Overview

HPE Virtual Connect SE 16Gb FC Module for HPE Synergy

The HPE Virtual Connect SE 16Gb FC Module for HPE Synergy is a Storage Area Network (SAN) interconnect with a wire-once change-ready technology. The Fibre Channel (FC) module in conjunction with Synergy composer powered by HPE OneView allows workloads to be moved or managed without modifying the network. HPE OneView provides an intuitive management console for seamless connectivity between virtualized Synergy Compute Modules 16Gb FC SAN fabrics.

For the best-in-class enterprise datacenter performance environments, the HPE VC SE 16Gb FC module or the alternative, Brocade 16Gb FC SAN Switch Module for HPE Synergy, are the best choices for operating systems and applications demanding low-latency high I/O performance, i.e. SSD storage. No other server enclosure technology (iSCSI, Ethernet, or FCoE) on the market can guarantee up to 384Gb/s of bandwidth. The unique QSFP ports not only significantly simplify cabling infrastructure, reduces cabling from four to one, but also helps reduce power 2.5x attributed to optics transceivers.

If deployment costs are a concern, by adopting the Synergy frame and Gen 5 16Gb FC technology, you can reduce costs and simplify connections to SANs, consolidate your network connections and enable administrators to add, replace and recover compute modules resources on-the-fly. The integrated Synergy design frees up rack space, reduces power and cooling requirements.

The HPE Virtual Connect SE 16Gb FC Module for HPE Synergy is protected by HPE Services 3-Years Next Business Day 9x5 Hardware Support.

Figure 1 The HPE Virtual Connect SE 16Gb FC Module for HPE Synergy Front View

1. Q1-Q2 QSFP+ ports
2. 1-8 SFP+ ports
3. Q3-Q4 QSFP+ ports

Models

HPE Virtual Connect SE 16Gb Fibre Channel Module for HPE Synergy	P08477-B21

Standard Features

Supported Products

Compatibility

New HW part number is being introduced due to business process updates. The previous part number (779227-B21) is being deprecated and will no longer be orderable.

The new part number will be supported on Virtual Connect Firmware v4.63 and VCSU 1.13.1 and later. For customers using HPE OneView, the new part number will be supported by HPE OneView 4.20 and later. For customers on older OneView releases, the new part number is supported on the 4.00.11 and 4.10.02 update releases. Customers will have to be on the supported VCM and OneView releases in order to use the modules with new part numbers. The interconnect modules are unchanged except for the part number.

HPE Compute Module

HPE Compute Modules:

- HPE Synergy 480 Gen9 Compute Module
- HPE Synergy 620 Gen9 Compute Module
- HPE Synergy 660 Gen9 Compute Module
- HPE Synergy 680 Gen9 Compute Module
- HPE Synergy 480 Gen10 Compute Module
- HPE Synergy 660 Gen10 Compute Module

Fibre Channel Host Bus Adapters (HBA)

- HPE Synergy 3530C 16Gb Fibre Channel Host Bus Adapter
- HPE Synergy 3830C 16Gb Fibre Channel Host Bus Adapter

Notes: Consult individual compute module TechSpecs for specific adapter support

Supported Configurations

HPE Synergy 12000 Frame - Rear View

Standard Features

Mezzanines

Port Mapping

Port mapping differs slightly between full height and half-height compute modules due to the support for additional Mezzanine cards on the full height version.

HPE 12000 Synergy Frame

Notes: For ease of representation and understanding paired Interconnect Bay (ICB) are shown adjacent rather than vertically as in the real-frame. Interconnect frames are formed between ICB 1 with ICB 4, ICB 2 with ICB 5, and ICB 3 with ICB 6. Hence the below representation.

Interconnect Module Configurations					Compute Module Network Adapters Used
Frame Table 1					
[ICB 1]	HPE VC SE 16Gb	->	HPE VC SE 16Gb	[ICB 4]	HPE Synergy 16Gb HBA
[ICB 2]	Empty/Interconnect	->	Empty/Interconnect	[ICB 5]	Empty/Adapter
[ICB 3]	Empty/Interconnect	->	Empty/Interconnect	[ICB 6]	Empty/Adapter
Frame Table 2					
[ICB 1]	Empty/Interconnect	->	Empty/Interconnect	[ICB 4]	Empty/Adapter
[ICB 2]	HPE VC SE 16Gb	->	HPE VC SE 16Gb	[ICB 5]	HPE Synergy 16Gb HBA
[ICB 3]	Empty/Interconnect	->	Empty/Interconnect	[ICB 6]	Empty/Adapter
Frame Table 3					
[ICB 1]	HPE VC SE 16Gb	->	HPE VC SE 16Gb	[ICB 4]	HPE Synergy 16Gb HBA
[ICB 2]	HPE VC SE 16Gb	->	HPE VC SE 16Gb	[ICB 5]	HPE Synergy 16Gb HBA
[ICB 3]	Empty/Interconnect	->	Empty/Interconnect	[ICB 6]	Empty/Adapter

