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# How to setup an ACI fabric from scratch

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BRKACI-2004

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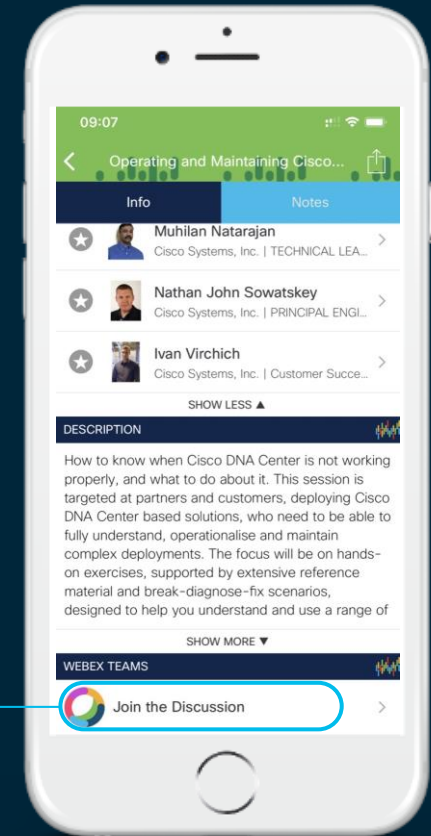
# Cisco Webex Teams

## Questions?

Use Cisco Webex Teams to chat with the speaker after the session

## How

- 1 Find this session in the Cisco Events Mobile App
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- 4 Enter messages/questions in the team space



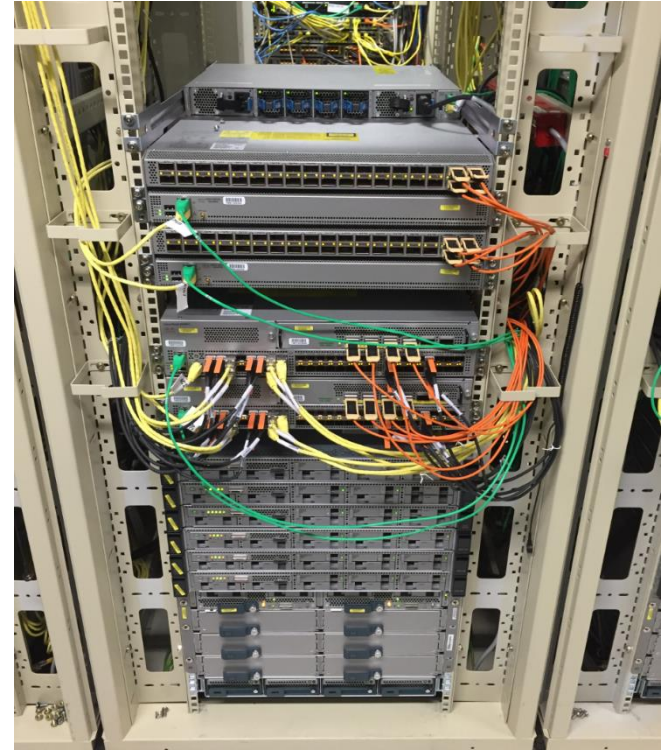
# Agenda

- Prerequisites
- Hardware inspection
- Hardware installation
- Build fabric topology
- Configure the fabric
- Upgrade the fabric

# Prerequisites

- Before starting, you should have:
  - At least 6 routable IP addresses for APIC OOB mgmt and APIC CIMC
  - Functional NTP server
  - Serial number of all leafs and spines
  - Optionally but recommended:
    - 1 IP per leaf and spine for OOB
    - SCP / FTP / HTTP server
    - Console / serial server
  - Infrastructure VLAN / VTEP pool
  - vCenter IP address and credentials

# Hardware inspection / installation



# Configure APIC CIMC



Press <F2> Setup, <F6> Boot Menu, <F7> Diagnostics, **<F8> CIMC Config**, <F12> Network Boot

Bios Version : C220M3.1.5.4h.0.031920140440  
Platform ID : C220M3

CIMC IP Address : 10.48.22.74  
- Loading LSI EFI SAS Driver

Processor(s) Intel(R) Xeon(R) CPU E5-2620 v2 @ 2.10GHz  
Total Memory = 64 GB Effective Memory = 48 GB  
Memory Operating Speed 1600 Mhz

Entering CIMC Configuration Utility...

