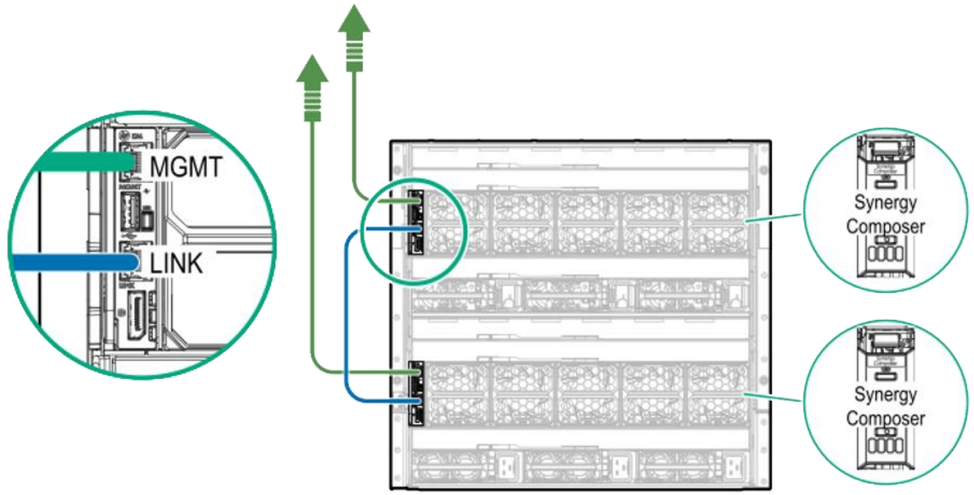
HPE SYNERGY GEN11

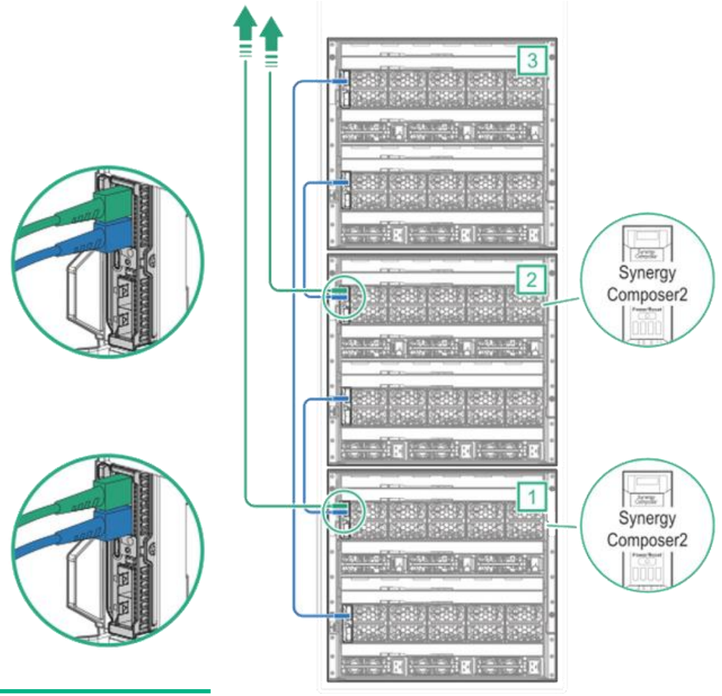
مانیاسرویس
Mania Service

+

Hewlett Packard
Enterprise



Single Frame



Multi Frame

HPE SYNERGY GEN11

Front

Midplane

Rear

Half-height

Full-height

Double-width

HPE Synergy Zones

6 Zones / 12 Bays

2 Half Height & 5 Full Height Bays

6 Full Height Bays

6 Zones/12 Half Height Bays

Dimension & Weight

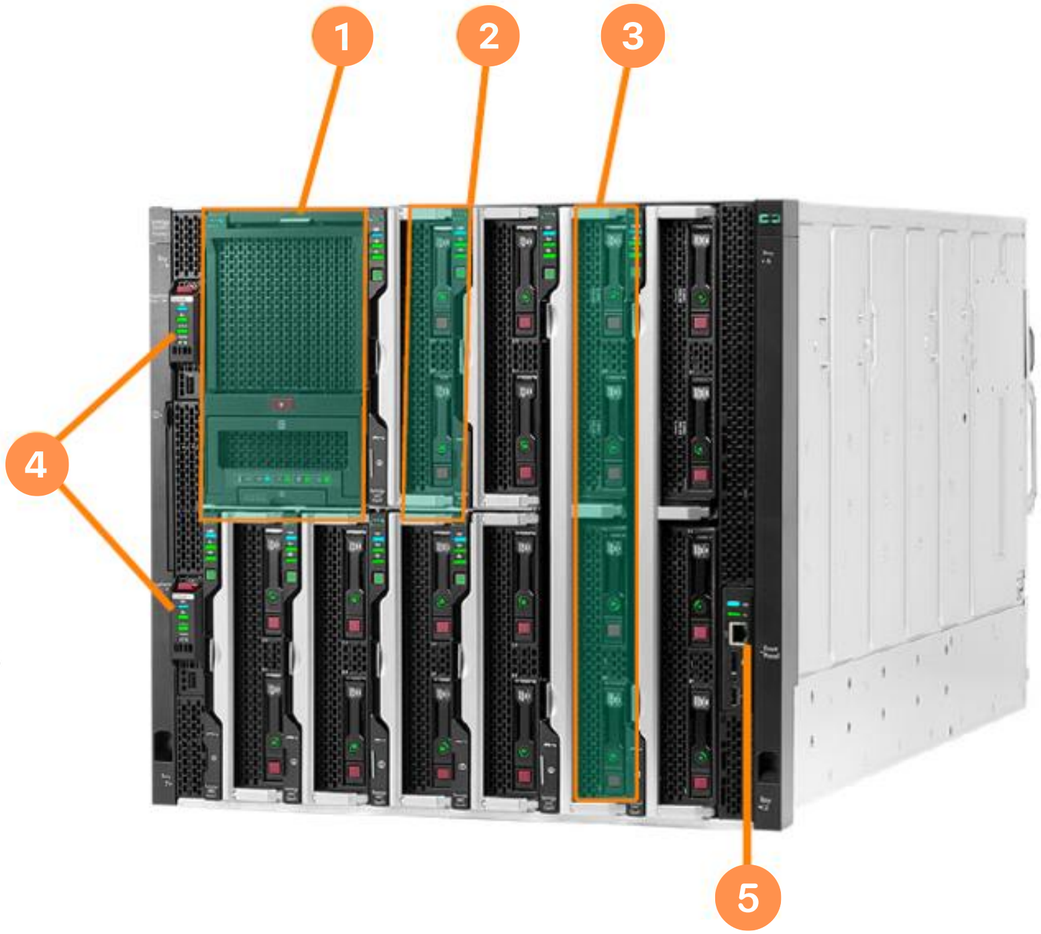
	Dimensions	Shipping Dimensions
Height	17.4in (442mm)	30.13in (765.3mm)
Width	18.98in (482mm)	24.50in (622.3mm)
Depth	36.88in (936mm)	40.50in (1028.7mm)

10 Rack Unit

FLEXIBLE DESIGN FOR A SEAMLESS TRANSITION INTO THE DATACENTTER

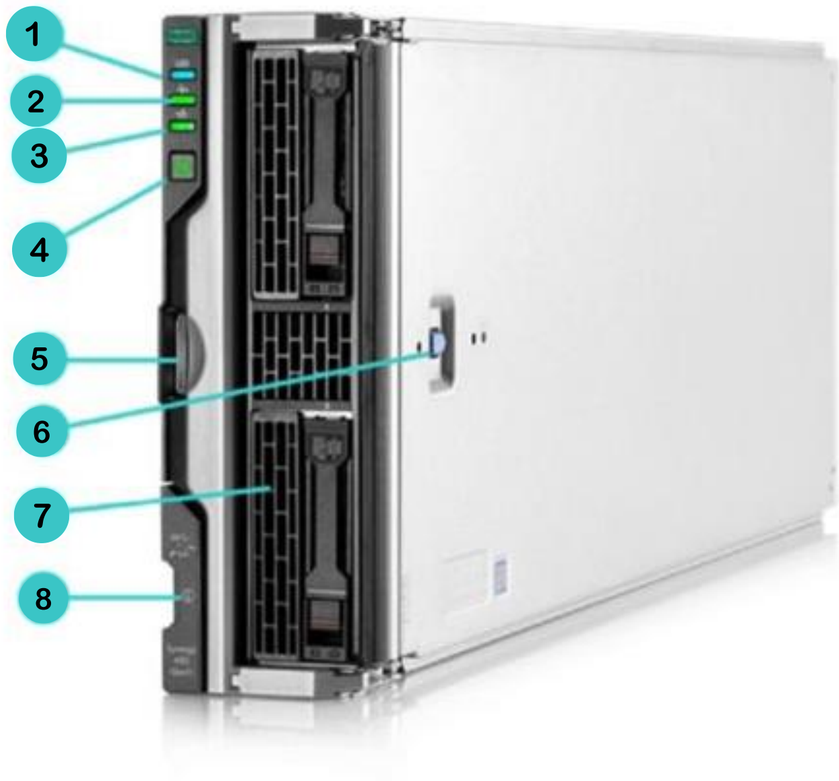
HPE Synergy 12000 Frame (Front View)

1. **Double-wide storage module**
2. **Half-height compute module**
3. **Full-height compute module**
4. **Redundant management appliance modules**
5. **Front panel / HPE Synergy Console**



