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Enterprise**

# **HPE Synergy and Cisco ACI Networking Interop Overview**

**Hongjun Ma  
HPE Synergy Technical Enablement**

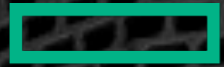
**V1.2**

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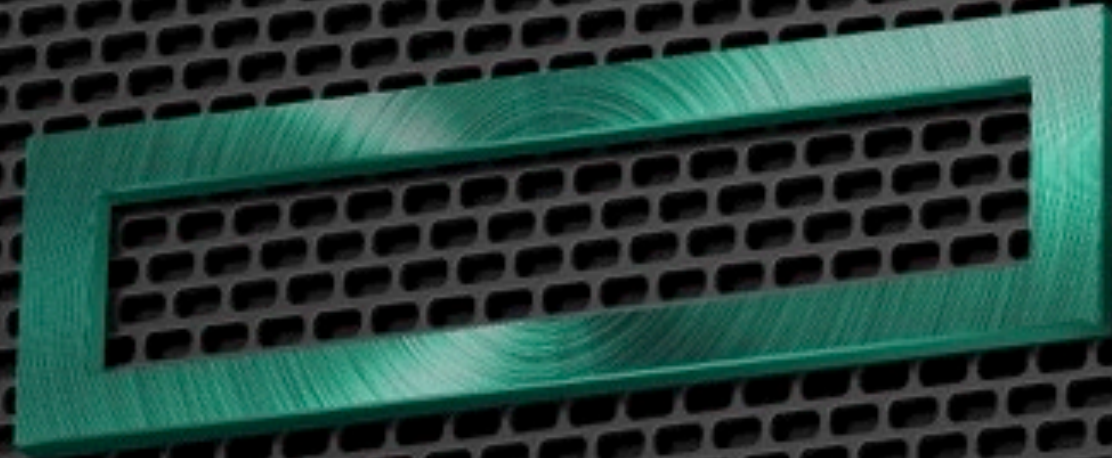
# Agenda

- **Synergy Networking Overview**
- **Synergy Networking with Cisco ACI**
- **OneView 5.0 Synergy Networking Features**





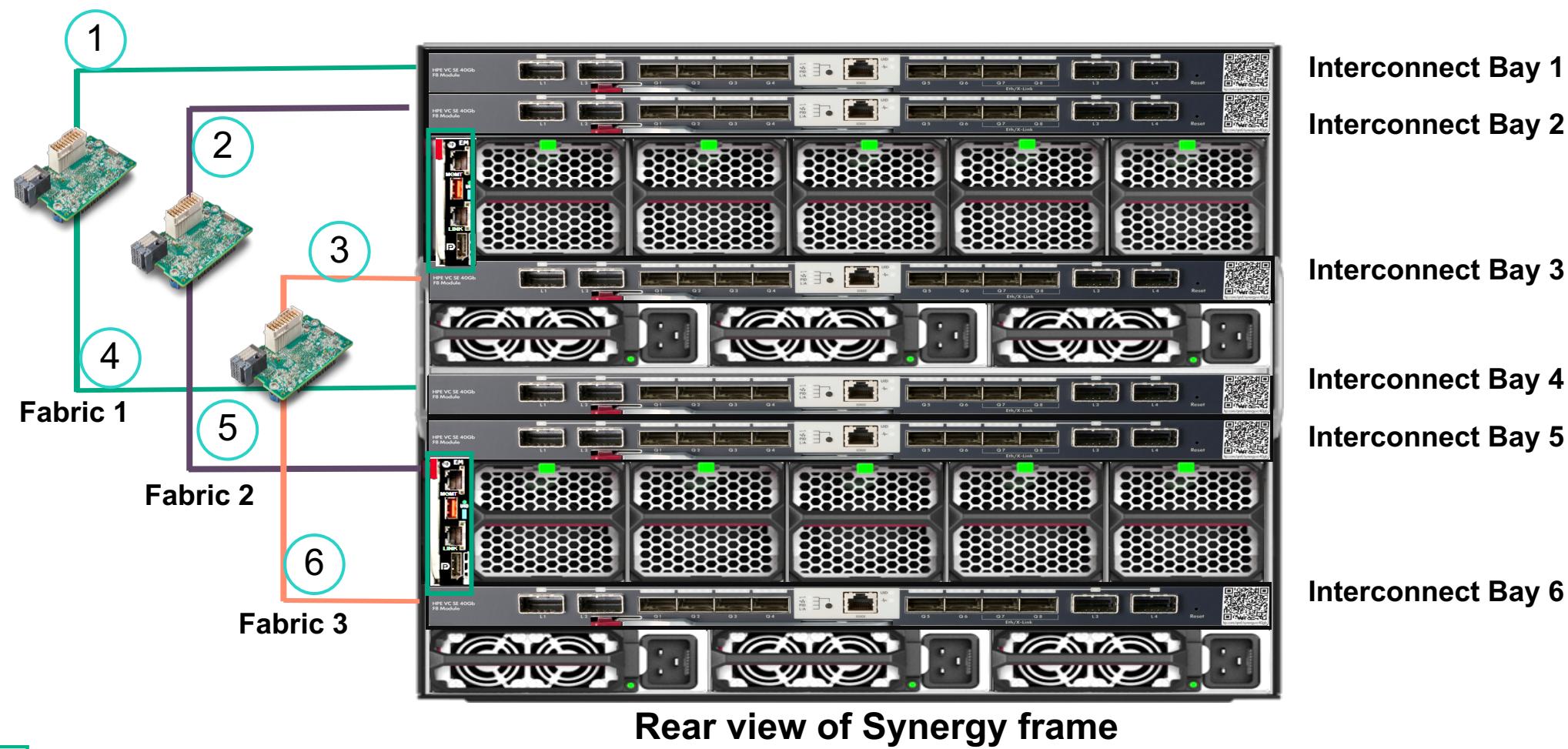
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# **Synergy Networking Overview**

# Synergy Fabric Layout

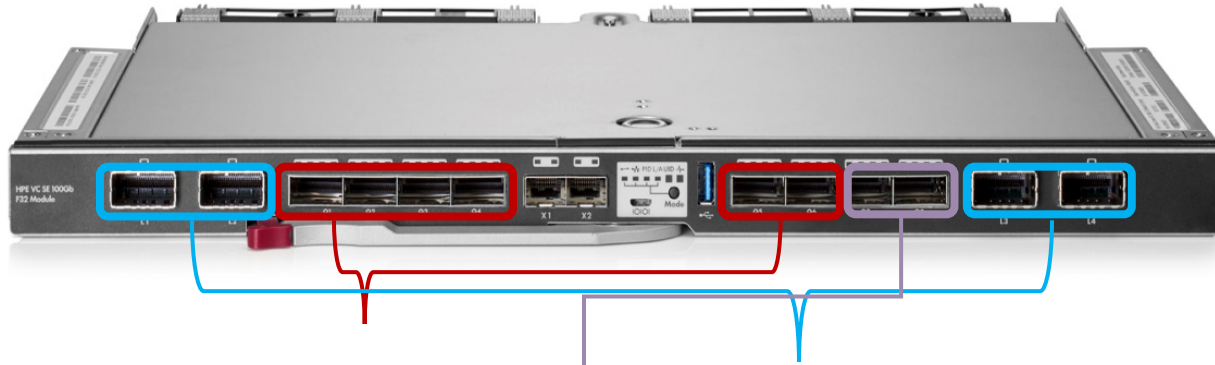
Synergy supports three redundant fabrics





# Synergy Virtual Connect SE 100Gb F32 Module

12x 25/50Gb to Internal Compute Modules



## – 6x 100Gb uplink ports

- Q1-Q6: 100/40Gb, 4x 10Gb or 4x25Gb Eth/FCoE
- 4x 8/16/32Gb FC

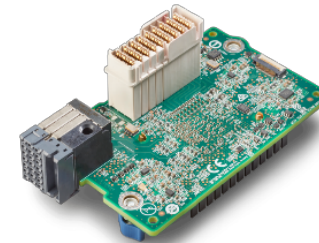
## – 2x 100Gb cluster ports

- Q7-Q8: 100Gb ICM cluster ports

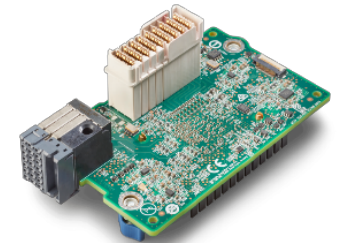
## – 4x 300Gb Interconnect Link ports

- AOC ICM cables (3m, 7m and 15m)
- DAC cables (1.1m, 1.6m and 2.1m)

