Migration layer 2 vPC

Core

Migration Layer 2

Aggregation
L3
vPC PKAL
vPC PL

Migration Layer 2

Aggregation
L3
vPC PKAL
vPC PL

Layer 3
Classical Ethernet
FabricPath
M1 or M2 Ports
F2e Ports
F3 Ports

OTV-1

Step 6:
Verify New OTV-1 is AED for odd or even VLANs.

Step 5:
Un shut Overlay and Internal interfaces.

OTV-2

OTV-1

Step 3:
Suspend this OTV VDC

Step 4:
Verify OTV-2 is AED for all VLANs

OTV-2

Impact: Minimal impact to traffic flow

Cisco live!
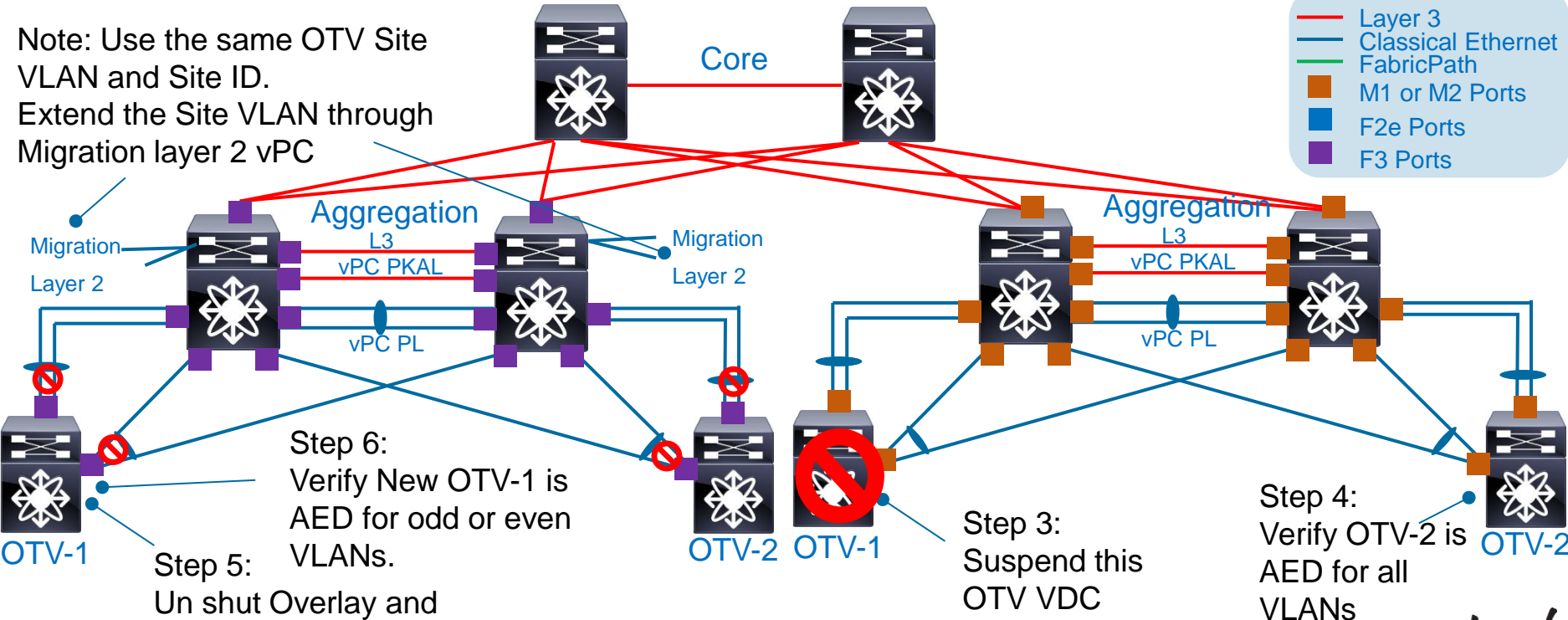
M1 VDC to F3 VDC Migration (OTV VDC)

Task 2 – OTV Migration – OTV VDC 2

Note: Use the same OTV Site VLAN and Site ID.
Extend the Site VLAN through Migration layer 2 vPC

Core

Aggregation

Migration Layer 2

L3
vPC PKAL

vPC PL

Migration Layer 2

Aggregation

L3
vPC PKAL

vPC PL

Layer 3
Classical Ethernet
FabricPath
M1 or M2 Ports
F2e Ports
F3 Ports

OTV-1

OTV-2

OTV-1

OTV-2

Step 8:
Verify OTV-1 is AED for all VLANs

Step 9:
Un shut Overlay and Internal interfaces.