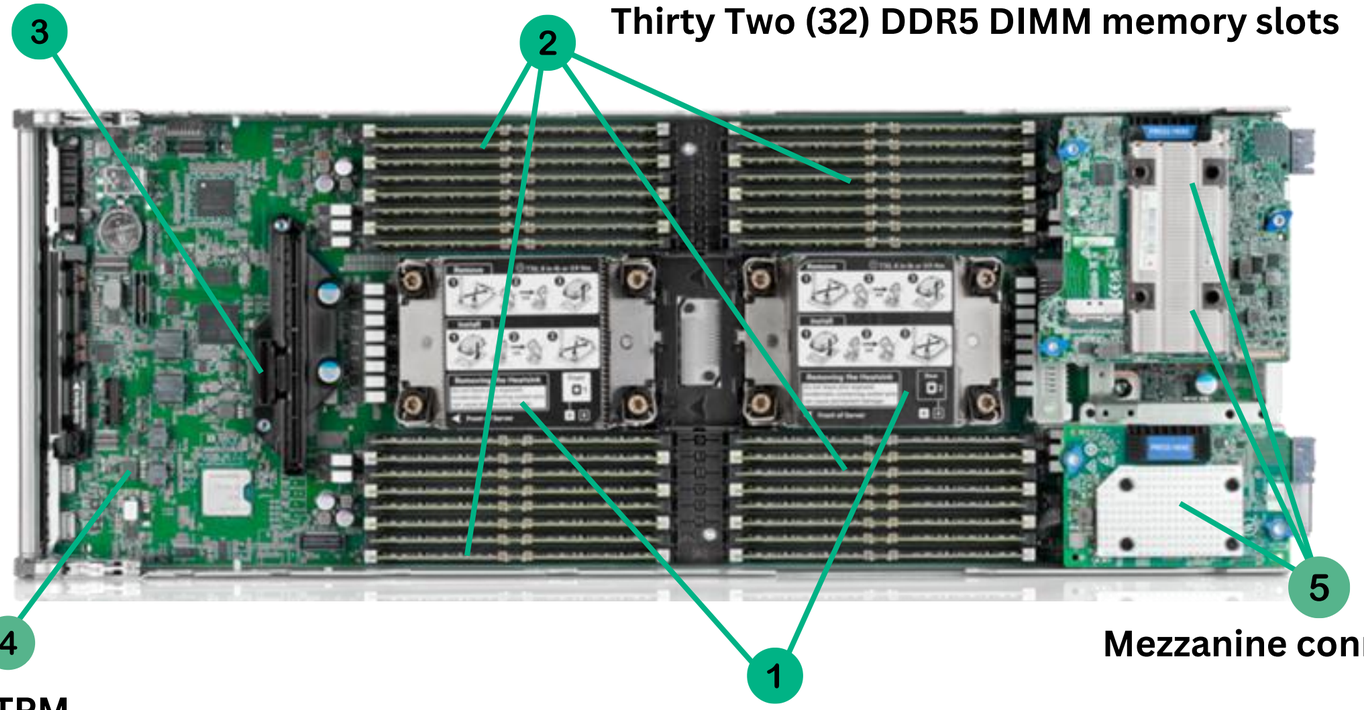
HPE Synergy 480 Gen11 Compute Module (Front View)

1. UID LED
2. Health Status LED
3. Mezzanine NIC status LED
4. Power On/Stand by button and system power LED
5. Compute Module handle release latch
6. Quick Access Panel
7. Removable drive cage
8. Pull Out Label



HPE SYNERGY 480 Gen11 COMPUTE MODULE (Drive Cage Removed)

HPE NS204i Gen11 Boot Controller Connector



Thirty Two (32) DDR5 DIMM memory slots

Mezzanine connecttors (3*16 PCLe 5.0)

Embedded TPM

Up to two (2) Gen4 or Gen5 Intel Xeon Scalable Family Processors

HPE SYNERGY COMPOSER/COMPOSER2

Overview

- Upgraded to Composer2
- Manage Via OneView
- Dual Layer Redundancy
- Auto Discovery Components
- 21 Frames Can Be Managed
- Reimage By USB Port

HPE Synergy 12000 Frame

HPE ONEVIEW GLOBAL DASHBOARD FEATURES

Dashboard user interface

GREEN

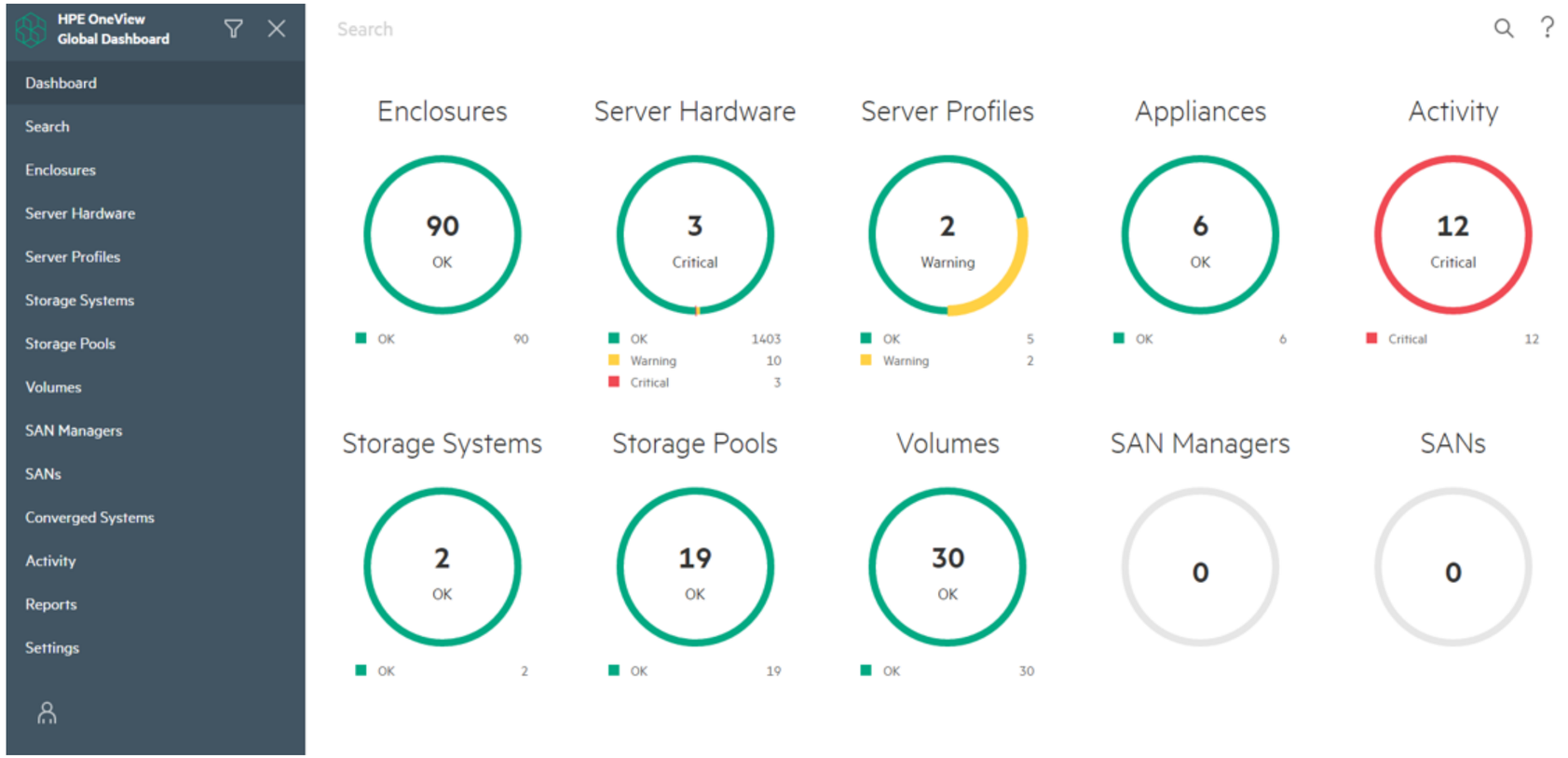
A healthy status

YELLOW

An events has occurred that might require attention

RED

A critical condition that requires your immediate attention



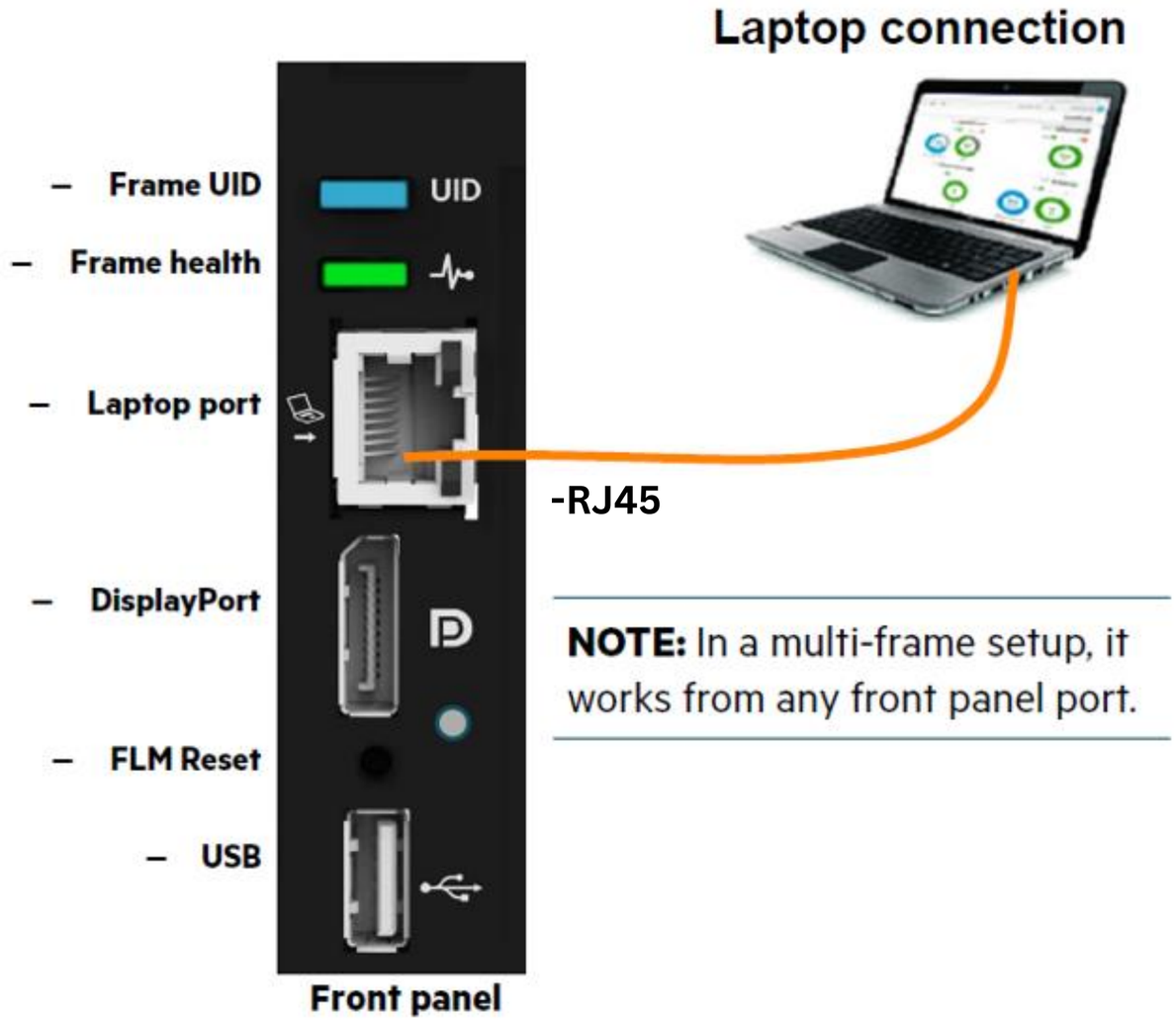
ACCESS HPE SYNERGY COMPOSER LOCALLY

Using a laptop connection to the front panel

Front panel console RJ45 port

Connect to FLM via VNC 192.168.10.1:5900 OR Web browser

Easy access connection port



NOTE: In a multi-frame setup, it works from any front panel port.