- High performance, low latency
  - 6.40 Tbps switching capacity
  - 300 ns sec for port to port latency
- Converged and resilient fabrics
  - Ethernet, FCoE, FC, RDMA and iSCSI
  - M-LAG for resilient fabric
- Multi-frame composable
- Paired with full-featured currently shipping and new adapters



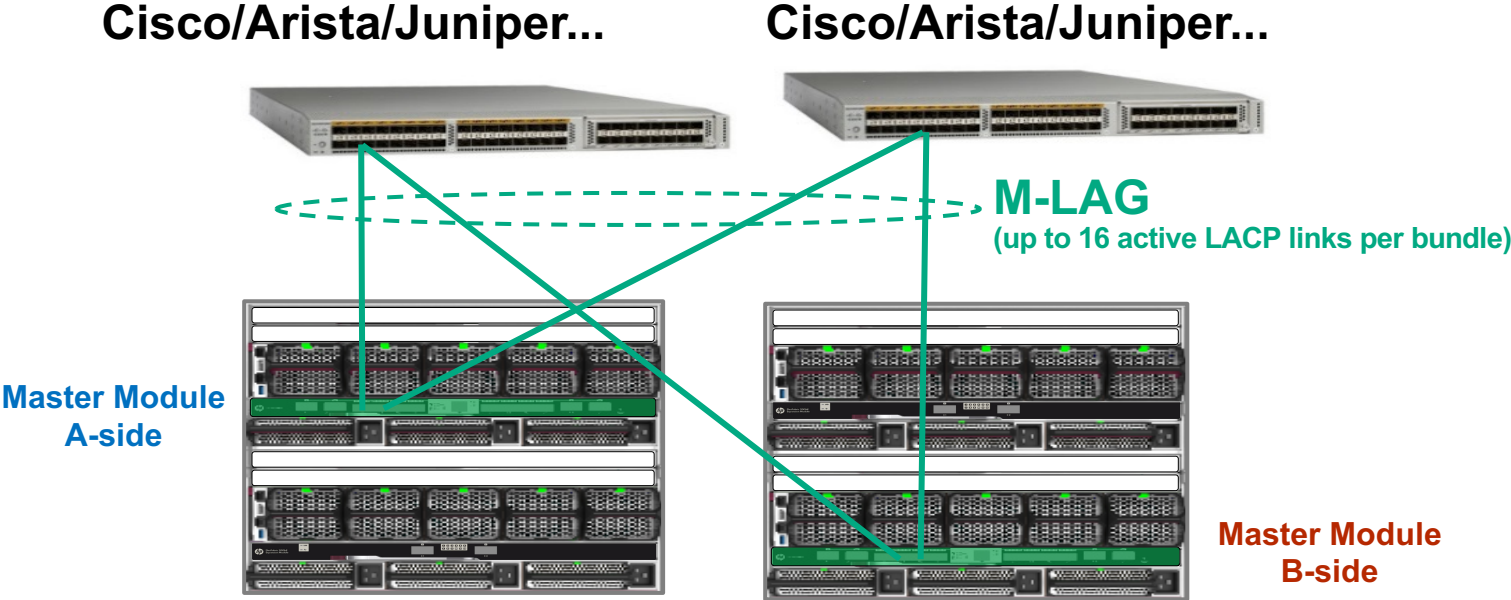
4820C @ 25 Gb/s



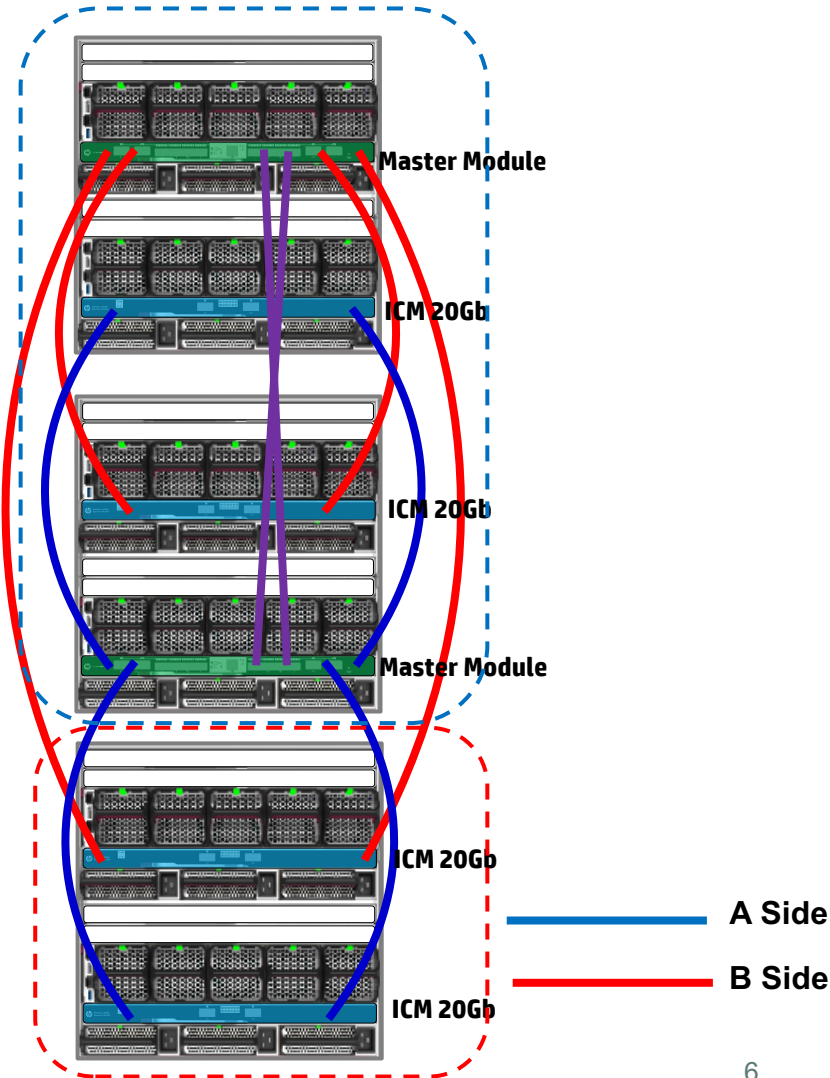
6820C @ 25/50 Gb/s

# Multi-Module Link Aggregation For Resilient Fabric

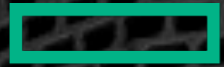
## Synergy Network Uplink Topology



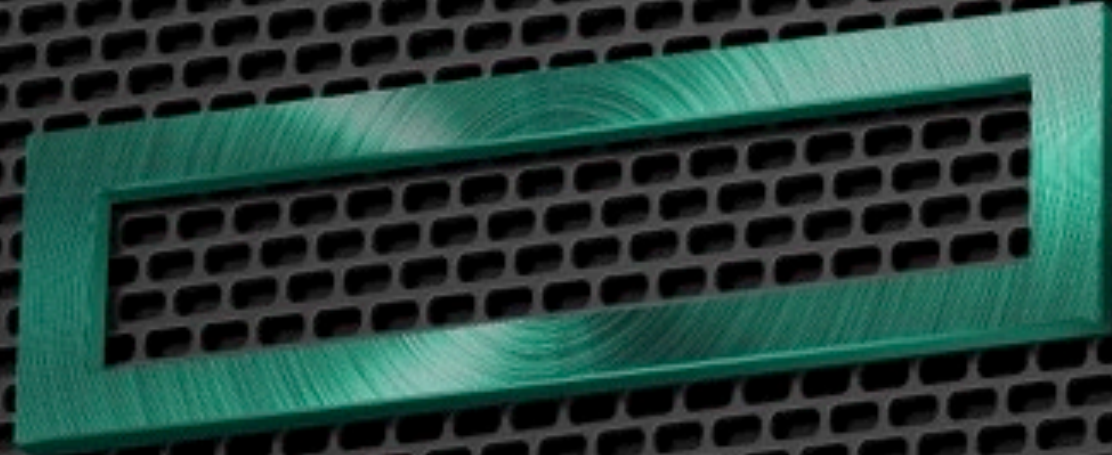
## Synergy Interconnect Topology Across Frames





