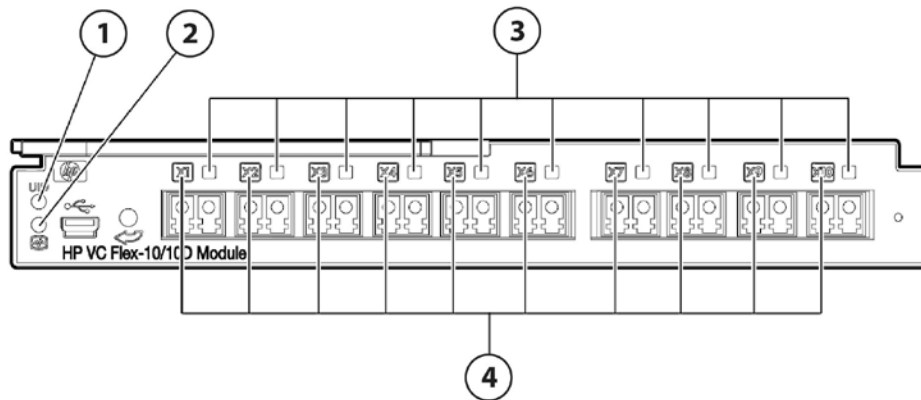## Overview

HPE Virtual Connect Flex-10/10D Module for c-Class BladeSystem

Simplify and make your data center change-ready. The HPE Virtual Connect Flex-10/10D Module for the c-Class BladeSystem is the simplest, most flexible connection to your networks. The Virtual Connect Flex-10/10D Module is a new class of blade interconnect that simplifies server connections by cleanly separating the server enclosure from LAN, simplifies networks by reducing cables without adding switches to manage, allows you to change servers in just minutes, not days, and tailors network connections and speeds based on application needs. HPE Flex-10 technology significantly reduces infrastructure costs by increasing the number of NICs per connection without adding extra blade I/O modules, and reducing cabling uplinks to the data center network. The HPE Virtual Connect Flex-10/10D Module for c-Class BladeSystem is an innovative, new class of integrated interconnects from HPE.

Virtual Connect Flex-10/10D Module Front Bezel

1. Module locator UID
2. Module status indicator

3. Link/Port activity
4. Port Status

What's New

- Virtual Connect v4.40 highlights for the Virtual Connect Flex-10/10D Module
    - SR-IOV management allows assigning Virtual Functions to any Physical Functions

Models

HPE Virtual Connect Flex-10/10D Module for c-Class BladeSystem	638526-B21
HPE Virtual Connect Flex-10/10D Module Enterprise Edition for BLc7000 Option	662048-B21

NOTE: Includes 2 x HPE Virtual Connect Flex-10/10D modules plus 1 x VCEM enclosure license. Customer will receive a printed license entitlement certificate and 2 Virtual Connect modules as a single deliverable. The license entitlement certificate must be redeemed online or via fax to obtain the VCEM license activation key.

Hewlett Packard Enterprise

Supported Products

Compatibility

HPE ProLiant and Integrity Servers and Network options

NOTE: The HPE BladeSystem c-Class Virtual Connect Firmware v4.50 supports the following hardware. (HPE Integrity BL8x0c i2 servers require VC FW 3.0 or higher and HPE Integrity BL8x0c i4 servers require VC FW 3.70 or higher). For the HPE Virtual Connect Manager Release Notes and Compatibility Matrix and the full listing of recommended and minimum firmware versions, see the **Hewlett Packard Enterprise website.**

- **ProLiant Server blades and workstation blades**
  - HPE ProLiant BL2x220c G5 Server Blade
  - HPE ProLiant BL2x220c G7 Server Blade
  - HPE ProLiant BL260c G5 Server Blade
  - HPE ProLiant BL280c G6 Server Blade
  - HPE ProLiant BL420c Gen8 Server Blade
  - HPE ProLiant BL460c Server Blade
  - HPE ProLiant BL460c G5 Server Blade
  - HPE ProLiant BL460c G6 Server Blade
  - HPE ProLiant BL460c G7 Server Blade
  - HPE ProLiant BL460c Gen8 Server Blade
  - HPE Proliant BL460c Gen8 Server Blade with Intel E5-2600 v2 series Processors
  - HPE Proliant BL460c Gen9 Server Blade
  - HPE ProLiant BL465c Server Blade
  - HPE ProLiant BL465c G5 Server Blade
  - HPE ProLiant BL465c G6 Server Blade
  - HPE ProLiant BL465c G7 Server Blade
  - HPE ProLiant BL465c Gen8 Server Blade
  - HPE ProLiant BL480c Server Blade
  - HPE ProLiant BL490c Server Blade
  - HPE ProLiant BL495c G5 Server Blade or greater
  - HPE ProLiant BL620c G7 Server Blade
  - HPE ProLiant BL660c Gen8 Server Blade
  - HPE ProLiant BL660c Gen9 Server Blade
  - HPE ProLiant BL680c G5 Server Blade or greater
  - HPE ProLiant BL685c Server Blade
  - HPE ProLiant BL685c G5 Server Blade
  - HPE ProLiant BL685c G6 Server Blade
  - HPE ProLiant BL685c G7 Server Blade
  - HPE ProLiant xw460c Blade Workstation
  - HPE ProLiant xw2x220c Blade Workstation
  - HPE ProLiant WS460c G6 Workstation
  - HPE ProLiant WS460c G8 Workstation
  - HPE ProLiant WS460c G9 Workstation

- **Integrity Server Blades**
  - HPE Integrity BL860c i2 Server series
  - HPE Integrity BL860c i4 Server series
  - HPE Integrity BL870c i2 Server series
  - HPE Integrity BL870c i4 Server series
  - HPE Integrity BL890c i2 Server series
  - HPE Integrity BL890c i4 Server series
  - HPE Integrity BL860c i6 Server series
  - HPE Integrity BL870c i6 Server series
  - HPE Integrity BL890c i6 Server series

