Overview

Simplify and make your data center change-ready. The HP Virtual Connect 8Gb 20-port Fibre Channel Module for BladeSystem c-Class is the next-generation successor to the current HP 4Gb Virtual Connect Fibre Channel Module with enhanced support for server side NPIV.

The new HP Virtual Connect 8Gb 20-port FC module offers enhanced Virtual Connect capabilities, allowing up to 128 virtual machines running on the same physical server to access separate storage resources. Provisioned storage resource is associated directly to a specific virtual machine - even if the virtual server is re-allocated within the BladeSystem; Storage management of virtual machines is no longer limited by the single physical HBA on a server blade: SAN administrators can now manage virtual HBAs with the same methods and viewpoint of physical HBAs. The HP Virtual Connect 8Gb 20-port Fibre Channel Module for the c-Class BladeSystem is the simplest, most flexible connection to your SAN fabrics. The HP Virtual Connect 8Gb 20-port Fibre Channel Module simplifies server connections by cleanly separating the server enclosure from SAN, simplifies SAN fabrics by reducing cables without adding switches to the domain, and allows you to change servers in just minutes, not days.

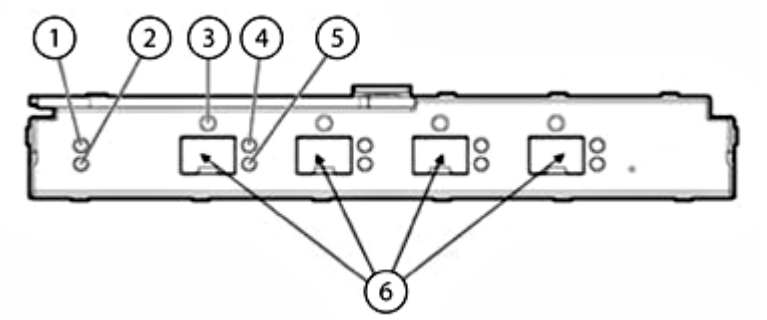


Figure 1 HP Virtual Connect 8Gb 20 Port Fibre Channel Module Front Bezel

1. UID Indicator
2. Module Health Indicator
3. Port Configuration Status Indicator
4. Link Status Indicator
5. Port Activity Indicator
6. Ports 1-4 (2,4, or 8Gb Fibre Channel)

What's New

Virtual Connect v3.00:

- Support for new HP Integrity server blades: HP Integrity BL860c i2 Server series, HP Integrity BL870c i2 Server series, and HP Integrity BL890c i2 Server series
- Support for Virtual Connect Support Utility 1.5.0 (Firmware update removed from GUI and CLI interfaces)
- VCM GUI enhancements and new Adobe Flash Player 10.x requirement for supported Internet Explorer Mozilla FireFox browsers

Virtual Connect v3.01:

- Support for new HP ProLiant BL465c G7 Server Blade, HP ProLiant BL685c G7 Server Blade
- IE8 support in IE7 compatibility mode

Overview

At A Glance

Performance:

- Allows up to 128 virtual machines running on the same physical server to access separate storage SAN resources.
- (4) 2, 4, 8Gb Auto-negotiating Fibre Channel uplinks connected to external SAN switches
- (16) 1,2, 4 or 8Gb Auto-negotiating Fibre Channel downlink ports provide maximum HBA performance
- HBA Aggregation on uplinks ports using ANSI T11 standards-based N_Port ID Virtualization (NPIV) technology
- Extremely low latency throughput provides switch-like performance.

Management:

- Storage management of virtual machines is no longer limited by the single physical HBA on a server blade
- Managed with the Virtual Connect Ethernet Module
- Does not add to SAN switch domains or require traditional SAN management
- Appears as a pass-thru device to the SAN Manager

Virtual server profiles:

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

Options:

- HP Virtual Connect Flex-10 Ethernet Module for c-Class BladeSystem
- HP 1/10Gb-F Virtual Connect Ethernet Module for c-Class BladeSystem
- 8Gb Fibre Channel SFP+'s not included with the Virtual Connect Fibre Channel Module
- Virtual Connect Enterprise Manager
  - www.hp.com/go/bladesystem/virtualconnect
  - www.hp.com/go/vcem

Models

HP Virtual Connect 8Gb Fibre Channel Module for c-Class BladeSystem	572018-B21

Compatibility

HP BladeSystem ProLiant and Integrity Servers

HP ProLiant and Integrity Servers:

Compatible with current releases of HP ProLiant and HP Integrity c-Class Generation 6 Blade Servers supporting the QMH2562 8 Gb FC HBA or LPe1205 8 Gb HBA for HP c-Class BladeSystem.

