

Overview

Simplify and make your data center change-ready. The HP Virtual Connect Flex-10 10Gb Ethernet Module for the c-Class BladeSystem is the simplest, most flexible connection to your networks. The Virtual Connect Flex-10 Ethernet 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. HP 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 HP Virtual Connect Flex-10 10Gb Ethernet Module for c-Class BladeSystem is an innovative, new class of integrated interconnects from HP.

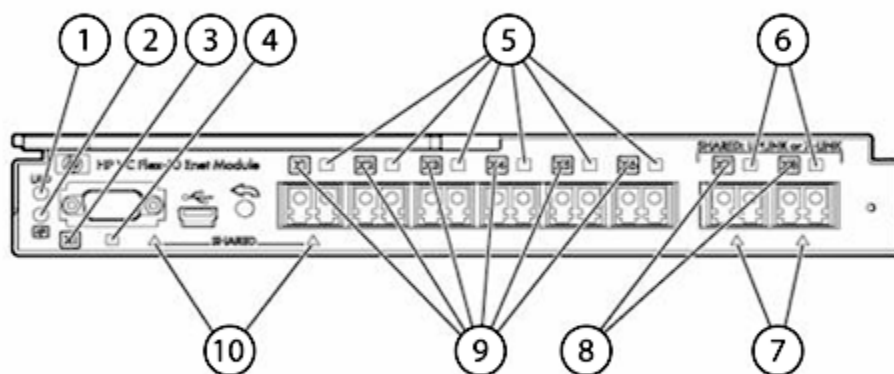


Figure 1 Virtual Connect Ethernet Module Front Bezel

- | | |
|--|---|
| 1. Module locator UUID | 6. Link indicator |
| 2. Module status indicator | 7. Active multiplexed port indicator |
| 3. 10Gb CX4 Backlit port number and status indicator | 8. Backlit port number and status indicator LED |
| 4. 10Gb CX4 link indicator | 9. Backlit port number and status indicator LED |
| 5. Link indicator | 10. Active multiplexed port indicator |

Overview

At A Glance

Performance

- 16 x 10Gb downlinks to server NICs
- 2 x 10Gb cross connects for redundancy and stacking
- 1 x 10Gb copper uplinks CX-4 for stacking to Virtual Connect Modules or uplinking to data center switches
- 8 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 240Gbps bridging fabric
- Less than 1ms latency
- MTU up to 9216 Bytes - Jumbo Frames
- Configurable up to 8192 MAC addresses and 1000 IGMP groups
- VLAN Tagging, Pass-Thru and Link Aggregation supported on all uplinks

Management

- Virtual Connect Manager is included with every module
- HTTP and a secure, scriptable CLI interface is ready out of the box. Easy setup and management via the Onboard Administrator interface
- SNMP v.1 and v.2, provide ease of administration and maintenance.
- Role-based security for network and server administration with LDAP compatibility
- 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
- Recognizes and directs Server-Side VLAN tags
- Appears as a Pass-Thru device to the LAN Manager

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

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 provides a complete LAN and SAN Virtual Connect solution
- HP CX4 Ethernet cables are available in .5m, 1m, 3m, and 15m lengths
- Optional HP 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

Models

HP Virtual Connect Flex-10 10Gb Ethernet Module for the c-Class BladeSystem

455880-B21

Supported Products

Compatibility

HP ProLiant Servers and Network options

The HP BladeSystem c-Class Virtual Connect Firmware v2.X supports the following hardware. For the HP Virtual Connect Manager Release Notes and Compatibility Matrix and the full listing of recommended and minimum firmware versions, see the [HP website](#).