Supported Products

NOTE: BL860c and BL870c are not supported effective. VC 4.30

- **Virtual Connect Modules**
    - HPE Virtual Connect FlexFabric 10Gb/24-port Module
    - HPE Virtual Connect 4 Gb Fibre Channel Module
    - HPE Virtual Connect 8Gb 24-Port Fibre Channel Module
    - HPE Virtual Connect 16Gb 24-Port Fibre Channel Module
    - HPE Virtual Connect 8Gb 20-Port Fibre Channel Module

- **Integrated Network Interfaces and mezzanine cards**
    - HPE NC325m PCI Express Quad Port 1Gb server adapter
    - HPE NC326i Integrated Dual Port PCI Express Gigabit Server Adapter
    - HPE NC326m PCI Express Dual Port Multifunction Gigabit Server Adapter
    - HPE NC360m Dual Port 1GbE BL-c Adapter
    - HPE NC364m Quad Port 1GbE BL-c Adapter
    - HPE NC370i Dual Port Multifunction Gigabit Network Adapter
    - HPE NC373i Dual Port Multifunction Gigabit Network Adapter
    - HPE NC373m Dual Port Multifunction Gigabit Network Adapter
    - HPE NC382i Integrated Dual Port PCI Express Gigabit Server Adapter
    - HPE NC382m Integrated Dual Port PCI Express Gigabit Server Adapter
    - HPE NC522m Dual Port Flex-10 10GbE Multifunction BL-c Adapter
    - HPE NC532i Dual Port Flex-10 10GbE Multifunction BL-c Adapter
    - HPE NC532m Dual Port Flex-10 10GbE Multifunction BL-c Adapter
    - HPE NC542m Dual Port Flex-10 10GbE BL-c Adapter
    - HPE NC550m 10Gb 2-port PCIe x8 Flex-10 Ethernet Adapter
    - HPE NC551i Dual Port FlexFabric 10Gb Converged Network Adapter
    - HPE NC551m Dual Port FlexFabric 10Gb Converged Network Adapter
    - HPE NC553i 10Gb 2-port FlexFabric Converged Network Adapter
    - HPE NC553m 10Gb 2-port FlexFabric Converged Network Adapter
    - HPE NC554m/FLB 10Gb 2 port Converged Network Adapter
    - HPE FlexFabric 20Gb 2-port 630FLB Adapter (Only at 10Gb downlinks)
    - HPE FlexFabric 20Gb 2-port 630M Adapter (Only at 10Gb downlinks)
    - HPE FlexFabric 20Gb 2-port 650FLB Adapter (Only at 10Gb downlinks)
    - HPE FlexFabric 20Gb 2-port 650M Adapter(Only at 10Gb downlinks)
    - HPE Flexfabric 10Gb-2 port 536FLB Adapter
    - HPE FlexFabric 10Gb 2-port 534FLB Adapter
    - HPE FlexFabric 10Gb 2-port 534M Adapter
    - HPE FlexFabric 10Gb 2-port 554M Adapter
    - HPE FlexFabric 10Gb 2-port 554FLB Adapter
    - HPE Flex-10 10Gb 2-port 530FLB Adapter
    - HPE Flex-10 10Gb 2-port 530M Adapter
    - HPE Flex-10 10Gb 2-port 552M Adapter
    - HPE Ethernet 1Gb 2-port 361FLB Adapter
    - HPE Ethernet 1Gb 4-port 366M Adapter

NOTE: For optimal operation of HPE Virtual Connect Manager, use the following recommended firmware version for the Onboard Administrator and iLO.
NOTE: For Integrity i4 server blades, recommended Onboard Administrator version is 3.60 or higher.
NOTE: For IPv6 management, Onboard Administrator version 4.00 or higher is required.
NOTE: Some of the servers and/or options listed above may be discontinued.

Virtual Connect Firmware   Virtual Connect Firmware v4.40 is recommended with the following release sets for HPE ProLiant and HPE Integrity environments:

HPE ProLiant server blades:

Supported Products

HPE Service Pack for ProLiant : Version SPP 2014.09.0 or greater
The HPE Service Pack for ProLiant (SPP) with HPE Smart Update Manager (HPE SUM) as the deployment engine provides a comprehensive approach to firmware and system software maintenance. The SPP is a comprehensive collection of firmware and system software components, all tested together as a single solution stack that include drivers, agents, utilities, firmware packages for HPE ProLiant servers, controllers, storage, blades and enclosures, and other options. It is available on all supported HPE ProLiant Gen 8 servers (HPE ProLiant SL/ML/DL/BL 100, 200, 300, 500, 700, 900 servers, and HPE CloudSystem Matrix) in addition to earlier generation HPE ProLiant servers. The SPP is released with most major HPE ProLiant server releases.

To access the latest HPE Service Pack for ProLiant click here:
https://www.hpe.com/us/en/product-catalog/detail/pip.service-pack-for-proliant.5104018.html

HPE Integrity Server Blades
To access latest HPE Smart Update Firmware, click here:
https://www.hpe.com/us/en/products/servers/smart-update.html

HPE Integrity i4 Server Blades

Recommended HPE Smart Update Firmware:
HPE Smart Update Firmware-HPE Integrity BL860c/870c/890c i4 System Firmware Bundle for Linux/Windows, 44.01

HPE Integrity i2 Server Blades
HPE Smart Update Firmware-HPE Integrity BL860c/870c/890c i2 System Firmware Bundle for Linux/Windows,26.36

HPE BladeSystem c-Class Enclosures The HPE BladeSystem c3000 and c7000 Enclosure has been designed up front with the Virtual Connect Architecture in mind incorporating the HPE Onboard Administrator, ILO Management, and HPE Management tools inside the Virtual Connect framework.