Compatible with current releases of HP ProLiant and HP Integrity c-class Blade Servers supporting the QLogic QMH2462 4Gb FC HBA, Emulex LPe1105-HP 4Gb HBA, or Brocade 804 8Gb FC HBA for HP c-Class BladeSystem.

For the latest additional information on required firmware versions and to download firmware upgrades, see the HP website: http://www.hp.com/go/bladesystemupdates

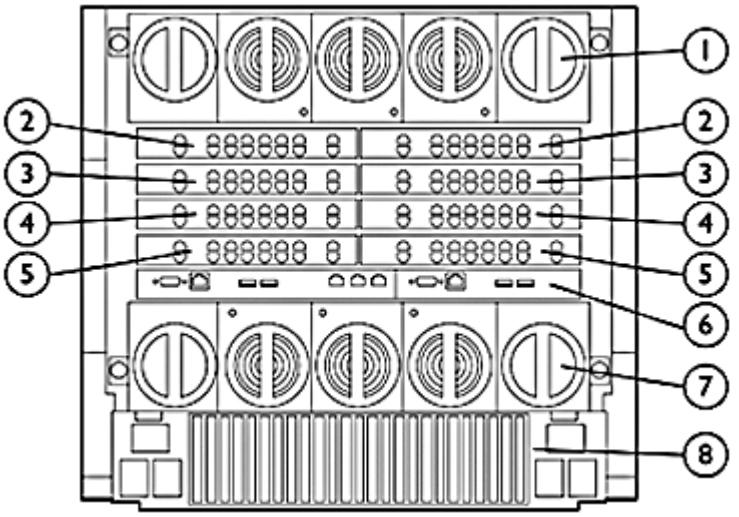
HP ProLiant and Integrity BL c-Class Server Blade Enclosures

The HP BladeSystem c3000 and c7000 Enclosures have been designed up front with the Virtual Connect Architecture in mind incorporating the HP Onboard Administrator, ILO Management, and HP Management tools inside the Virtual Connect framework.

NOTE: HP Integrity BL8x0c i2 Server Blades require OA version 3.0 or later.

For the latest additional information on required firmware versions and to download firmware upgrades, see the HP website: http://www.hp.com/go/bladesystemupdates