HPE SYNERGY D3940 STORAGE MODULE

Drive placement

- **Populate drives from back to front for better cooling**
- **Blanks not required**
- **Disk drives are hot-pluggable**
- **Disk drives tray can be opened in-service**

NOTE: The limit for cooling the drives is up to 5 minutes.
Then, close the tray for one minute at least.

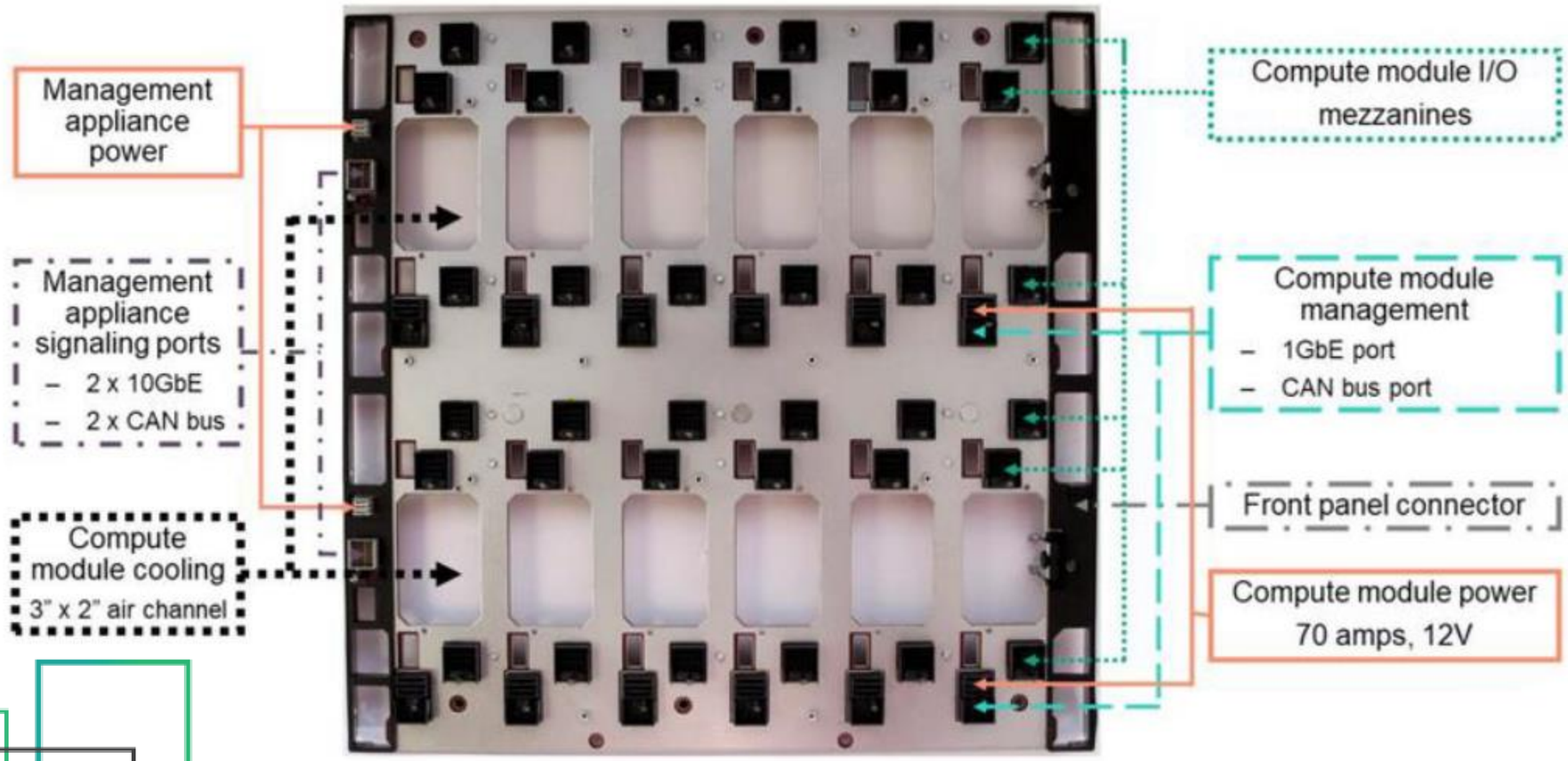
HPE SYNERGY IN-FRAME STORAGE SOLUTION

D3940 Storage Module

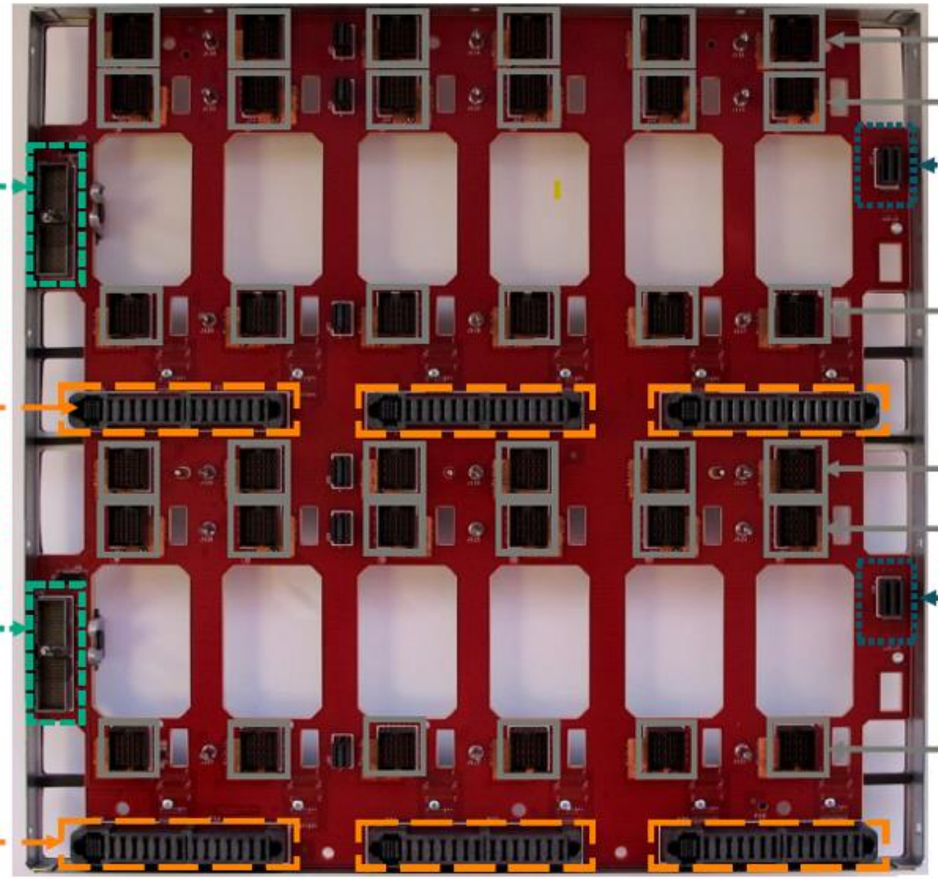
12Gb SAS Connection module

HPE SR P416ie-m Controller (for Gen11)

SYNERGY 12000 MIDPLANE FRONT



SYNERGY 12000 MIDPLANE REAR



Frame Link Modules

- 2 x CAN bus ports
- 12 x 1GbE server management ports
- 6 x 1GbE ICM ports
- 1 x 10Gb connection to appliance bay 1
- 1 x 10Gb connection to appliance bay 2
- 1 x 10Gb connection to redundant FLM

Power Supplies

35 amps x 12V

ICM connections

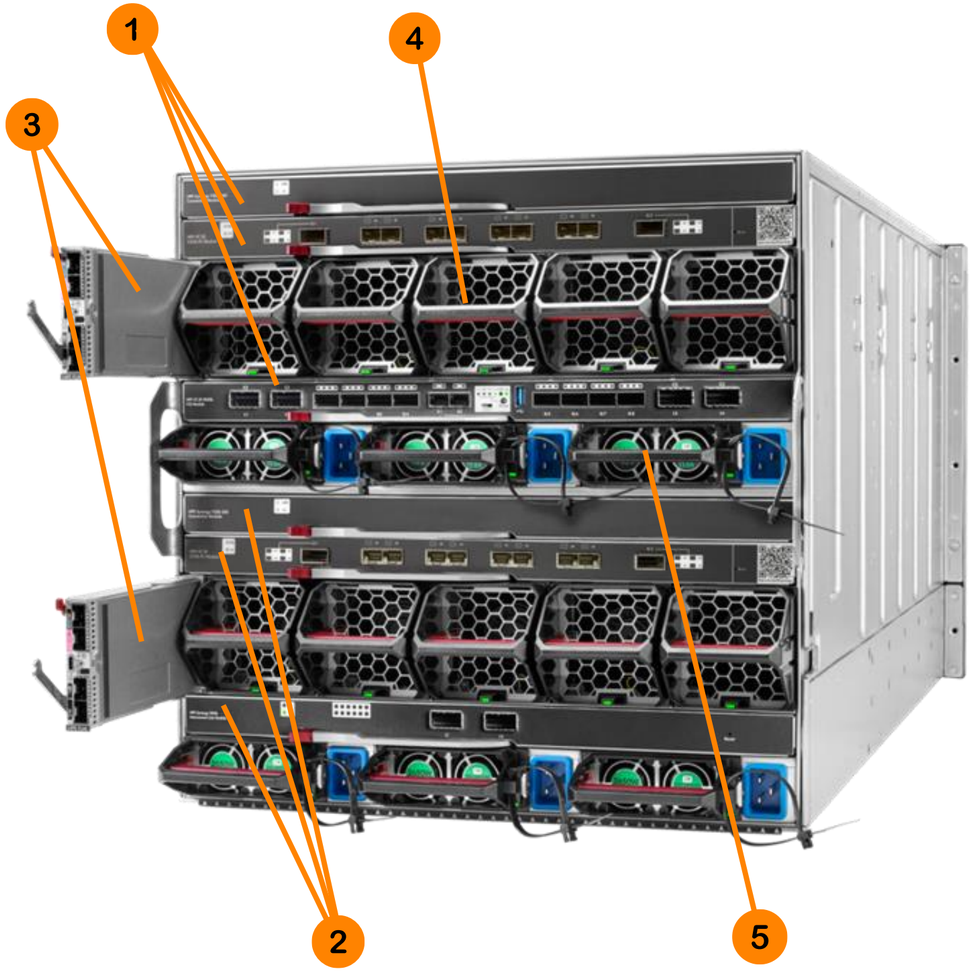
- 6 x 2 I/O port connectors
- 4 lanes per port
- 1.34 Tb/s bandwidth per ICM
- **16.1 Tb/s total bandwidth**
- Redundant 1 GbE management
- Redundant CAN bus