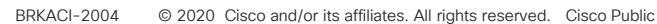
```
CIMC Configuration Utility  Version 1.7  Cisco Systems, Inc.
*****
NIC Properties
NIC mode                               NIC redundancy
Dedicated:      [X]                     None:          [X]
Shared LOM:     [ ]                     Active-standby:[ ]
Cisco Card:     [ ]                     Active-active: [ ]
Shared LOM Ext: [ ]

IPv4 (Basic)                               Factory Defaults
DHCP enabled:   [ ]                       CIMC Factory Default:[ ]
CIMC IP:        10.48.22.74                Default User (Basic)
Subnetmask:     255.255.255.0              Default password:
Gateway:        10.48.22.100               Reenter password:

VLAN (Advanced)                           Port Profile
VLAN enabled:   [ ]                       Reset:         [ ]
VLAN ID:        1                           Name:
Priority:        0

Port Properties
Auto Negotiation: [X]
Speed[1000/100 Mbps]: 100
Duplex mode[half/full]: full
*****
<Up/Down>Selection  <F10>Save  <Space>Enable/Disable  <F5>Refresh  <ESC>Exit
```

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# Physical Layout

N3K
Spine2 SAL1925H0JK
Spine1 SAL1925H0HV
Leaf 2 ACI SAL1951VHXH
Leaf 1 ACI SAL19079J47
UCS R3
UCS R2
UCS R1
APIC
APIC
APIC
UCS Mini

# Consoles

Device	bdsol-2901-51	Device	bdsol-2901-51
bdsol-aci12-ucs-A	2011	bdsol-aci12-spine1	2015
bdsol-aci12-ucs-B	2012	bdsol-aci12-spine2	2016
bdsol-aci12-leaf1	2013	bdsol-aci12-n3k	2017
bdsol-aci12-leaf12	2014		