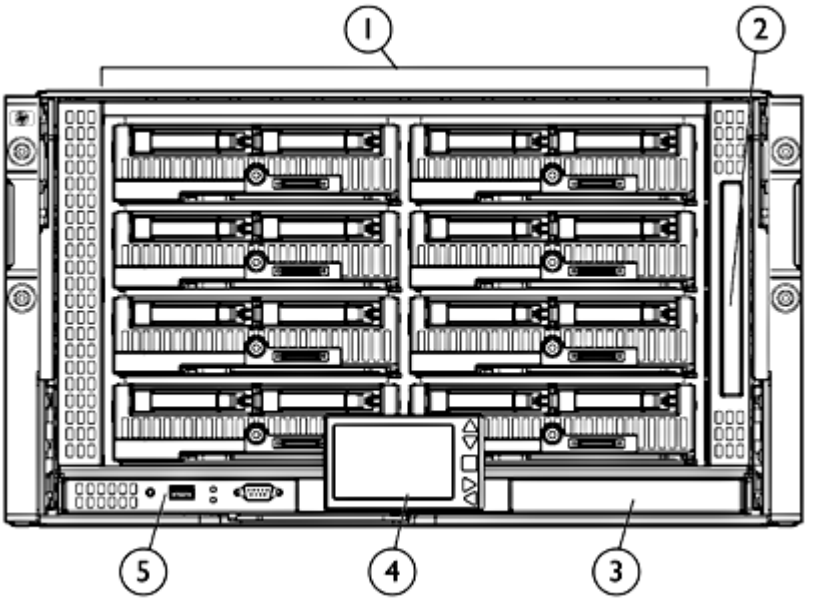
Supported Configurations



HP BladeSystem c7000 Enclosure - Rear View

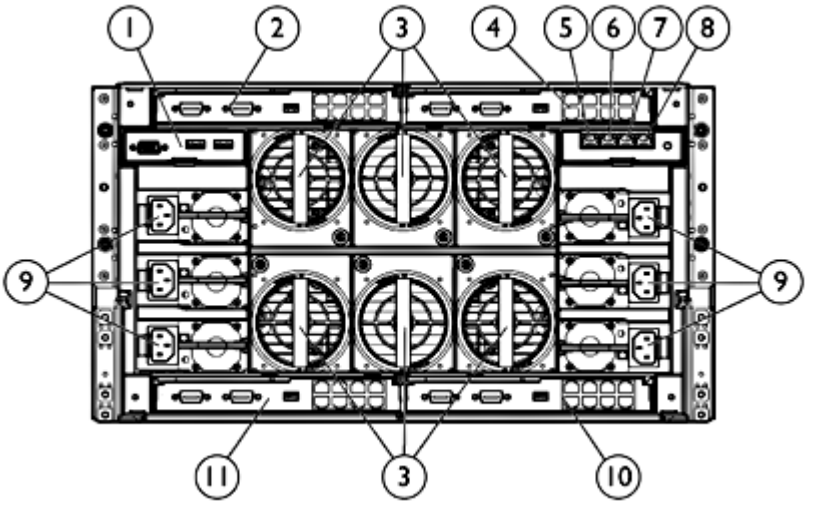
1. Upper Fan System
2. Interconnect Bays 1 /2
3. Interconnect Bays 3 / 4
4. Interconnect Bays 5 / 6
5. Interconnect Bays 7 / 8
6. On Board Administrator
7. Lower Fan System
8. Rear Redundant Power Complex

Supported Products



HP BladeSystem c3000 Enclosure - Front View

1. Device Bays 1 thru 8
2. Enclosure DVD Drive
3. Standby Onboard Administrator (reserved for Future)
4. Insight Display
5. Active Onboard Administrator



HP BladeSystem c3000 Enclosure - Rear View

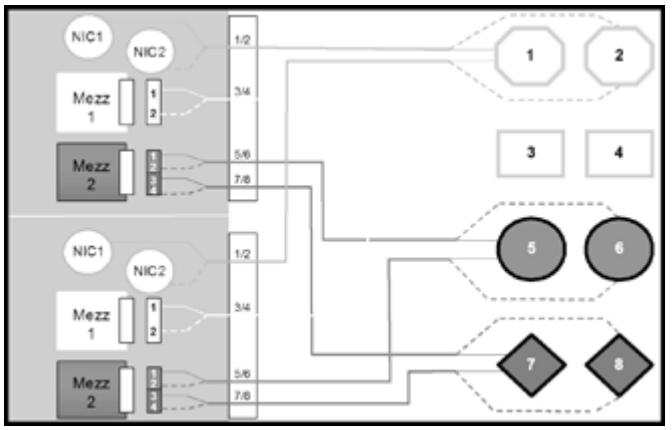
1. Local KVM interface (reserved for future)
2. Interconnect Bay 1
3. Active Cool Fans
4. Interconnect Bay 2
5. Enclosure Up-link and Service Port
6. Enclosure Down-link
7. iLO/Onboard Administrator Port
8. iLO/Onboard Administrator Port 2 (reserved for future)
9. Power Supplies
10. Interconnect Bay 4
11. Interconnect Bay 3