Notes: This configuration is only applicable for single frame, not for multi-frame

Stacking Configuration

Stacking is only supported on Virtual Connect SE 40Gb F8 Modules via Primary/Satellite stacking or between two Virtual Connects with M-LAG. The Virtual Connect FC modules don't support stacking.

Product Features

Performance

- (8) 4/8/16Gb Auto-negotiating Fibre Channel uplinks connected to external SAN switches
- (12) 16Gb Fibre Channel downlink ports provide maximum HBA performance
- HBA Aggregation on uplinks ports using ANSI T11 standards-based N_Port ID Virtualization (NPIV) technology
- Allows up to 255 virtual machines running on the same physical compute modules to access separate storage resources
- Extremely low latency throughput provides switch-like performance.

Management

- Storage management is no longer constrained to a single physical HBA on a compute module
- Managed with composer based HPE OneView
- Does not add to SAN switch domains or require traditional SAN management
- Appears as a pass-thru device to the SAN Manager

Standard Features

Virtual server profiles

- Provisioned storage resource is associated directly to a specific virtual machine - even if the virtual server is re-allocated within the Synergy Frame
- Ability to pre-configure compute module I/O connections
- Ability to move, add, or change compute modules on the fly
- Once defined, SAN Administrators don't have to be involved in compute modules changes

Related Options

Transceivers

HPE B-series 4x16 Short Wave QSFP Transceiver	K2Q87A
HPE B-series 16Gb SFP+ Short Wave 1-pack Secure Transceiver	R6B10A
HPE B-series 16Gb SFP+ Short Wave 8-pack Secure Transceiver	R6W28A

Cables

HPE Multi Fiber Push On to 4 x Lucent Connector 5m Cable	K2Q46A
HPE Multi Fiber Push On to 4 x Lucent Connector 15m Cable	K2Q47A
HPE Premier Flex MPO/MPO Multi-mode OM4 12 Fiber 10m Cable	QK729A
HPE Premier Flex MPO/MPO Multi-mode OM4 8 Fiber 50m Cable	QK731A
HPE Premier Flex MPO/MPO OM4 100m Cable	H6Z30A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 1m Cable	QK732A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 2m Cable	QK733A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 5m Cable	QK734A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 15m Cable	QK735A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 30m Cable	QK736A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 50m Cable	QK737A
HPE LC to LC Multi-mode OM3 2-Fiber 0.5m 1-Pack Fiber Optic Cable	AJ833A
HPE LC to LC Multi-mode OM3 2-Fiber 1.0m 1-Pack Fiber Optic Cable	AJ834A
HPE LC to LC Multi-mode OM3 2-Fiber 2.0m 1-Pack Fiber Optic Cable	AJ835A
HPE LC to LC Multi-mode OM3 2-Fiber 5.0m 1-Pack Fiber Optic Cable	AJ836A
HPE LC to LC Multi-mode OM3 2-Fiber 15.0m 1-Pack Fiber Optic Cable	AJ837A
HPE LC to LC Multi-mode OM3 2-Fiber 30.0m 1-Pack Fiber Optic Cable	AJ838A
HPE LC to LC Multi-mode OM3 2-Fiber 50.0m 1-Pack Fiber Optic Cable	AJ839A

HPE Synergy Services

Notes: See HPE Support Services Central for additional services at **https://ssc.hpe.com/portal/site/ssc/**

Deployment/Installation & Start-up Services

HPE Factory Express Synergy Initial Frame Package 4 Service	HA454A1-300
HPE Factory Express Synergy Add-on Frame Package 4 Service	HA454A1-301
HPE Synergy First Frame Startup Service	U8JM3E
HPE Synergy Additional Frame Startup Service	U8JM4E

Service and Support

HPE Services

No matter where you are in your digital transformation journey, you can count on HPE Services to deliver the expertise you need when, where and how you need it. From planning to deployment, ongoing operations and beyond, our experts can help you realize your digital ambitions.

https://www.hpe.com/services

Consulting Services

No matter where you are in your journey to hybrid cloud, experts can help you map out your next steps. From determining what workloads should live where, to handling governance and compliance, to managing costs, our experts can help you optimize your operations.

https://www.hpe.com/services/consulting

HPE Managed Services

HPE runs your IT operations, providing services that monitor, operate, and optimize your infrastructure and applications, delivered consistently and globally to give you unified control and let you focus on innovation.