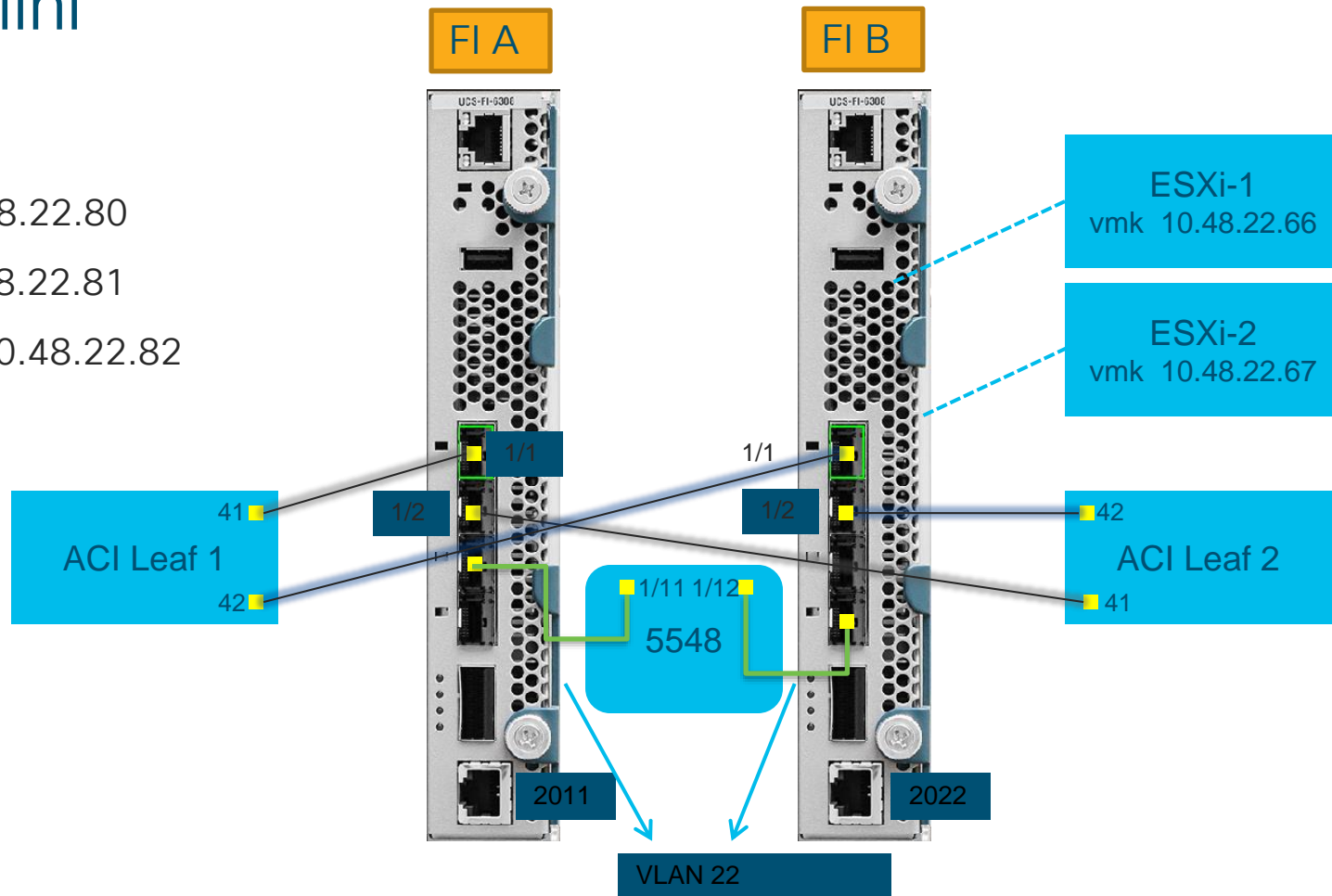
# IPs

Device	IP
bdsol-aci12-apic1	10.48.22.69
bdsol-aci12-apic2	10.48.22.70
bdsol-aci12-apic3	10.48.22.71
leaf1	10.48.22.77
leaf2	10.48.22.78
spine1	10.48.22.75
spine2	10.48.22.76