- Virtual Connect Modules
 - HP 1/10Gb Virtual Connect Ethernet Module
 - HP 1/10Gb-F Virtual Connect Ethernet Module
 - HP 4Gb Virtual Connect Fibre Channel Module
- Server blades and workstation blades
 - HP ProLiant BL2x220c G5 Server Blade
 - HP ProLiant BL260c G5 Server Blade
 - HP ProLiant BL460c Server Blade
 - HP ProLiant BL465c Server Blade
 - HP ProLiant BL480c Server Blade
 - HP ProLiant BL495c Server Blade
 - HP ProLiant BL680c G5 Server Blade
 - HP ProLiant BL685c Server Blade
 - HP Integrity BL860c Server Blade
 - HP Integrity BL870c Server Blade
 - HP ProLiant xw460c Blade Workstation
- Enclosures
 - HP BladeSystem c-Class c7000 Enclosure with Onboard Administrator
 - HP BladeSystem c-Class c3000 Enclosure with Onboard Administrator
- Integrated Network Interfaces and mezzanine cards
 - HP BladeSystem Dual NC370i Multifunction Network Adapter
 - HP NC373i Integrated Multifunction Gigabit Server Adapter
 - HP NC373m PCI Express Dual Port Multifunction Gigabit Server Adapter
 - HP NC326i Integrated Dual Port PCI Express Gigabit Server Adapter
 - HP NC326m PCI Express Dual Port Multifunction Gigabit Server Adapter
 - HP NC382m PCI Express Dual Port Multifunction Gigabit Server Adapter
 - HP NC325m PCI Express Quad Port Gigabit Server Adapter
 - HP NC532m Dual Port 10GbE Multifunction Server Adapter
 - HP NC360m Dual Port 1GbE BL-c Adapter (supported by v1.21)
 - HP NC364m Quad Port 1GbE BL-c Adapter (supported by v1.21)
 - HP Qlogic QMH2462 4Gb FC HBA for c-Class BladeSystem
 - HP Emulex LPe1105-HP 4Gb FC HBA for c-Class BladeSystem

For optimal operation of HP Virtual Connect Manager, use the following recommended firmware version for the Onboard Administrator and iLO.

| Virtual Connect Firmware version | Onboard Administrator | iLO |
|----------------------------------|--|---|
| VC 2.0 | For c7000 Enclosure, recommended version 2.25 or higher For c3000 Enclosure, recommended version 2.25 or higher | ProLiant: Recommended version 1.6 or higher Integrity: Recommended version T.02.17 or higher |

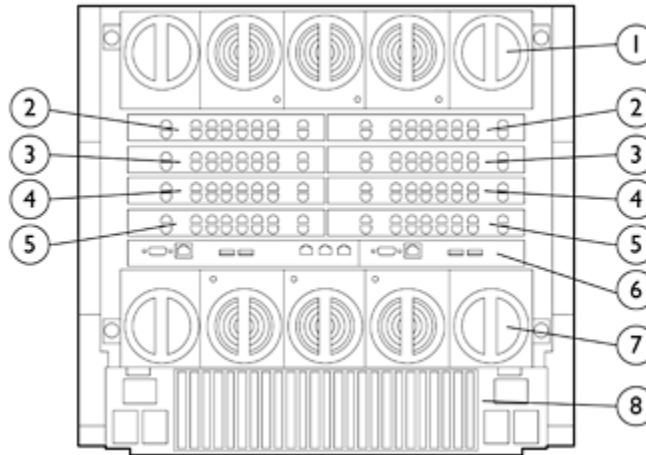
For the HP Virtual Connect Manager Release Notes and Compatibility Matrix and the full listing of recommended and minimum firmware versions, see the [HP website](#).

ProLiant BL c-Class Server Blade Enclosures

- The HP BladeSystem c3000 and c7000 Enclosure has 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. Virtual Connect requires the following minimum firmware levels:

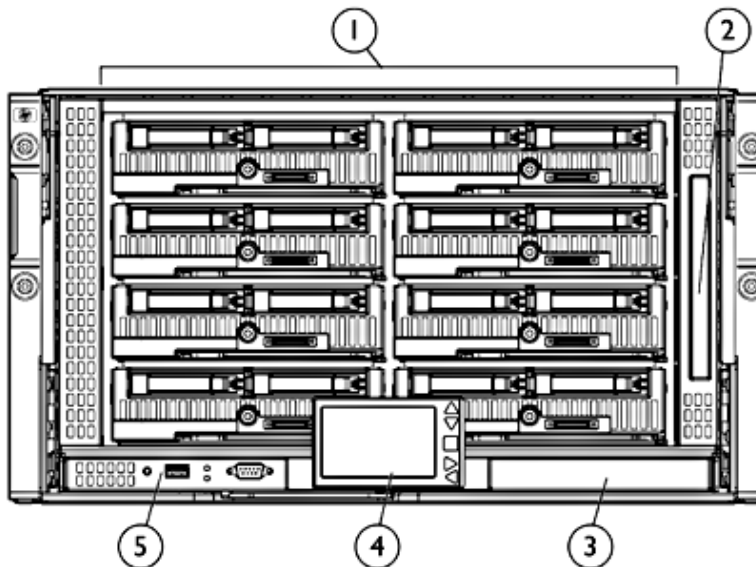
Supported Products

Supported Configurations



HP BladeSystem c7000 Enclosure - Rear View

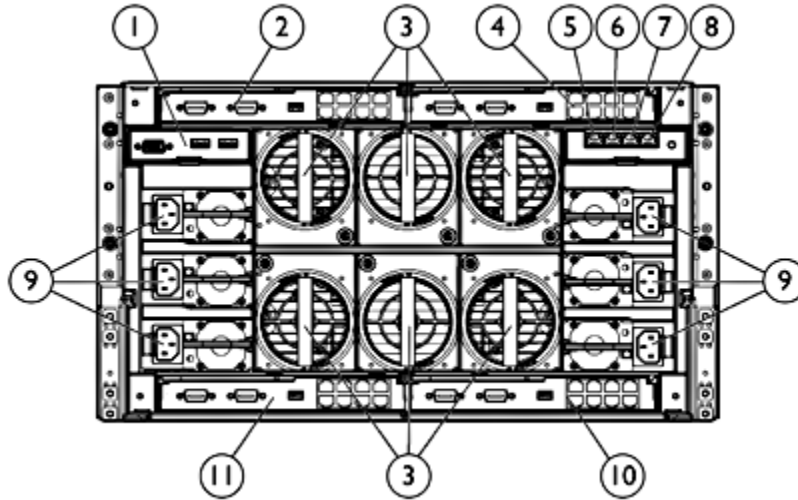
- | | |
|----------------------------|---------------------------------|
| 1. Upper Fan System | 5. Interconnect Bays 7 / 8 |
| 2. Interconnect Bays 1 / 2 | 6. On Board Administrator |
| 3. Interconnect Bays 3 / 4 | 7. Lower Fan System |
| 4. Interconnect Bays 5 / 6 | 8. Rear Redundant Power Complex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



HP BladeSystem c3000 Enclosure - Front View

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

Supported Products



HP BladeSystem c3000 Enclosure - Rear View

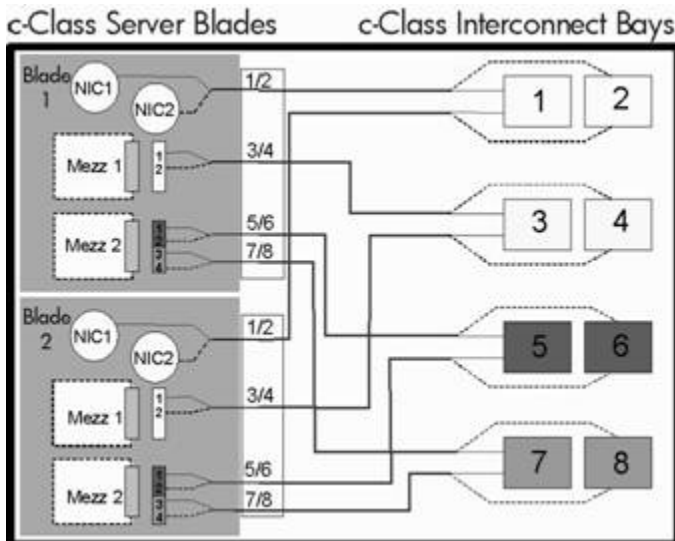
- | | |
|--|---|
| 1. Local KVM interface (reserved for future) | 7. iLO/Onboard Administrator Port |
| 2. Interconnect Bay 1 | 8. iLO/Onboard Administrator Port 2 (reserved for future) |
| 3. Active Cool Fans | 9. Power Supplies |
| 4. Interconnect Bay 2 | 10. Interconnect Bay 4 |
| 5. Enclosure Up-link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

