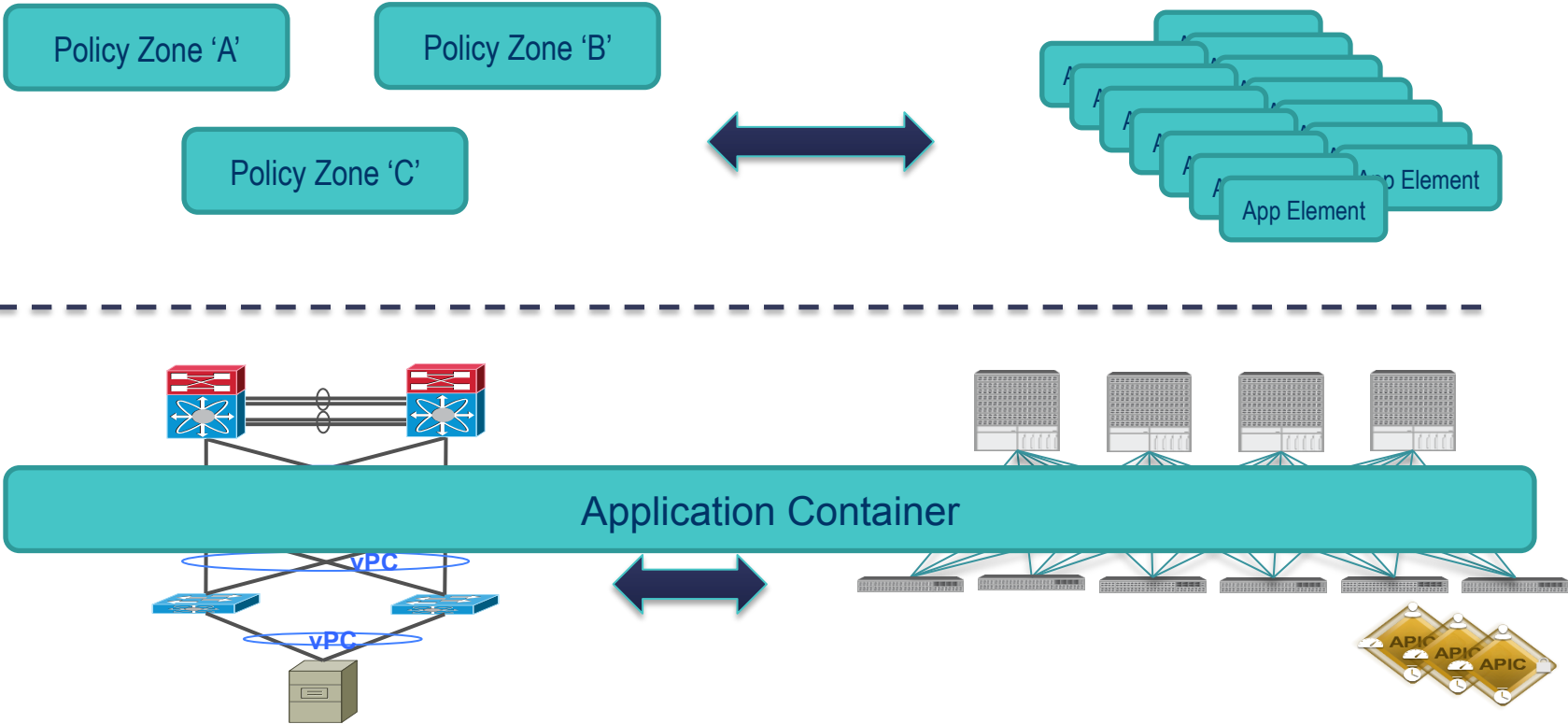# ACI-SE M10

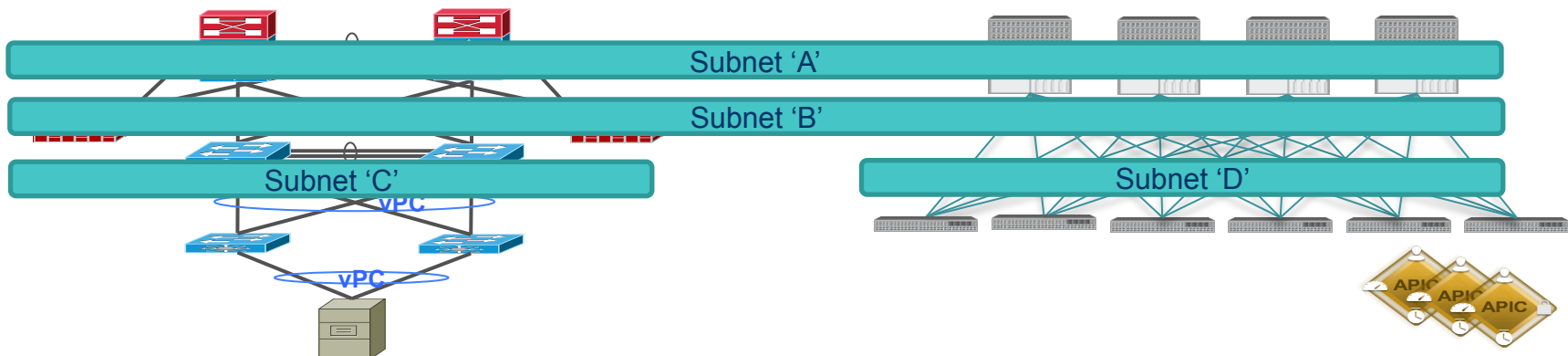Migration and Building Mixed Environments

Agenda

- Leveraging the existing networking with ACI
- From Standalone mode to ACI
- AS Offerings

Transitioning Business Logic Independently from Infrastructure Changes

Policy Zone 'A'

Policy Zone 'B'

Policy Zone 'C'

App Element

App Element

Application Container
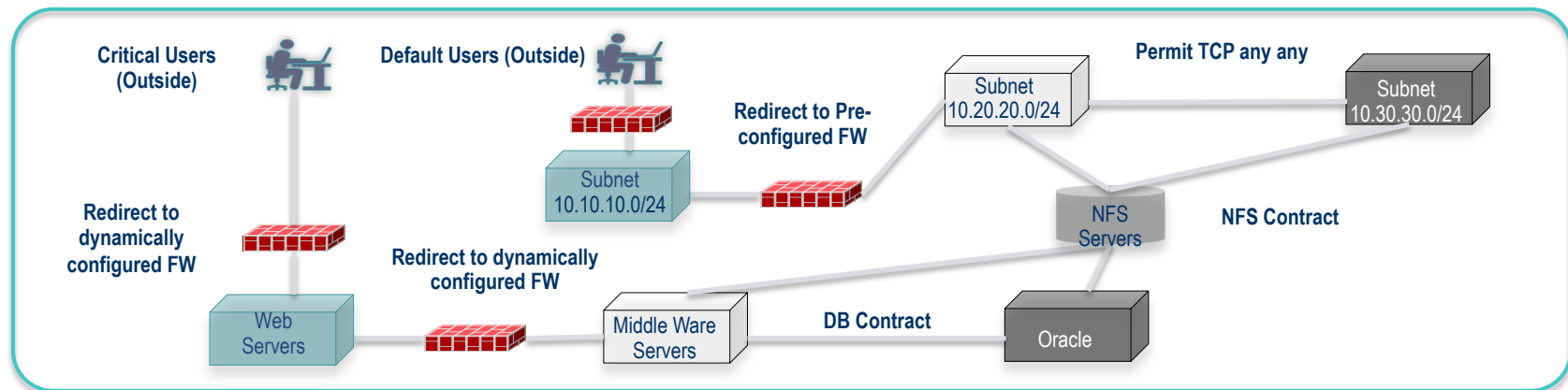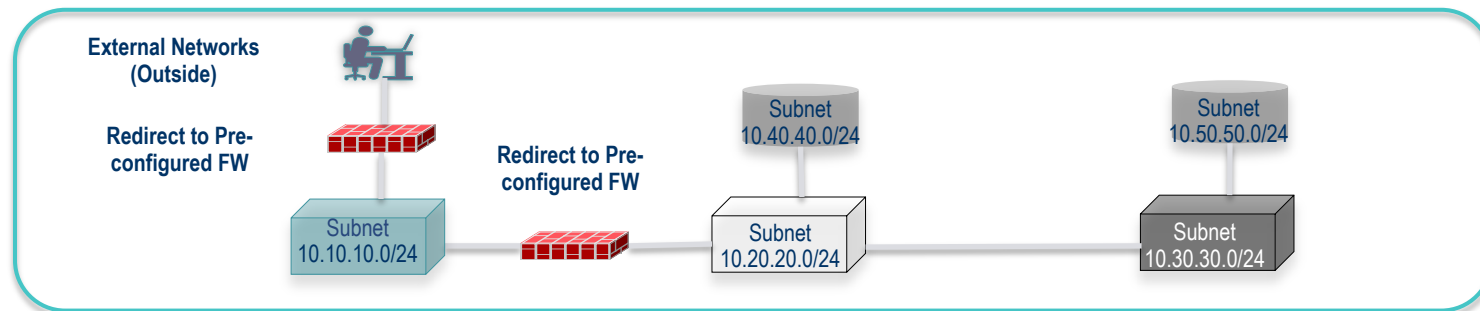
vPC