Step 10:
Verify New OTV-2 is AED for odd or even VLANs.

Step 7:
Suspend this OTV VDC

Impact: Minimal impact to traffic flow

Use Case 4: F2e VDC to F3 VDC Migration

F2e VDC to F3 VDC Migration

Migration Topology – Current State

Core

Aggregation

F2 VDC

L3
vPC+ PKAL
vPC+ PL

Access

FEX-A

FEX-B

Legend:
- Layer 3
- Classical Ethernet
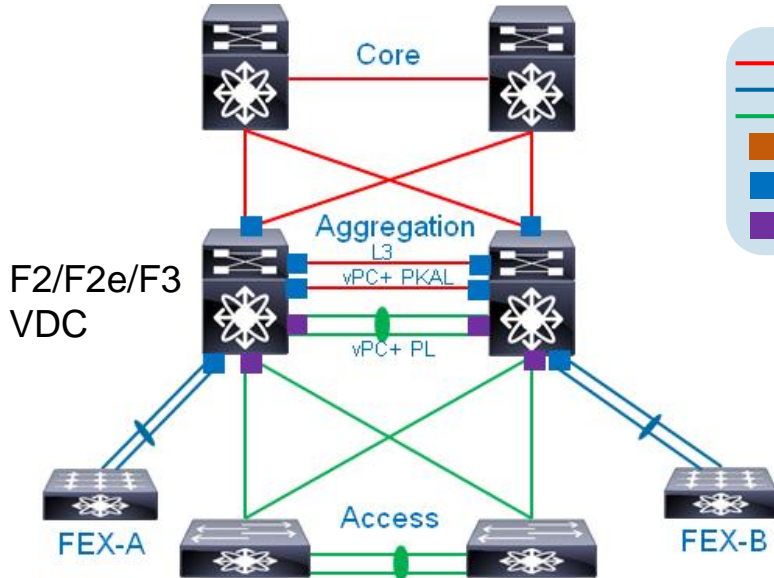- FabricPath
- M1 or M2 Ports
- F2e Ports
- F3 Ports
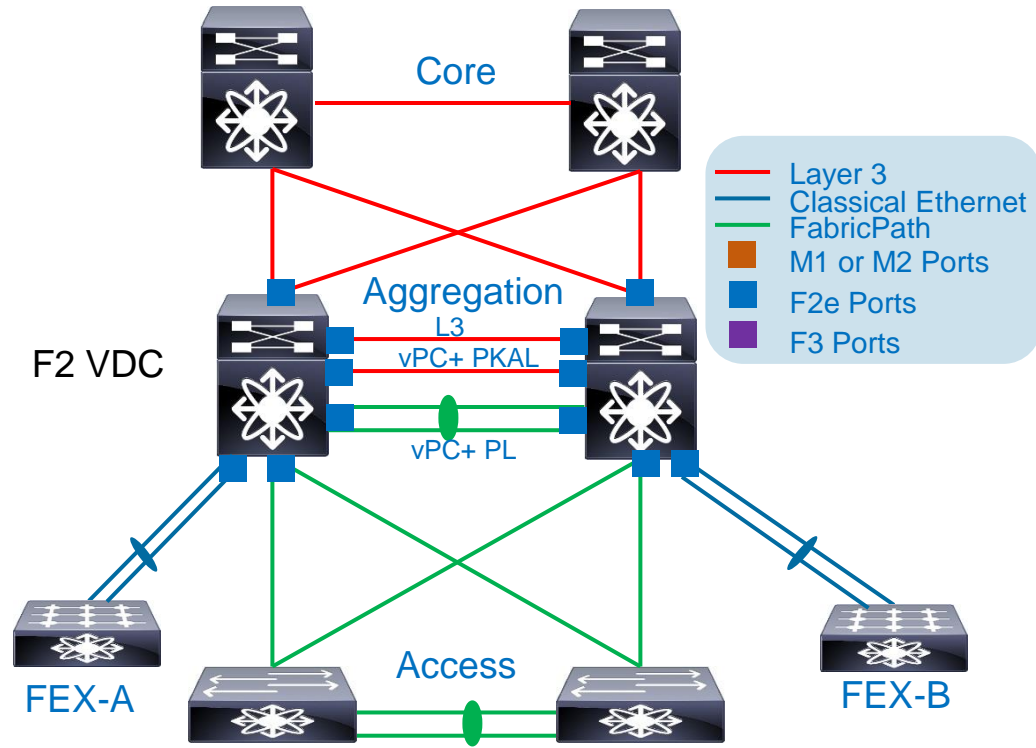
➢ This migration methodology can be used for Nexus 7700 Chassis as well.
➢ Nexus 7700 is supported from NX-OS 6.2(2)
➢ Nexus 7700 supports only Supervisor 2E Module
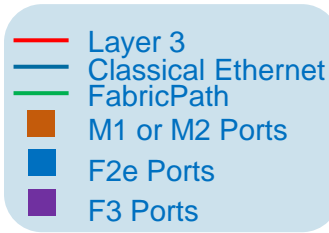➢ Nexus 7700 Supports F2e (6.2(2))and F3 Modules (6.2(6))