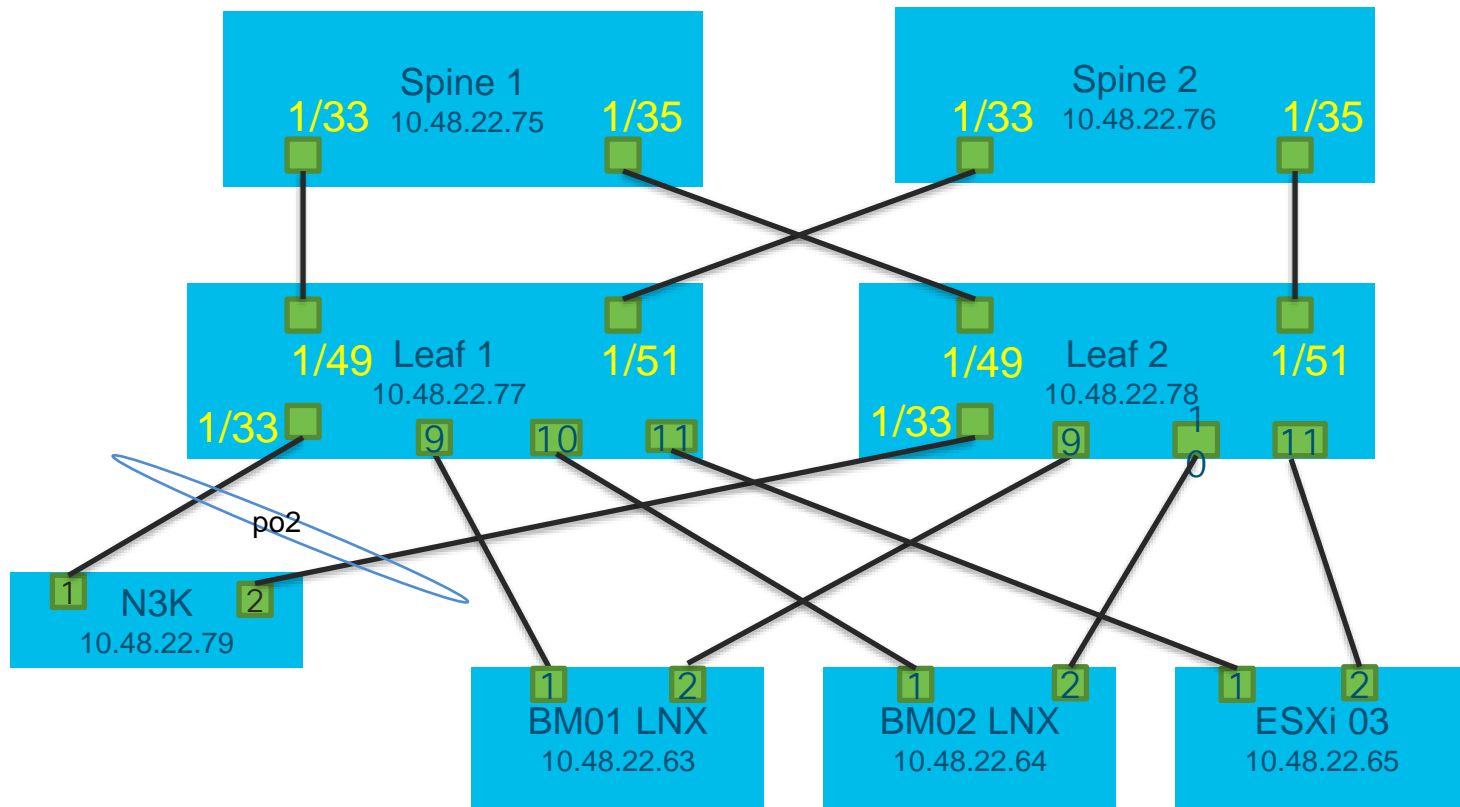
# UCS Mini

## Details

- FI A: 10.48.22.80
- FI B: 10.48.22.81
- Cluster: 10.48.22.82



# ACI - topology



# Build fabric topology

- APIC initial configuration (APIC #1) [only the 1st one for now]
- 1st leaf discovery
- spine discovery
- leaf discovery
- Remaining APIC 2 and 3 configuration
- Verification
- OOB mgmt. IP's for leafs and spines
- NTP configuration
- Route reflector



# Live demo #1

# Configure the fabric

- Bringing workloads into the fabric
  - VMware vCenter integration with UCS-B / UCS-C / vPC
  - Bare metal integration
- Tenant / EPG's
- External connectivity through OSPF