vPC

APIC

APIC

APIC

Transitioning Business Logic Independently from Infrastructure Changes

- Layer 2 and Layer 3 interoperation between ACI Fabric and Existing Data Center builds
- Layer 3 interconnect via standard routing interfaces, OSPF, MP-BGP, EIGRP, …
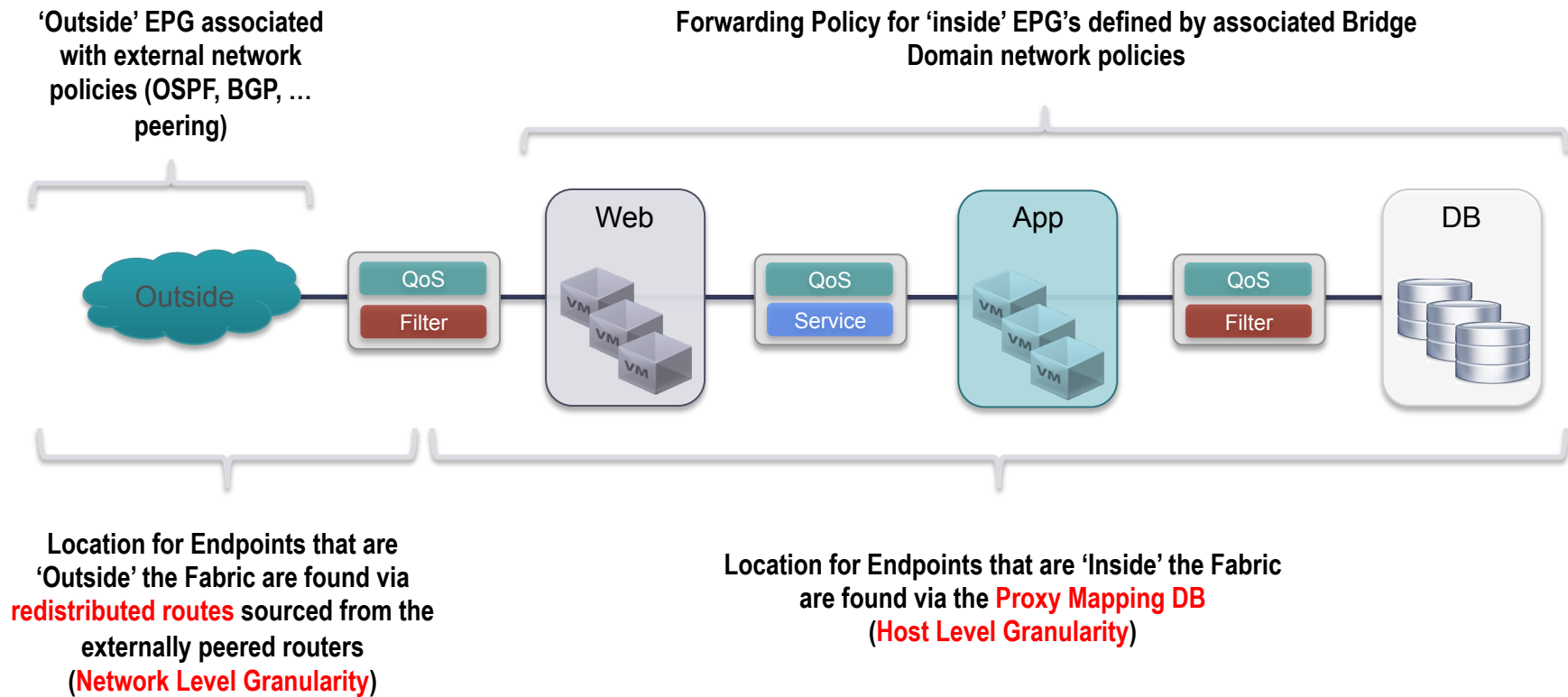- Layer 2 interconnect via standard STP or via VXLAN overlays

Transitioning Business Logic Independently from Infrastructure Changes

External Networks (Outside)

Redirect to Pre-configured FW

Redirect to Pre-configured FW

Subnet 10.40.40.0/24

Subnet 10.50.50.0/24

Subnet 10.10.10.0/24

Subnet 10.20.20.0/24

Subnet 10.30.30.0/24

Critical Users (Outside)

Default Users (Outside)

Permit TCP any any

Subnet 10.20.20.0/24

Subnet 10.30.30.0/24

Redirect to Pre-configured FW

Subnet 10.10.10.0/24

NFS Servers

NFS Contract

Redirect to dynamically configured FW

Redirect to dynamically configured FW

Web Servers

Middle Ware Servers

DB Contract

Oracle

Fabric Infrastructure
Policy and the Network

'Outside' EPG associated with external network policies (OSPF, BGP, … peering)

Forwarding Policy for 'inside' EPG's defined by associated Bridge Domain network policies

| Outside | QoS / Filter | Web (VM) | QoS / Service | App (VM) | QoS / Filter | DB |

Location for Endpoints that are 'Outside' the Fabric are found via redistributed routes sourced from the externally peered routers (Network Level Granularity)