F2e VDC to F3 VDC Migration

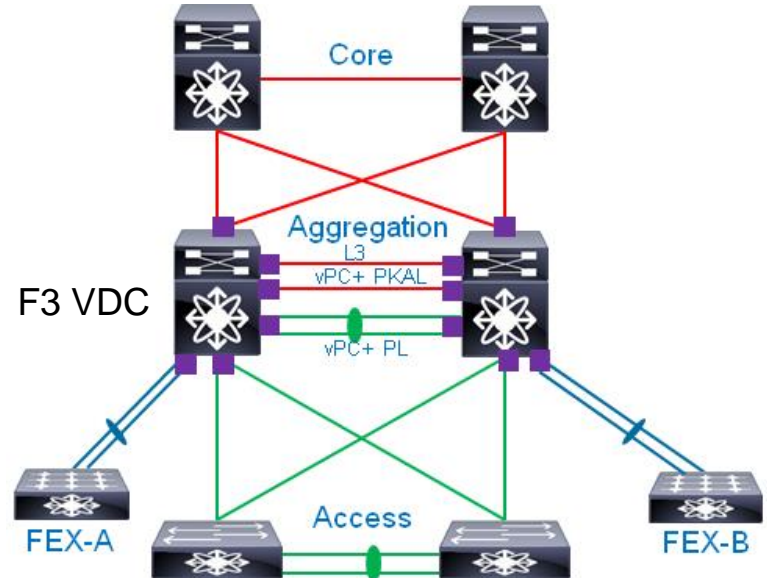Migration Topology - Interim State & Final State

F2e VDC to F3 VDC Migration
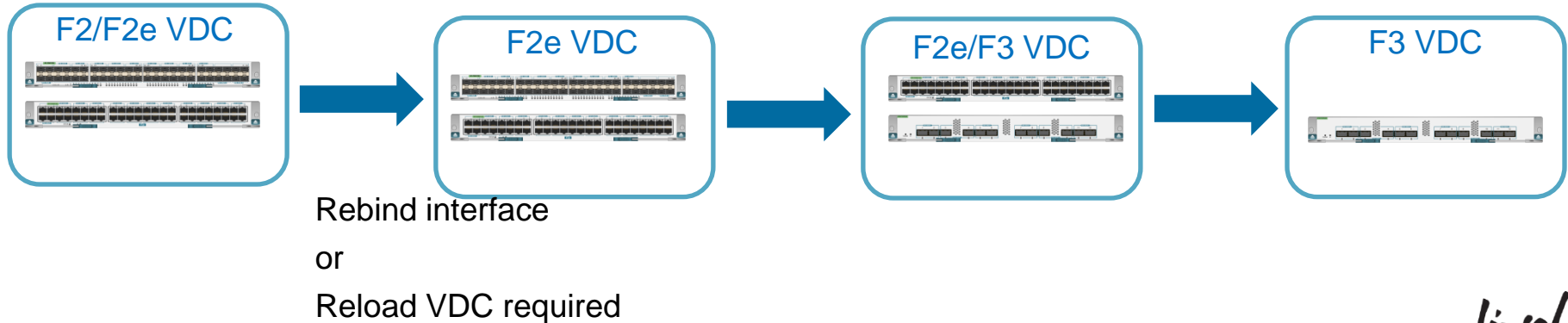
Migration Overview