Enclosures:
- HPE BladeSystem c-Class c7000 Enclosure with Onboard Administrator
- HPE BladeSystem c-Class c3000 Enclosure with Onboard Administrator
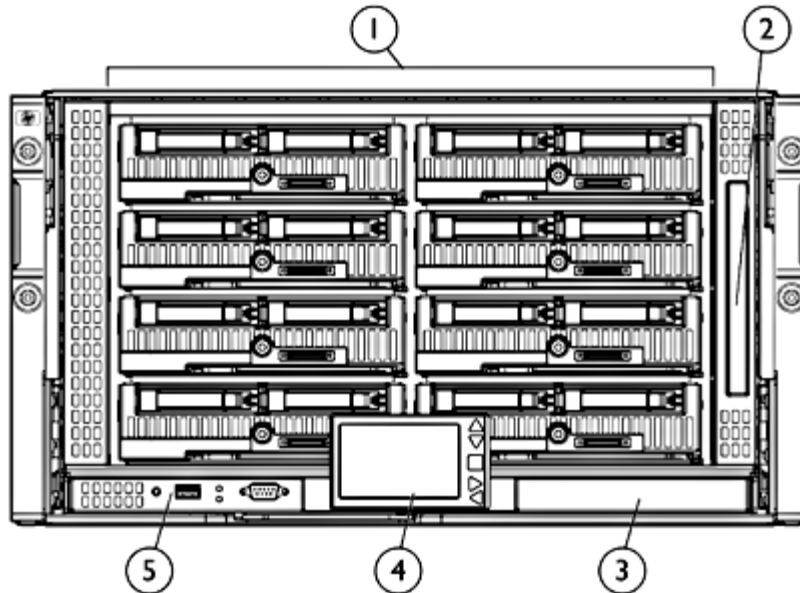
Supported Configurations
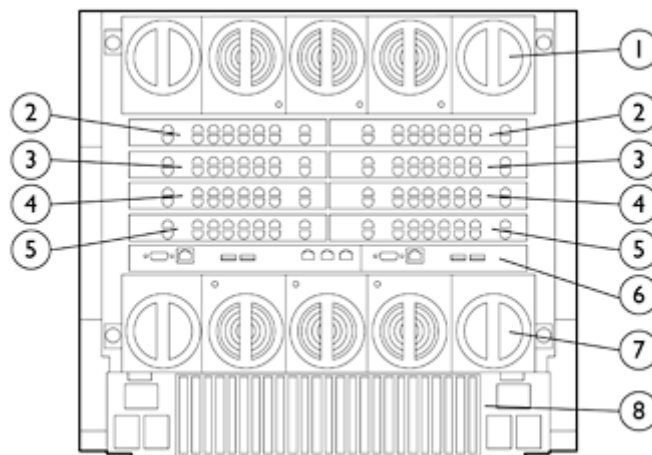
HPE BladeSystem c7000 Enclosure - Rear View

1. Upper Fan System
2. Interconnect Bays 1 /2
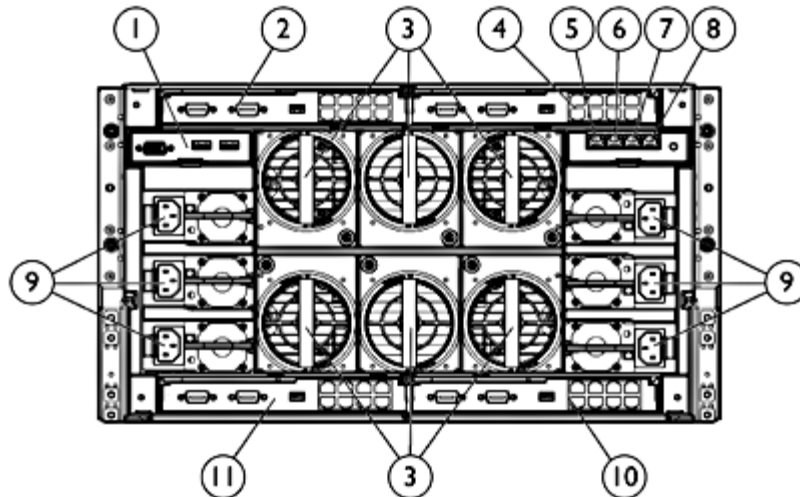
5. Interconnect Bays 7 / 8
6. On Board Administrator

Supported Products

3. Interconnect Bays 3 / 4
4. Interconnect Bays 5 / 6

7. Lower Fan System
8. Rear Redundant Power Complex

HPE 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

HPE 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
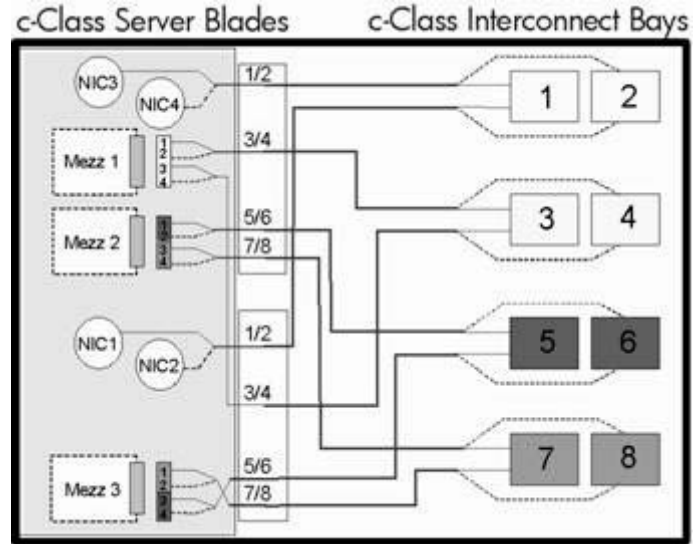11. Interconnect Bay 3

Mezzanines

Supported Products

c-7000 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.
Hewlett Packard Enterprise has simplified the processes of mapping Mezzanine ports to switch ports by providing intelligent management tools via the Onboard Administrator and HPE Insight Manager Software. The Onboard Administrator Guide, Enclosure Setup and Installation Guide provides detailed information on port mapping.
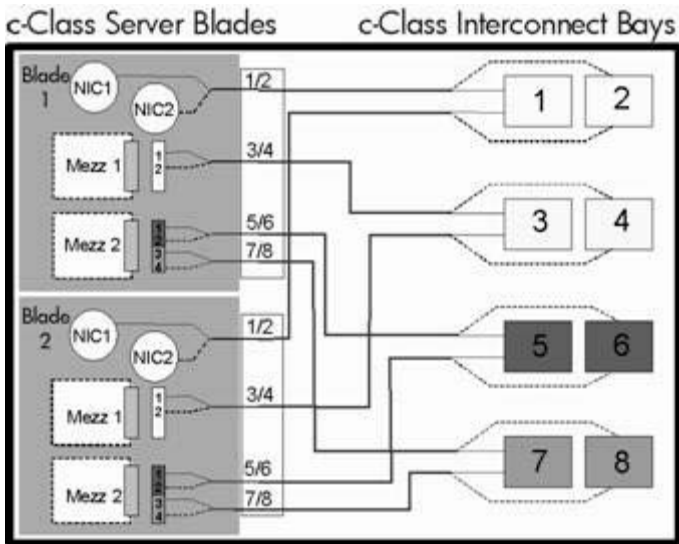
Half Height Server Blade   **Full Height Server Blade**