Location for Endpoints that are 'Inside' the Fabric are found via the Proxy Mapping DB (Host Level Granularity)
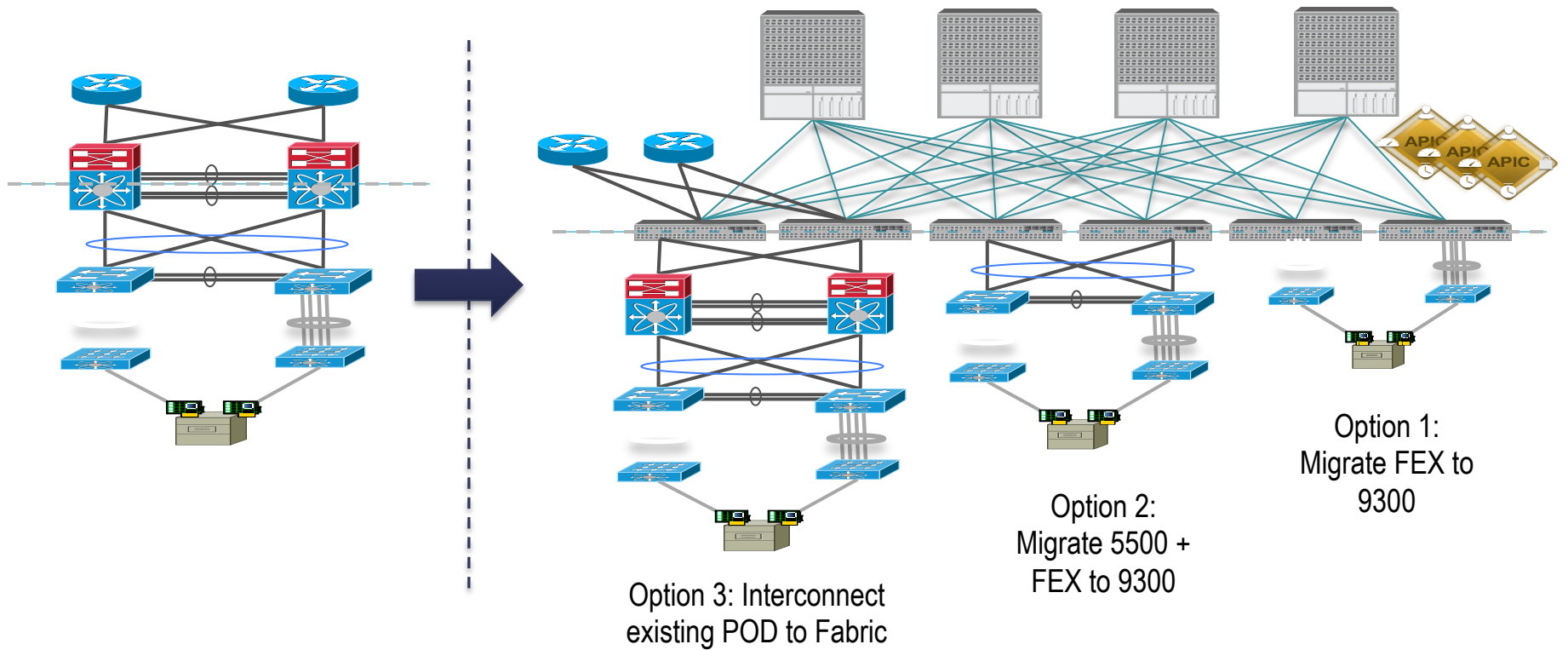
Implementation example of classical Web-App-DB ANP
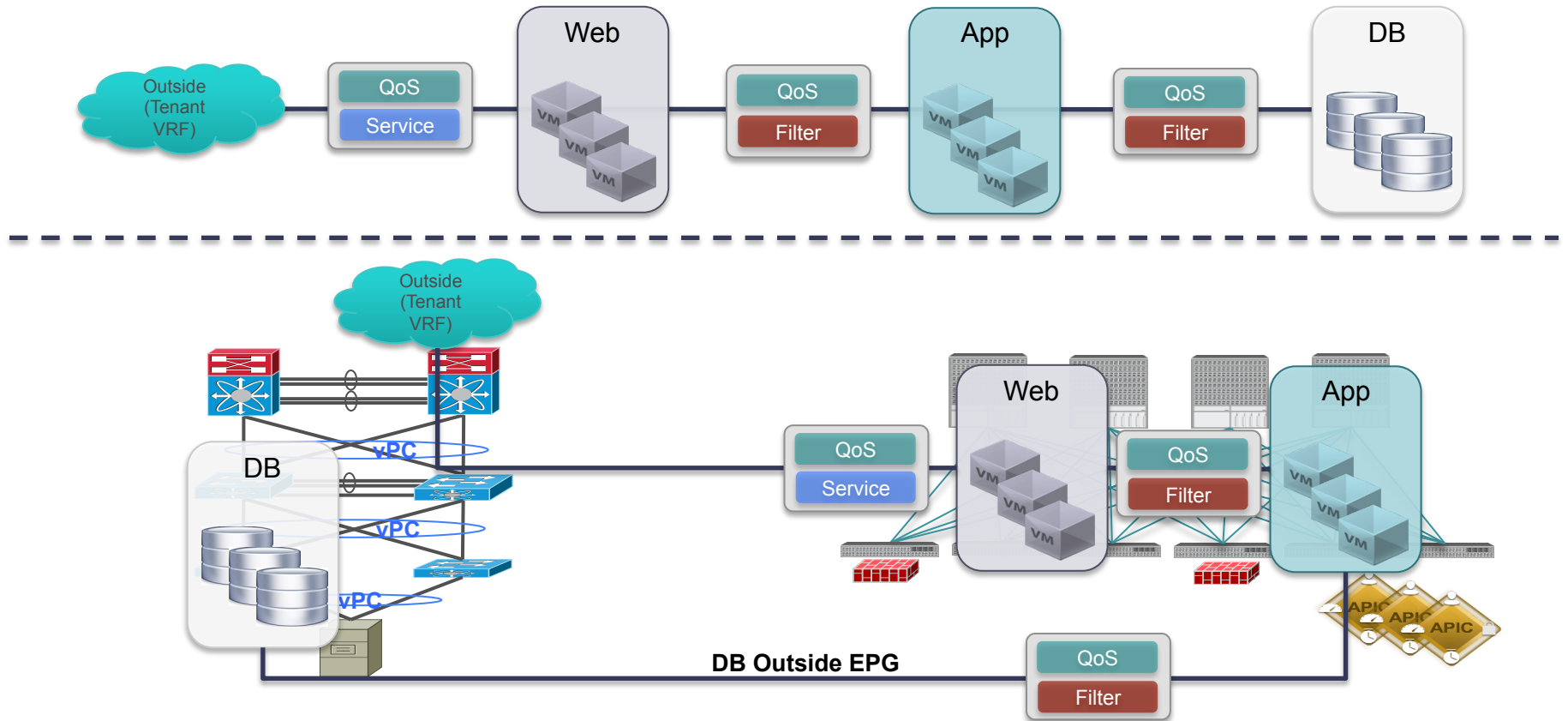
Integration of Existing DC Network Assets
Migration or Interconnection

Option 1:
Migrate FEX to 9300

Option 2:
Migrate 5500 +
FEX to 9300

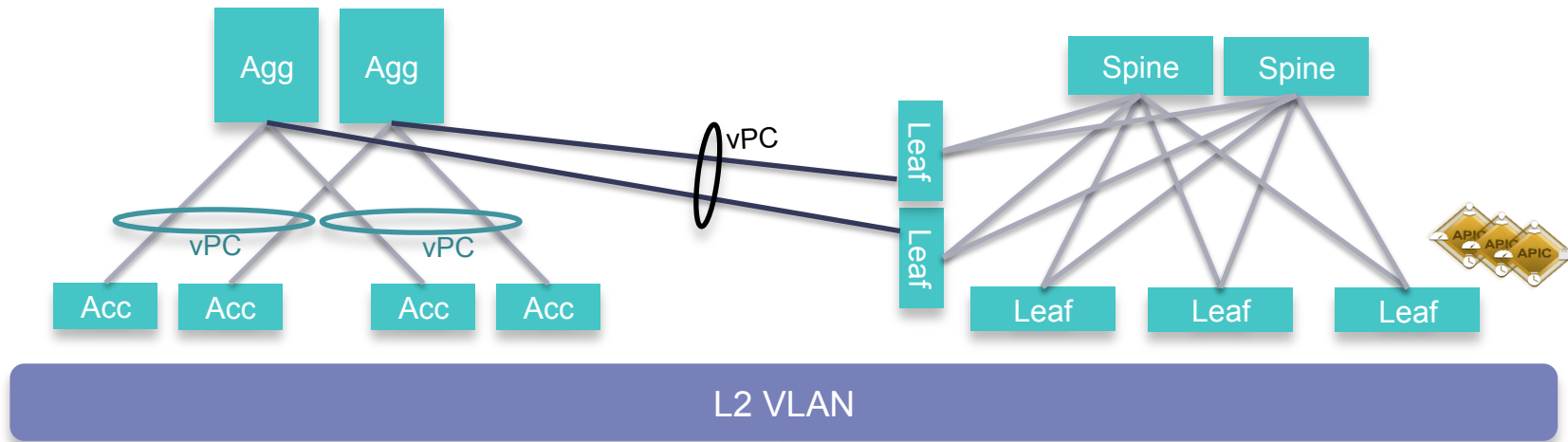Option 3: Interconnect
existing POD to Fabric