F2/F2e VDC → F2/F2e/F3 VDC →

Rebind interface
or
Reload VDC required

→ F3 VDC

F2/F2e VDC → F2e VDC → F2e/F3 VDC → F3 VDC

Rebind interface
or
Reload VDC required

Cisco Public
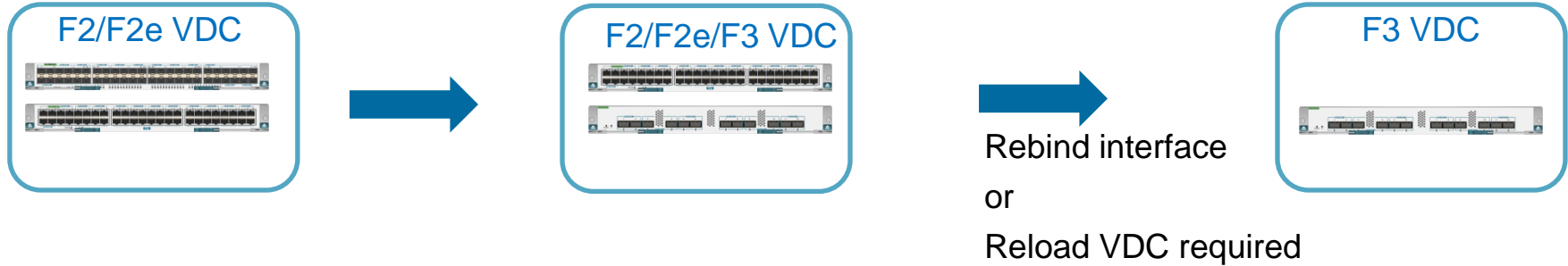
F2e VDC to F3 VDC Migration

Task 1 – NX-OS Upgrade

- Plan
  - Hardware Requirement
    - Sup 2 or Sup 2E
  - Release Notes
    - Upgrade/Downgrade Paths and Caveats
    - Changed Software Features
    - Limitations
    - Open Caveats
  - Bug Search Tool

- Upgrade
  - Upgrade NX-OS to 6.2(6) or above

- Verify

     Cisco Public

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F2e VDC to F3 VDC Migration

Task 2 – Change VDC Type

Current VDC Configuration

```
vdc Nexus-7010-Agg-1 id 2
  limit-resource module-type f2 f2e
  allocate interface Ethernet9/1-48
  allocate interface Ethernet10/1-48
```

Change VDC Type

```
Nexus-7010-admin-1(config)# vdc Nexus-7010-Agg-1
Nexus-7010-admin-1(config-vdc)# limit-resource module-type f2 f2e f3
This will cause all ports of unallowed types to be removed from this vdc.
Continue (y/n)? [yes]

Nexus-7010-admin-1(config-vdc)# allocate interface Ethernet1/1-12
Nexus-7010-admin-1(config-vdc)# allocate interface Ethernet2/1-12
Nexus-7010-admin-1(config-vdc)# end
```
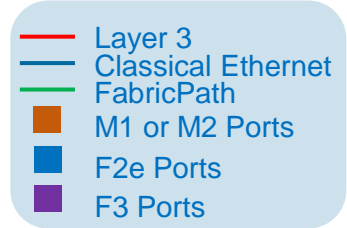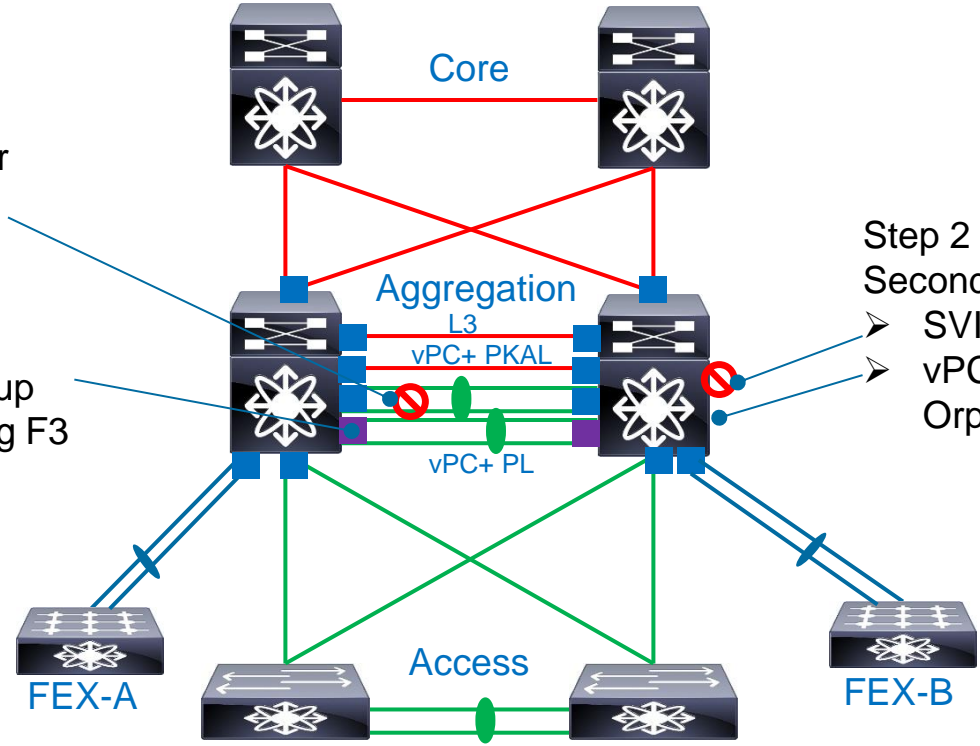
Impact: Non Disruptive Change