Fan interposers

60 amps x 12V

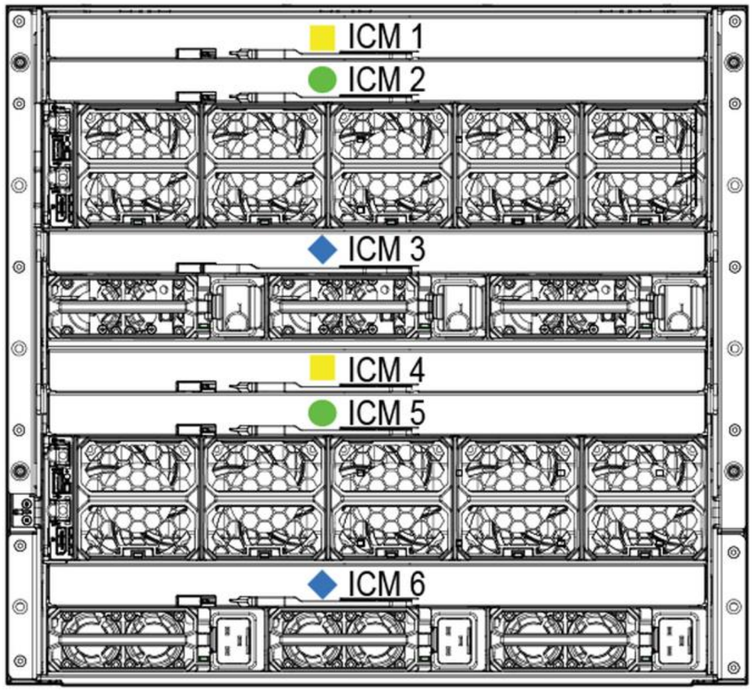
FLEXIBLE DESIGN FOR A SEAMLESS TRANSITION INTO THE DATACENTTER

HPE Synergy 12000 Frame (rear View)



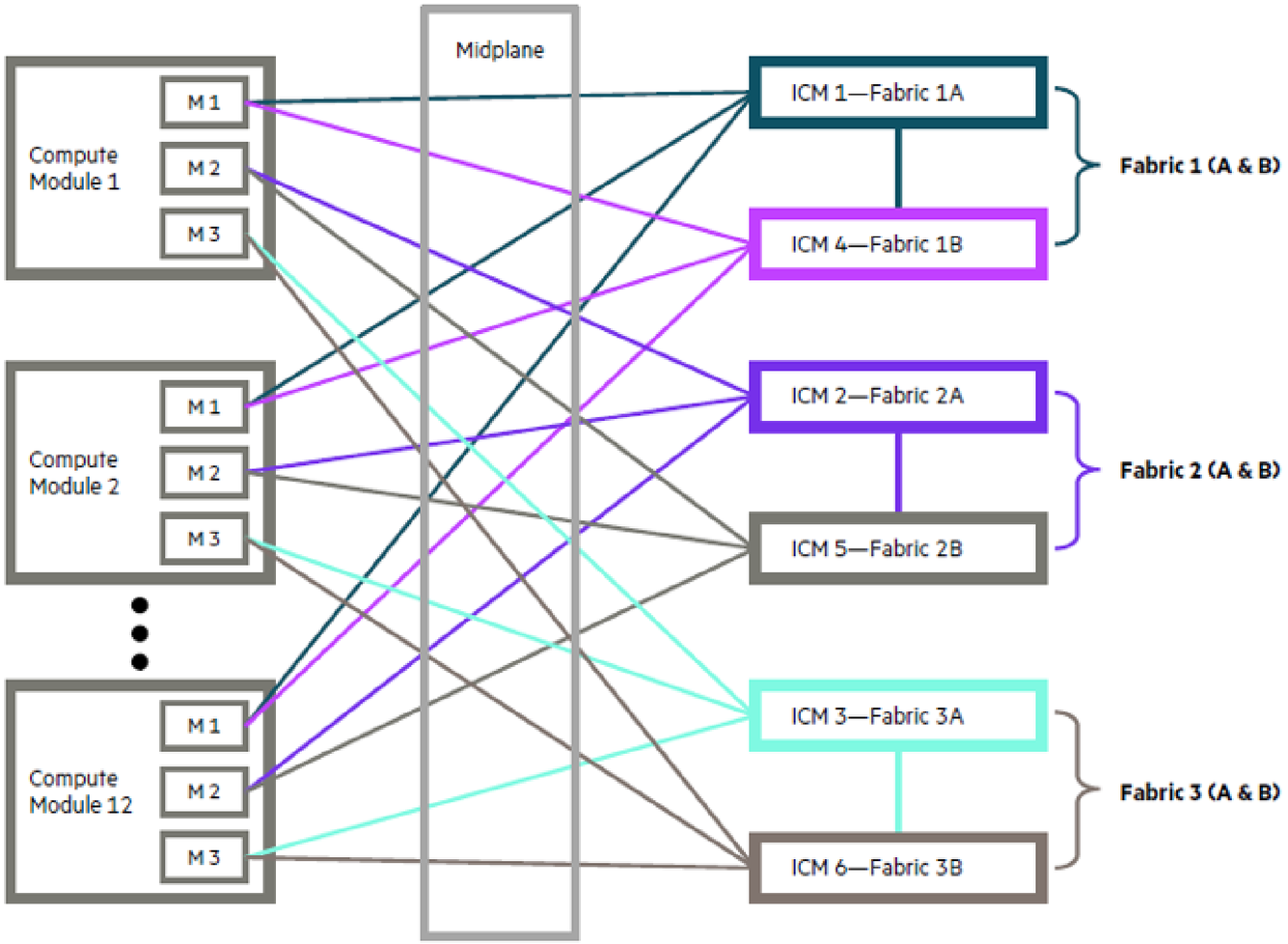
1. Three primary interconnect module (ICM) bays
2. Redundant interconnect module bays
3. Redundant Frame Link Module bays
4. Ten system fan modules (included)
5. Six titanium 2650W power supplies

HPE SYNERGY FRAME & INTERCONNECT MODULES



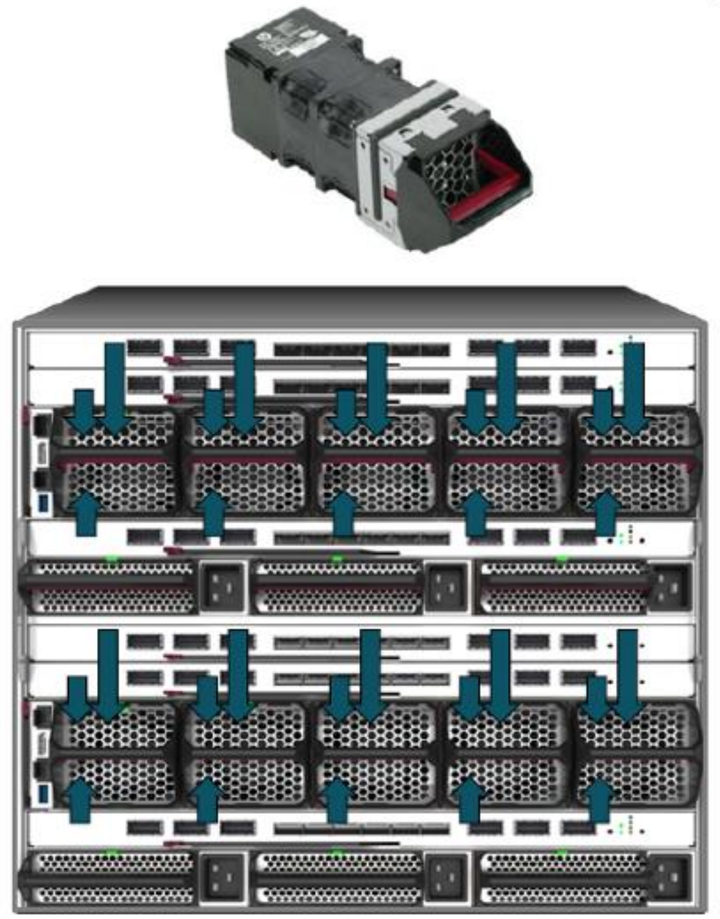
Fabric	Inter connect modules	Fabric Sample
1	1 & 4	HPE Synergy 12Gb SAS Connection Module (2)
2	2 & 5	Brocade 32Gb FC SAN switch Module for HPE Synergy (2)
3	3 & 6	HPE Synergy Virtual Connect 100Gb F32 Module & HPE Synergy 25/50Gb Interconnect Link Modules

SYNERGY FABRIC



FRAME COOLING

- **Deterministic airflow** for compute and interconnect modules
- Fan Filter blanks **are not required**
- No fan rules (all ten are installed in each frame)
- Fan **redundancy**
  - **Top** five fans cool the **upper** six compute modules, appliance bay, FLM, and interconnect modules 1,2, and 3
  - **Bottom** five fans cool the **lower** six compute modules, appliance bay, FLM, and interconnect modules 4, 5, and 6
  - 4+1 redundancy for cooling under **all conditions**
  - Variable conditions__Total cooling requirements may differ

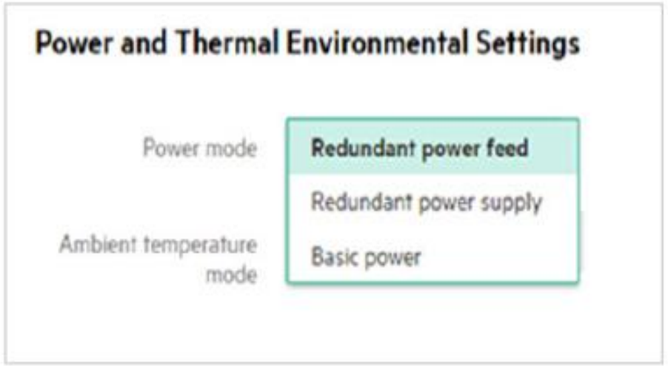


NOTE: Losing more than one fan in a row results in a serious thermally degraded frame state. You cannot power on additional modules until a serious thermally degraded frame state is resolved.