Mezzanines

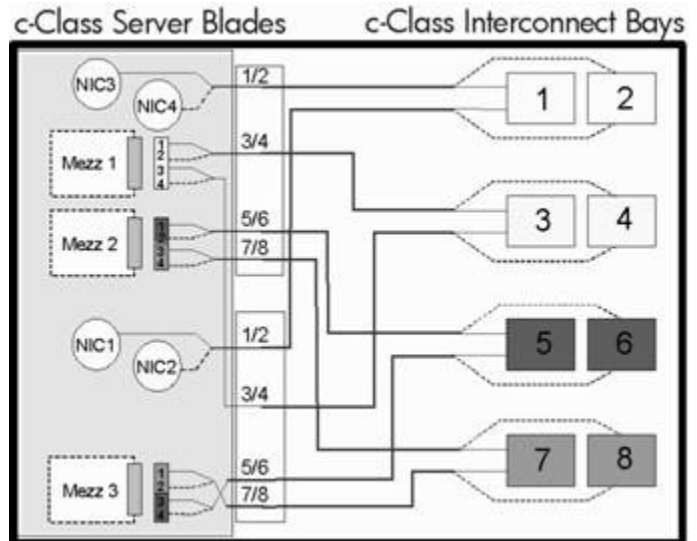
c-7000 Port Mapping

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.

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.



Half Height Server Blade



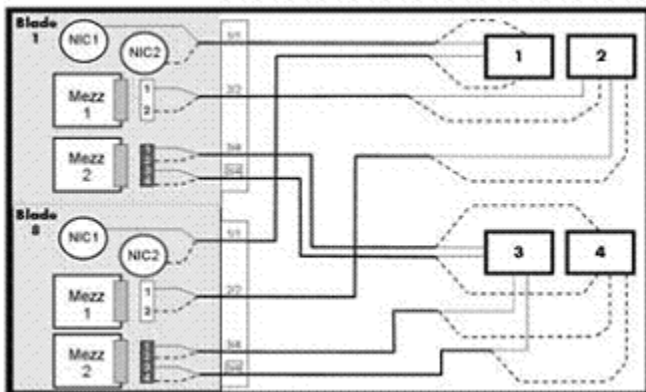
Full Height Server Blade

Supported Products

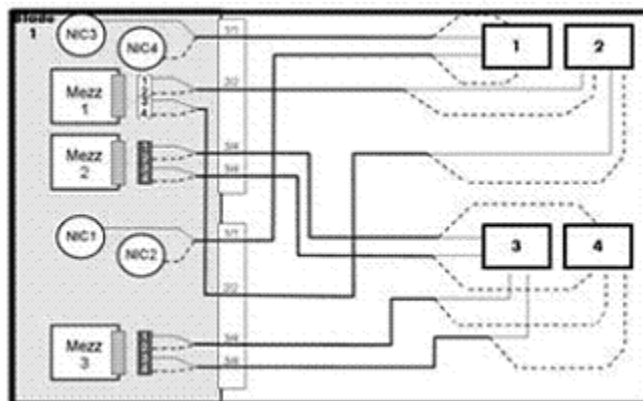
c-3000 Port Mapping

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.

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.



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-Through 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.

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 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 |

Supported Products

| | |
|-----------------|-----------------|
| [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 |

| | |
|------------------|-----------------|
| [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 |

Supported Products

| | |
|-----------------|-----------------|
| [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 |

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 2] VC-Enet |
| [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 |

Required Cabling

10GBASE-CX4

Twinax CX4 (0.5 to 15m)

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.hewlett-packard.com/rnd/pdfs/10gig_cabling_technical_brief.pdf