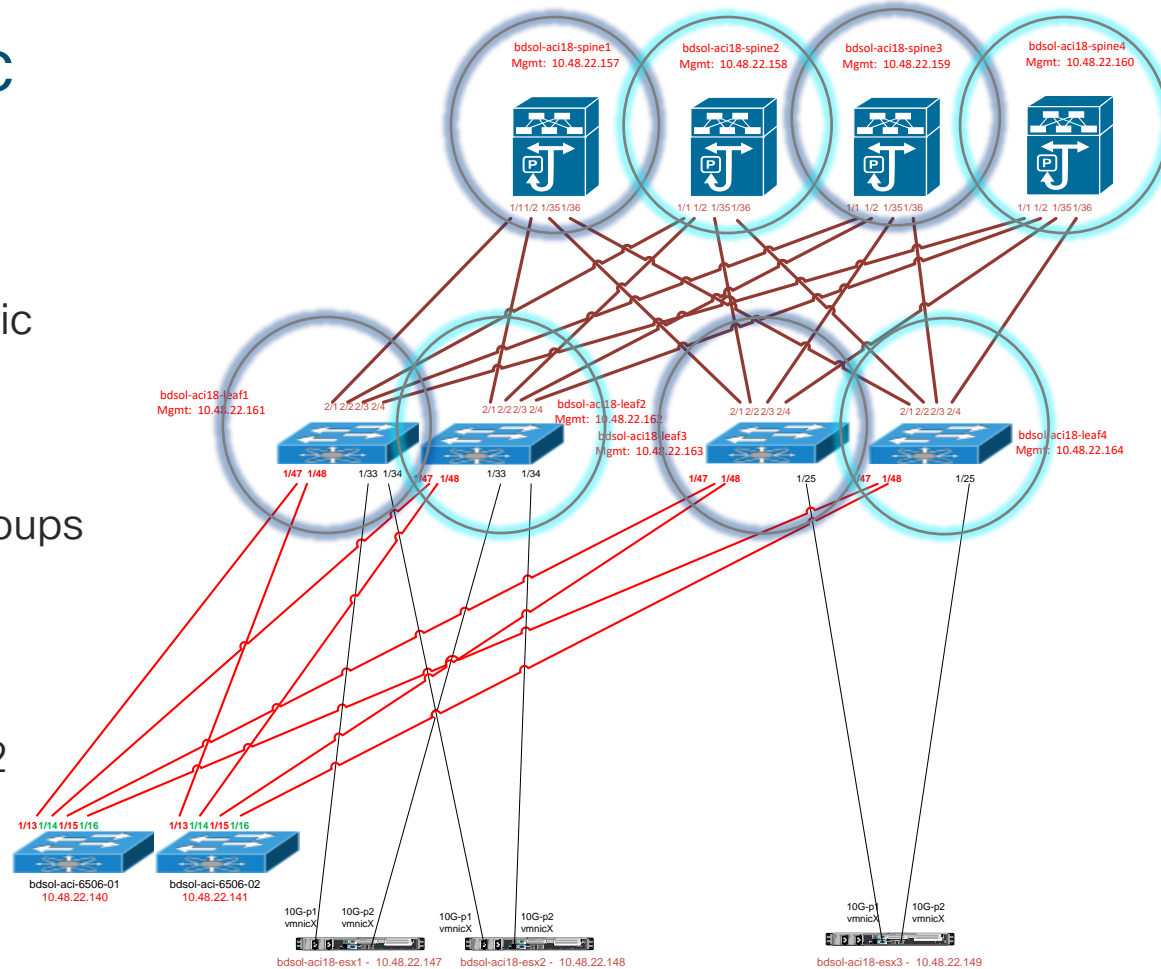




## Live demo #2

# Upgrade the fabric

- Download APIC software and leaf/spine software to the fabric
- Verify critical hosts are dual connected
- Separate in 2 maintenance groups
- Upgrade APIC's
- Upgrade maintenance group 1
- Upgrade maintenance group 2