HPE SYNERGY POWER MODES

3 Modes:

- Basic Power Mode
- Redundant power feed (N+N)
- Redundant power supply (N+1)



Frame Link Module (FLM) manages power in an HPE Synergy frame

- Tracks and update the available power
- Determines if enough power is delivered to the frame
- Communicates with power supplies and provides the power usage information
- Uses the maximum power estimates

CABLING POWER SUPPLIES FOR POWER FEED REDUNDANCY

Single frame

- **Connent 1+1, 2+2 or 3+3 power supplies to phase A+B**
- **Best practice:**
  - Power supplies 1, 2, and 4 to the A-side power distribution unit
  - Power supplies 3, 5, and 6 to the B-side power distribution unit
- **Frames power up automatically when power is supplied**
- **The power and health LEDs on the front panel, HPE Synergy Composer appliance, and frame link modules illuminate green**

NOTE: The number of supported power supplies in the frame ranges from a minimum of one to a maximum of six

HPE SYNERGY 4-PORT FRAME LINK MODULE ENHANCEMENTS

Security for Synergy FLM

- Hardware Root of Trust
- Trusted Platform Module (TPM) circuitry

Optical connections

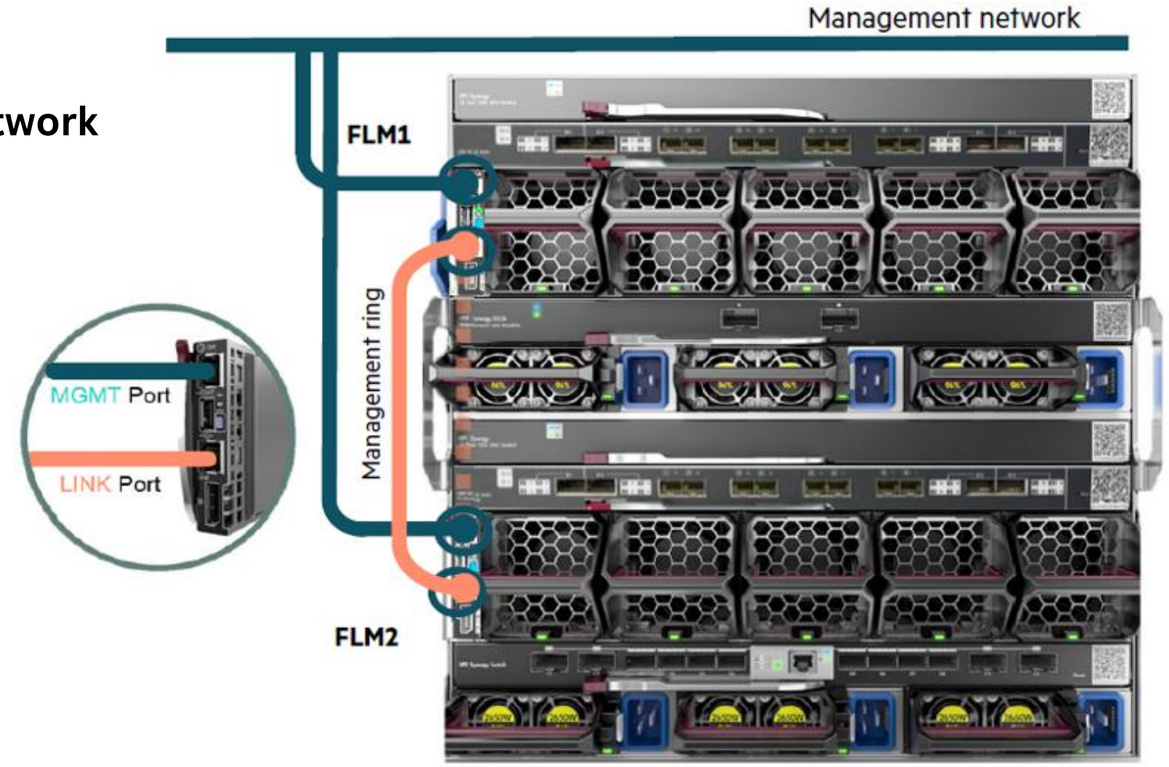
- Four* SFP+ ports enable optical or copper connections
- Enables direct optical links to switches
- Capability for distant connections

Compatibility with 2-port FLM

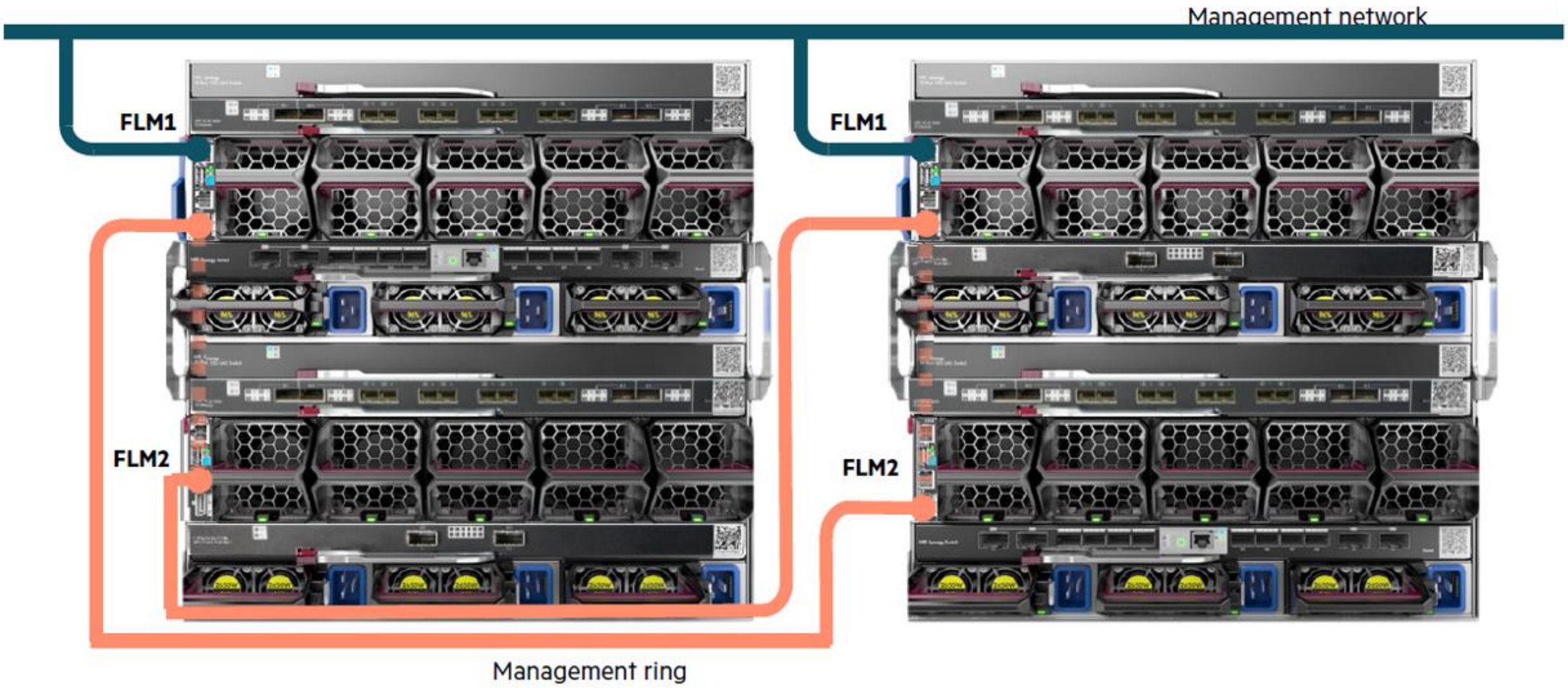
- MGMT & LINK ports
- USB-C type connector (with DisplayPort connection via dongle)
- Health LED, UID