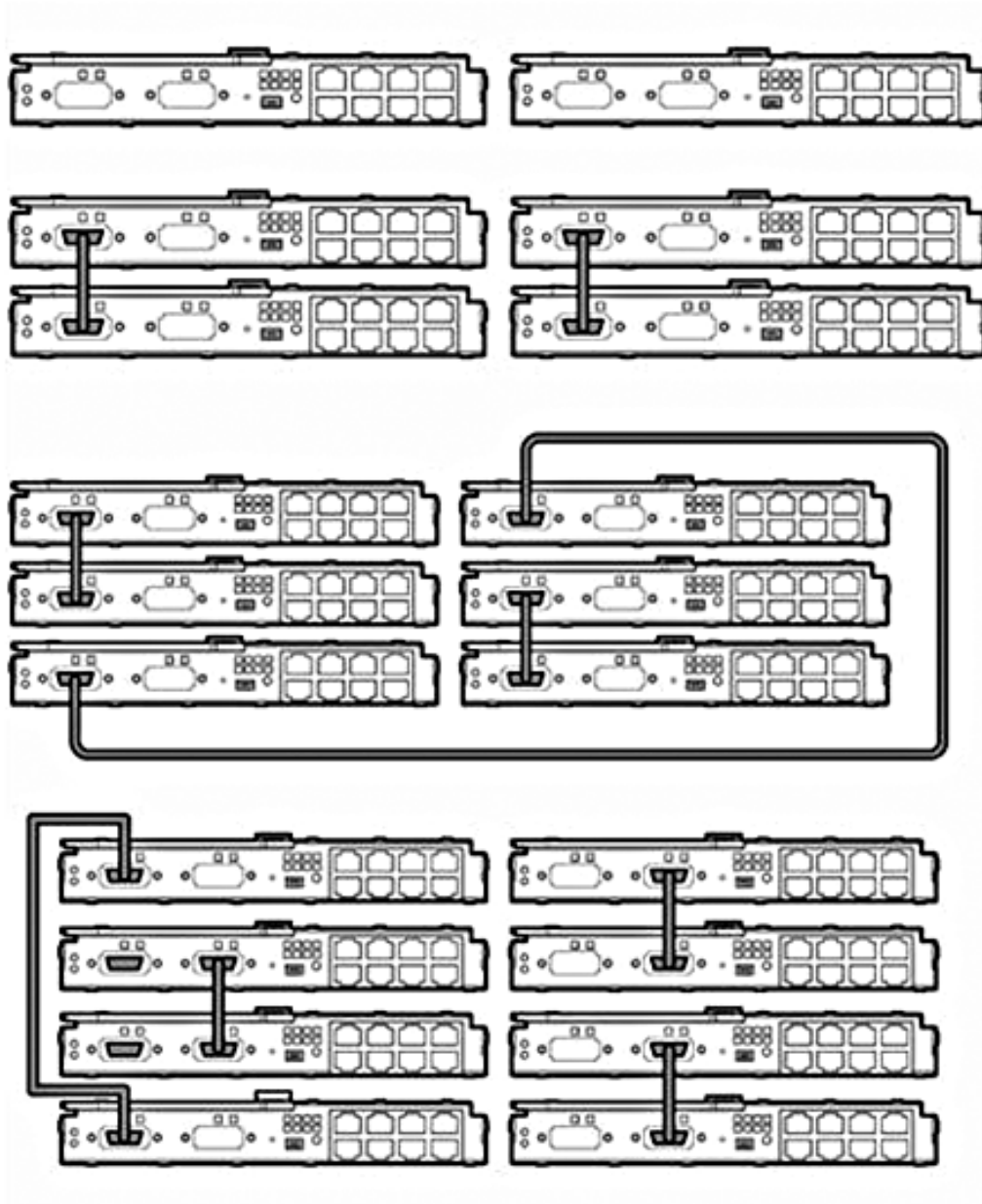
Stacking Configuration

Stacking links are used to interconnect Virtual Connect Ethernet Modules when using more than one enclosure (future) 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 HP 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.

Supported Products



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 BladeSystem server support offer to help you speedily deploy and maximize system uptime.

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

- **Support Service** - 4-Hour Response Coverage, 3-Year, 24 x 7, Same Business Day
- **Deployment Service** - Installation and Start Up for HP BladeSystem Infrastructure

Enhanced Service - Optimize service level to increase IT performance and availability

- **Support Service** - HP Proactive BladeSystem Service, 1-Year
- **Deployment Service** - Enhanced Network Installation and Start-up for HP BladeSystem Switches. This service has been updated to include coverage for the Flex-10 features.