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F2e VDC to F3 VDC Migration

Task 3 – Migrate vPC+ Peer Link

Legend:
- Layer 3
- Classical Ethernet
- FabricPath
- M1 or M2 Ports
- F2e Ports
- F3 Ports

Step 1:
Shutdown vPC+ Peer Link that has F2e ports(Disruptive)

Step 3:
Configure and bring up vPC+ Peer Link using F3 Ports

Core

Aggregation
L3
vPC+ PKAL
vPC+ PL

Access

FEX-A

FEX-B

Step 2 : Verify on vPC+ Secondary Switch
- SVIs suspended
- vPC Port Channels & vPC Orphan Ports Suspended

Step 4 : Verify on vPC+ Secondary Switch
- SVIs are up
- vPC Port Channels and vPC Orphan Ports are up
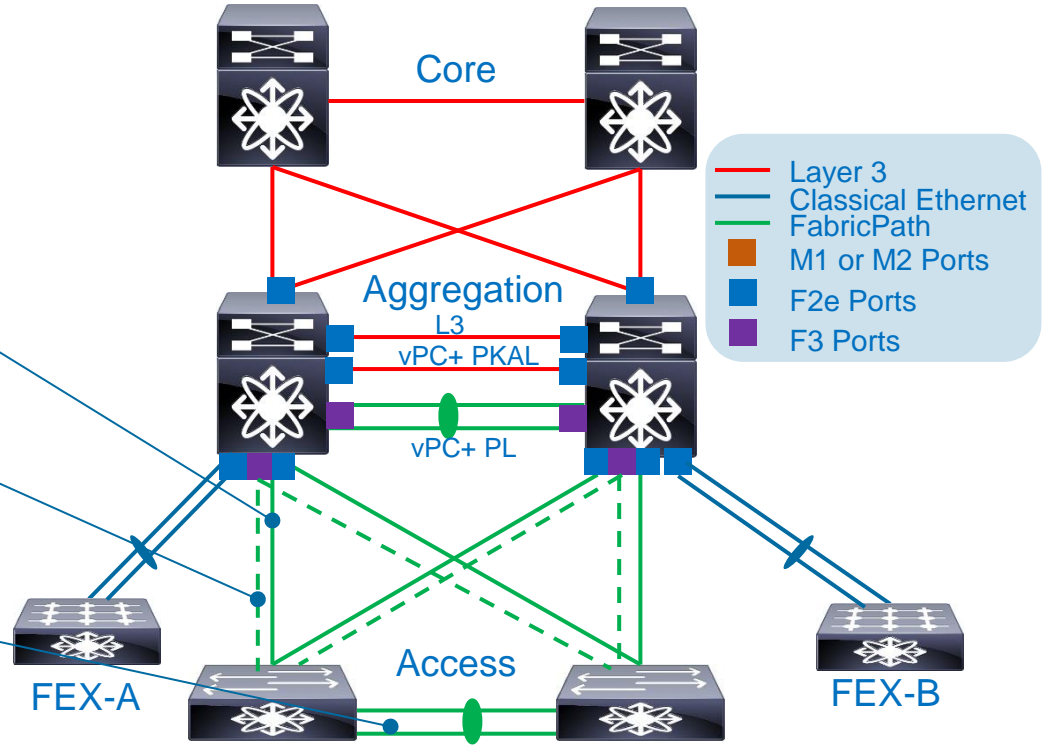
Impact: Disruptive Change

F2e VDC to F3 VDC Migration

Task 4 – Migrate Access Layer

Step 3:
Shutdown the 10 GE Links.