HPE Managed Services | HPE

Operational services

Optimize your entire IT environment and drive innovation. Manage day-to-day IT operational tasks while freeing up valuable time and resources. Meet service-level targets and business objectives with features designed to drive better business outcomes.

https://www.hpe.com/services/operational

HPE Complete Care Service

HPE Complete Care Service is a modular, edge-to-cloud IT environment service designed to help optimize your entire IT environment and achieve agreed upon IT outcomes and business goals through a personalized experience. All delivered by an assigned team of HPE Services experts. HPE Complete Care Service provides:

- A complete coverage approach -- edge to cloud
- An assigned HPE team
- Modular and fully personalized engagement
- Enhanced Incident Management experience with priority access
- Digitally enabled and AI driven customer experience

https://www.hpe.com/services/completecare

HPE Tech Care Service

HPE Tech Care Service is the operational support service experience for HPE products. The service goes beyond traditional support by providing access to product specific experts, an AI driven digital experience, and general technical guidance to not only reduce risk but constantly search for ways to do things better. HPE Tech Care Service delivers a customer-centric, AI driven, and digitally enabled customer experience to move your business forward. HPE Tech Care Service is available in three response levels. Basic, which provides 9x5 business hour availability and a 2-hour response time. Essential which provides a 15-minute response time 24x7 for most enterprise level customers, and Critical which includes a 6-hour repair commitment where available and outage management response for severity 1 incidents.

https://www.hpe.com/services/techcare

Service and Support

HPE Lifecycle Services

HPE Lifecycle Services provide a variety of options to help maintain your HPE systems and solutions at all stages of the product lifecycle. A few popular examples include:

- Lifecycle Install and Startup Services: Various levels for physical installation and power on, remote access setup, installation and startup, and enhanced installation services with the operating system.
- HPE Firmware Update Analysis Service: Recommendations for firmware revision levels for selected HPE products, taking into account the relevant revision dependencies within your IT environment.
- HPE Firmware Update Implementation Service: Implementation of firmware updates for selected HPE server, storage, and solution products, taking into account the relevant revision dependencies within your IT environment.
- Implementation assistance services: Highly trained technical service specialists to assist you with a variety of activities, ranging from design, implementation, and platform deployment to consolidation, migration, project management, and onsite technical forums.
- HPE Service Credits: Access to prepaid services for flexibility to choose from a variety of specialized service activities, including assessments, performance maintenance reviews, firmware management, professional services, and operational best practices.

Notes: To review the list of Lifecycle Services available for your product go to:
https://www.hpe.com/services/lifecycle

For a list of the most frequently purchased services using service credits, see the **HPE Service Credits Menu**

Other Related Services from HPE Services:

HPE Education Services

Training and certification designed for IT and business professionals across all industries. Broad catalogue of course offerings to expand skills and proficiencies in topics ranging from cloud and cybersecurity to AI and DevOps. Create learning paths to expand proficiency in a specific subject. Schedule training in a way that works best for your business with flexible continuous learning options.
https://www.hpe.com/services/training

Defective Media Retention

An option available with HPE Complete Care Service and HPE Tech Care Service and applies only to Disk or eligible SSD/Flash Drives replaced by HPE due to malfunction.

Consult your HPE Sales Representative or Authorized Channel Partner of choice for any additional questions and services options.

Parts and Materials

HPE will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

How to Purchase Services

Services are sold by Hewlett Packard Enterprise and Hewlett Packard Enterprise Authorized Service Partners:

- Services for customers purchasing from HPE or an enterprise reseller are quoted using HPE order configuration tools.
- Customers purchasing from a commercial reseller can find services at **https://ssc.hpe.com/portal/site/ssc/**

Service and Support

AI Powered and Digitally Enabled Support Experience

Achieve faster time to resolution with access to product-specific resources and expertise through a digital and data driven customer experience

Sign into the HPE Support Center experience, featuring streamlined self-serve case creation and management capabilities with inline knowledge recommendations. You will also find personalized task alerts and powerful troubleshooting support through an intelligent virtual agent with seamless transition when needed to a live support agent.
https://support.hpe.com/hpesc/public/home/signin

Consume IT On Your Terms

HPE GreenLake edge-to-cloud platform brings the cloud experience directly to your apps and data wherever they are—the edge, colocations, or your data center. It delivers cloud services for on-premises IT infrastructure specifically tailored to your most demanding workloads. With a pay-per-use, scalable, point-and-click self-service experience that is managed for you, HPE GreenLake edge-to-cloud platform accelerates digital transformation in a distributed, edge-to-cloud world.