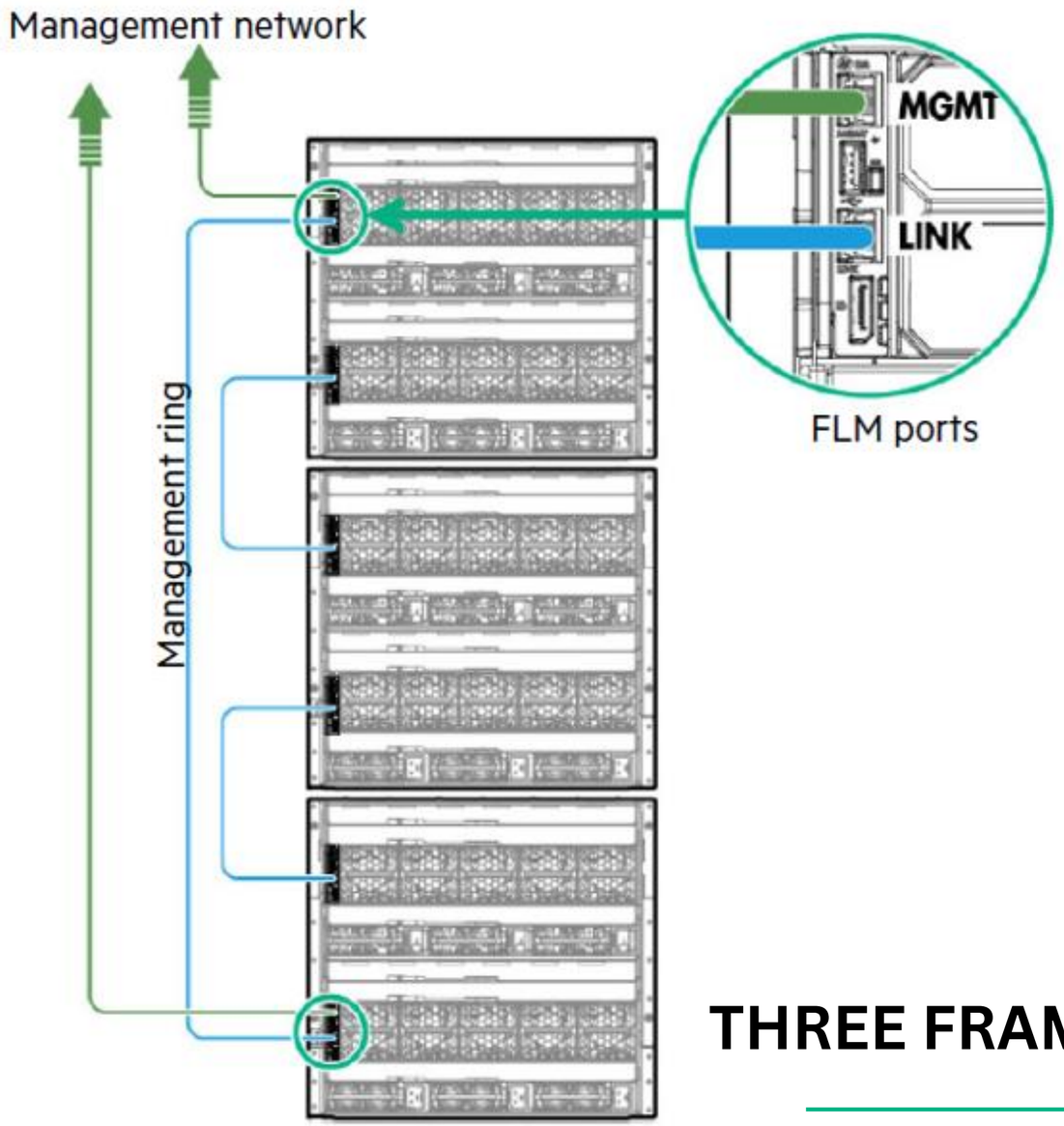
SINGLE-FRAME CONFIGURATION CABLING

- **Upper frame link module MGMT port to management network**
- **LINK ports of each FLM must be interconnected**
- **Make sure all LEDs are green**
  - Fans, power supplies
  - FLMs
  - Front panel



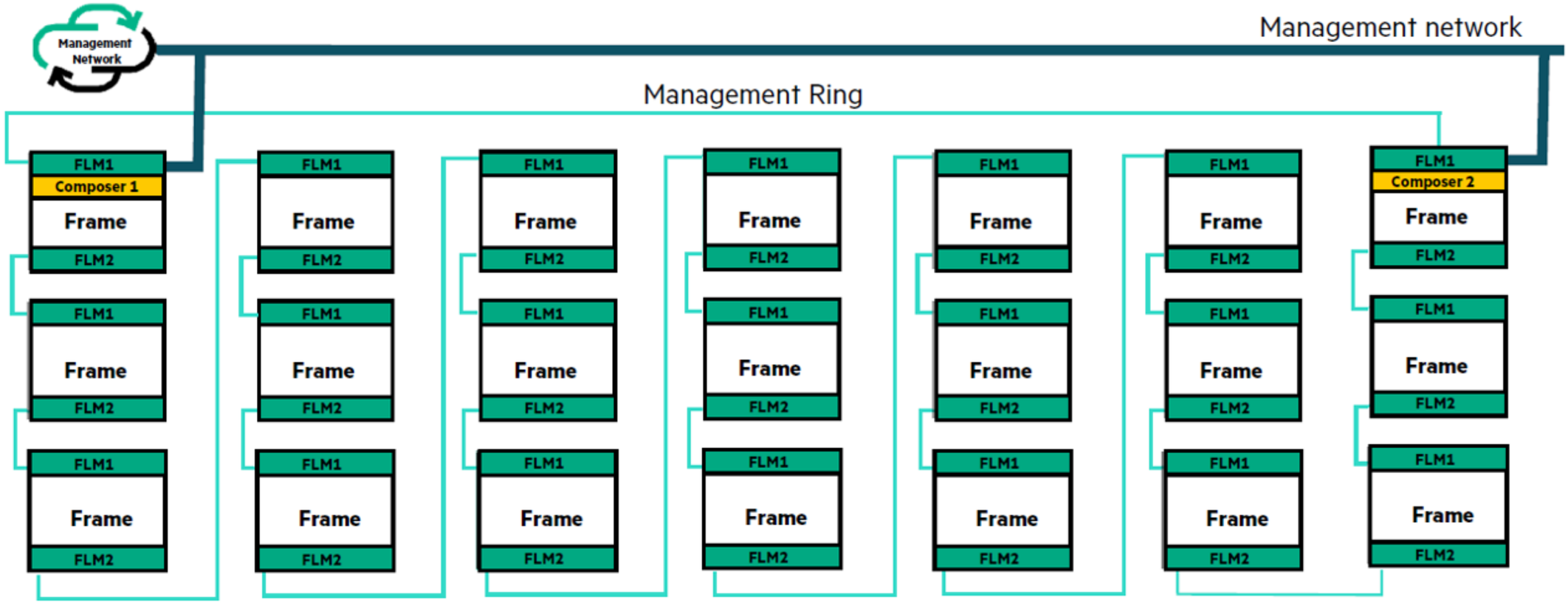
TWO-FRAME CONFIGURATION CABLING





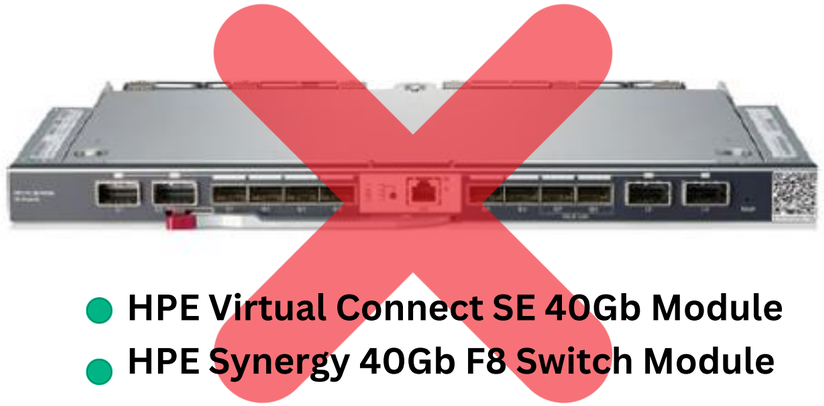
THREE FRAME CONFIGURATION CABLING

UP TO 21 SYNERGY FRAMES ARE SUPPORTED IN ONE MANAGEMENT RING



HPE SYNERGY INTERCONNECT MODULES

Composable Fabric



- HPE Virtual Connect SE 40Gb Module
- HPE Synergy 40Gb F8 Switch Module

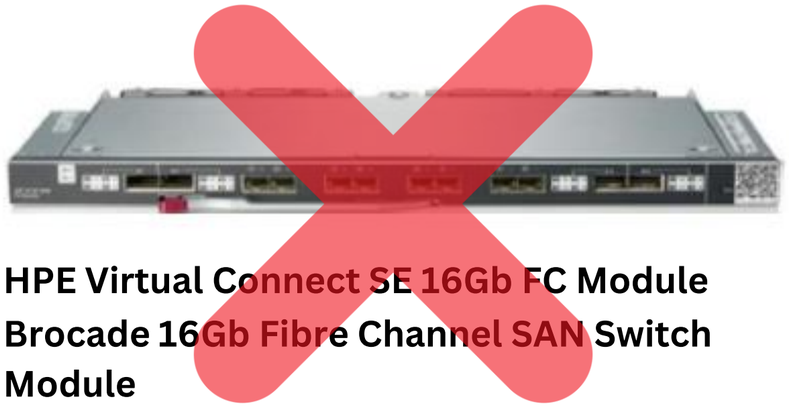
- HPE Virtual Connect SE 100Gb F32 Module

- HPE Synergy 20Gb Interconnect Link Module
- HPE Synergy 10Gb Interconnect Link Module

- HPE Synergy 25/50Gb Interconnect Link Module

HPE SYNERGY INTERCONNECT MODULES

Composable Fabric



- HPE Virtual Connect SE 16Gb FC Module
- Brocade 16Gb Fibre Channel SAN Switch Module

- HPE Synergy Virtual Connect SE 32Gb FC Module
- Brocade 32Gb FC SAN Switch

- HPE Synergy 12Gb SAS Connection Module

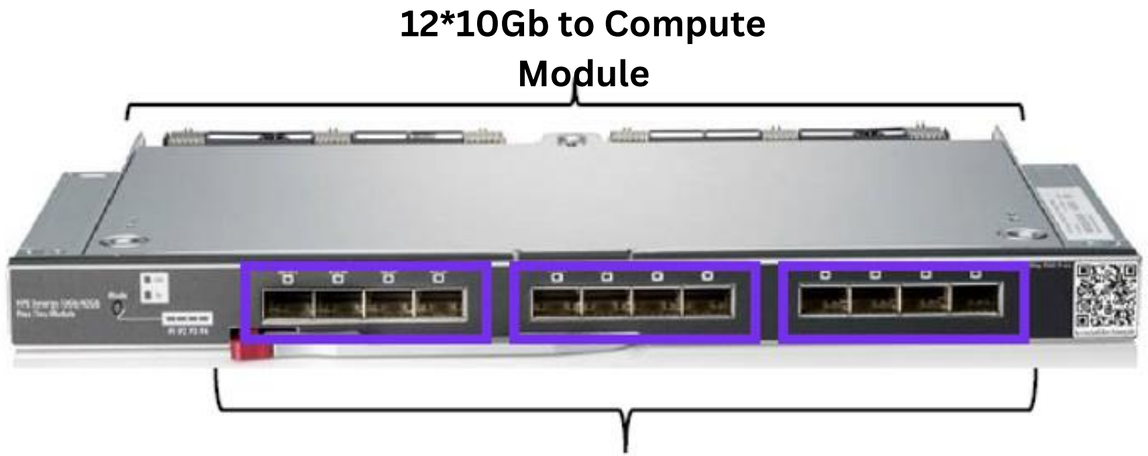
- HPE Synergy 10Gb Pass-Through Module

HPE VC SE 100GB F32 VS HPE SE 4GB F8 MODULES

Key Differences

	HPE VS SE 40Gb F8	HPE VC SE 100Gb F32
Switch ASIC	BCM56850 (Trident2)	BCM56960 (Tomahawk1)
Bi-directional switching capacity	2.56 Tbps	6.40 Tbps
Storage	1GB Raw NAND	32GB M.2 SATA3 SSD
CPU	Broadcom XLPII V0.3 FPU V0.3 @ 800MHz Runs with 2 threads each on 2 cores	Intel(R) Atom(TM) CPU C3538 @ 2.10GHz 4 cores, no CPU threads
RAM	4GB DDR3 (about 2.5GB usable)	8GB DDR4
Boot Flash	8MB NOR	2*16MB SPI