Step 2:
Bring up New 40 GE links.

Step 1:
Consider increasing bandwidth if bandwidth to Aggregation layer is increased.

Impact: Minimal impact to traffic flow

This is the Interim State

F2e VDC to F3 VDC Migration
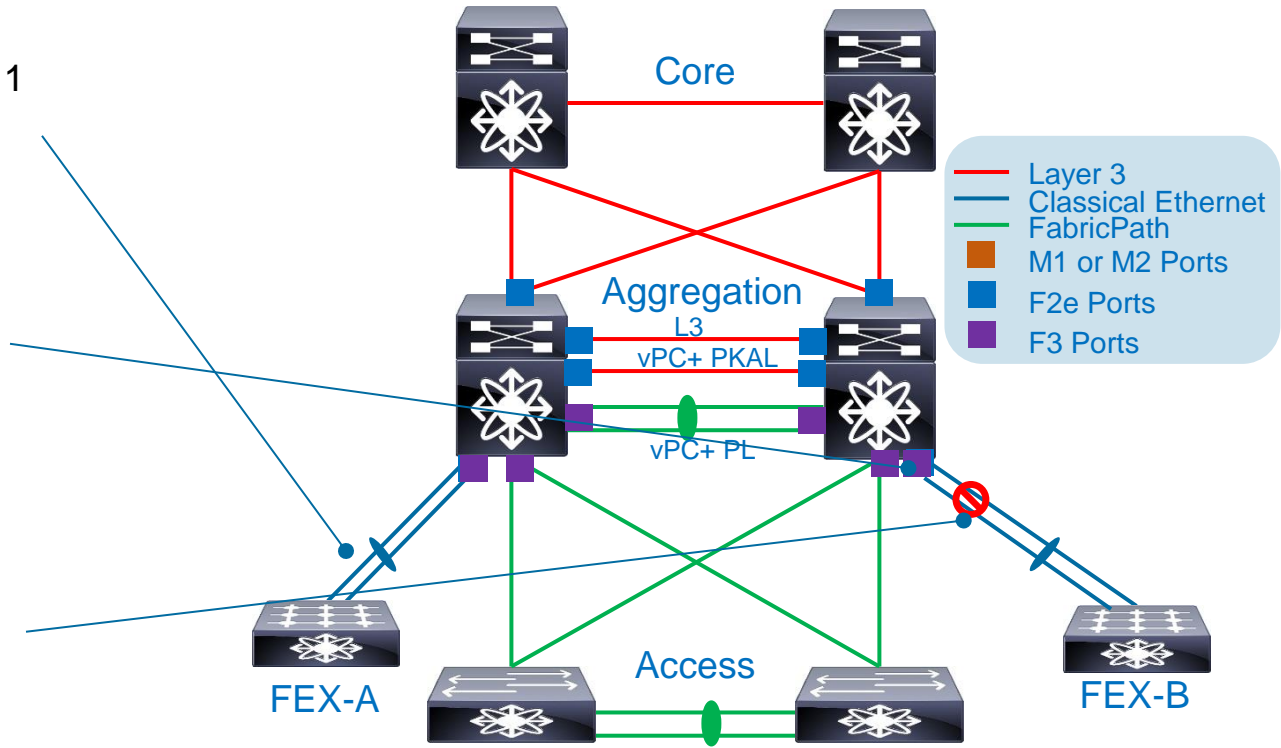
Task 5 – Migrate FEX

Step 3: Repeat the steps 1 & 2 for FEX-A

Step 2:
➢ Migrate the links to F3 Ports.
➢ Configure F3 Ports identical to the Port Channel
➢ Assign the Ports to the Port Channel.

Step 1:
➢ Shutdown the Port Channel to FEX-B.
➢ Remove the ports from the Port Channel.

Core

Aggregation
L3
vPC+ PKAL
vPC+ PL

Access

FEX-A

FEX-B

Legend:
— Layer 3
— Classical Ethernet
— FabricPath
■ M1 or M2 Ports
■ F2e Ports
■ F3 Ports