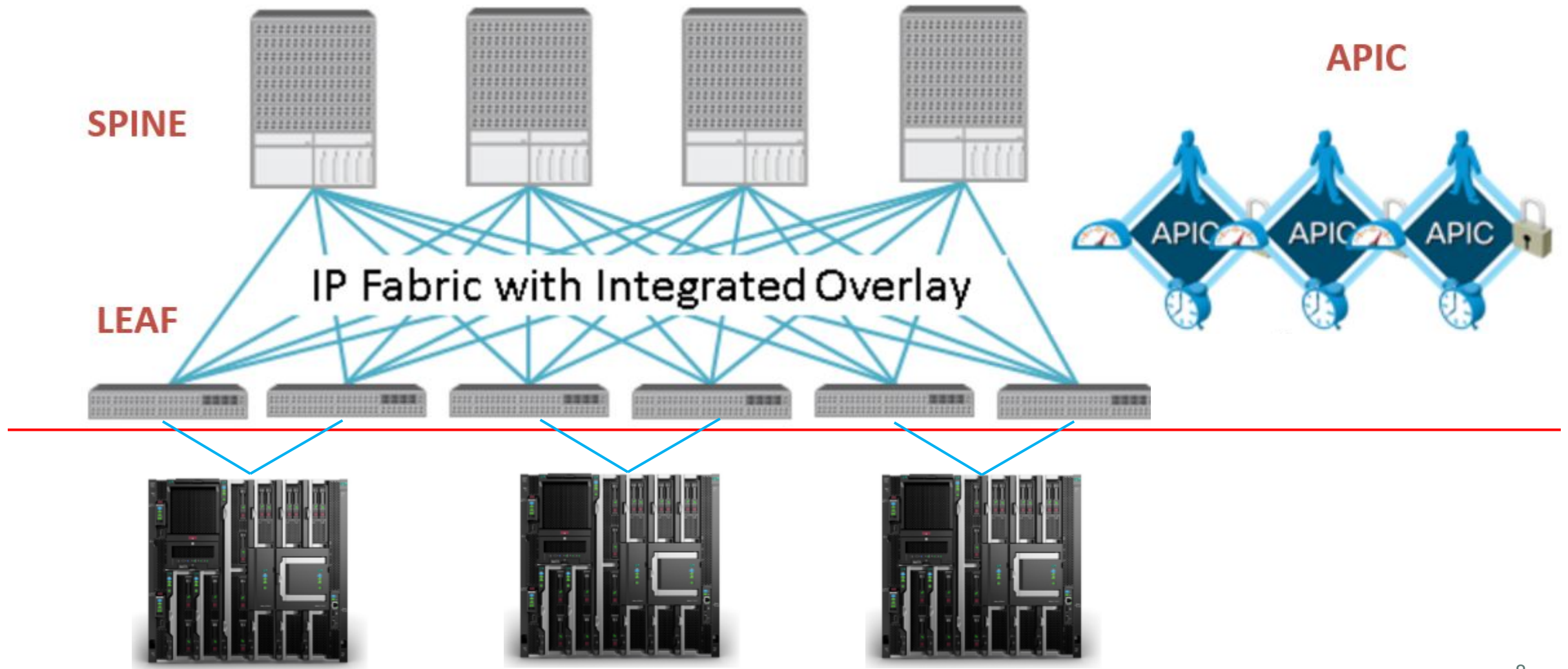


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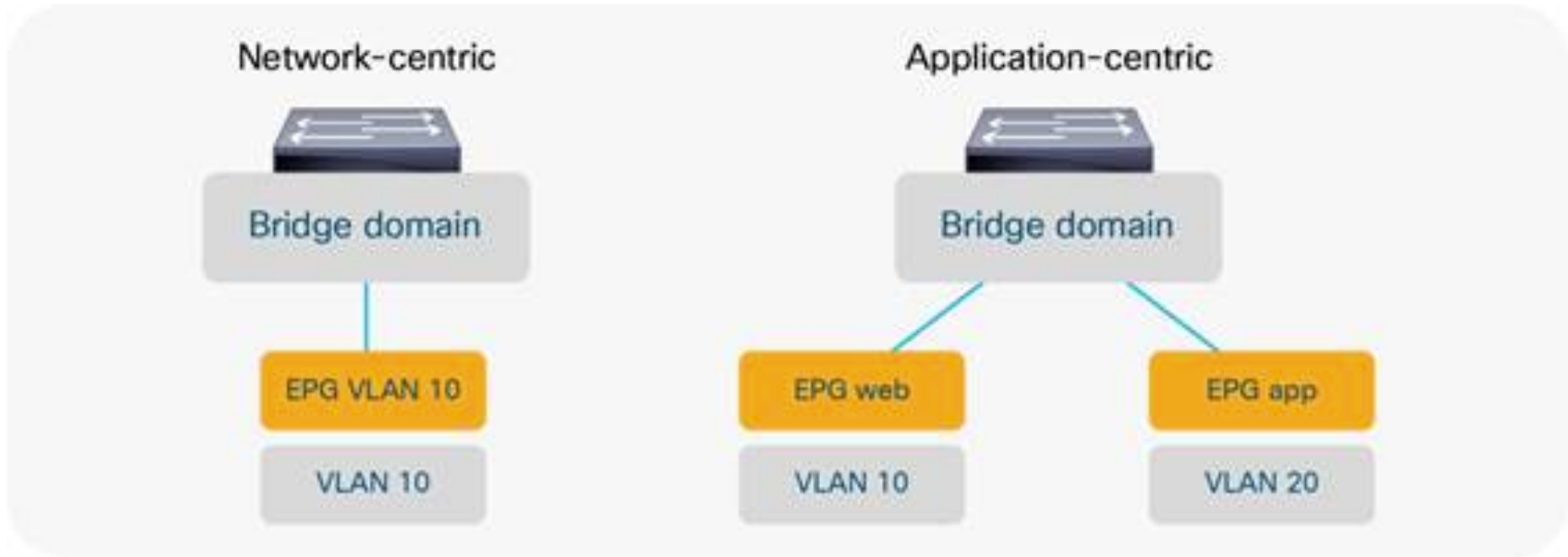
# **Synergy Networking with Cisco ACI**