## Live demo #3

# Special considerations

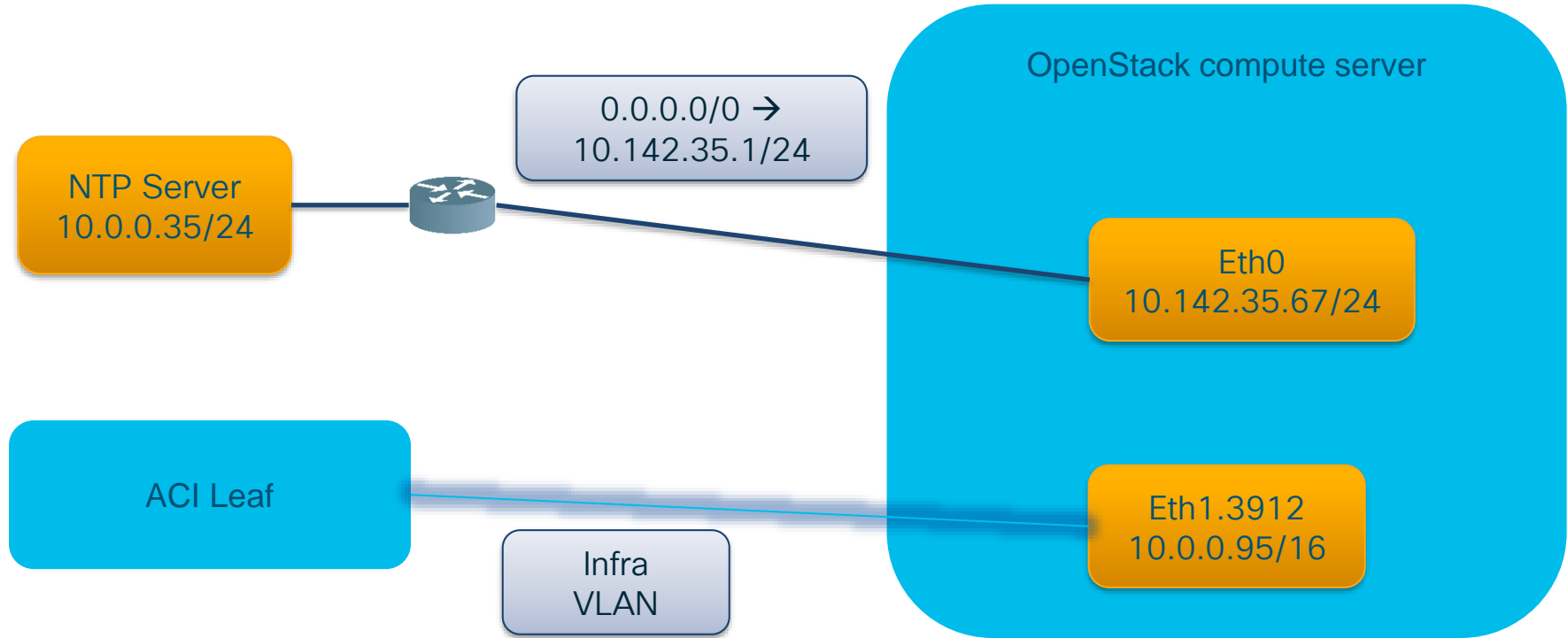
# Special considerations

- # 1 TEP pool / infrastructure VLAN
- #2 UCS-B connectivity with VMware

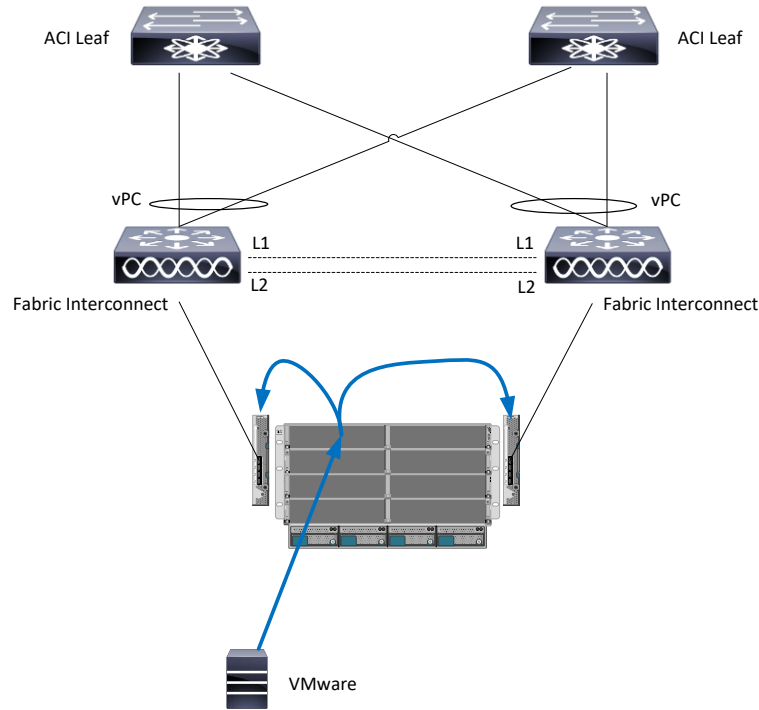
# # 1 TEP pool / infrastructure VLAN

- TEP Pool
  - Tunnel endpoint address pool
  - IP addresses from this pool are assigned to all fabric elements to communicate over the infrastructure VLAN
  - “This subnet should not overlap with any other routed subnets in your network. If this subnet does overlap with another subnet, change this subnet to a different /16 subnet. The recommended minimum mask is /19.
- Infrastructure VLAN:
  - In-band VLAN
  - Allows APIC to communicate with leafs and spines