Supported Products

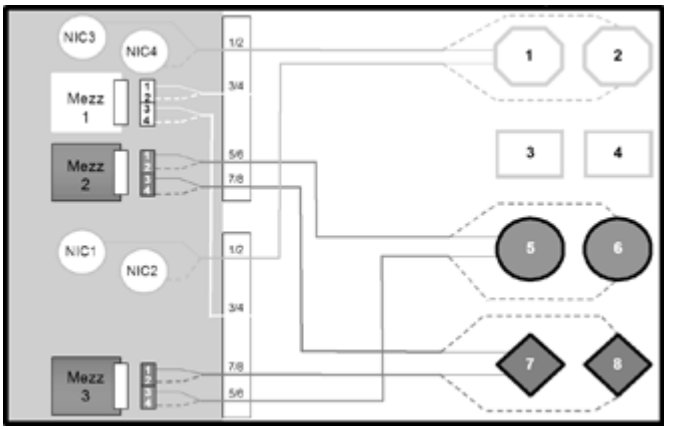
Mezzanines

Port Mapping

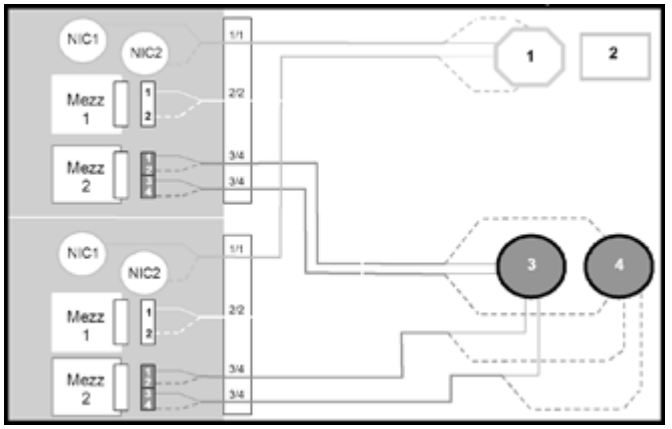
Port mapping differs slightly between full height and half height server blades due to the support for additional Mezzanine cards on the full height version.
HP has simplified the processes of mapping Mezzanine ports to switch ports by providing intelligent management tools via the Onboard Administrator and HP Insight Manager Software. The Onboard Administrator Guide, Enclosure Setup and Installation Guide provides detailed information on port mapping.



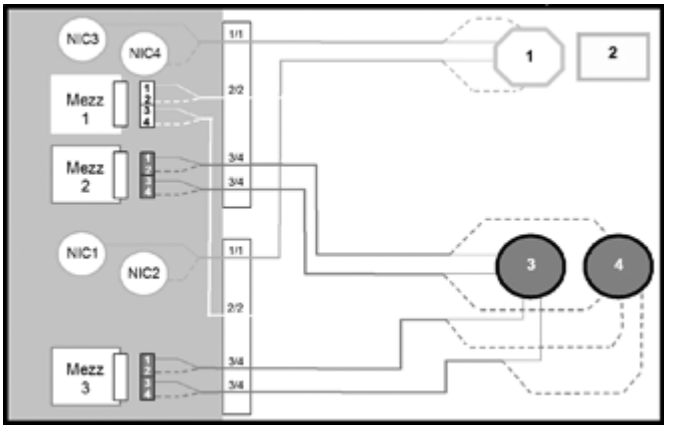
c7000 Half Height Server Blade



c7000 Full Height Sever Blade



c3000 Half Height Server Blade



c3000 Full Height Sever Blade

The following are supported configurations for the HP Virtual Connect 8Gb 20-port Fibre Channel Module. Please note that other interconnect options can be installed in the enclosure, but they do not inherit the benefits of Virtual Connect. Switches and Pass-Thru modules will operate per their default configurations. Any moves, adds, or changes to servers which are connected to non-Virtual Connect modules will require reconfiguration on the LAN and/or SAN. The Virtual Connect Manager will only manage Virtual Connect Modules.

The HP Virtual Connect 8Gb 20-port Fibre Channel Module requires a Virtual Connect Ethernet Module installed in the system for management and administration. The HP Virtual Connect 8Gb 20-port Fibre Channel Module requires VC Firmware version 2.30 or higher with VC FC Firmware version 1.40. Following are more details.

NOTE: HP Integrity BL860c i2, BL870c i2, BL890c i2 require VC Firmware 3.0 or higher.

Supported Products

HP Virtual Connect FW Package	HP 8Gb 24 Port Virtual Connect Fibre Channel Module (P/N 466482-B21)	8Gb 20 Port Virtual Connect Fibre Channel Module (P/N 572018-B21)
VC 1.34	Not Supported	Not Supported
VC 2.01	Not Supported	Not Supported
VC 2.10 (4Gb Edition)	Not Supported	Not Supported
VC 2.10 (8Gb Edition)	VCM 2.10	Not Supported
	VC-FC2 1.00	
VC 2.3x	VCM 2.30 (8Gb 24-port Edition)	VCM 2.30 (4/8Gb 20-port Edition)
	VC-FC2 1.01	VC-FC 1.40
VC 3.0x	VC-FC2 1.02	VC-FC 1.40

HP BladeSystem c7000 Enclosure

NOTE: The following tables show a number of typical, supported configurations for an HP BladeSystem c7000 Enclosure.