# Cisco Application Centric Infrastructure

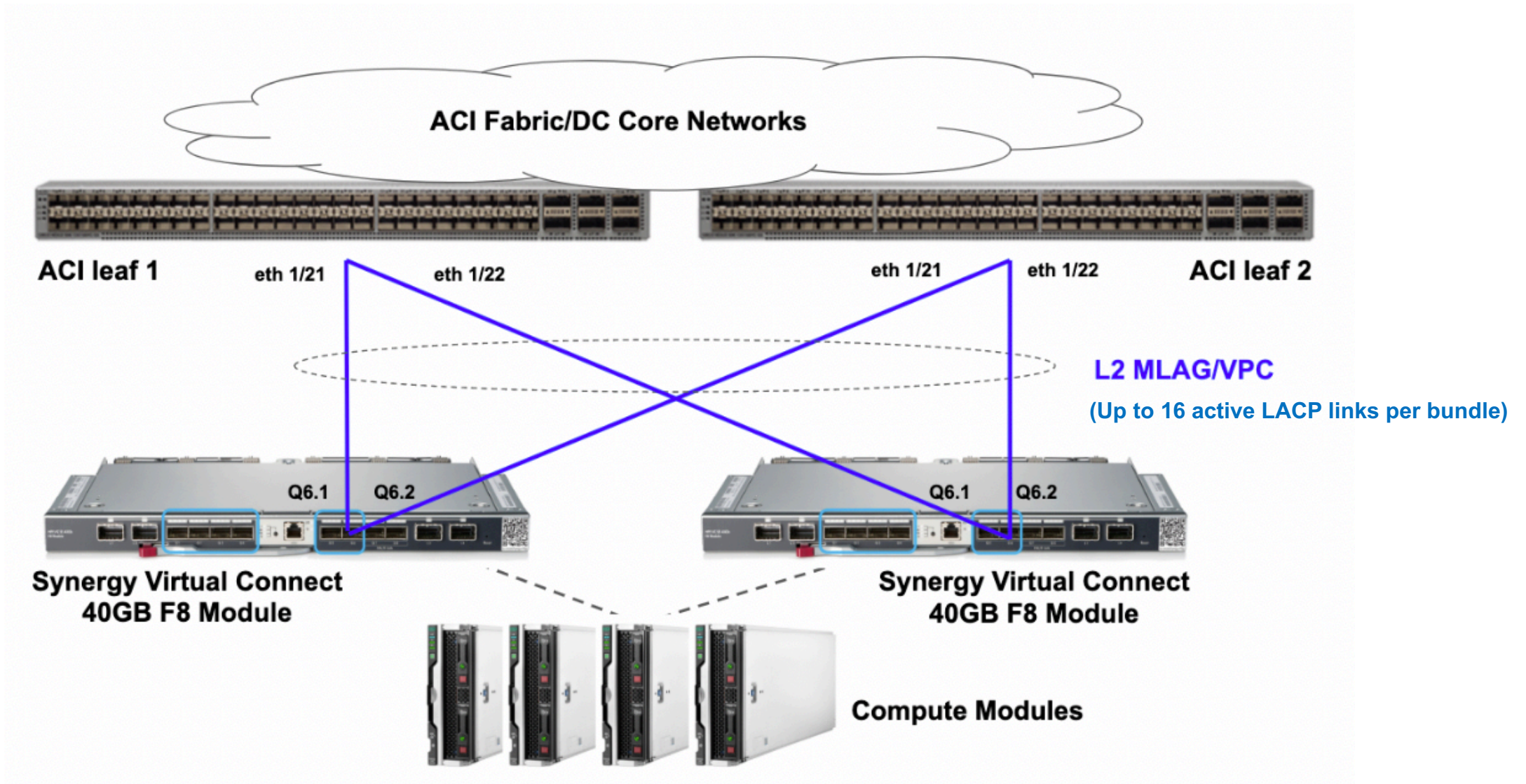




# Cisco ACI Endpoint Connectivity



# Synergy and Cisco ACI Sample Topology





# Synergy Uplink Ports to Cisco ACI



**6 x 100Gb QSFP28 uplink ports**

**Eth/FCOE: 100Gb, 40Gb, 4x25Gb or 4x10Gb**

**FC: 4x32/16/8Gb**

# Synergy Network Configuration (Tagged or Tunnel)

The screenshot shows the OneView interface with a list of networks on the left and the details for 'vlan\_200' on the right. The 'vlan\_200' row in the list is highlighted in light blue, and its 'VLAN' column is enclosed in a yellow box. The details panel on the right shows the 'General' tab for 'vlan\_200'.

Name	VLAN	Type
vlan_205	205	Ethernet
vlan_204	204	Ethernet
vlan_203	203	Ethernet
vlan_202	202	Ethernet
vlan_201	201	Ethernet
vlan_200	200	Ethernet

**vlan\_200** Overview

**General** Edit

Type: Ethernet  
VLAN: 200  
Associated with subnet ID: none  
Purpose: General  
Preferred bandwidth: 2.5 Gb/s

The screenshot shows the OneView interface with a list of networks on the left and the details for 'Tunnel-Net-For-All-VLANs' on the right. The 'Tunnel-Net-For-All-VLANs' row in the list is highlighted in light blue, and its 'VLAN' column is enclosed in a yellow box. The details panel on the right shows the 'General' tab for 'Tunnel-Net-For-All-VLANs'.

Name	VLAN	Type
Tunnel-Net-For-All-VLANs	Tunnel	Ethernet
iscsi-a-net	10	Ethernet
iscsi-b-net	11	Ethernet
MGMT	40	Ethernet

**Tunnel-Net-For-All-VLANs** Overview

**General** Edit

Type: Ethernet  
VLAN: Tunnel  
Associated with subnet ID: none  
Purpose: General



# Synergy Uplink Configuration with Tagged Networks

**OneView** Search

**Logical Interconnects** 3 All statuses All types

- EG-DCA-Synergy-01-LIG-SAS-Switch-1
- EG-DCA-Synergy-01-LIG-VC
- EG-DCA-Synergy-01-LIG-VC-FC-16Gb-1

**Edit leaf-101-102-uplinkset** General

**General**

Name: leaf-101-102-uplinkset

Type: Ethernet

Connection mode: Automatic

LACP timer: Short (1s)

LACP load balancing: Source & Destination MAC Address

**Networks**

Name	Type	VLAN ID	Native
external-access-mgmt	Ethernet	170	<input type="checkbox"/>
pvlan-910	Ethernet	910	<input type="checkbox"/>
pvlan-911	Ethernet	911	<input type="checkbox"/>
pvlan-1035	Ethernet	1035	<input type="checkbox"/>
pvlan-1036	Ethernet	1036	<input type="checkbox"/>

**Uplink Ports**

Interconnect Module	Port	Capability
Frame 01 Bottom, interconnect 3	Q5:1	Ethernet + FCoE

# Synergy Uplink Configuration with Tunnel Networks

**OneView** Search

Logical Interconnects 3 All statuses All types

- EG-DCA-Synergy-01-LIG-SAS-Switch-1
- EG-DCA-Synergy-01-LIG-VC
- EG-DCA-Synergy-01-LIG-VC-FC-16Gb-1

**Edit leaf-103-104-uplink** General

**General**

Name leaf-103-104-uplink

Type Tunnel

Connection mode Automatic

LACP timer Short (1s)

LACP load balancing Source & Destination MAC Address

**Networks**

Network Tunnel-Net-For-All-VLANs

**Uplink Ports**

Interconnect Module	Port	Capability	
Frame 01 Bottom, interconnect 3	Q6:1	Ethernet + FCoE	×
Frame 01 Bottom, interconnect 3	Q6:2	Ethernet + FCoE	×
Frame 02 Middle, interconnect 6	Q6:1	Ethernet + FCoE	×
Frame 02 Middle, interconnect 6	Q6:2	Ethernet + FCoE	×

Add uplink ports Remove uplink ports Remove all

# Synergy Uplink Configuration Overview

OneView

Logical Interconnects 3

Name

EG-DCA-Synergy-01-LIG-SAS-Switch-1

EG-DCA-Synergy-01-LIG-VC

EG-DCA-Synergy-01-LIG-VC-FC-16Gb-1

Edit EG-DCA-Synergy-01-LIG-VC

Logical Interconnect

Logical Interconnect

Internal  
4 networks

streamer-...  
1 network  
4 uplink ports

openshift-...  
7 networks  
2 uplink ports

leaf-101-1-...  
5 networks  
2 uplink ports

leaf-103-1-...  
1 network  
4 uplink ports

leaf101-10-...  
1 network  
no uplink ports

Add uplink set

Frame 01 Bottom

3

L1 L2

1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4

Q1 Q2 Q3 Q4

● Frame 01 Bottom, interconnect 3

State: Configured

Expected: Virtual Connect SE 40Gb F8 Module for Synergy

Actual: Virtual Connect SE 40Gb F8 Module for Synergy

6

L1 L2

● Frame 01 Bottom, interconnect 6

State: Configured

Expected: Synergy 20Gb Interconnect Link Module

Actual: Synergy 20Gb Interconnect Link Module



# Synergy Server Connection Configuration

**OneView** Search

**Server Profiles** 17 All statuses All labels All resources

+ Create profile

Name
esxi-vlan170-01
esxi-vlan170-02
esxi-vlan170-03
esxi-vlan170-04
hj-esx65-dvs-18
hj-esx65-dvs-19
hj-esxi-ave-01
hj-esxi-ave-02
openshift-worker-01
openshift-worker-02

### Edit Connection

#### General

Name:

Function type:

Network:

Port:

Link aggregation group:

Requested bandwidth (Gb/s):

Requested virtual functions:

**Required**

If the network you are looking for is not found, it may be that it is not in scope per your permissions or it is not accessible via the logical interconnect group(s) associated with the selected enclosure group for this server profile.