c-3000 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.
Hewlett Packard Enterprise has simplified the processes of mapping Mezzanine ports to switch ports by providing intelligent management tools via the Onboard Administrator and HPE Insight Manager Software. The Onboard Administrator Guide, Enclosure Setup and Installation Guide provides detailed information on port mapping.
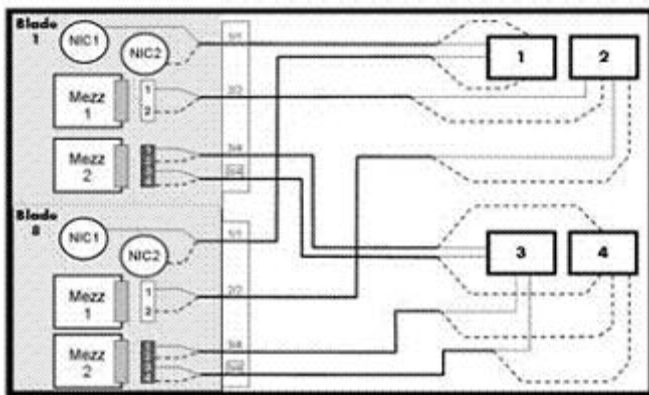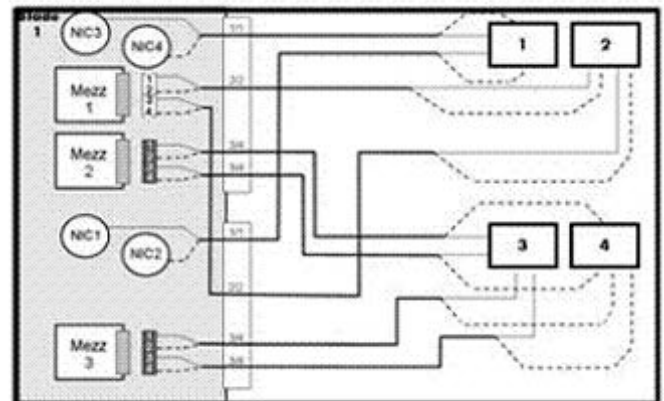

Half Height Server Blade   **Full Height Server Blade**

The following are supported configurations for the Virtual Connect Flex-10 Ethernet 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

Supported Products

Modules.

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

[Bay 1] VC-Enet	[Bay 2] Empty
[Bay 3] Other/empty	[Bay 4] Other/empty
[Bay 5] Other/empty	[Bay 6] Other/empty
[Bay 7] Other/empty	[Bay 8] Other/empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] Other/empty	[Bay 4] Other/empty
[Bay 5] Other/empty	[Bay 6] Other/empty
[Bay 7] Other/empty	[Bay 8] Other/empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-Enet	[Bay 4] VC-Enet
[Bay 5] Other/empty	[Bay 6] Other/empty
[Bay 7] Other/empty	[Bay 8] Other/empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] Other/empty	[Bay 4] Other/empty
[Bay 5] VC-Enet	[Bay 6] VC-Enet
[Bay 7] Empty	[Bay 8] Empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-Enet	[Bay 4] VC-Enet
[Bay 5] VC-Enet	[Bay 6] VC-Enet
[Bay 7] Empty	[Bay 8] Empty

[Bay 1] VC-Enet	[Bay 2] Empty
[Bay 3] VC-FC	[Bay 4] Empty
[Bay 5] Other/empty	[Bay 6] Other/empty
[Bay 7] Other/empty	[Bay 8] Other/empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-FC	[Bay 4] VC-FC
[Bay 5] Other/empty	[Bay 6] Other/empty
[Bay 7] Other/empty	[Bay 8] Other/empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-Enet	[Bay 4] VC-Enet
[Bay 5] VC-FC	[Bay 6] VC-FC
[Bay 7] Empty	[Bay 8] Empty

Supported Products

[Bay 1] VC-Enet*	[Bay 2] VC-Enet
[Bay 3] VC-Enet	[Bay 4] VC-Enet
[Bay 5] VC-FC	[Bay 6] VC-FC
[Bay 7] VC-FC	[Bay 8] VC-FC

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

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-FC	[Bay 4] VC-FC
[Bay 5] VC-Enet	[Bay 6] VC-Enet
[Bay 7] Empty	[Bay 8] Empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-FC	[Bay 4] VC-FC
[Bay 5] VC-Enet	[Bay 6] VC-Enet
[Bay 7] VC-Enet	[Bay 8] VC-Enet

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] Other/empty	[Bay 4] Other/empty
[Bay 5] VC-FC	[Bay 6] VC-FC
[Bay 7] Empty	[Bay 8] Empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-FC	[Bay 4] VC-FC
[Bay 5] VC-FC	[Bay 6] VC-FC
[Bay 7] Empty	[Bay 8] Empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-Enet	[Bay 4] VC-Enet
[Bay 5] VC-Enet	[Bay 6] VC-Enet
[Bay 7] VC-Enet	[Bay 8] VC-Enet

HPE BladeSystem c3000 Enclosure

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

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

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

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

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

Supported Products

NOTE: When using VC Flex-10 Modules with Flex-10 NICs on server blades, only VC Ethernet modules may be used for Ethernet connections in the same enclosure.

Required Cabling NOTE: For available cables; please see the "Options" section below of this QuickSpecs.