[Bay 1] VC-Enet
[Bay 3] Other/empty
[Bay 5] Other/empty
[Bay 7] Other/empty

[Bay 2] Empty
[Bay 4] Other/empty
[Bay 6] Other/empty
[Bay 8] Other/empty

[Bay 1] VC-Enet
[Bay 3] Other/empty
[Bay 5] Other/empty
[Bay 7] Other/empty

[Bay 2] VC-Enet
[Bay 4] Other/empty
[Bay 6] Other/empty
[Bay 8] Other/empty

[Bay 1] VC-Enet
[Bay 3] VC-Enet
[Bay 5] Other/empty
[Bay 7] Other/empty

[Bay 2] VC-Enet
[Bay 4] VC-Enet
[Bay 6] Other/empty
[Bay 8] Other/empty

[Bay 1] VC-Enet
[Bay 3] Other/empty
[Bay 5] VC-Enet
[Bay 7] Empty

[Bay 2] VC-Enet
[Bay 4] Other/empty
[Bay 6] VC-Enet
[Bay 8] Empty

[Bay 1] VC-Enet
[Bay 3] VC-FC
[Bay 5] Other/empty
[Bay 7] Other/empty

[Bay 2] Empty
[Bay 4] Empty
[Bay 6] Other/empty
[Bay 8] Other/empty

Supported Products

[Bay 1] VC-Enet
[Bay 3] VC-FC
[Bay 5] Other/empty
[Bay 7] Other/empty

[Bay 2] VC-Enet
[Bay 4] VC-FC
[Bay 6] Other/empty
[Bay 8] Other/empty

[Bay 1] VC-Enet
[Bay 3] VC-Enet
[Bay 5] VC-FC
[Bay 7] Empty

[Bay 2] VC-Enet
[Bay 4] VC-Enet
[Bay 6] VC-FC
[Bay 8] Empty

[Bay 1] VC-Enet*
[Bay 3] VC-Enet
[Bay 5] VC-FC
[Bay 7] VC-FC

[Bay 2] VC-Enet
[Bay 4] VC-Enet
[Bay 6] VC-FC
[Bay 8] VC-FC

* This configuration is only applicable for enclosures with full-height servers.

[Bay 1] VC-Enet
[Bay 3] VC-FC
[Bay 5] VC-Enet
[Bay 7] Empty

[Bay 2] VC-Enet
[Bay 4] VC-FC
[Bay 6] VC-Enet
[Bay 8] Empty

[Bay 1] VC-Enet
[Bay 3] VC-FC
[Bay 5] VC-Enet
[Bay 7] VC-Enet

[Bay 2] VC-Enet
[Bay 4] VC-FC
[Bay 6] VC-Enet
[Bay 8] VC-Enet

[Bay 1] VC-Enet
[Bay 3] Other/empty
[Bay 5] VC-FC
[Bay 7] Empty

[Bay 2] VC-Enet
[Bay 4] Other/empty
[Bay 6] VC-FC
[Bay 8] Empty

[Bay 1] VC-Enet
[Bay 3] VC-FC
[Bay 5] VC-FC
[Bay 7] Empty

[Bay 2] VC-Enet
[Bay 4] VC-FC
[Bay 6] VC-FC
[Bay 8] Empty

[Bay 1] VC-Enet
[Bay 3] VC-Enet
[Bay 5] VC-Enet
[Bay 7] VC-Enet

[Bay 2] VC-Enet
[Bay 4] VC-Enet
[Bay 6] VC-Enet
[Bay 8] VC-Enet

Supported Products

HP BladeSystem c3000 Enclosure

NOTE: The following tables show a number of typical, supported configurations for an HP BladeSystem c3000 Enclosure.