# ACI/Synergy Network Configuration with Synergy Tagged Networks

System

Tenants

Fabric

Virtual Networking

L4-L7 Services

Admin

Operations

Apps

ALL TENANTS | Add Tenant | Tenant Search: name or descr | common | Tenant1 | Plexxi | Tenant2 | mgmt

Tenant Tenant1

- epg-vlan-170
  - Domains (VMs and Bare-Metals)
  - EPG Members
  - Static Ports
  - Static Leafs
  - Fibre Channel (Paths)
  - Contexts

Static Ports

Path	Primary VLAN for Micro-Seg	Port Encap (or Secondary VLAN for Micro-Seg)	Deployment Immediacy	Mode
Node: Pod-1				
Pod-1/Node-102/eth1/3	unknown	vlan-170	On Demand	Trunk
Pod-1/Node-101-102/synergy-101-102-vpc	unknown	vlan-170	On Demand	Access (802.1P)

OneView

Logical Interconn

Name

EG-DCA-Synergy-C SAS-Switch-1

EG-DCA-Synergy-C

EG-DCA-Synergy-C FC-16Gb-1

Edit leaf-101-102-uplinkset

General

General

Name

leaf-101-102-uplinkset

Type

Ethernet

Connection mode

Automatic

LACP timer

Short (1s)

LACP load balancing

Source & Destination MAC Address

Networks

Name	Type	VLAN ID	Native
external-access-mgmt	Ethernet	170	<input checked="" type="checkbox"/>

# ACI/Synergy Network Configuration with Synergy Tagged Networks

System

Tenants

Fabric

Virtual Networking

L4-L7 Services

Admin

Operations

Apps

ALL TENANTS | Add Tenant | Tenant Search: name or descr | common | Tenant1 | Plexxi | Tenant2 | mgmt

Tenant Tenant1

epg-vlan-170

Domains (VMs and Bare-Metals)

EPG Members

Static Ports

Static Leafs

Fibre Channel (Paths)

Contracts

Static Ports

Path	Primary VLAN for Micro-Seg	Port Encap (or Secondary VLAN for Micro-Seg)	Deployment Immediacy	Mode
Node: Pod-1				
Pod-1/Node-102/eth1/3	unknown	vlan-170	On Demand	Trunk
Pod-1/Node-101-102/synergy-101-102-vpc	unknown	vlan-170	On Demand	Trunk

OneView

Logical Interconn

Name

EG-DCA-Synergy-C SAS-Switch-1

EG-DCA-Synergy-C

EG-DCA-Synergy-C FC-16Gb-1

Edit leaf-101-102-uplinkset

General

General

Name

leaf-101-102-uplinkset

Type

Ethernet

Connection mode

Automatic

LACP timer

Short (1s)

LACP load balancing

Source & Destination MAC Address

Networks

Name	Type	VLAN ID	Native
external-access-mgmt	Ethernet	170	<input type="checkbox"/>

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# ACI/Synergy Network Configuration with Synergy Tunnel Networks

Tenant Tenant1

- Quick Start
- Tenant Tenant1
  - Application Profiles
    - ap-1
      - Application EPGs
        - epg-vlan-100
        - epg-vlan-140
      - Domains (VMs and Bare-Metals)
      - EPG Members
      - Static Ports
        - Pod-1/Node-101/eth1/11
        - Pod-1/Node-102/eth1/3
        - Pod-1/Node-103-104/synergy-v...
      - Static Leafs

Static Path - Pod-1/Node-103-104/synergy-vpc

Properties

Path: Pod-1/Node-103-104/synergy-vpc

Path Description:

Port Encap (or Secondary VLAN for Micro-Seg): VLAN 140 Integer Value

Deployment Immediacy: Immediate On Demand

Primary VLAN for Micro-Seg: VLAN Integer Value

Mode: Trunk Access (802.1P) Access (Untagged)

IGMP Snoop Static Group:

Group Address Source Address

No items have been found.

OneView

Logical Interconnects

- EG-DCA-Synergy-C SAS-Switch-1
- EG-DCA-Synergy-C SAS-Switch-2
- EG-DCA-Synergy-C FC-16Gb-1

Edit leaf-103-104-uplink General

General

Name leaf-103-104-uplink

Type Tunnel

Connection mode Automatic

LACP timer Short (1s)

LACP load balancing Source & Destination MAC Address

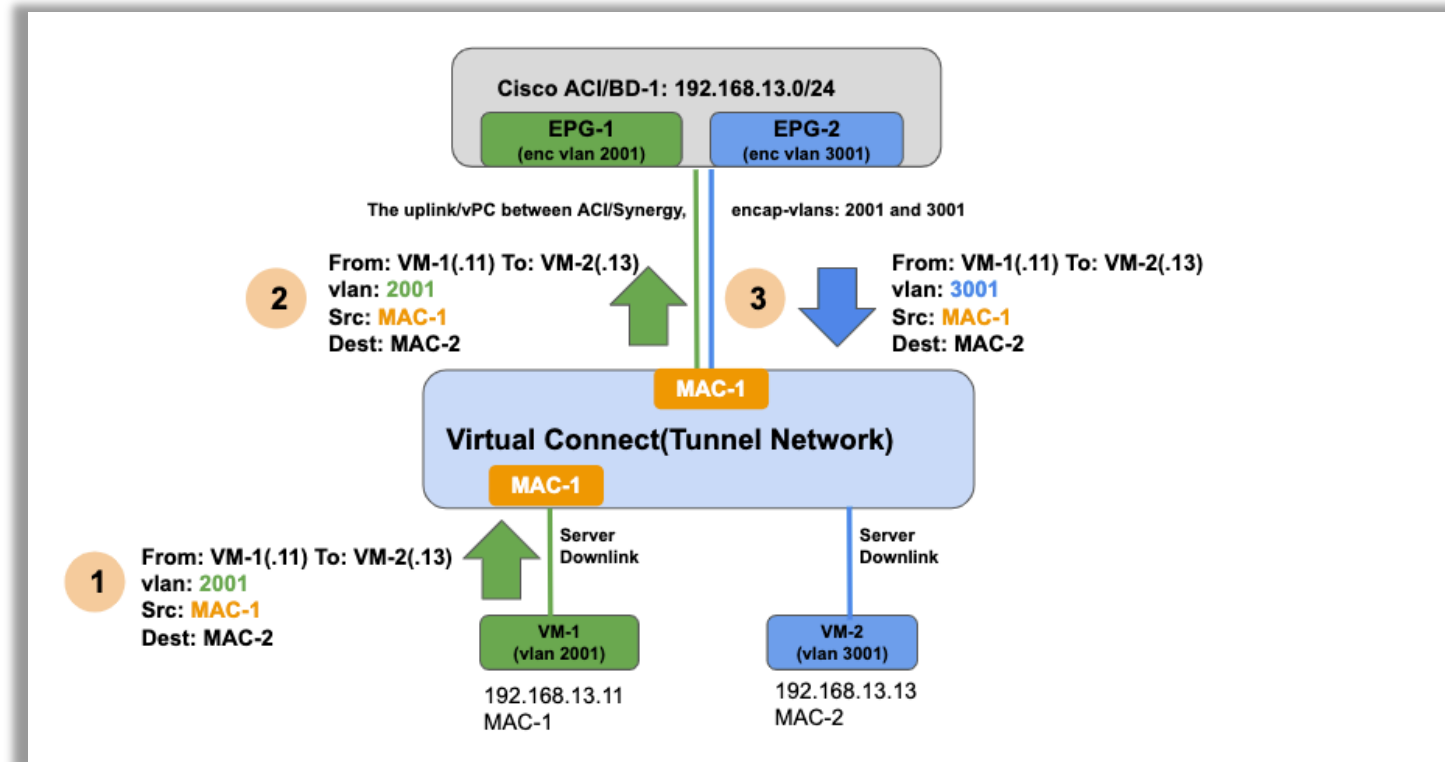
Networks

Network Tunnel-Net-For-All-VLANs

# Synergy Tunnel network when ACI doing Inter-VLAN Bridging

For **Tunnel** mode, one ACI use case requiring user attention where ACI is doing **Inter-VLAN bridging**.

- Multiple EPGs are under one BD **AND**
- These EPGs share the same IP subnet defined on BD



ACI inter-vlan bridging will switch the packets with the same source MAC address across different encapsulation VLANs like MAC-1 shown in the diagram across EPG VLAN 2001 and 3001.

Synergy Tunnel mode does not look into user VLANs when switching traffic so it will regard the same MAC-1 address learned from both downlink and uplink at the same time.

As a result, Synergy will interrupt the traffic forwarding for the packets with MAC-1 source address.