- Get faster time to market
- Save on TCO, align costs to business
- Scale quickly, meet unpredictable demand
- Simplify IT operations across your data centers and clouds

To learn more about HPE Services, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Contact information for a representative in your area can be found at "Contact HPE"
https://www.hpe.com/us/en/contact-hpe.html

For more information
http://www.hpe.com/services

Technical Specifications

Shipping Dimensions		
Length	19.45 in (494 mm)	
Width	15.55 in (395 mm)	
Height	5.75 in (154 mm)	
Shipping Weight	1.497 kg (3.18 lbs)	
Product Specifications Hardware		
Performance	16 Gb/sec line speed, full duplex Maximum frame size 2148 bytes (2112 byte payload)	
Bandwidth	96Gbps, Full Duplex @ 4-Gbps	
	192Gbps, Full Duplex @ 8-Gbps	
	384Gbps, Full Duplex @ 16-Gbps	
Fabric Latency (intra-switch)	700 nSec. Latency increases as input port speed is lower than the output port speed.	
Number of Fibre Channel Ports	24 external 4/8/16-Gbps ports (Max 12 usable)	
	12 internal 16-Gbps ports	
External Port Type	Configured as Node port s (N_Port), 16Gb, 8Gb or 4Gb auto- negotiating SFP ports	
Internal Port Type	Configured as Fabric port (F_Port), 16Gb	
Classes of Service	Class 2 and Class 3 Fibre Channel services	
Scalability	Does not contribute to the total switch limit. See the SAN Design Guide for latest supported configurations.	
Buffer Credits	8 buffer credits per port, ASIC embedded memory	
Connectors and Cabling	QSFP+ and SFP+ optical hot-pluggable transceiver with LC connector	
Indicators	Port ID Indicator	
	Module Status Indicator	
	Port Link/Activity Indicator	
	Module Locator (UID)	
Dimensions	**Width**	16.918 in
	Depth	11.051 in
	Height	1.082 in
Weight	Approx 3.18 lbs – without media	
Environmental Ranges	**Specification**	10C to 35C (50F to 95F)
	Temperature Range	
	Operating	Inlet air temperature up to 43°C (109.4°F) at sea level with an altitude derating of 1.0°C per every 1000 feet of elevation above sea level to a maximum operating altitude. For example, the maximum inlet air temperature requirement at 5000 ft. above Sea level is 38ºC.
	Non-operating	-40°C to 70°C (-40° to 158°F). Maximum rate of change is 20°C/Hr (36°F/Hr).
	Relative humidity (noncondensing)	
	Operating	5 to 95% relative humidity, 38.7°C maximum wet bulb temperature, and Non-condensing.
	Non-Operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	Altitude	

Technical Specifications

	Operating	3050 m (10,000 ft.). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Non-operating	9144 m (30,000 ft.). Maximum allowable altitude change rate is 457 m/min (1500 ft. /min).
	Vibration	
	Operating	1 G, 10-500 Hz, 60 minutes per axis
	Non-Operating	9144 m (30,000 ft.). Maximum allowable altitude change rate is 457 m/min (1500 ft. /min).
	Shock	
	Operating	Half-sine-wave shock, 40 G, 2 ms duration, in each direction of three mutually perpendicular axes.
	Non-Operating	Half-sine-wave shock, 140 G, 2 ms duration, in each direction of three mutually perpendicular axes; and square-wave shock up to 80 G, 180 inches/s velocity change, in each direction of three mutually perpendicular axes.
Power Specification	12V @ 4.65A (56 W)	

Product Specifications Software

Industry Standard NPIV Support

The Virtual Connect Fibre Channel module works by aggregating multiple FC HBA ports over a single N-port uplink through the use of N_port_ID virtualization (NPIV). NPIV allows multiple distinguishable identities (multiple port WWNs and port IDs) over a single N-port connection. Most Fibre Channel SAN switch vendors have support for NPIV in their latest firmware release. By conforming to the NPIV standard, SAN equipment interoperability simplified. The Virtual Connect Fibre Channel Module Provides basic 4:1, 8:1, or 12:1 NPIV Fibre Channel concentration.