Integration of Existing DC Network Assets
Migration or Interconnection

- VLAN Trunking from VEM/DVS through to the Leaf Node
  - Requires prior configuration of VLAN on transit L2 switching 'or' scripting automation of VLAN configuration
- VXLAN overlay from VEM/DVS to Leaf Node
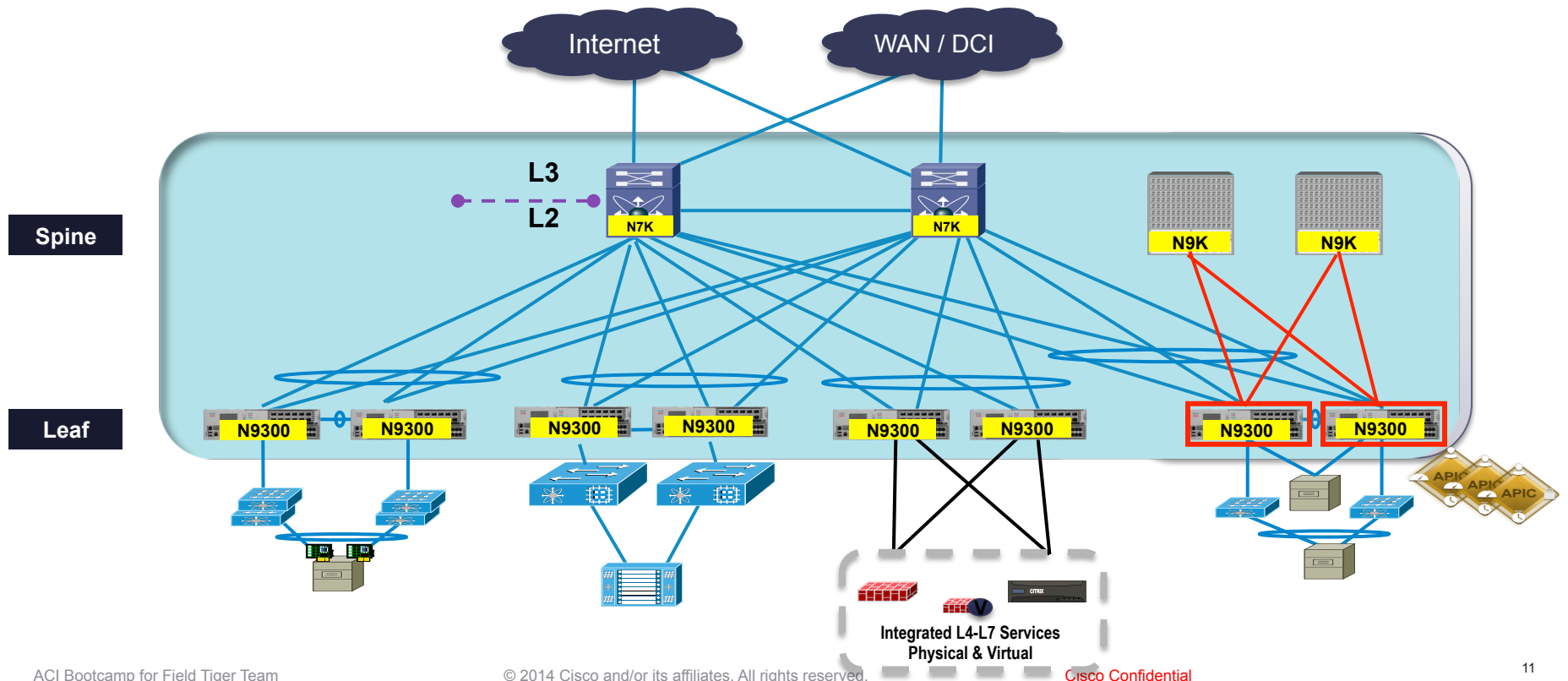 - Single infrastructure VLAN required in transit L2 network