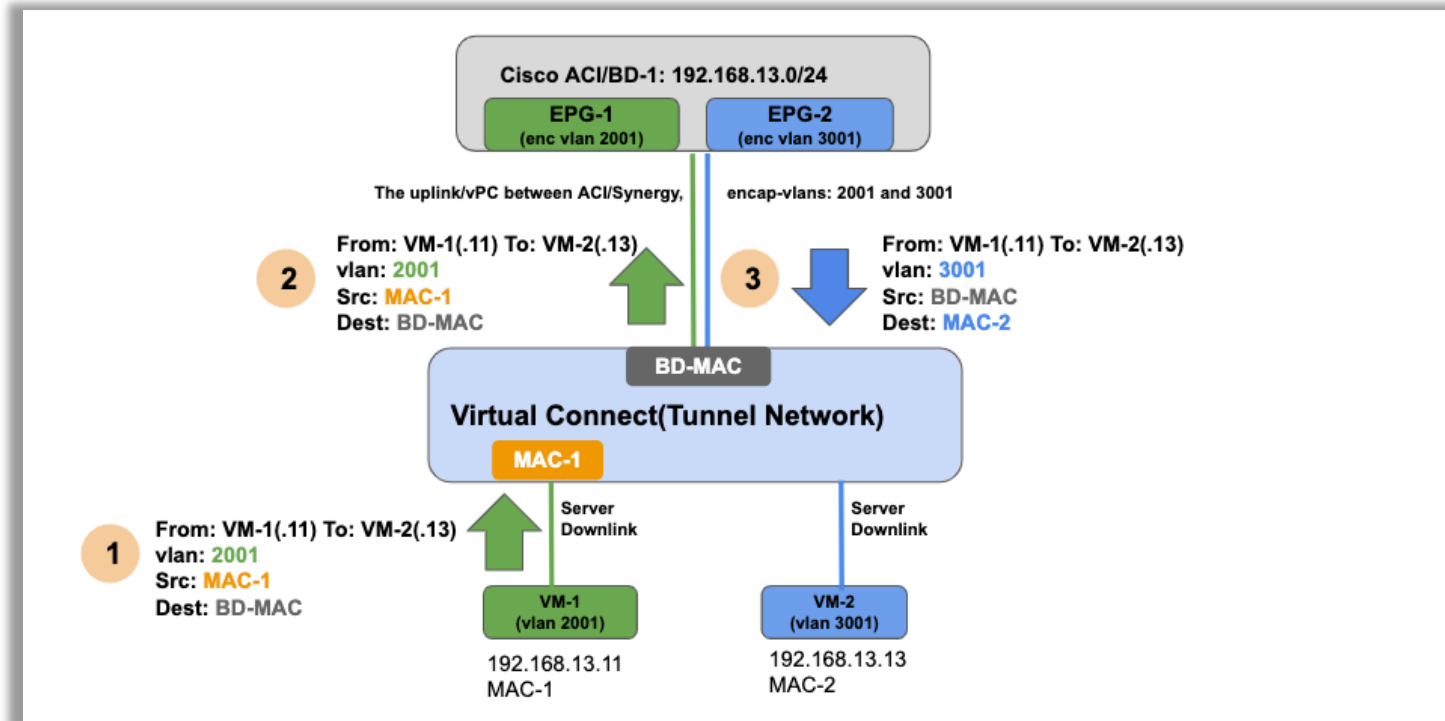
# Introducing ACI “Proxy-ARP” feature

The issue for ACI inter-VLAN bridging with Synergy tunnel mode can be solved with ACI “[Proxy-ARP](#)” feature.

**Note:** ACI Proxy-ARP is not a feature configured separately. It is implemented behind the scene in various ACI features like Flood-in-Encapsulation, Micro-segmentation and Intra-EPG isolation.

## About Proxy ARP

Proxy ARP in Cisco ACI enables endpoints within a network or subnet to communicate with other endpoints without knowing the real MAC address of the endpoints. Proxy ARP is aware of the location of the traffic destination, and offers its own MAC address as the final destination instead.



ACI proxy-ARP will switch packets source MAC with its own BD MAC when doing inter-VLAN bridging.

Endpoints will learn source MACs for other endpoints in different EPGs under same BD as ACI BD MACs.

This will ensure Synergy always learn true source endpoint MACs from downlinks and BD MAC from the uplink and hence forward the traffic successfully.



# Option 1 for Synergy Tunnel network with ACI Inter-VLAN Bridging

[ACI 3.1\(1\)](#) has introduced the “Flood-in-Encapsulation” enhancement specifically for this use case

Configuring flood in encapsulation for all protocols and proxy ARP across encapsulations

In this release, on the Cisco ACI switches with the Application Leaf Engine (ALE), all protocols are flooded in encapsulation. Multiple EPGs are now supported under one bridge domain with an external switch. When two EPGs share the same bridge domain and the **Flood in Encapsulation** option is turned on, the EPG flooding traffic does not reach the other EPG. It overcomes the challenges of using the Cisco ACI switches with the Virtual Connect (VC) tunnel network.

For more information, see the *Cisco APIC Layer 2 Networking Configuration Guide*.

Bridge Domain - dvs-vm-bd2

Summary Policy Operational Stats Health Faults History

General L3 Configurations Advanced/Troubleshooting

Properties

VRF:

Resolved VRF: common/hj-common-vrf

L2 Unknown Unicast:  Hardware Proxy

L3 Unknown Multicast Flooding:  Optimized Flood

Multi Destination Flooding:  Drop

PIM: ☐

IGMP Policy:

ARP Flooding: ☒

Users should enable “Flood in Encapsulation” and set “L2 Unknown Unicast” as “Flood” under BD.

The reason “L2 Unknown Unicast” needs to be set in “Flood” when doing “Flood in Encapsulation” is specified in [APIC Layer2 configuration guide](#)

Note:

“L2 Unknown Unicast” as “Flood” will automatically enable “ARP flooding” as prompted in APIC GUI.

# Endpoints and APIC view with ACI Proxy-ARP

Endpoints see other endpoints from different EPGs in same BD doing inter-vlan bridging as BD MACs

```
[root@dvs-epg3-vm1 ~]# ip addr show eno16780032 | egrep "ether|inet "
```

```
link/ether 00:50:56:82:a7:9b brd ff:ff:ff:ff:ff:ff
```

```
inet 192.168.13.11/24 brd 192.168.13.255 scope global eno16780032
```

```
[root@dvs-epg3-vm1 ~]# arp
```

Address	HWtype	HWaddress	Flags	Mask	Iface
192.168.13.1	ether	00:22:bd:f8:19:ff	C		eno16780032
192.168.13.12	ether	00:50:56:82:eb:93	C		eno16780032
192.168.13.13	ether	00:22:bd:f8:19:ff	C		eno16780032

**VM-1 arp tables shows inter-EPG VM-2(13.13) MAC as BD MAC 19:ff.**

**The other intra-EPG VM(13.12) has original VM MAC**

ACI sees all true endpoints MACs

Tenant Tenant1

- Quick Start
- Tenant Tenant1
  - Application Profiles
    - ap-1
    - ap-2
      - Application EPGs
        - AVE-EPG
        - AVE-EPG-2
        - DVS-EPG
        - DVS-EPG-2
        - DVS-EPG-3

EPG - DVS-EPG-3

- Summary
- Policy
- Operational
- Stats
- Health
- Faults
- History

Client End-Points

Configured Access Policies

Contracts

Controller End-Points

End Point	MAC	IP	Interface	Encap	Learning Source
dvs-epg3-vm1	00:50:56:82:A7:9B	192.168.13.11	10.16.43.118 (vmm) Pod-1/Node-103-104/synergy-vpc (learned)	vlan-2001	learned vmm
dvs-epg3-vm2	00:50:56:82:EB:93	192.168.13.12	10.16.43.118 (vmm) Pod-1/Node-103-104/synergy-vpc (learned)	vlan-2001	learned vmm

# Option 2 for Synergy Tunnel network with ACI Inter-VLAN Bridging

Proxy-ARP is also enabled behind the scene for EPGs enabled for Micro-segmentation.

**Note:** Users don't need to configure any ACI uSeg for Proxy-ARP to take affect.

The screenshot displays the ACI GUI interface for configuring a VMM domain association. The left sidebar shows the hierarchy: Tenant Tenant1 > Application Profiles > ap-2 > Application EPGs > DVS-EPG > Domains (VMs and Bare-Metals). The main panel shows the 'Edit VMM Domain Association' dialog box with the following settings:

- VMM Domain Profile: uni/vmmp-VMware/dom-aci-dvs
- Deploy Immediacy: Immediate
- Resolution Immediacy: Immediate
- Enhanced Lag Policy: select an option
- Allow Micro-Segmentation: ☒
- Untagged VLAN Access: ☐
- VLAN Mode: Static
- Primary VLAN for Micro-Seg: VLAN 900
- Secondary VLAN for Micro-Seg: VLAN 901
- Netflow: Disable
- Allow Promiscuous: Reject

The vSphere Client interface is also visible, showing the 'Launch vSphere Client (HTML5)' button and the 'Administrator@VSPHERE.LOCAL' user. The 'Virtual Machines' tab is selected, showing two virtual machines: 'dvs-epg-vm2' and 'dvs-epg-vm1' under the 'Tenant1|ap-2|DVS-EPG' group, and 'dvs-epg2-vm1' and 'dvs-epg2-vm2' under the 'Tenant1|ap-2|DVS-EPG-2' group. The 'Private VLAN: Isolated (900, 9...)' is also visible.