Data Center Connectivity

Each Virtual Connect Fibre Channel module supports up to 12 SAN fabrics and is typically connected to a Fibre Channel switch that has been configured to run in NPIV mode. The 12 uplink ports are speed selectable from 16, 8 or 4Gb/s.

The setup allows SAN administrators to name the fabric that servers will connect into and set the oversubscription rate. Fibre Channel boot parameters and WWN administration are configurable options that can be integrated into server profiles.

In an NPIV environment, there is an initial brief login function between the Virtual Connect Fibre Channel Module and the data center switch. Once completed, all HBA connections appear as though they are directly connected between the compute modules and the SAN switch. The Virtual Connect Fibre Channel Module appears as a pass-thru device to the SAN, yet cables are reduced as much as 12:1.

Management Features

- Simple and intuitive Graphical User Interface (GUI) of composer based HPE OneView for defining, configuring, and managing all elements of the SAN.
- Comprehensive administration, definition, and management of Ethernet Networks, Shared Uplink Sets using VLANs, SAN Fabric management, and Server Profiles
- Management of user accounts, enclosure, Virtual Connect settings, and firmware updates
- WWN Address Administration allows local administration of predefined WWN addresses ranges to allow pre-provisioning of SAN volumes.

Technical Specifications

Management and Standards Support

Standards

- ANSI T11 N_Port ID Virtualization
- FC-PH Rev. 4.3
- FC-PH-2
- FC-PH-3
- FC-AL Rev 4.6
- FC-AL-2 Rev 7.0
- FC-FLA
- FC-GS
- FC-GS-2
- FC-GS-3
- FC-FG
- FC-VI
- FC Element MIB RFC 2837
- Fibre Alliance MIB Version 4.0
- Fibre Channel Management MIB RFC4044

Safety and Compliance

Safety Certifications

- UL/CUL Recognition to UL/CSA 60950-1
- TUV to EN 60950-1
- CB report and certificate to IEC 60950-1 with all country deviations
- CE Marking

Electromagnetic Emissions Certifications FCC Part 15 Class A

- FCC Part 15 Class A
- EN 55022 Class A (CISPR22 Class A)
- VCCI Class A
- AS/NZS 3548 Class A or AS/NZS CISPR22 Class A
- MIC Class A
- CE Marking

Environment-friendly Products and Approach - End-of-life Management and Recycling

Hewlett Packard Enterprise offers end-of-life **product return, trade-in, and recycling programs**, in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the **Hewlett Packard Enterprise web site** at: These instructions may be used by recyclers and other WEEE treatment facilities as well Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change
08-Jan-2024	Version 11	Changed	Service and Support section was updated
15-Sep-2021	Version 10	Changed	Related Options section was updated Obsolete SKUs were removed Services and Support Pointnext Tech Care and Complete Care information added
11-Jan-2021	Version 9	Changed	Standard Features section was updated.
24-Aug-2020	Version 8	Changed	Related Options section was updated. Rebranding applied to document.
13-Nov-2018	Version 7	Changed	Standard Features section was updated.
05-Nov-2018	Version 6	Changed	Overview and Supported Products were updated. SKU added in Overview section: P08477-B21. SKU deleted in Overview section: 779227-B21
05-Mar-2018	**Version 5**	**Changed**	HPE Compute Module section was updated.
08-May-2017	Version 4	Changed	Related Options section was updated. Obsolete SKUs were deleted: QK725A, H6Z29A, AJ717A
27-Jan-2017	Version 3	Changed	Related Options and Service and Support sections were updated.
31-Mar-2016	Version 2	Changed	Overview, Supported Products, Standard Features, Related Options, Technical Specifications sections were updated. SKUs added in Related Options section: QK724A, QK725A, H6Z29A, K2Q87, AJ716B, AJ717A, K2Q46A, K2Q47A, QK729A, QK731A, H6Z30A, QK732A, QK733A, QK734A, QK735A, QK736A, QK737A, AJ833A, AJ834A, AJ835A, AJ836A, AJ837A, AJ838A, AJ839A, H0XQ7E, H0XQ9E, H0XR0E, H0XR2E, HA454A1-300, HA454A1-301, U8JM3E, U8JM4E.
01-Dec-2015	Version 1	Created	New QuickSpecs

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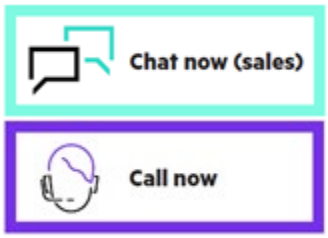
Contact our presales specialists.



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