Maximum Distances	Multimode OM1 62.5/125 micron	Multimode OM2 50/125 micron	Multimode OM3 50/125 micron	Singlemode 9 micron
SR	2 - 26m/33m*	2 - 82m	2 - 300m	
LR				2 -10km
LRM	0.5 - 220m	0.5 - 220m	0.5 - 220m	

* 26m at 160MHz and 33m at 200MHz.
NOTE: For additional information on 10Gb cable specifications go to:
http://www.hpe.com/rnd/pdfs/10gig_cabling_technical_brief.pdf

---

Stacking Configuration Stacking links are used to interconnect Virtual Connect Ethernet Modules when using more than one enclosure or when using more than two Virtual Connect Ethernet Modules in a single enclosure.
All Virtual Connect Modules within the VC Domain must be interconnected. Any combination of 1Gb and 10Gb cables can be used to interconnect the Virtual Connect Modules; however the following provides recommended configurations (note that a built-in 10Gb link is provided between modules in horizontally adjacent bays). Supported cable lengths on 10Gb uplinks are 3 to 15 meters and supported 10Gb stacking links (connecting between two HPE Virtual Connect Ethernet Modules) are 0.5 to 7 meters. Interconnecting the modules allows all Ethernet NICs on all server blades in the Virtual Connect domain to have access to any Virtual Connect uplink port. By using these module-to-module links, a single pair of uplinks can be used as the data center network connections for the entire Virtual Connect domain, and allows any server blade to be connected to any Ethernet network.
NOTE: Supported module-to-module and multi-enclosure stacking configurations may be found in the HPE Virtual Connect for c-Class BladeSystem Setup and Installation Guide which can be downloaded at the following address: **HPE Virtual Connect for c-Class BladeSystem and Installation Guide**

Standard Features

Product Features   **Performance**
- 16 x 10Gb downlinks to server NICs
- Each 10Gb downlink supports up to 4 FlexNICs or 3 FlexNICs and 1 iSCSI FlexHBA
- Each iSCSI FlexHBA can be configured to transport Accelerated iSCSI protocol.
- Each FlexNIC and iSCSI FlexHBA is recognized by the server as a PCI-e physical function device with adjustable speeds from 100Mb to 10Gb in 100Mb increments when connected to a HPE NC553i 10Gb 2-port FlexFabric Converged Network Adapter or any Flex-10 NIC and from 1Gb to 10Gb in 100Mb increments when connected to a NC551i Dual Port FlexFabric 10Gb Converged Network Adapter or NC551m Dual Port FlexFabric 10Gb Converged Network Adapter including NC554FLB Dual Port FlexFabric Adapter
- 4 x 10Gb cross connects for redundancy and stacking
- 10 x 10Gb SR, LR, or LRM fiber and copper SFP+ uplinks
- Supports up to 4 FlexNICs per 10Gb server connections.
- Each FlexNIC is recognized by the server as a PCI-e physical function device with customizable speeds from 100Mb to 10Gb.
- Line Rate, full-duplex 600 Gbps bridging fabric
- 1.0 μs latency
- MTU up to 9216 Bytes - Jumbo Frames
- Supports up to 128K MAC addresses and 1K IGMP groups
- VLAN Tagging, Pass-Thru and Link Aggregation supported on all uplinks
- In tunneled VLAN mode, up to 4,096 networks are supported per network uplink and server downlink. In mapped VLAN mode, up to 1,000 networks are supported on network uplinks per Share Uplink Set, domain or module and on server downlinks up to 162 networks are supported per 10Gb physical port (VC v3.30 or later).
- Stack multiple Virtual Connect Flex-10/10D modules with other VC Flex-10/10D, VC FlexFabric or VC Flex-10 across up to 4 BladeSystem enclosures allowing any server Ethernet port to connect to any Ethernet uplink

Management
- Virtual Connect Manager is included with every module
- HTTPS and a secure, scriptable CLI interface is ready out of the box. Easy setup and management via the Onboard Administrator interface
- SNMP v.1, v.2 and v.3, provide ease of administration and maintenance.
- Port Mirroring on any uplink provides network troubleshooting support with Network Analyzers
- IGMP Snooping optimizes network traffic and reduces bandwidth for multicast applications such as streaming applications
- Role-based security for network and server administration with LDAP, TACACS+ and RADIUS compatibility
- Remotely update Virtual Connect firmware on multiple modules using Virtual Connect Support Utility 1.11.0 or greater
- CLI auto-filling with TAB key
- GUI and CLI session timeout for security
- QoS configurable based on DOT1P and DSCP
- Configurable filtering of multicast traffic
- sFlow monitoring

Virtual Connect Server Profiles
- Create up to 4 individual FlexNICs with their own dedicated, customized bandwidth per 10Gb downlink connection.
- Set FlexNIC speeds from 100Mb to 10Gb per connection
- Allows setup of server connectivity prior to server installation for easy deployment
- Ability to move, add, or change server network connections on the fly
- Once defined, LAN and SAN administrators don't have to be involved in server changes

Standard Features

Options
- Stack multiple Virtual Connect Ethernet modules together in an enclosure to allow any server Ethernet port to connect to any uplink
- The Fibre Channel Virtual Connect Module included provides a complete LAN and SAN Virtual Connect solution
- Optional HPE SFP+ SR, LR, and LRM modules and SFP+ Copper cables in 0.5m, 1m, 3m, and 7m lengths
- Supports all 1Gb Server NICs including LOM and Mezzanine card options and the latest 10Gb KR NICs

Service and Support, HPE Care Pack and Warranty Information

Service and Support

HPE Technology Services for Industry Standard Servers and BladeSystem
Capitalizing on HPE ProLiant server and HPE BladeSystem capabilities requires a service partner who understands your increasingly complex business technology environment. That's why it makes sense to team up with the people who know Hewlett Packard Enterprise infrastructure hardware and software best - the experienced professionals at HPE Services.

Protect your business beyond warranty with HPE Pointnext operational services
HPE Pointnext operational services offer complete care and support expertise with committed response choices designed to meet your IT and business needs.

HPE Foundation Care services offer scalable reactive support-packages for Hewlett Packard Enterprise servers and software. You can choose the type and level of service that is most suitable for your IT and business needs. HPE Proactive Care delivers high levels of system availability through proactive service management and advanced technical response. HPE Datacenter Care provides highly flexible environmental support to address unique customer business needs.