Option 1: Migrate FEX to 9300

Option 2: Migrate 5500 + FEX to 9300

Option 3: Interconnect existing POD to Fabric
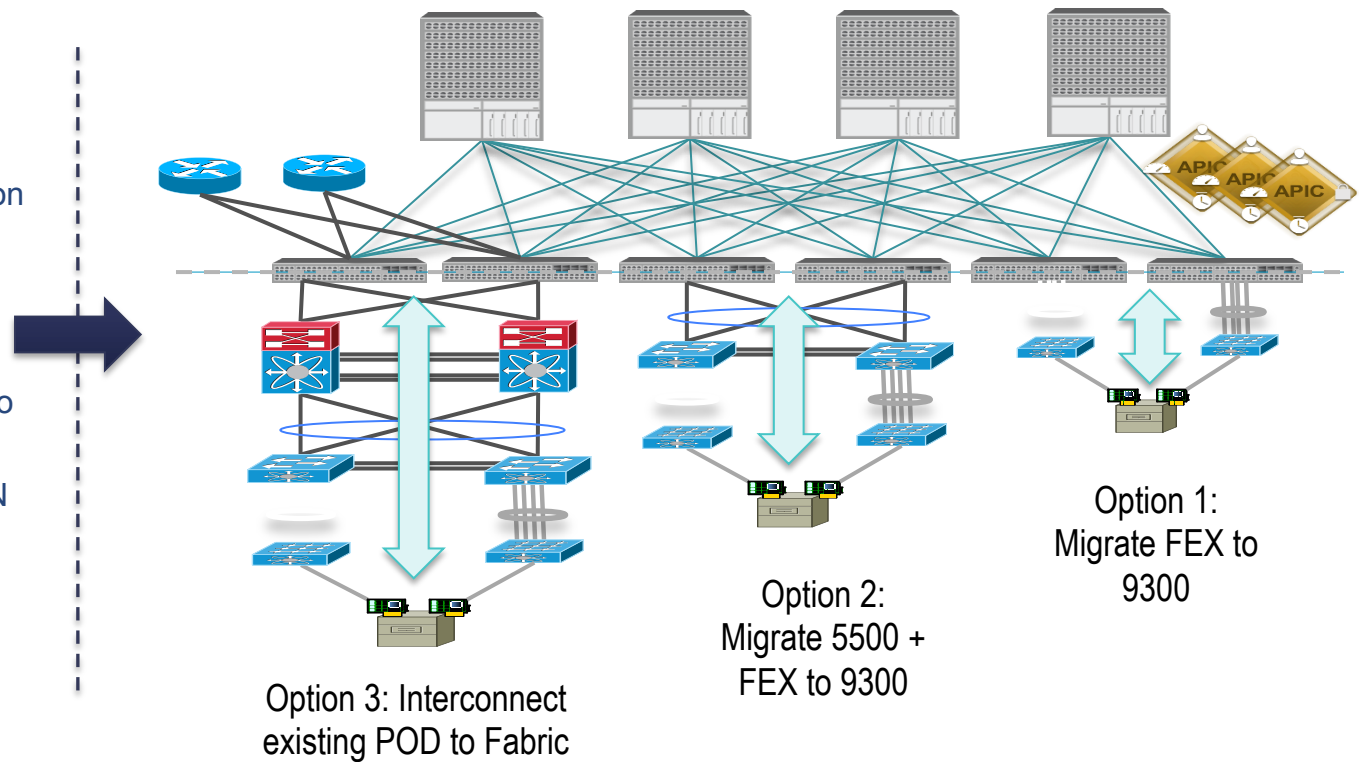
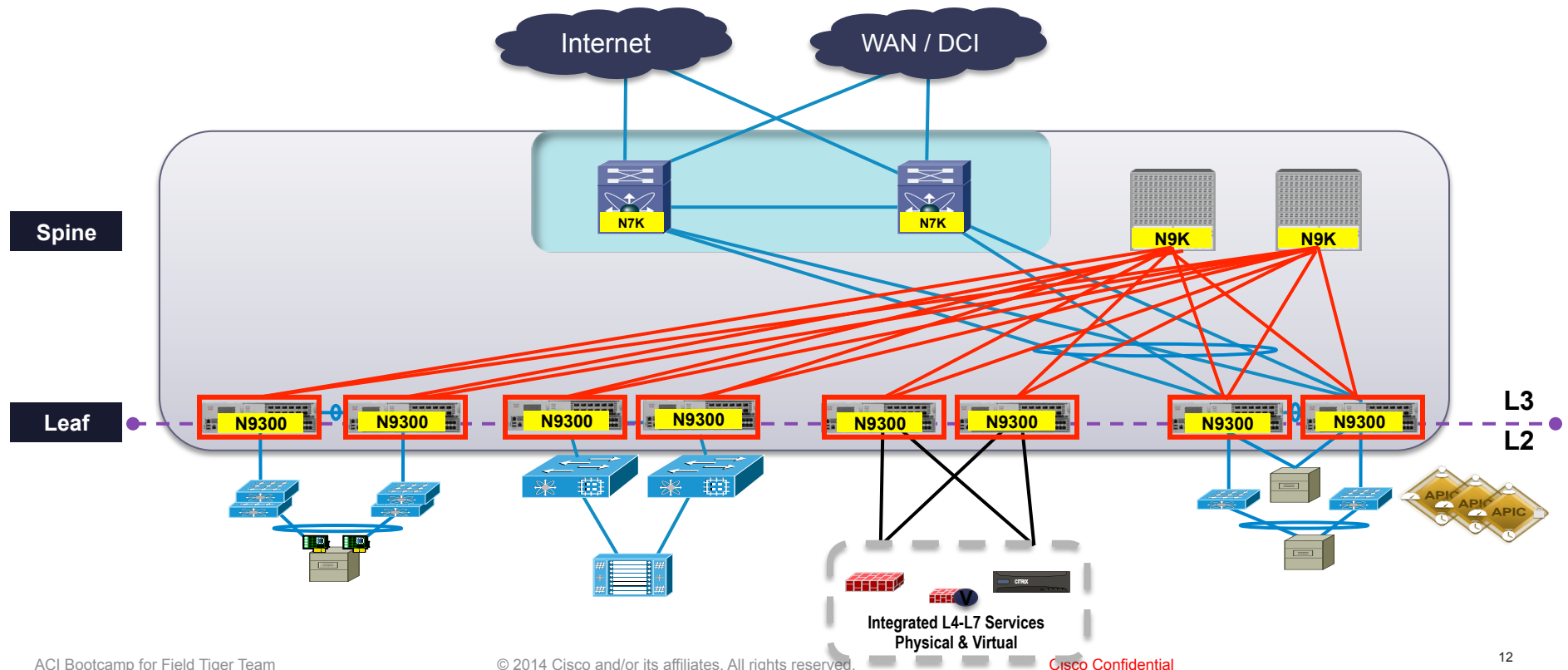# Migration Scenario 1: L2 vPC (recommended) from N2K-N7K

L2 VLAN

- HSRP default gateway on aggregation layer

- Migration of hosts: move virtual and physical hosts to ACI.   Default-gateway on Agg Layer.

- Migrate default gateway: disable HSRP on Aggregation Layer

- Flooding enabled, routing disabled. Host default gateway in Agg layer.

- Migration of hosts: move virtual and physical hosts. Gateway on Agg Layer.

- Migrate default gateway: enable routing, use HSRP MAC as ACI default gateway MAC.
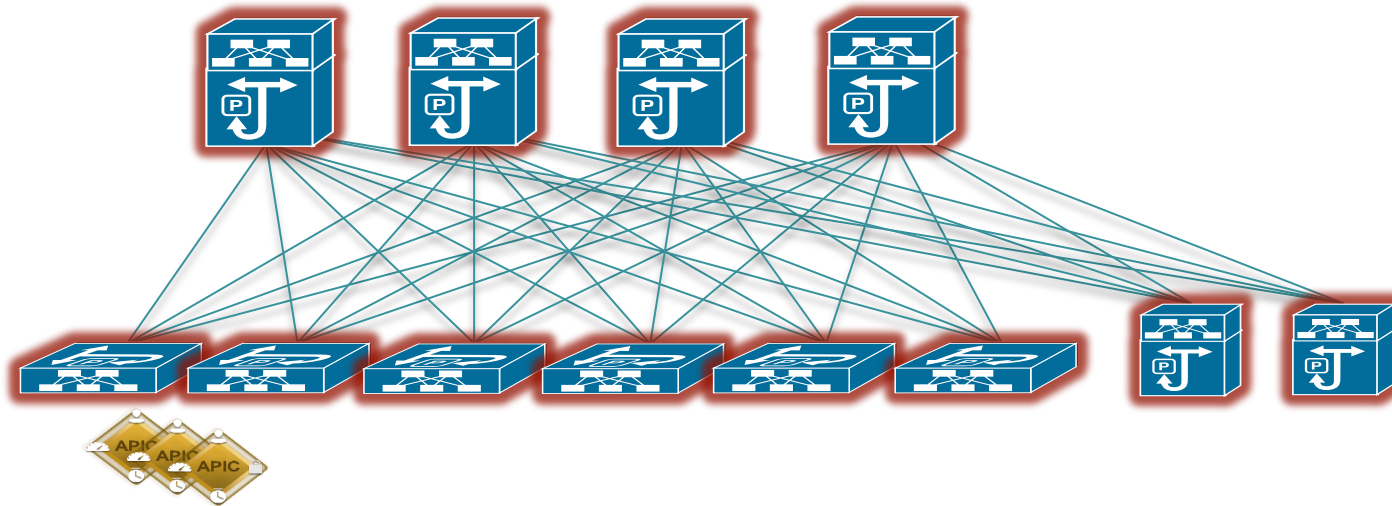
Growing towards ACI starting with Nexus 9300 as access layer