# Option 3 for Synergy Tunnel network with ACI Inter-VLAN Bridging

A typical AVE deployment uses VXLAN to carry traffic between AVEs and ACI leaf nodes. The VXLAN traffic is encapsulated using a single ACI infra VLAN through Synergy. All underlying endpoint VLAN operation like inter-VLAN bridging is transparent to Synergy.

Users only need to config a single mapped or tunnel network to allow this infra VLAN traffic through Synergy.

The screenshot displays the VMware vSphere Web Client interface for configuring an ACI AVE. The left sidebar shows the navigation tree with 'aci-ave' selected. The main pane shows the 'Configure' tab for 'aci-ave', displaying a list of virtual machines and their associated VLANs. Annotations highlight key configuration details:

- AVE VM vxlan uplink port group:** Points to the 'ave-external-vxlan-1' entry, which has a 'VLAN trunk range: 4000'.
- AVE VM inside port group to EPG VMs:** Points to the 'ave-internal-1' entry, which has a 'VLAN trunk range: 500-525'.
- Port group used by tenant EPG VMs to connect to AVE VM inside trunk interface:** Points to the 'Tenant1[ap-2]AVE-EPG' entry, which has a 'Private VLAN: Isolated (502, 5...)'.
- vlan 4000 is ACI infra\_vlan configured during ACI initial setup. This vlan should be allowed in Synergy to pass vxlan traffic.** This annotation is placed near the 'ave-external-vxlan-1' entry.
- DVS vmnic uplinks are connected to Synergy Virtual Connect downlinks:** Points to the 'vmnic3' entry in the 'aci-ave-DVUplinks-233' section.

The right pane shows the properties for 'vmnic3', including the 'System Description' field, which is highlighted with an orange box and contains the text 'VC SE 40Gb F8 Module'.

# Synergy and ACI VMM Integration

Synergy Tunnel mode really simplifies ACI VMM integration as it can pass the traffic from DVS port-group derived from ACI dynamic vlan pool without any Synergy configuration changes.

The screenshot displays the ACI GUI for the EPG - DVS-EPG-2 configuration. The 'Operational' tab is selected, showing a table of Client End-Points. Below the table, the 'Topology' section is visible, showing the configuration for Tenant1|ap-2|DVS-EPG-2 and Tenant1|ap-2|DVS-EPG-2.

End Point	MAC	IP	Interface	Encap	Learning Source
dvs-epg2-vm2	00:50:56:82:3D:0D	192.168.10.13	10.16.43.118 (vmm) Pod-1/Node-103-104/synergy-vpc (learned)	vlan-900(P) vlan-901(S)	learned vmm

**Topology**

- Private VLAN
- NetFlow
- Port mirroring
- Health check
- More
  - Network Protocol Profiles
  - Resource Allocation

**Tenant1|ap-2|DVS-EPG**

- Private VLAN: Isolated (900, 9...
- Virtual Machines (2)
  - dvs-epg-vm2
  - dvs-epg-vm1

**Tenant1|ap-2|DVS-EPG-2**

- Private VLAN: Isolated (900, 9...
- Virtual Machines (2)
  - dvs-epg2-vm1
  - dvs-epg2-vm2

# Synergy Fabric Managers with ACI Integration

Synergy Fabric Manager aligns HPE OneView resources as defined by Cisco ACI APIC policies.

It intends to help Synergy admins to match Synergy network configurations with APIC policies so network configuration mismatch can be prevented.

**Note:** Users don't have to config Fabric Manager feature in order to pass traffic successfully between ACI and Synergy.

The screenshot displays the HPE OneView interface for managing Fabric Managers. At the top, there is a search bar and a filter for 'Fabric Managers 1'. A table lists the fabric managers, with 'NA-ACI' of type 'Cisco ACI' highlighted. To the right, the 'NA-ACI' configuration details are shown, including its type, APIC version (3.2(7f)), IP addresses (10.16.42.100), and the user it is used by (NA-ACI LS). Below this, the 'Tenants' section shows a single tenant named '1' with a status of 'Consistent'.

Name	Type
NA-ACI	Cisco ACI

**NA-ACI** Overview

**General >**

- Type: Cisco ACI
- APIC version: 3.2(7f)
- IP Addresses or hostnames: 10.16.42.100
- Used by: NA-ACI LS

**Tenants >** [Edit](#)

Tenant	Status
1	Consistent

# Synergy Fabric Managers with ACI Integration

Fabric Managers 1 All statuses ▾ All labels ▾

+ Add fabric manager

⚠ DCA-ACI Tenants ▾ ⚙

Actions ▾

▲ One or more networks associated with tenant "Tenant2" are missing. Active 8/20/18 1:57:02 pm All 0 2 1 ▾

**FM reports inconsistency information. In this example, It sees ACI EPGs for Tenant2 are configured for vlan 200-202, 220 but only sees Synergy is configured vlan 200 so it reports the other three vlan 201-202 and 220 missing**

**FM suggests Synergy admin to add the 3 vlans into uplink set.**

**FM shows if it can automatically remediate the inconsistency**

Tenants [Edit](#)

▼ Tenant2

Description none

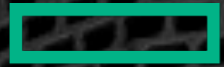
Used by 3 networks  
1 logical interconnect

► Resource mappings

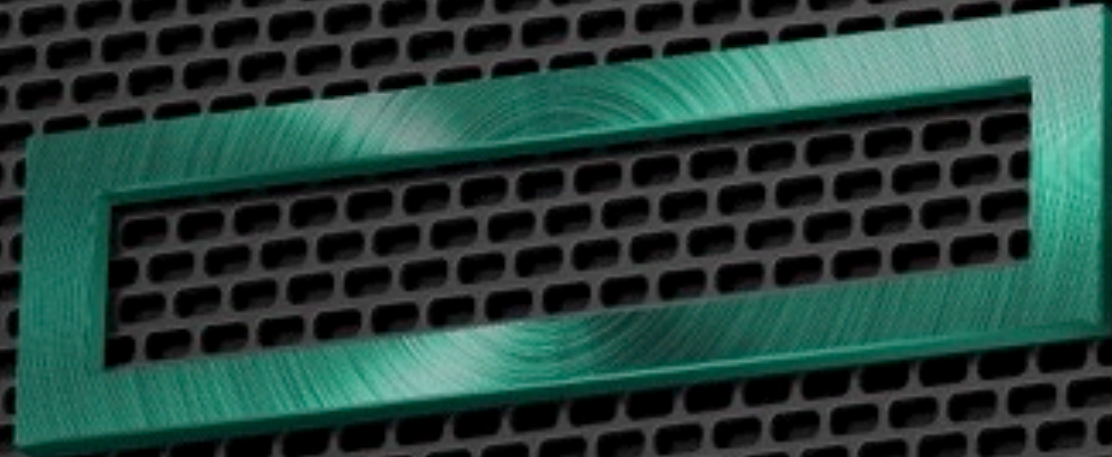
▼ Inconsistency details

Resource	Inconsistency	Resolution	Remediation
EG-DCA-Synergy-01-LIG-VC Logical interconnect		Any of the suggested logical interconnect remediations will also be performed on the logical interconnect groups.	
Uplink set "leaf-101-102-uplinkset" networks	VLAN 202 missing	Add VLAN 202 to the uplink set.	Yes
Uplink set "leaf-101-102-uplinkset" networks	VLAN 220 missing	Add VLAN 220 to the uplink set.	Yes
Uplink set "leaf-101-102-uplinkset" networks	VLAN 201 missing	Add VLAN 201 to the uplink set.	Yes





**Hewlett Packard  
Enterprise**



# **OneView 5.0 Synergy Networking Features**

# Large Network Sets on VC SE 100Gb F32 Module

Eliminates current VLAN limits imposed on the network sets

"I want to define and utilize large number of discrete networks without having to resort to tunnel mode" - Customer

- OneView 3.x
  - Network Sets were limited to 162 VLANs
  - One had to use Tunnel networks to achieve higher limits
- OneView 4.00
  - Network Set limits increased up to 1000 VLANs (in a single frame)
- Large Network Sets
  - Completely eliminates VLAN limits
  - Enables Synergy mapped networks full interoperability with Cisco ACI and allows users to define a large number of EPGs in the same ACI Bridge Domain

**Create Network Set** General

**General**

Name: ACI Large Set

Preferred bandwidth: 2.5 Gb/s

Maximum bandwidth: 20.0 Gb/s

Type: Large

Regular network sets can contain up to 1000 networks. Specifying a large network set type will extend the number of networks up to a maximum of 4044. There is no limit to how many large network sets can be created, however, a maximum of 60 unique large network sets can be simultaneously deployed per logical interconnect.