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/bladestystemsolutions>

<http://www.hp.com/go/proliant/carepack>

Related Options

Cabling and Transceiver Options

| | |
|--|------------|
| HP .5m 10GbE CX4 Cable | 444477-B21 |
| HP 1m 10GbE CX4 Cable | 444477-B22 |
| HP 3m 10GbE CX4 Cable | 444477-B23 |
| HP 15m 10GbE CX4 Cable | 444477-B27 |
| HP 0.5m SFP+ 10GbE Copper Cable | 487649-B21 |
| HP 1m SFP+ 10GbE Copper Cable | 487652-B21 |
| HP 3m SFP+ 10GbE Copper Cable | 487655-B21 |
| HP 7m SFP+ 10GbE Copper Cable | 487658-B21 |
| HP BladeSystem 10Gb SR SFP+ | 455883-B21 |
| HP BladeSystem 10Gb LR SFP+ | 455886-B21 |
| HP BladeSystem 10Gb LRM SFP+ | 455889-B21 |
| HP BladeSystem 1Gb SX SFP Opt Kit | 453151-B21 |
| HP BladeSystem 1Gb RJ-45 SFP Opt Kit | 453154-B21 |
| HP 2 m LC-LC Multi-Mode OM2 Fiber Optic 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 |
| HP .5 m LC-LC Multi-Mode OM3 Fiber Optic Cable | AJ833A |
| HP 1 m LC-LC Multi-Mode OM3 Fiber Optic Cable | AJ834A |
| HP 2 m LC-LC Multi-Mode OM3 Fiber Optic Cable | AJ835A |
| HP 5 m LC-LC Multi-Mode OM3 Fiber Optic Cable | AJ836A |
| HP 15 m LC-LC Multi-Mode OM3 Fiber Optic Cable | AJ837A |
| HP 30 m LC-LC Multi-Mode OM3 Fiber Optic Cable | AJ838A |
| HP 50 m LC-LC Multi-Mode OM3 Fiber Optic Cable | AJ839A |

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 Enclosures 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 enclosures Care Pack services.

Related Options

NOTE: SAN/Fabric switches for the HP c-Class BladeSystem are not covered under the c7000 and c3000 enclosures 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 UE477E

NOTE: Uplifts the Ethernet devices to the same level of service as the c-class enclosure.

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

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 additional information; please visit:
<http://www.hp.com/services/bladessystemservices>

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 240Gbps bridging fabric Non-blocking architecture Maximum transmission unit (MTU) of up to 9216 bytes (jumbo frames) |
| | Connectors and Cabling | 16 x 10Gb downlinks midplane 2 x 10Gb cross connect 1 x 10Gb copper uplinks CX-4 8 x 10Gb SR, LR, or LRM fiber uplinks SFP+ 1 management USB port 1 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 CX4-port, green Link indicator, one per SFP+-port, green/amber USB port (covered) Active multiplexed port indicator, green |
| | 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% |
| | Power Specification | 12V @ 8.75A (105 W) |

* 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.

Product Specifications Security Features

- HTTPS (HTTP exchanged over an SSL-encrypted session) is



Technical Specifications

Software

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.
- User verification by account name and password (Case Sensitive) LDAP Authentication services provide role based security via an LDAP SSL Directory Server connection.

Trunking and Failover Features

Private VLAN's for secure connectivity between servers within a domain 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.

VLAN Features

Configure uplink speeds to Auto, 1Gb, or 10Gb on the associated uplinks 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 targeted to a specific server ports.

Management Features

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 configuration.

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

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

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

Technical Specifications

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.

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

VC manager runs as a high-availability pair when an HP 1/10Gb VC-Enet Module is installed in adjacent bays. 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.

Management and Standards Support

Standards

802.1AB LLDP
 802.1D MAC Bridges
 802.1Q (VLAN, 1024 maximum, 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
 IGMP v1,v2,

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

Technical Specifications

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.

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