Choose a recommended service appropriate to your product or contact your Hewlett Packard Enterprise sales representative or authorized HPE ServiceOne partner for additional HPE Pointnext operational services information.

Recommended HPE Pointnext operational services for your HPE product

Optimized Care

3-Year HPE 6 hour Call to Repair Response, Proactive Care
Combined reactive and proactive support for hardware and software helping optimize your systems and delivering high levels of availability through proactive service management and advanced technical response. Hardware problem resolution to return the hardware in operating condition within 6 hours of the initial service request. A Technical Account Manager, as your single point of contact, will own your call or issue end to end until resolved.
https://www.hpe.com/h20195/v2/getpdf.aspx/4aa3-8855eee.pdf

HPE Installation and Startup Service for HPE BladeSystem c-Class Infrastructure for c7000 enclosure
Provides for hardware installation (c-Class ProLiant and Integrity server blades, storage blades, Ethernet Interconnects and Virtual Connect) and software installation and startup of a BladeSystem c7000 Infrastructure in a single enclosure including deployment of OS (two servers), HPE Insight Control and Server Deployment (formerly RDP).
https://www.hpe.com/h20195/v2/getpdf.aspx/4aa0-5964enw.pdf

HPE Installation and Startup Service for HPE BladeSystem c-Class Enhanced Network
Hewlett Packard Enterprise provides for the configuration and testing of BladeSystem Ethernet interconnect switches and Virtual Connect to facilitate proper implementation of network protocols and access to advanced features.
https://www.hpe.com/h20195/v2/getpdf.aspx/4aa0-5969enw.pdf

Standard Care

3-Year HPE 24x7 4 hour response, Proactive Care Service
This service gives you combined reactive and proactive support including rapid access to our Advanced Solution Center to manage and prevent problems and a Technical Support Specialist with a broad level of technical knowledge that will engage with additional technical expertise as needed from HPE's vast global resources.
https://www.hpe.com/h20195/v2/getpdf.aspx/4aa3-8855eee.pdf

HPE Installation and Startup Service for HPE BladeSystem c-Class Infrastructure for c7000 enclosure

Service and Support, HPE Care Pack and Warranty Information

Provides for hardware installation (c-Class ProLiant and Integrity server blades, storage blades, Ethernet Interconnects and Virtual Connect) and software installation and startup of a BladeSystem c7000 Infrastructure in a single enclosure including deployment of OS (two servers), HPE Insight Control and Server Deployment (formerly RDP).
https://www.hpe.com/h20195/v2/getpdf.aspx/4aa0-5964enw.pdf

HPE Installation and Startup Service for HPE BladeSystem c-Class Enhanced Network
Hewlett Packard Enterprise provides for the configuration and testing of BladeSystem Ethernet interconnect switches and Virtual Connect to facilitate proper implementation of network protocols and access to advanced features.
https://www.hpe.com/h20195/v2/getpdf.aspx/4aa0-5969enw.pdf

Related Services	**HPE Proactive Care Personalized Support - Environmental Option** The Personalized Support option provides an assigned Account Support Manager who can bring best practices from across the industry plus extra technical skills to your IT team. This option is only available as an add-on to HPE Proactive Care Support. **HPE Proactive Select Service** Provides a flexible way to purchase HPE best-in-class consultancy and technical services. You can buy Proactive Select Service Credits when you purchase your hardware and then use the credits over the next 12 months. **https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855enw.pdf** **NOTE:** Additional HPE Pointnext operational services can be found at: **http://ssc.hpe.com/portal/site/ssc/**
Insight Online/Insight Remote Support	HPE Insight Remote Support provides 24 X 7 remote monitoring, proactive notifications, and problem resolution. This comes at no additional cost with your HPE solution. Learn more about Insight Remote Support **http://www.hpe.com/info/insightremotesupport/docs** and Insight Online **http://www.hpe.com/info/insightonline** **NOTE:** Insight Remote Support is a prerequisite for Proactive Care. All blades within a single HPE BladeSystem enclosure must be at the same service level
HPE Support Center	Personalized online support portal with access to information, tools and experts to support Hewlett Packard Enterprise business products. Submit support cases online, chat with HPE experts, access support resources or collaborate with peers. Learn more **http://www.hpe.com/info/hpesc** The HPE Support Center Mobile App allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime. HPE Insight Remote Support and HPE Support Center are available at no additional cost with a HPE warranty, HPE Care Pack or Hewlett Packard Enterprise contractual support agreement. **NOTE:** HPE Support Center Mobile App is subject to local availability.
Parts and materials	Hewlett Packard Enterprise 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 QuickSpecs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services. The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by HPE due to malfunction
Warranty	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:

Service and Support, HPE Care Pack and Warranty Information

http://h17007.www1.hpe.com/us/en/enterprise/servers/warranty/

For more information

To learn more on HPE ProLiant servers and HPE BladeSystem servers, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Or visit: **http://www.hpe.com/services/bladesystem**

Parts and Materials

Hewlett Packard Enterprise 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.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction.

Related Options

Cabling and Transceiver Options	HPE BladeSystem c-Class 10GbE SFP+ to SFP+ 0.5m Direct Attach Copper Cable	487649-B21
	HPE BladeSystem c-Class 10GbE SFP+ to SFP+ 1m Direct Attach Copper Cable	487652-B21
	HPE BladeSystem c-Class 10GbE SFP+ to SFP+ 3m Direct Attach Copper Cable	487655-B21
	HPE BladeSystem c-Class 10GbE SFP+ to SFP+ 5m Direct Attach Copper Cable	537963-B21
	HPE BladeSystem c-Class 10GbE SFP+ to SFP+ 7m Direct Attach Copper Cable	487658-B21
	HPE C-series SFP+ to SFP+ Active Copper 7.0m Direct Attach Cable	QK701A
	HPE C-series SFP+ to SFP+ Active Copper 10.0m Direct Attach Cable	QK702A
	HPE FlexNetwork X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
	HPE FlexNetwork X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
	HPE X242 10G SFP+ to SFP+ 1m Direct Attach Copper Cable	J9281B
	HPE X242 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	J9283B
	HPE X242 10G SFP+ to SFP+ 7m Direct Attach Copper Cable	J9285B
	HP X242 10G SFP+ to SFP+ 10m Direct Attach Copper Cable	J9286B
	HP X242 10G SFP+ to SFP+ 15m Direct Attach Copper Cable	J9287B
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
	HPE B-series SFP+ to SFP+ Active Copper 1.0m Direct Attach Cable	AP818A
	HPE B-series SFP+ to SFP+ Active Copper 3.0m Direct Attach Cable	AP819A
	HPE B-series SFP+ to SFP+ Active Copper 5.0m Direct Attach Cable	AP820A

10GBase-T SFP+ Transceivers

HPE 10GBase-T SFP+ Transceiver	813874-B21

Ethernet Optical Transceivers

HPE BladeSystem c-Class 10Gb SFP+ SR Transceiver	455883-B21
HPE BladeSystem c-Class 10Gb SFP+ LR Transceiver	455886-B21

NOTE: Requires single-mode fiber.