**Networks**

Name	VLAN ID	Untagged
ACI_large_1000	1000	<input type="checkbox"/>
ACI_large_1001	1001	<input type="checkbox"/>
ACI_large_1002	1002	<input type="checkbox"/>
ACI_large_1003	1003	<input type="checkbox"/>
ACI_large_1004	1004	<input type="checkbox"/>
ACI_large_1005	1005	<input type="checkbox"/>
ACI_large_1006	1006	<input type="checkbox"/>
ACI_large_1007	1007	<input type="checkbox"/>

Add networks Remove networks Remove all

Changed: Name to "ACI Large Set" Create Create + Cancel

# Synergy Automated VLAN Provisioning

Streamlines network deployment across OneView resources in a single step

"It takes too many steps to create a network, provision into a logical interconnect, network set, and finally serve profile" - Customer

- Direct association of a network set with an uplink set immediately propagates all network set modifications to the uplink sets
- Reduces time, effort, and risk of error when adding networks to an uplink set
- When a network is added and associated with an existing network set, it will be automatically deployed across both the uplink sets on LIG/LI and server profiles where network set is provisioned

Create Uplink Set?

Networks

Name	Type	VLAN ID	Native
prod-_1021	Ethernet	1021	<input type="checkbox"/> x
prod-_1022	Ethernet	1022	<input type="checkbox"/> x
prod-_1023	Ethernet	1023	<input type="checkbox"/> x
prod-_1024	Ethernet	1024	<input type="checkbox"/> x
prod-_1025	Ethernet	1025	<input type="checkbox"/> x
prod-_1041	Ethernet	1041	<input type="checkbox"/> x
prod-_1042	Ethernet	1042	<input type="checkbox"/> x
prod-_1043	Ethernet	1043	<input type="checkbox"/> x

Add networks

Remove networks

Add networks from network set

Network Sets

Name

Prod NetSet

Add network set

Remove network set

Uplink Ports

Add uplink ports

Create

Create +

Cancel

# Synergy Automated VLAN Provisioning

## Streamlines network deployment across OneView resources in a single step

### Create Network

Name

prod-

Type

☒ Ethernet ☐ Fibre Channel ☐ FCoE

VLAN

Tagged

VLAN ID

1021-1025

Associate with IPv4 subnet ID

none

Associate with IPv6 subnet ID

none

Purpose

General

Preferred bandwidth

2.5

Gb/s

Maximum bandwidth

50

Gb/s

☒ Smart link

☐ Private network

Network sets

Name

Prod NetSet

There are no available network sets to add.

Remove from network sets

OneView

Dashboard

Activity

Firmware Compliance

Settings

SERVERS

Server Profiles

Server Profile Templates

Enclosure Groups

Logical Enclosures

Enclosures

Server Hardware

Server Hardware Types

HYPERVISORS

Networks

Network Sets

Logical Interconnect Groups

Logical Interconnects

Logical Interconnects 1

Prod LE-Production LIG

Uplink Sets

mgmt	11	prod- 1024	1024	prod- 1003	1003	prod- 1007	1007	prod- 1011	1011	prod- 1015	1015
prod- 1021	1021	prod- 1025	1025	prod- 1004	1004	prod- 1008	1008	prod- 1012	1012	vmotion	1012
prod- 1022	1022	prod- 1001	1001	prod- 1005	1005	prod- 1009	1009	prod- 1013	1013		
prod- 1023	1023	prod- 1002	1002	prod- 1006	1006	prod- 1010	1010	prod- 1014	1014		

Network sets (1)

Prod NetSet

Uplinks

Uplink	State	Operational Speed	Requested Speed	Auto-negotiation	LAG	LAG State
0000A66101.interconnect.3. Q2	Linked active	40 Gb/s	Auto	Enabled	2	LACP activity
0000A66101.interconnect.3. Q3	Linked active	40 Gb/s	Auto	Enabled	2	LACP activity
0000A66102.interconnect.6. Q2	Linked active	40 Gb/s	Auto	Enabled	2	LACP activity
0000A66102.interconnect.6. Q3	Linked active	40 Gb/s	Auto	Enabled	2	LACP activity

OneView

Server Profiles 1

+ Create profile

Server 1

Server 1

Connections

Create Completed 41s

Connections

Expand all Collapse all

ID	Name	Network	Port
1	mgmt VLAN11		Mezzanine 3:1-a
2	mgmt VLAN11		Mezzanine 3:2-a
3	vmotion VLAN101		Mezzanine 3:1-c
4	vmotion VLAN101		Mezzanine 3:2-c
5	Prod NetSet (network set)		Mezzanine 3:1-d
6	Prod NetSet (network set)		Mezzanine 3:2-d



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# OneView for Synergy 5.0 Interop features

- **Synergy Fabric Manager with ACI**

- On demand ability to download APIC policy alerts for investigating issues in APIC policy configurations.
- Selectable granular remediation options within a tenant

- **Integration will monitor Arista Leaf ToR switches and model them as part of the Logical Switch resource.**

- It will display physical switch and port attributes, such as switch model, health information, as well as, LLDP neighbor data, connector info and per port statistical information. OneView will configure Synergy ICM and compute profile connectivity while simultaneously provisioning corresponding VLANs to the Arista ToR ports connected to the Synergy ICMs. This will enable Synergy administrators to discover and validate Synergy to Arista cabling and connectivity, receive an alert on connection errors allowing basic troubleshooting and remediation. This release adds support for additional Arista switch families - 7050, 7260, and 7160, in addition to already supported 7060.



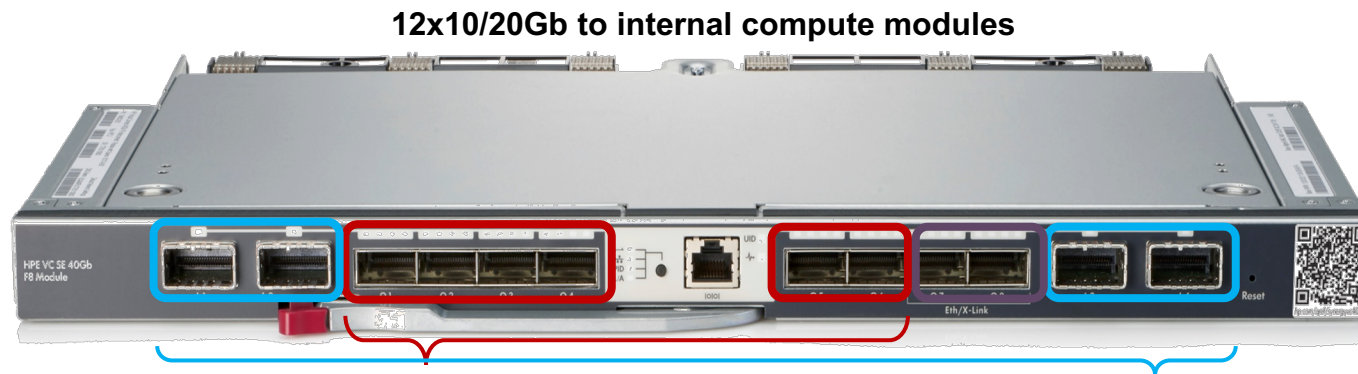
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# Thank You

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# Backup

# Synergy Virtual Connect SE 40Gb F8 module



## 6x 40Gb uplink ports

- Q1-Q6: 40Gb, 4x10Gb Ethernet/FCoE, or 4x8Gb Fibre Channel

## 2x 40Gb cluster ports

- Q7-Q8: 40Gb ICM cluster ports (exclusively reserved)

## 4x 120Gb interconnect link ports

- AOC ICM cables (3m, 7M, 10M and 15M)
- DAC cables (1m, 1.6m and 2.1m)

- High performance, low latency
  - 2.56 Tbps switching capacity
  - 1.0  $\mu$  sec for port to port
- Converged network and resilient fabric
  - Ethernet, FCoE, Fibre Channel, and iSCSI
  - MLAG for resilient fabric
- Composable for multiple frames
  - Optimize the bandwidth for workloads
  - Adding new frames does not impact traffic on existing frames

# Synergy VC SE 40Gb F8 Module Uplink Ports to Cisco ACI



**6x 40Gb uplink ports**

Q1-Q6: 40Gb, 4x10Gb Ethernet/FCoE, or 4x8Gb Fibre Channel