F2e VDC to F3 VDC Migration
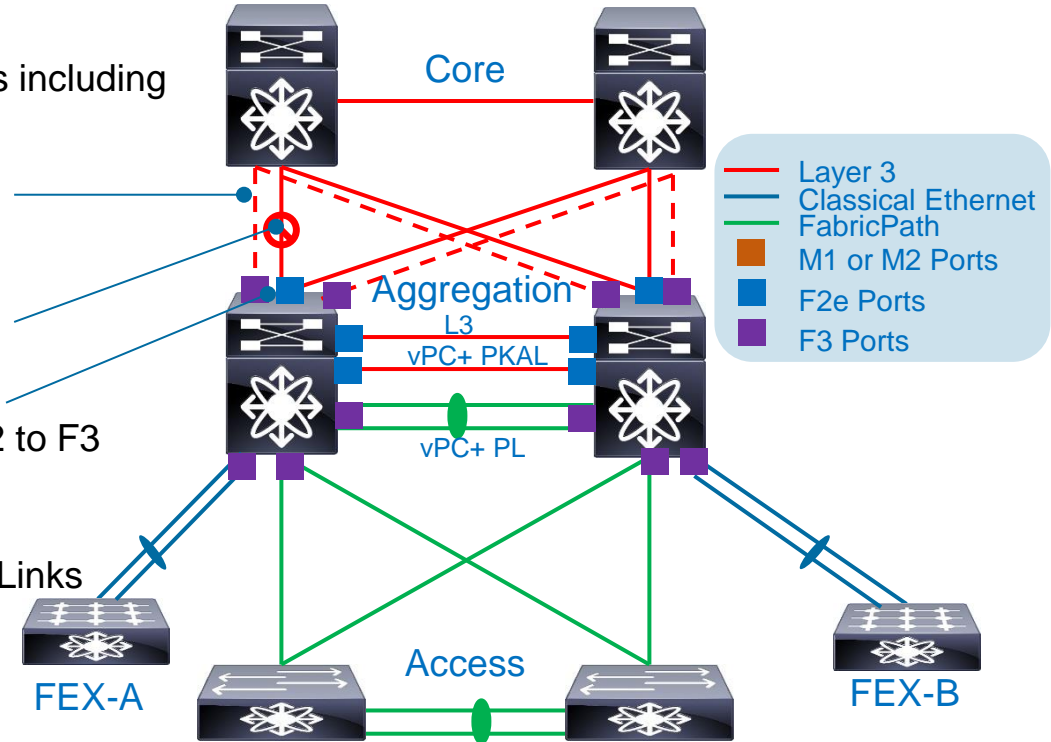
Task 6 – Migrate Layer 3 Links

The below steps applicable to all Layer 3 links including vPC PKAL

Step 1: Build a Parallel links using F3 Ports.

Step 2: Shutdown One link (F2) at a time

Step 3: Migrate the port configuration from F2 to F3 Port and Un shut F3 Port

Step 4: Repeat Step 2 & 3 for all the Layer 3 Links

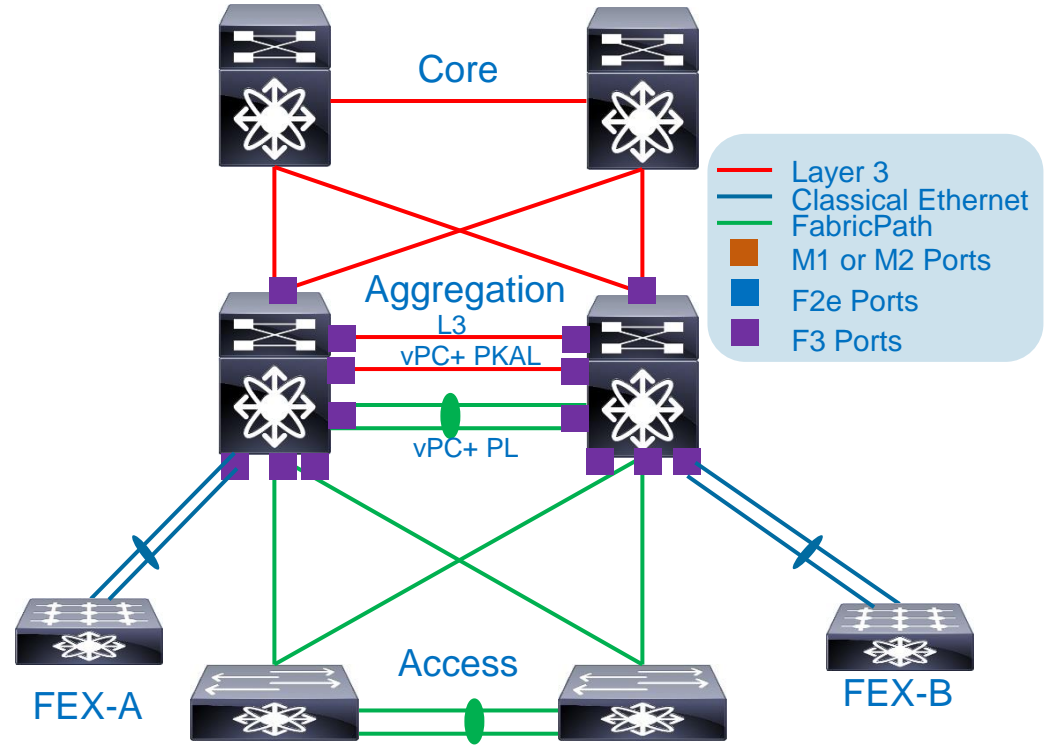**Impact: Very Minimal impact to traffic flow**