HPE BladeSystem c-Class 10Gb SFP+ LRM Transceiver	455889-B21
HPE BladeSystem c-Class Virtual Connect 1G SFP SX Transceiver	453151-B21
HPE BladeSystem c-Class Virtual Connect 1G SFP RJ-45 Transceiver	453154-B21
HPE X132 10G SFP+ LC SR Transceiver	J9150A
HPE X132 10G SFP+ LC LR Transceiver	J9151A

NOTE: Requires single-mode fiber.

HPE X132 10G SFP+ LC LRM Transceiver	J9152A
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

Related Options

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

NOTE: In addition to the supported HPE and non-HPE Copper Twinax and Active Copper SFP+ cables above, Virtual Connect provides "allowed" connections using third party cables that meet the following criteria: connector=copper pigtail; transceiver code=active cable or passive cable; speed equal or less than 10Gb; length between 1m and 7m, inclusive. All "allowed" DACs are connected and logged. Prior to requesting support from HPE, a DAC from the supported list above must be used to verify a cable issue is not involved.

Service and Support Offerings

NOTE: HPE Pointnext operational services for the c7000 and c3000 Enclosures cover the enclosure, power supplies and fans. HPE Virtual Connect Flex-10/10D Modules for c-Class BladeSystem are also covered by the c7000 and c3000 enclosures Care Pack services.

NOTE: Some options, including Fibre Channel and InfiniBand switches for the HPE c-Class BladeSystem, are not covered under the c7000/c3000 enclosure Care Packs and carry separate Care Packs. Care Pack service level support for these options should always be uplifted to match existing storage or server service level.

Proactive Care Services for the c7000 Enclosure

HPE 3 year Proactive Care 24x7 c7000 Enclosure Service	U3C33E
HPE 3 year Proactive Care Call to Repair c7000 Enclosure Service	U3C36E
HPE 3 year Proactive Care 24x7 c7000 Enclosure with Insight Control Service	U3P10E
HPE 3 year Proactive Care Call to Repair c7000 Enclosure with Insight Control Service	U3P13E

Proactive Care Services for the c3000 Enclosure

HPE 3 year Proactive Care 24x7 c3000 Enclosure Service	U3C42E
HPE 3 year Proactive Care Call to Repair c3000 Enclosure Service	U3C45E
HPE 3 year Proactive Care 24x7 c3000 Enclosure with Insight Control Service	U3P19E
HPE 3 year Proactive Care Call to Repair c3000 Enclosure with Insight Control Service	U3P22E

HPE Proactive Care Personalized Support (Environmental Option)

Installation & Start-up Services recommended for the c7000

HPE BladeSystem c7000 Infrastructure Startup Service	UE602E
HPE BladSys c7000 Encd Network Startup Service	UE603E

Installation & Start-up Services recommended for the c3000

HPE BladeSystem c3000 Infrastructure Startup Service	UF817E
HPE BladeSystem c3000 + OS Startup Service	UF818E
HPE BladSys c3000 Encd Network Startup Service	UF814E

Additional HPE Pointnext operational services can be found at:
http://www.hpe.com/info/cpc

Technical Specifications

Shipping Dimensions	**Length**	13.88 in (352.55 mm)	
	Width	10.63 in (270.00 mm)	
	Height	4.75 in (120.65 mm)	
Shipping Weight		4.4 lbs (2.0 kg)	
Product Specifications Hardware	**Performance**	Line Rate, full-duplex 600Gbps bridging fabric	
		Non-blocking architecture	
		Maximum transmission unit (MTU) of up to 9216 bytes (jumbo frames)	
	Connectors and Cabling	16 x 10Gb downlinks midplane	
		4x 10Gb cross connect	
		10 x 10Gb SR, LR, or LRM fiber uplinks SFP+	
		Ethernet and RS-232 internal interface to c-Class Onboard Administrator Module	
	Indicators	Recessed Momentary Reset Switch	
		Momentary Next/Step Switch	
		Backlit port number and status indicator LED, one per bulkhead port, blue/amber/green	
		Module status indicator, amber/green	
		Module locator (UID), blue	
		Link indicator, one per SFP+-port, green/amber	
	Dimensions	Length	10.5 in (267.7 mm)
		Width	7.5 in (92.79 mm)
		Height	1.1 in (27.94 mm)
	Weight	1.27Kg (2.8 Lbs)	
	Environmental Ranges	**Temperature Range**	
		Specification	10C to 35C (50F to 95F)
		Temperature Range*	
		Operating	10C to 35C (50F to 95F)
		Shipping	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%

* All temperature ratings shown are for sea level. An altitude derating of 1°C per 304.8 m (1.8°F per 1,000 ft) to 3048 m (10,000 ft) is applicable. No direct sunlight allowed. Upper operating limit is 3,048m (10,000 ft) or 70 Kpa/10.1 psia. Upper non-operating limit is 9,144 m (30,000 ft) or 30.3 KPa/4.4 psia.

** Storage maximum humidity of 95% is based on a maximum temperature of 45°C (113°F). Altitude maximum for storage corresponds to a pressure minimum of 70 KPa.