- Hypervisor integrations, MultiPOD → Infrastructure VLAN and TEP Pool will be extended
  - OpenStack, Kubernetes, ...

# # 1 VTEP pool / infrastructure VLAN



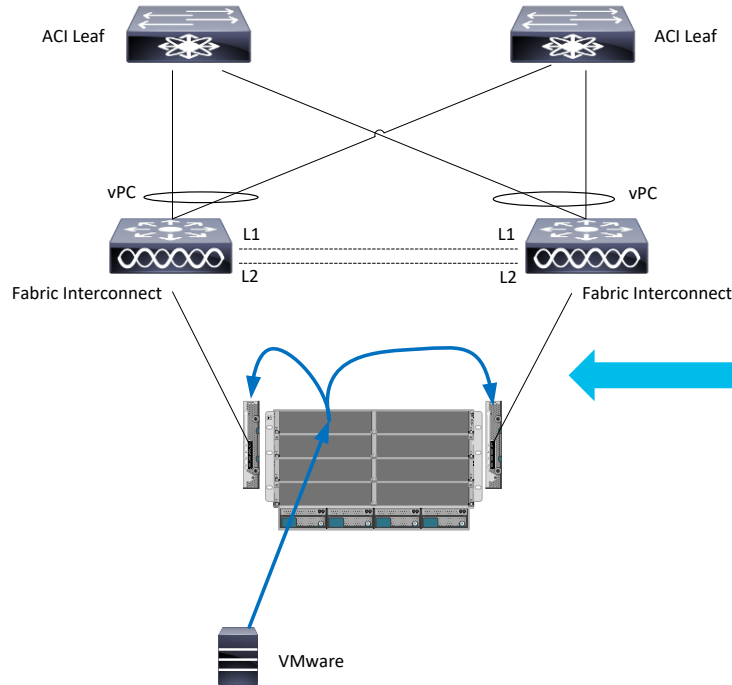
## #2 UCS-B connectivity with VMware



- Each Fabric Interconnect has a port-channel towards the ACI Leafs
- Fabric interconnects are connected for clustering → no data traffic is on the link
- The hypervisor running on a blade has 2 independent connections → no switch dependent protocols can be used
- Using IP-hash algorithms will cause MAC flaps on the UCS FI's and N5K's



## #2 UCS-B connectivity with Vmware (cont.)



PC Interface Policy Group  
Port Channel Policy → LACP

VSwitch Policy  
Port Channel Policy → MAC Pinning

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