Cisco Confidential

11

Growing towards ACI starting with Nexus 9300 as access layer

Spine

Internet

WAN / DCI

N7K

N7K

N9K

N9K

Leaf

N9300   N9300   N9300   N9300   N9300   N9300   N9300   N9300

L3

L2

APIC
APIC
APIC

Integrated L4-L7 Services
Physical & Virtual

Cisco Confidential

# Upgrading from NX-OS to Fabric Enabled Infrastructure

1. Install APIC Cluster on ACI enabled leaf switches

2. Upgrade 1st group of spine switches to ACI enabled NX-OS

3. Install ACI Directory and Proxy Server Switches

4. Migrate leaf switches on a per rack basis to ACI enabled NX-OS

5. Complete upgrade of remaining spine switches to ACI enabled NX-OS
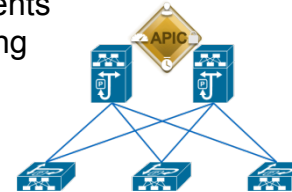
Migration Paths to ACI
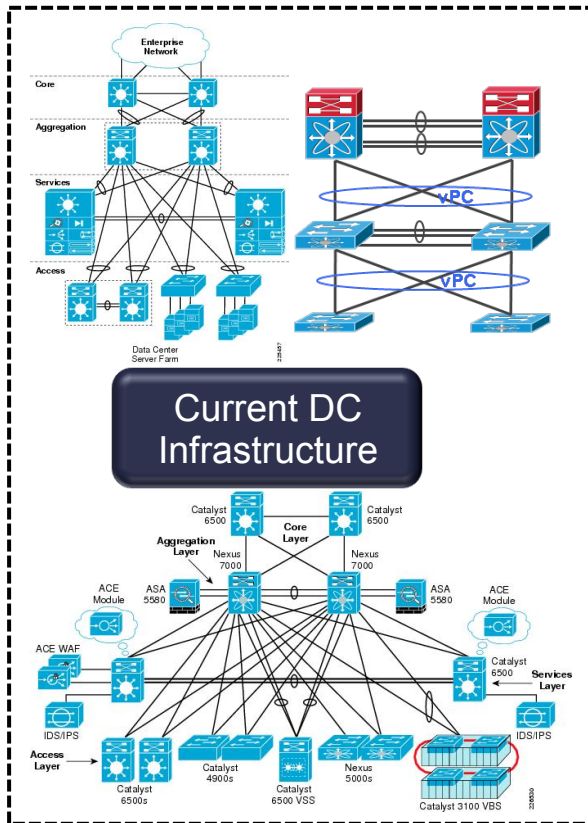
Classic mode
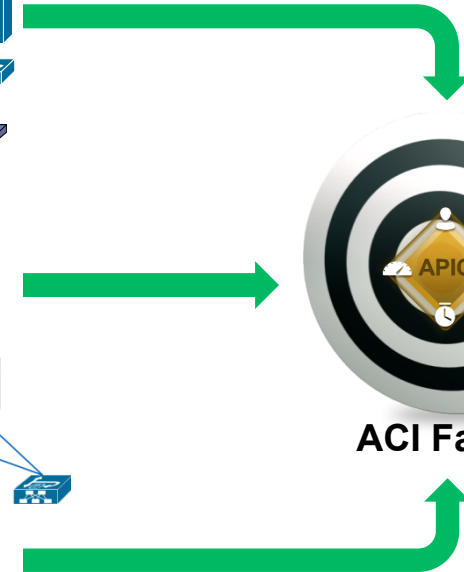- Growth – Addition
- Network refresh
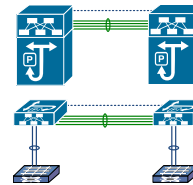
ACI Integration
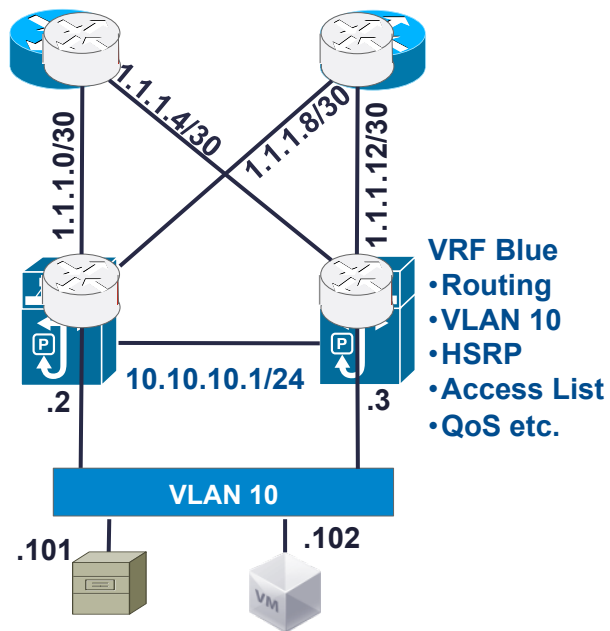- New environments
- Service Chaining
- Dev, Test

ACI Migration
- Business drivers
- Security, Compliance, TCO, Programmability, Operations etc.

ACI Fabric

Current DC Infrastructure

Network Centric Deployment example
1 VRF + 1 VLAN

Classic mode shown here for Reference

ACI Fabric

APIC

Blue Tenant and Context

Policies

Bridge Domain Blue_1
10.10.10.1/24

External EPG

Exchange Routes (Blue)

EPG blue_1

.101

VRF Blue
- Routing
- VLAN 10
- HSRP
- Access List
- QoS etc.

1.1.1.0/30

1.1.1.4/30

1.1.1.8/30

1.1.1.12/30

.2

10.10.10.1/24

.3

VLAN 10

.101

.102

Classic Access Switches

Tag 10

.102

Tag could be VLAN ID or VNID

1.1.1.0/30

1.1.1.4/30

1.1.1.8/30

1.1.1.12/30
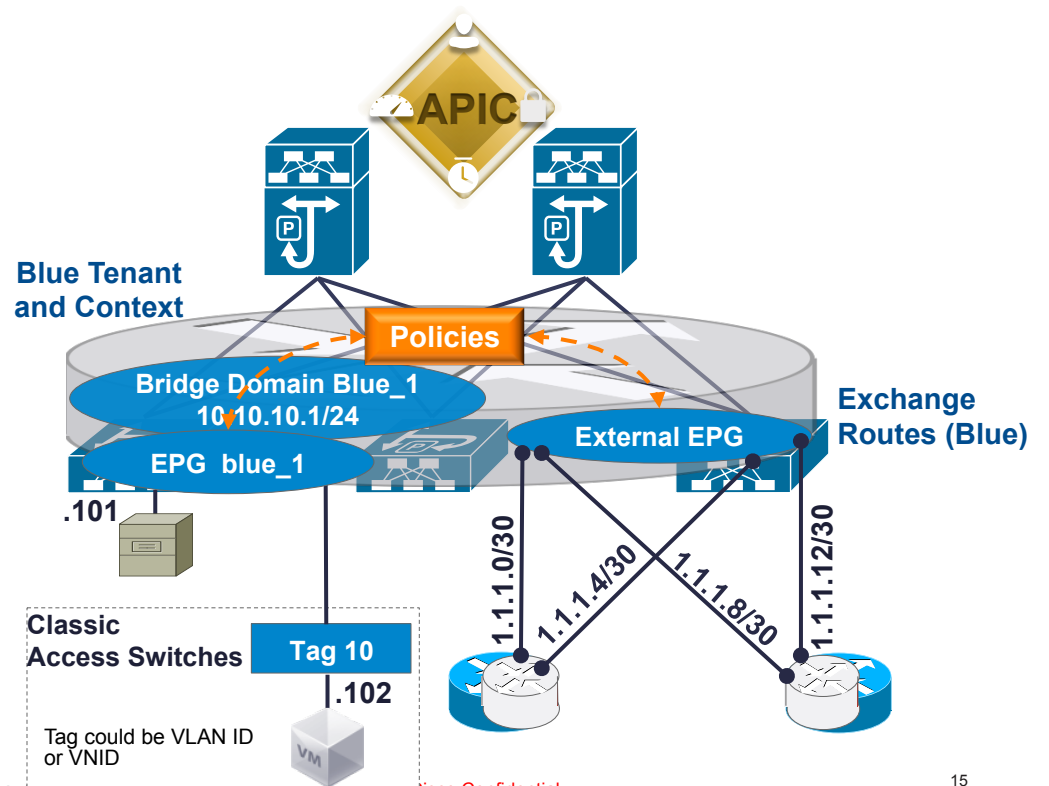
Network Centric Migration
VRF + 2 VLANs – with...