Power Specification   12V @ 5.83A (70W

Technical Specifications

Product Specifications Software	**Security Features**	HTTPS (HTTP exchanged over an SSL-encrypted session) is required for access to the Virtual Connect Manager.
		Access to the Virtual Connect Manager is via the system Onboard Administrator
		Each user account can be configured for a combination of four access privileges to control and/or view elements in the Virtual Connect Manager.
		Role based customization to assign various privileges to Server Admin, Network Admin and Storage Admin.
		User verification by account name and password (Case Sensitive) LDAP Authentication services provide role based security via an LDAP SSL Directory Server connection.
		Administrator controlled password length and strength requirements
		TACACS+ authentication, authorization and accounting RADIUS authentication and authorization
		Private VLAN's for secure connectivity between servers within a domain
		Configurable filtering of multicast traffic
		Compliant with United States Department of Defense **Policy on Use of Department of Defense (DoD) Information Systems Standard Consent Banner and User Agreement**
		GUI and CLI session timeout
	Trunking and Failover Features	Shared Uplink Sets using Link Aggregation Control Protocol (LACP) allows the creation of Ethernet channeling with upstream switches that conform to IEEE 802.3ad. Ports can alternatively be configured for failover only.
		External ports within a Port Set can be on the same VC Ethernet module or on multiple VC modules within the VC domain.
		In the event of an uplink failure to a data center switch, the next highest performance uplink connection or aggregation will become active.
		Fast MAC Cache failover enables rapid recovery of network connections when a standby module becomes active. Smart Link network senses a failed upstream switch connection and allows teamed NICs to properly failover.
		Configure uplink speeds to Auto, 1Gb or 10Gb on the associated uplinks
	VLAN Features	802.1Q VLAN supported on uplinks.
		Uplink ports can be configured for VLAN tagging at egress or pass-thru of tagged VLAN packets from Server ports.
		Native VLAN support for untagged packets on a shared uplink set. Packets can be

Technical Specifications

targeted to a specific server ports.

Simultaneous tunneled and mapped VLAN connections to a single domain.

	Management Features	Simple and intuitive Graphical User Interface (GUI) for defining, configuring, and managing all elements of the Virtual Connect Domain.

Setup Wizards for server profile creation and initial domain installation and configuration and network configuration.

Comprehensive administration, definition, and management of Ethernet Network, Shared Uplink Set, and Server Profiles

Embedded SNMP v1, v2, v3 and SMI-S agents allow Network Management applications to query Virtual Connect for statistics and trap information.

sFlow v5 for flow monitoring and capacity planning.

A robust, scriptable and secure Command Line Interface simplifies management and enables macros to control common Virtual Connect tasks

Any uplink port can be used as a dedicated mirrored port for traffic analysis and troubleshooting by a Network Analyzer or Sniffer.

Domain Management of user accounts, enclosure, Virtual Connect domain settings, and firmware updates

The location and status of Virtual Connect Modules in the HPE 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.

MAC Address Administration allows local administration of predefined or user-defined MAC address ranges.

VC manager runs as a high-availability pair when a partner module is installed in the adjacent bay. All configuration data is stored in flash memory and checkpointed to the standby module. Configurations can also be backed up to a workstation via the GUI.

Up to 128 Network Access Groups can be defined to prevent enabling specific network combinations in the same server profile

Supported by HPE Virtual Connect Enterprise Management v7.3.2 and higher. Provides centralized network connection management and workload mobility for thousands of servers. Learn more at: **http://www.hpe.com/info/vcem**

Management and Standards Support	**Standards**	IEEE 802.1Qbb IEEE 802.1Qaz 802.1AB LLDP 802.1Q (VLAN includes Native VLAN support and server side VLAN tag mapping) IEEE 802.2 LLC 802.3ad Link Aggregation IEEE 802.3ae 10Gb Fiber Ethernet IEEE 802.3ak 10Gb CX-4 Ethernet IEEE 802.3aq 10Gb LRM Ethernet SNMP v.1, v.2, v.3

Technical Specifications

IGMP v1, v2, v3
FC-BB5 (FIP Snooping (FCoE) supported only on C7000)
sFlow v5

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 Hewlett Packard Enterprise product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: **http://www.hpe.com/info/recycle**. To recycle your product, please go to: **http://www.hpe.com/info/recycle** or contact your nearest Hewlett Packard Enterprise sales office. 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: **http://www.hpe.com/info/recycle**. These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change
23-Oct-2017	From Version 18 to 19	Changed	Care Pack naming and Service and Support- Parts and Materials updated.
04-Sep-2017	From Version 17 to 18	Changed	Supported Products section was updated.
08-May-2017	From Version 16 to 17	Changed	Supported Products, and Related Options sections were updated. URLs updated to hpe.com
16-Dec-2016	From Version 15 to 16	Changed	Related Options section was updated.
		Added	SKU added in Related Options section: 813874-B21
21-Oct-2016	From Version 14 to 15	Changed	Rebranding edition.
13-Feb-2015	From Version 13 to 14	Changed	Overview and Supported Products were updated
10-Oct-2014	From Version 12 to 13	Changed	Compatibility and Product Features sections were updated.
15-Aug-2014	From Version 11 to 12	Changed	Cabling and Transceivers were revised.
03-Jul-2014	From Version 10 to 11	Changed	Cabling and Transceivers were revised.
18-Apr-2014	From Version 9 to 10	Changed	Compatibility and product descriptions were revised.
03-Mar-2014	From Version 8 to 9	Changed	Change made in the standard features.
10-Sep-2013	From Version 7 to 8	Changed	Supported Products, Standard Features, and Related Options were revised.
14-Jun-2013	From Version 6 to 7	Removed	Mentions of sFlow support were removed.
10-Jun-2013	From Version 4 to 6	Added	Added the Standard Features section
18-Jan-2013	From Version 3 to 4	Changed	Changes were made in the Overview, Supported Products, Service and Support, Related Options and Technical Specification sections.
		Changed	Changes were made in the Models, Supported Products and Related Options sections.
09-Nov-2012	From Version 2 to 3	Changed	Changes were made in Supported Products section.
24-Aug-2012	From Version 1 to 2	Changed	Changes were made in Overview, Compatibility and Related Options sections.

f 𝕏 in ✉
Sign up for updates

**Hewlett Packard
Enterprise**

c04154336 - 14408 - Worldwide - V19 - 23-October-2017