HPE SYNERGY 10GB PASS THRU MODULE



- **High performance, Low Latency**
  - 12 direct network connections
  - Line rate performance
  - standard Ethernet as well as FCoE
- **No management required**
- **Unmanaged support by HPE One View**
- **QSFP but only 10Gb**

HPE VIRTUAL CONNECT SE 100GB F32 MODULE

Next generation Composable Fabric

Master

High performance, Low Latency

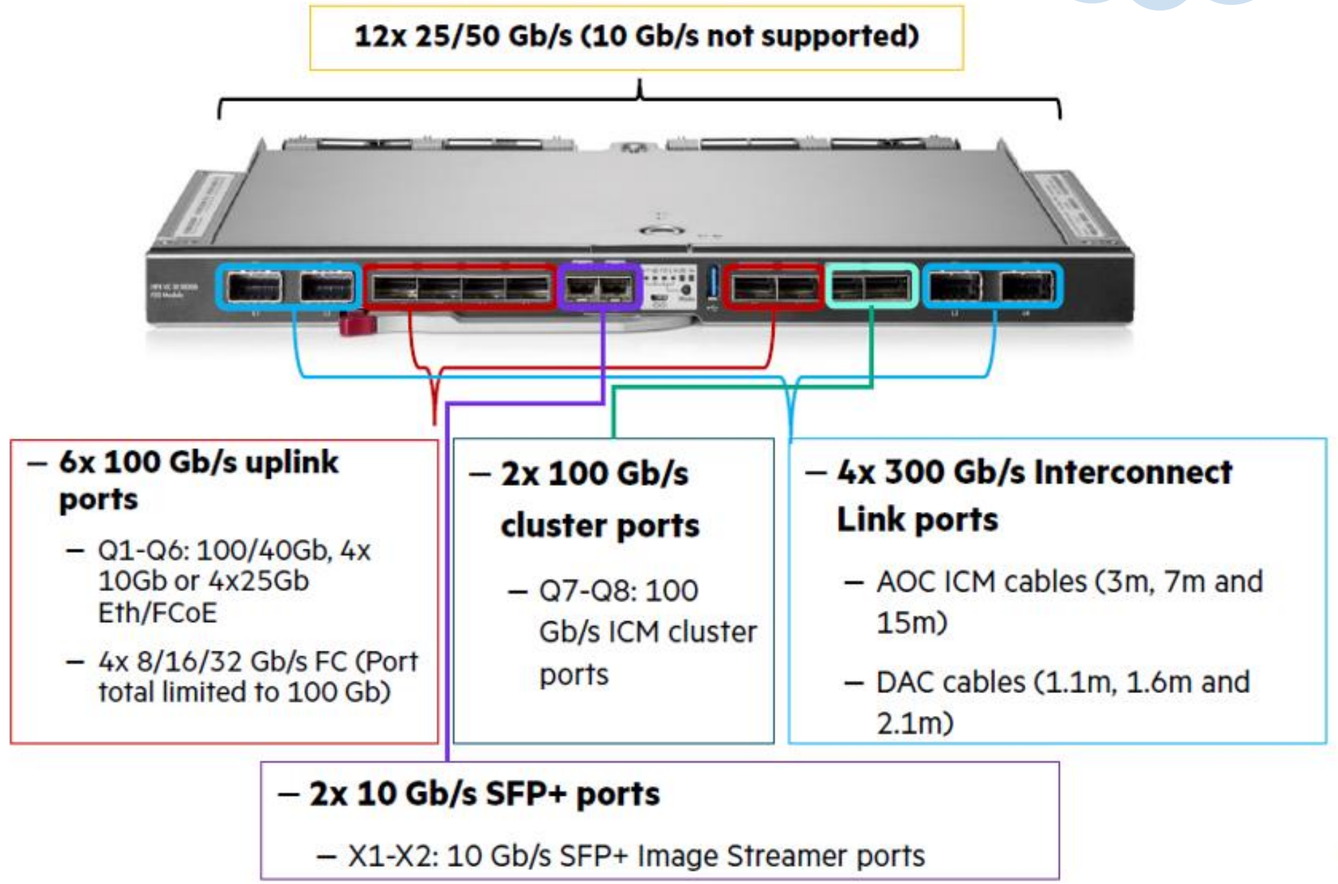
- 6.40 Tbps switching capacity
- 300 ns sec for port to port latency

Converged and resilient fabrics

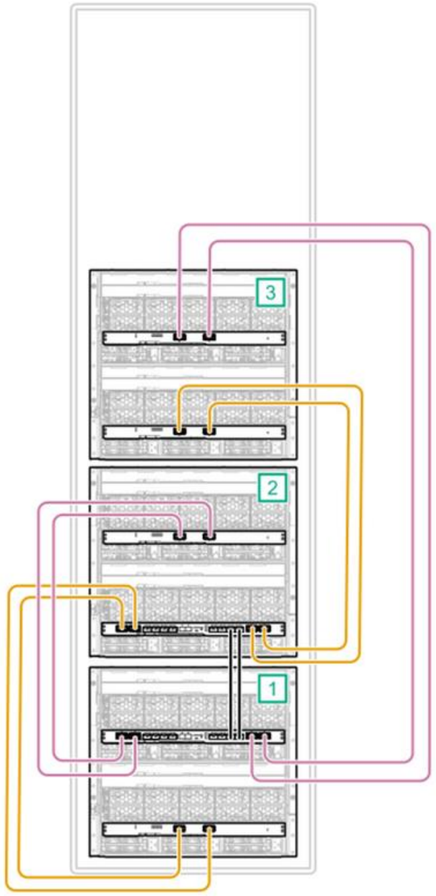
- Ethernet, FCoE, FC, RDMA and iSCSI

Multi-frame composable

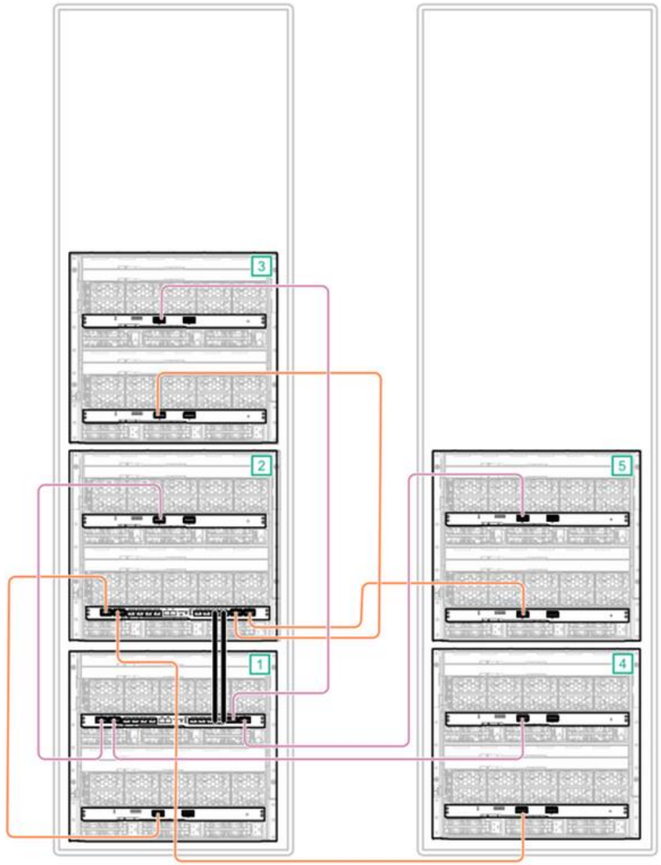
Upgrade to 32Gb/s FC via a License on demand