- **Step 1**: APIC connects to a vCenter and creates a DVS. In this step we need to provide a range of VLAN IDs (or VXLAN VNIDs) that would then be used as a TAG to identify EPGs outside of the fabric.
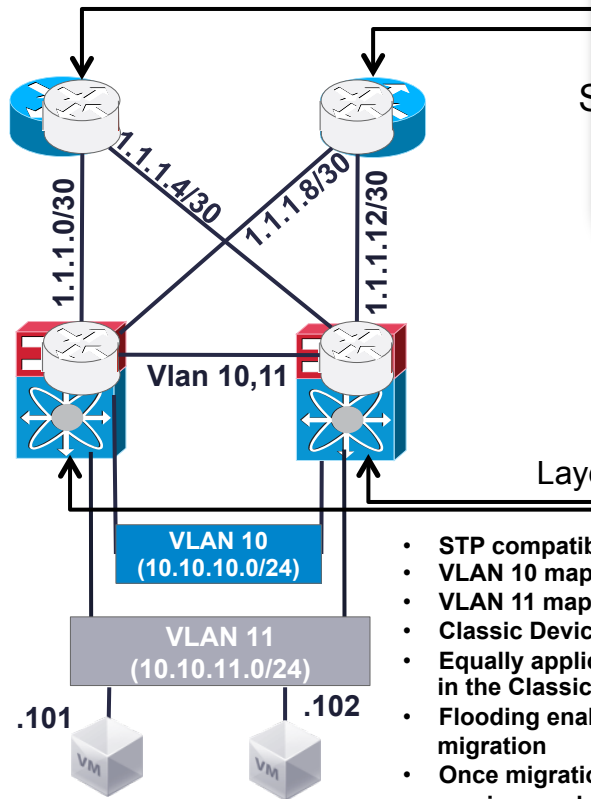
  What is Tag 1057 and 1113 ?

- **Step 2**: when EPG_ portgroup on the DVS. This portgroup will have a VLAN ID (or VXLAN VNID) assigned from the range we provided in Step 1. On this example, both 1057 and 1113 are in the VLAN ID (or VXLAN ID) range defined in Step 1.
- **Step 3**: EP starts using portgroup, which will make all traffic from the EP will reach leaf with a TAG of 1113, which would tell the Leaf that the traffic belongs to EPG_Blue2.

1.1.1.0/30 1.1.1.4/30 1.1.1.8/30 1.1.1.12/30

Vlan 10,11

Migration

and Context

Policies

BD Blue_1

BD Blue_2
10.10.11.1/24

L2_Out

EPG blue_1

EPG blue_2

L2_Out

External EPG

Layer 2 vPC Trunk

Integrated L4-L7 Services
Physical & Virtual

VLAN 10
(10.10.10.0/24)
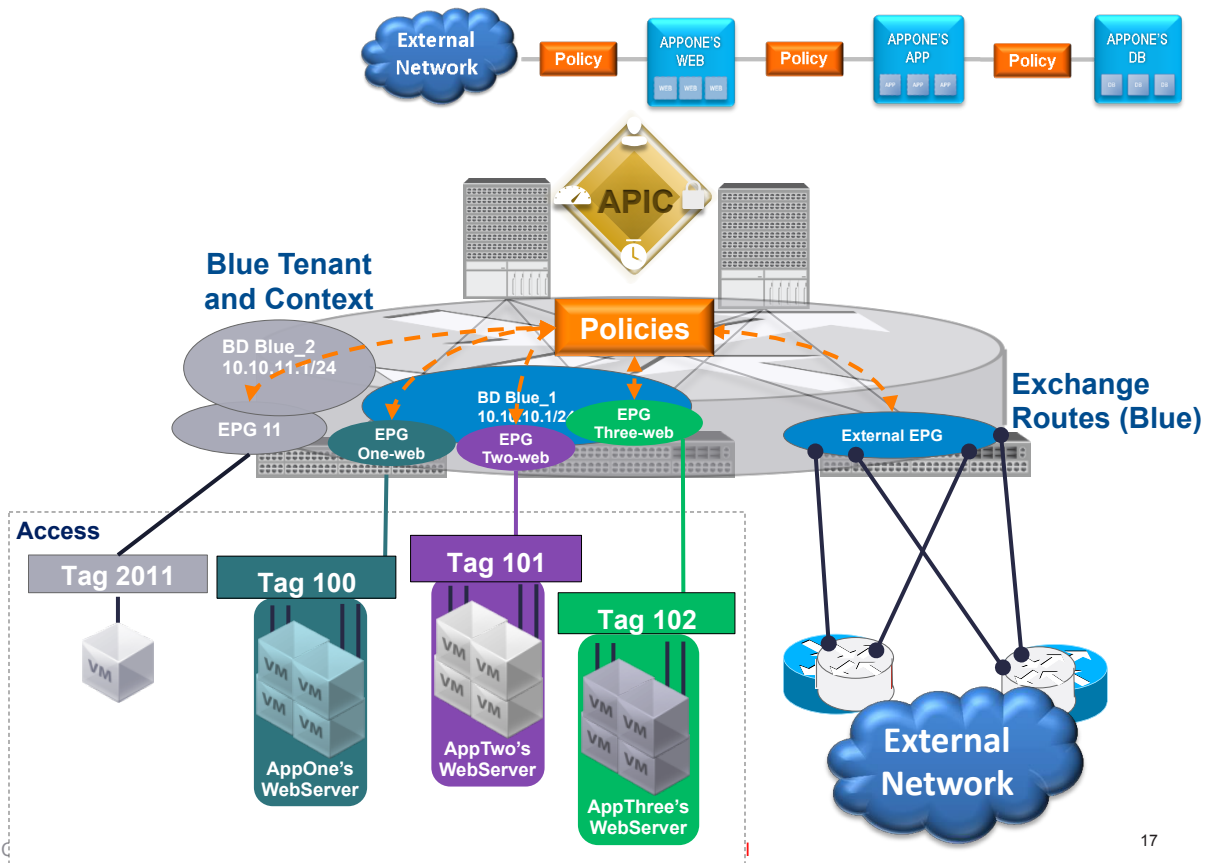
VLAN 11
(10.10.11.0/24)

.101   .102

VM   VM

- STP compatibility with Classic Network
- VLAN 10 maps to BD Blue_1
- VLAN 11 maps to BD Blue_2
- **Classic Devices are still the Default Gateway**
- **Equally applicable to L4-7 services (FW/LB) in the Classic Network**
- **Flooding enabled on ACI BDs during migration**
- **Once migration completed, insert needed services and move Default Gateway ACI BDs**