[Bay 1] VC-Enet [Bay 3] Empty	[Bay 2] VC-Enet [Bay 4] Empty
[Bay 1] VC-Enet [Bay 3] VC-Enet	[Bay 2] VC-Enet [Bay 4] VC-Enet
[Bay 1] VC-Enet [Bay 3] VC-FC	[Bay 2] VC-Enet [Bay 4] VC-FC

Stacking Configuration

Stacking is only supported on Virtual Connect Ethernet Modules. The Virtual Connect Fibre Channel modules are managed via the Virtual Connect Ethernet Modules. The Virtual Connect firmware is dynamically mirrored between modules so all configuration data is updated simultaneously in a stack. Fibre Channel data packets are not transmitted between modules in a stacked configuration.

Service and Support, HP Care Pack and Warranty Information

Service and Support

This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Additional support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements.

NOTE: Server Blade Interconnect Limited Warranty includes 1 year Parts, 1 year Labor, 1-year on-site support. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html

HP services provide total care and support expertise with committed response designed to meet your IT and business needs.

To fully capitalize on your HP BladeSystem servers' capabilities requires a service partner who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of multi vender support solutions provides a range of support services designed to meet the varying needs of business. Whether an SMB or large global corporation HP has a HP BadeSystem server support offer to help you speedily deploy and maximize system uptime.

Recommended Service - simplify ProLiant solution implementation, maintenance, and management.

- Support - 3-Year, 24x7, Same Business Day, 4-Hour response coverage
- Deployment Service - Installation and Start Up for HP BladeSystem Infrastructure

Enhanced Service - optimize service level to increase IT performance and availability.

- Support -1-Year HP Proactive BladeSystem Service
- Deployment Service - Enhanced Network Installation and Start-up for HP BladeSystem Switches

Installation & Start-Up service for HP BladeSystem Infrastructure plus HP BladeSystem Enhanced Network Installation and Start-UP as per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excluding HP holidays.

For a complete listing of service offerings and information visit:
http://www.hp.com/services/bladesystemservices

Related Options

Optional Network Cabling	Hardware	
8Gb Optical Transceivers (SFP+)	Short Wave 8Gb - 75m	AJ718A
4Gb Optical Transceivers (SFP)	Short Wave 4Gb - 150m	A7446B
	Long Wave - 10 km	AE493A
Optical cables	LC-LC for between 2/4/8Gb and 2/4/8Gb Fibre Channel devices	
	HP 2 m LC-LC Multi-Mode OM2 Fibre Channel Cable	221692-B21
	HP 5 m LC-LC Multi-Mode OM2 Fiber Optic Cable	221692-B22
	HP 15 m LC-LC Multi-Mode OM2 Fiber Optic Cable	221692-B23
	HP 30 m LC-LC Multi-Mode OM2 Fiber Optic Cable	221692-B26
	HP 50 m LC-LC Multi-Mode OM2 Fiber Optic Cable	221692-B27

Service and Support Offerings	NOTE: The HP Care Pack service part numbers below for ProLiant BL c-Class server blades, cover the server blade and all HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the server.	
	Hardware Services On-site Service	
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UE458E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE459E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE460E
	Support Plus 24	
	Onsite HW support 24x7, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	UE473E
	NOTE: HP Care Pack services for the c7000 and c3000 Enclosure cover the enclosure, power supplies and fans. HP qualified rack options are covered by these services when installed within the same rack. HP supported c-Class enclosure devices including pass thru, Ethernet interconnect and virtual connect modules are also covered by the c7000 and c3000 enclosure Care Pack services.	
	NOTE: SAN/Fabric switches for the HP c-Class BladeSystem are not covered under the c7000 and c3000 enclosure Care Packs, SAN/Fabric switches carry separate Care Packs. SAN/Fabric Switch Care Pack service level support should always be uplifted to match existing storage or server service level.	
	Hardware Services On-site Service	
	Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years, Electronic NOTE: Uplifts the Ethernet devices to the same level of service as the c-class enclosure.	UE477E
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UE478E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE479E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE480E
	Installation & Start-up Services	
	Hp BladeSystem c-Class Infrastructure Installation and Startup Service, Electronic	UE602E

Related Options

HP BladeSystem Enhanced Network Installation and Startup Service, Electronic	UE603E
ProLiant BL c-Class Blade Server Hardware Installation, Electronic	UE493E
ProLiant BL c-Class Enclosure and Server Blade Hardware Installation, Electronic	UE494E