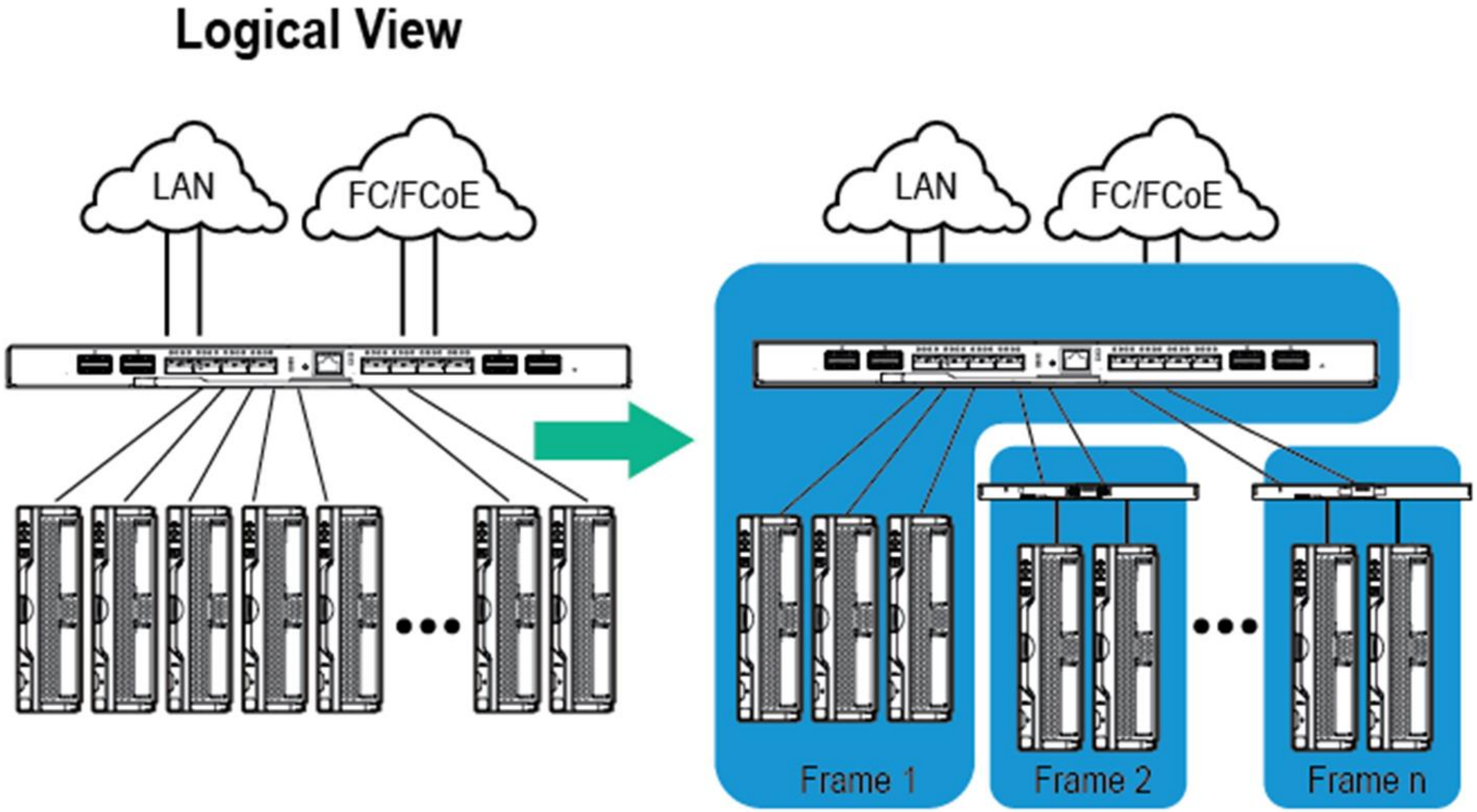
Master and satellite for three frames



Master and satellite in five frames



Logical view of a master/satellite configuration

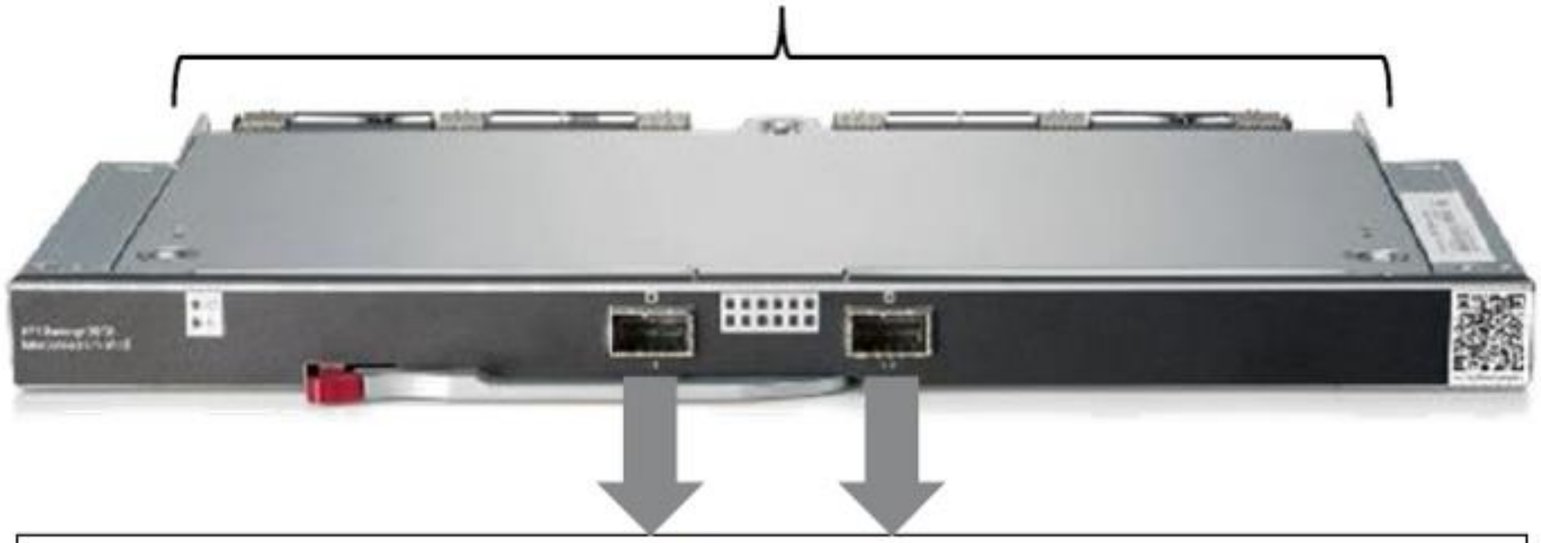


HPE SYNERGY 50GB INTERCONNECT LINK MODULE

FOR VC SE 100GB F32 MODULE

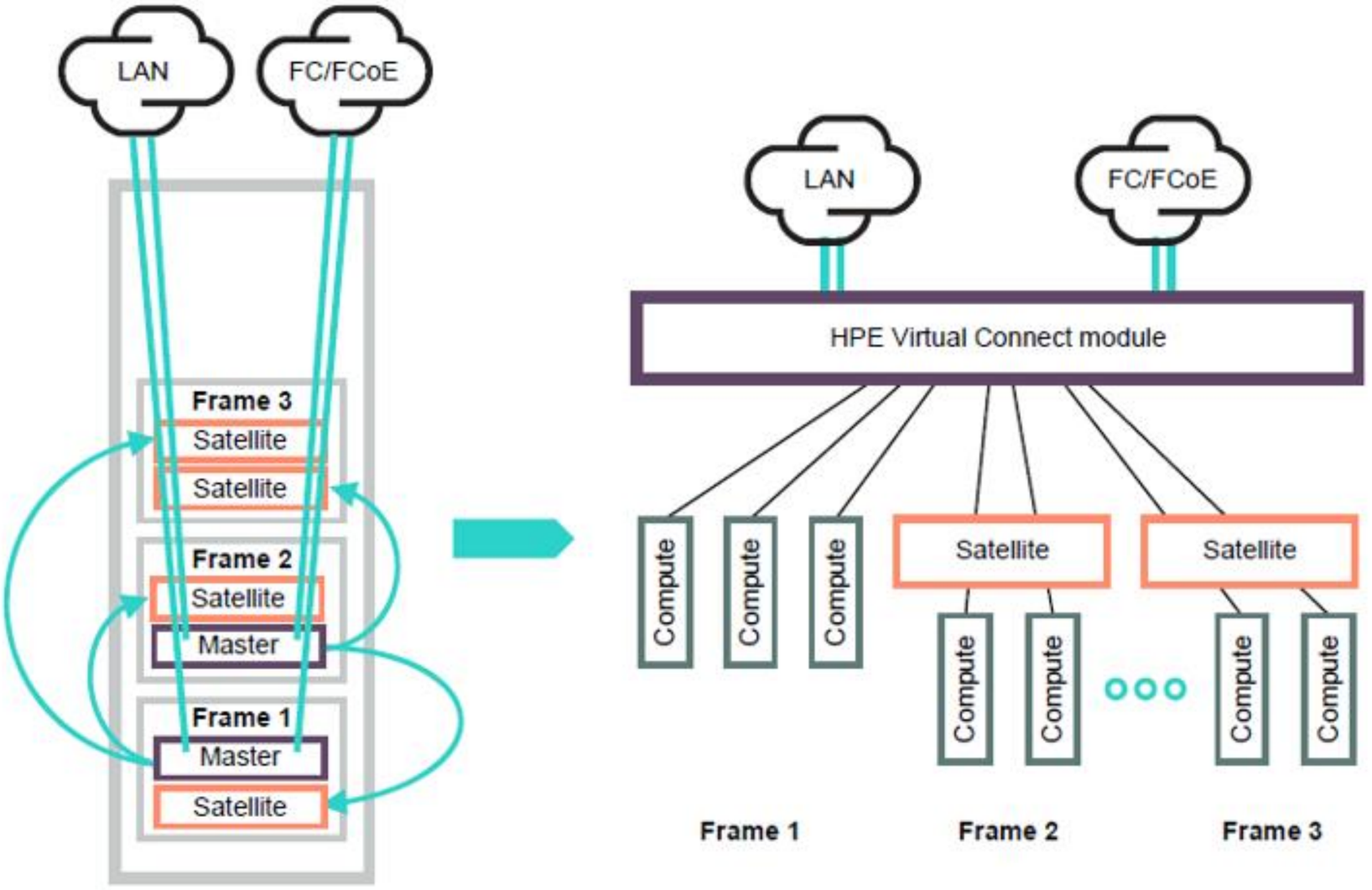
Satellite

12 x 25/50 Gb to compute modules



300 Gb interconnect link module ports to a master module

SYNERGY FABRIC



VC SE 100GB F32 MODULE SUPPORTED CONFIGURATIONS/TOPOLOGIES

Supported Configurations - Highly Available (HA) and Non-Redundant Side-A/Side-B

2xFrames @25Gb

	Frame 1	Frame 2
Side-A	**Master**	Satellite
Side-B	Satellite	**Master**
	25 Gb	

2xFrames @50Gb

	Frame 1	Frame 2
Side-A	**Master**	Satellite
Side-B	Satellite	**Master**
	50 Gb	

3xFrames @25Gb

	Frame 1	Frame 2	Frame 3
Side-A	**Master**	Satellite	Satellite
Side-B	Satellite	**Master**	Satellite
	25 Gb		25 Gb

3xFrames @50Gb

	Frame 1	Frame 2	Frame 3
Side-A	**Master**	Satellite	Satellite
Side-B	Satellite	**Master**	Satellite
	50 Gb		50 Gb

4xFrames @25Gb

	Frame 1	Frame 2	Frame 3	Frame 4
Side-A	**Master**	Satellite	Satellite	Satellite
Side-B	Satellite	**Master**	Satellite	Satellite
	25 Gb		25 Gb	25 Gb

5xFrames @25Gb

	Frame 1	Frame 2	Frame 3	Frame 4	Frame 5
Side-A	**Master**	Satellite	Satellite	Satellite	Satellite
Side-B	Satellite	**Master**	Satellite	Satellite	Satellite
	25 Gb		25 Gb	25 Gb	25 Gb

Higher VM Densities, NVMe-oF Ready, Higher ROI

	32Gb FC Module	165Gb FC Module
Aggregate Throughput	384 Gbps	192 Gbps
Switching Bandwidth	896 Gbps	576 Gbps
Compatibility	8/16/32Gb and future Gen7/Gen8	8/16 Gb
Power Consumption (typical)	50W	95W

مانیاسرویس
Mania Service

لمس لذت خدماتی تخصصی...

مانیاسرویس
Mania Service
+
Hewlett Packard
Enterprise