Core

Aggregation

L3
vPC+ PKAL

vPC+ PL

Access

FEX-A

FEX-B

Layer 3
Classical Ethernet
FabricPath
M1 or M2 Ports
F2e Ports
F3 Ports

Cisco *live!*

F2e VDC to F3 VDC Migration

Is this a Final State?

All Links are using F3 Ports.

But the VDC type is still F2 F2e F3.

In order to see the full benefit of F3 Module, VDC type needs to be changed to F3 only VDC

Core

Aggregation
L3
vPC+ PKAL
vPC+ PL

Access

FEX-A

FEX-B

Legend:
- Layer 3
- Classical Ethernet
- FabricPath
- M1 or M2 Ports
- F2e Ports
- F3 Ports

F2e VDC to F3 VDC Migration

Task 7 – Change VDC Type to F3 Only VDC

```
vdc Nexus-7010-Agg-1 id 2
  limit-resource module-type f2 f2e f3
  allocate interface Ethernet1/1-12
  allocate interface Ethernet2/1-12
  allocate interface Ethernet9/1-48
  allocate interface Ethernet10/1-48


Nexus-7010-admin-1(config)# vdc Nexus-7010-Agg-1
Nexus-7010-admin-1(config-vdc)# no allocate interface Ethernet9/1-48
Nexus-7010-admin-1(config-vdc)# no allocate interface Ethernet10/1-48

Nexus-7010-admin-1(config-vdc)# limit-resource module-type f3
This will cause all ports of unallowed types to be removed from this vdc. Continue (y/n)? [yes] yes
Note: Warning (vdc 3): rebind interface is needed for proper system operation.
 Please backup the running-configuration for interface by redirecting the output of "show running-config
interface all".
 If breakout is configured, please also backup the breakout config by redirecting the output of "show
running-config | grep breakout".
 Reapply the breakout configuration if configured, followed by interface configuration after the "rebind
interface" command
Nexus-7010-admin-1(config-vdc)# end


Nexus-7010-admin-1# reload vdc Nexus-7010-Agg-1
```

Changing VDC type from F2e to F3 does not require rebind interface or reload VDC.

Changing VDC type from F2/F2e to F3 requires rebind interface or Reload VDC.

Impact: Disruptive Change

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Summary of VDC Migration Use Cases

Summary of VDC Migration Use Cases

VDC Type From	VDC Type To	Migration Method
M	M/F2e	Use Case 1
F2e	M/F2e	Use Case 2
M/F1	M/F2e	Use Case 3
M2	F3/M2 or F3	Use Case 4
F2/F2e	F3/F2/F2e or F3	Use Case 4
M1	F3	Use Case 3
M/F1	F3	Use Case 3
M/F2e	F3	Use Case 3

      Cisco Public

Cisco *live!*

Participate in the "My Favorite Speaker" Contest

Promote Your Favorite Speaker and You Could be a Winner

- Promote your favorite speaker through Twitter and you could win $200 of Cisco Press products (@CiscoPress)

- Send a tweet and include
  - Your favorite speaker's Twitter handle @microanees
  - Two hashtags: #CLUS #MyFavoriteSpeaker

- You can submit an entry for more than one of your "favorite" speakers

- Don't forget to follow @CiscoLive and @CiscoPress

- View the official rules at http://bit.ly/CLUSwin

Cisco live!

Complete Your Online Session Evaluation

- Give us your feedback and you could win fabulous prizes. Winners announced daily.

- Complete your session evaluation through the Cisco Live mobile app or visit one of the interactive kiosks located throughout the convention center.

Don't forget: Cisco Live sessions will be available for viewing on-demand after the event at CiscoLive.com/Online

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- Demos in the Cisco Campus

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Thank you.