Access

Tag 1057   **Tag 1113**
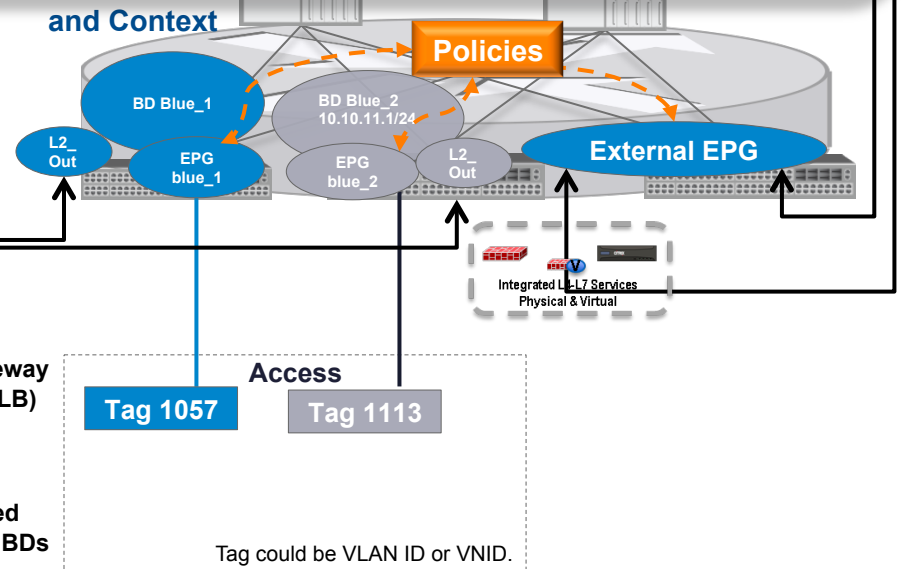
Tag could be VLAN ID or VNID.

Deployment Example – Hybrid Approach

Classic mode shown here for Reference
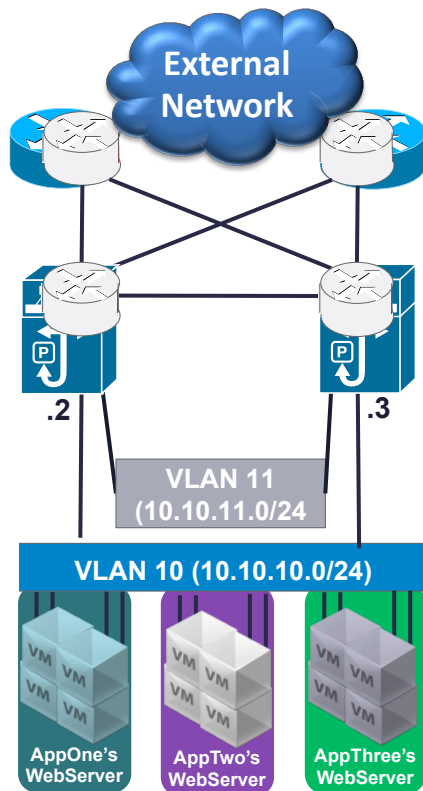
ACI Migration for Hybrid Approach

Exchange Routes (Blue)

APIC

Blue Tenant and Context

External EPG

BD Blue_2

Policies

EPG 11

EPG One-web

BD Blue_1

EPG Two-web

EPG Three-web

VLAN 11 (10.10.11.0/24)

Access

Tag 2011

VM

VLAN 10 (10.10.10.0/24)

Tag 100

Tag 101

Tag 102

L2 Extension
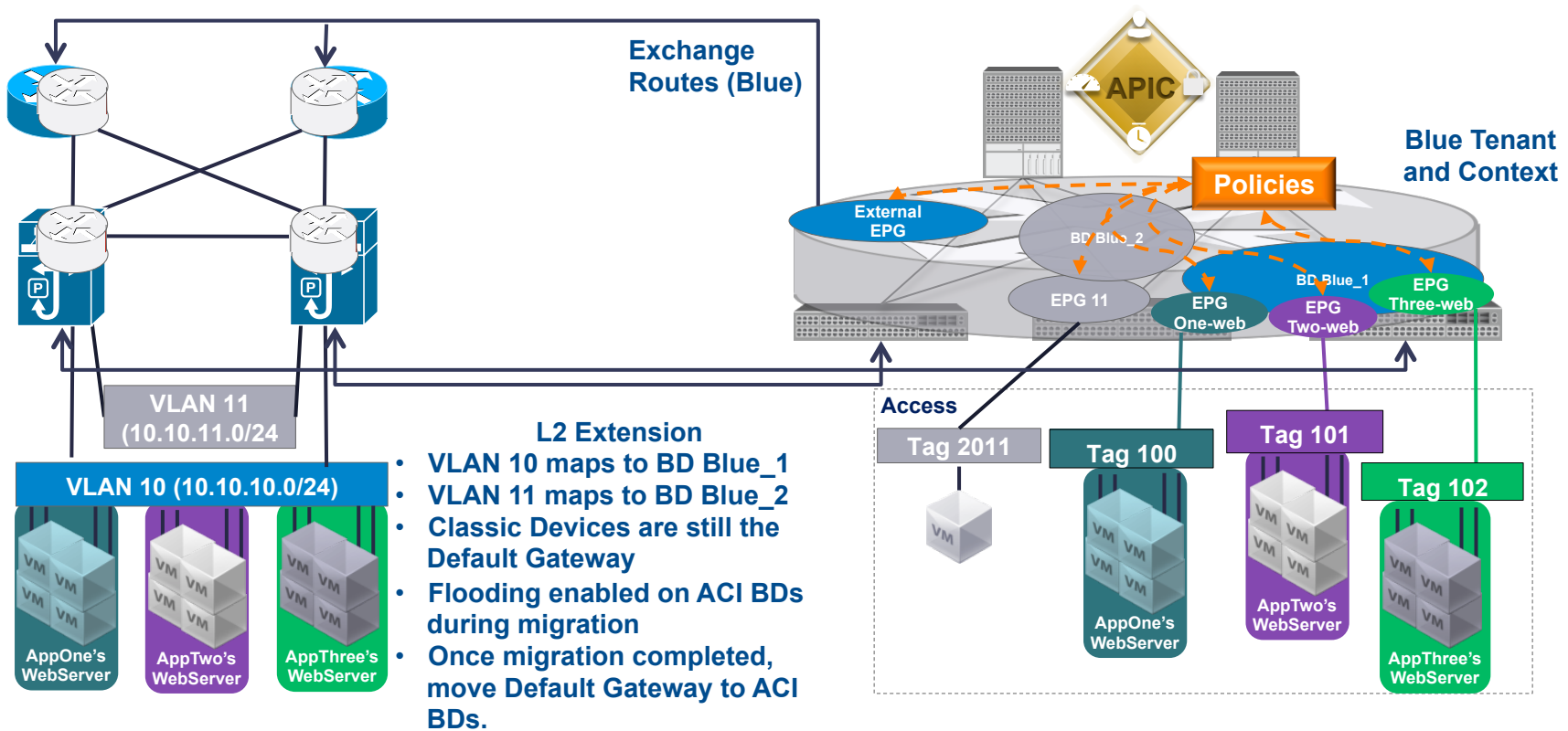
- VLAN 10 maps to BD Blue_1
- VLAN 11 maps to BD Blue_2
- Classic Devices are still the Default Gateway
- Flooding enabled on ACI BDs during migration
- Once migration completed, move Default Gateway to ACI BDs.

VM VM
VM VM
VM VM
AppOne's WebServer

VM VM
VM VM
VM VM
AppTwo's WebServer

VM VM
VM VM
VM VM
AppThree's WebServer

VM VM
VM VM
VM VM
AppOne's WebServer

VM VM
VM VM
VM VM
AppTwo's WebServer

VM VM
VM VM
VM VM
AppThree's WebServer

ACI Deployment Assistant
(Post Network Centric Migration)

- Comprehensive Application Dependencies
- Multiple Application Network Policies
- Application, Server Mapping
- Automate APIC Profile changes

Cisco Advanced Services

Application Dependency Analysis
- Network and Server data correlation
- Application fingerprinting
- Customer input

Network Discovery:
- Device Configurations
- Protocol State
- Traffic Capture

Server Discovery:
- Servers
- Process
- Network Stats