NOTE: For more information, customer/resellers can contact http://www.hp.com/services/bladesystemservices

Technical Specifications

Shipping Dimensions	Length	352.55mm (13.88 in)	
	Width	270.00mm (10.63 in)	
	Height	120.65mm (4.75 in)	
Shipping Weight		2.0Kg (4.4 lbs)	
Product Specifications Hardware	Performance	Up to 1600 MBps throughput per port Maximum frame size 2148 bytes (2112 byte payload)	
	Bandwidth	106 MB, Full Duplex @ 1-Gbps 212 MB, Full Duplex @ 2-Gbps 426 MB, Full Duplex @ 4-Gbps 852 MB, Full Duplex @ 8-Gbps	
	Aggregate Bandwidth	Up to 17.04 GB, Full Duplex	
	Fabric Latency (intra-switch)	1-Gbps to 1-Gbps < 0.6 µsec 2-Gbps to 2-Gbps < 0.4 µsec 4-Gbps to 4-Gbps < 0.2 µsec 8-Gbps to 8-Gbps < 0.2 µsec	
	Number of Fibre Channel Ports	4 external 2/4/8-Gbps ports 16 internal 1/2/4/8-Gbps ports	
	External Port Type	Configured as Node Port (N_Port), 2Gb, 4Gb or 8Gb auto- negotiating SFP ports	
	Internal Port Type	Configured as Fabric Port (F_Port), 1Gb, 2Gb, 4Gb or 8Gb auto- negotiating ports	
	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	16 buffer credits per port, ASIC embedded memory	
	Connectors and Cabling	SFP optical hot-pluggable transceiver with LC connector Short-Wavelength Laser (SWL) up to 500m (1,640 ft) Long-Wavelength Laser (LWL) up to10km	
	Indicators	Module locator (UID) Module status Link and Activity Port Configuration Status	
	Dimensions	Length	10.5in (267.7mm)
		Width	7.5 in (92.79mm)
		Height	1.1 in (27.94mm)
	Weight		1.27 kg (2.8 Lbs)
	Environmental Ranges	Specification	10C to 35C (50F to 95F)
		Temperature Range	
		Operating	10C to 35C (50F to 95F)
		Shipping	-40C to 60C (-40F to 140F)
		Storage	-20°C to 60°C (-4F to 140°F)
		Maximum wet bulb temperature	30C (80F)

		Relative humidity (noncondensing)	
		Operating	10% to 90%
		Shipping	10% to 90%
		Storage	10% to 95%
		Specification	10C to 35C (50F to 95F)
	Power Specification		12V @ 3A (36 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 16:1 NPIV Fibre Channel concentration.
	Data Center Connectivity	Each Virtual Connect Fibre Channel module supports up to 4 SAN fabrics and is typically connected to a Fibre Channel switch that has been configured to run in NPIV mode. The 4 uplink ports are speed selectable from 2, 4, or 8Gb/s. The setup wizard 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 server and the SAN switch. The Virtual Connect Fibre Channel Module appears as a pass-thru device to the SAN, yet cables are reduced as high as 16:1
	Management Features	An HP 1/10Gb Virtual Connect Module must be present in order to configure the VC FC Modules. This provides a complete Virtual Connect Environment for the server connections. Simple and intuitive Graphical User Interface (GUI) for defining, configuring, and managing all elements of the Virtual Connect Domain. Setup Wizards for initial domain installation and configuration and network and SAN configuration. Comprehensive administration, definition, and management of Ethernet Networks, Shared Uplink Sets using VLANS, SAN Fabric management, and Server Profiles Domain Management of user accounts, enclosure, Virtual Connect domain settings, and firmware updates

		The location and status of Virtual Connect Modules in the HP c-Class Enclosure and Onboard Administrator can be viewed from the Hardware Status page. Including at-a-glance detailed information of the hardware elements via mouse-over pop-up windows. WWN Address Administration allows local administration of predefined WWN addresses ranges to allow pre-provisioning of SAN volumes. VC manager runs as a high-availability pair when HP 1/10Gb VC-Ethernet Modules are installed in adjacent bays. All configuration data is stored in flash memory and check-pointed to the standby module. Configurations can also be backed up to a workstation via the GUI.
Management and Standards Support	Standards	ANCI 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
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 offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP 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 web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.