

Overview

HP supports 56 Gbps Fourteen Data Rate (FDR) and 40Gbps 4X Quad Data Rate (QDR) InfiniBand (IB) products that include mezzanine Host Channel Adapters (HCA) for server blades, dual mode InfiniBand or Ethernet mezzanine adaptors, switch blades for c-Class enclosures, and rack switches and cables for building scale-out solutions. This QuickSpecs focuses on mezzanine adaptors for server blades, and InfiniBand switch blades for c-Class enclosures; for details on the InfiniBand rack switches, standup PCI Express HCAs and FlexLOM Adaptors for HP ProLiant and Integrity servers, as well as InfiniBand cables, please refer to the HP InfiniBand for HP ProLiant and Integrity servers QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13078_div/13078_div.html

The following InfiniBand products based on Mellanox technology are available for the HP BladeSystem c-Class from HP:

- HP InfiniBand FDR 2-Port 545M Adapter for HP BladeSystem c-Class (Gen8 and beyond)
- HP InfiniBand QDR/Ethernet 10Gb 2P 544M Adapter for HP BladeSystem c-Class (Gen8 and beyond)
- HP IB FDR/Ethernet 10/40Gb 2P 544M Adapter for HP BladeSystem c-Class (Gen8 and beyond)
- HP BLc 4X FDR IB Managed Switch for HP BladeSystem c-Class
- HP BLc 4X FDR IB Switch for HP BladeSystem c-Class
- HP BLc 4X QDR IB Switch for HP BladeSystem c-Class

NOTE: The above Mellanox based devices of either speed can be used together but cannot be used with QLogic based devices.

The HP InfiniBand FDR 2-port 545M Mezzanine Adapter for HP BladeSystem c-Class is based on the Mellanox Connect-IB technology. The FDR IB HCA utilizes a PCI Express 3.0 x16 interface and two ports of FDR InfiniBand to provide more than 100Gb/s of throughput (dual port) and low latency for performance-driven server and storage clustering application. Additional application acceleration is achieved with a 4X improvement in message rate compared with previous generations of InfiniBand cards

NOTE: The HP InfiniBand FDR 2-port 545M Mezzanine Adapter is only supported in the HP BLc7000 Platinum Enclosures.

The HP InfiniBand FDR/Ethernet 10/40Gb 2P 544M Mezzanine Adapter for HP BladeSystem c-Class is based on the Mellanox ConnectX-3 InfiniBand technology. The FDR IB HCA delivers low-latency and up to 56Gbps (FDR) bandwidth (single port) for performance-driven server and storage clustering applications in High-Performance Computing (HPC) and enterprise data centers. The HP IB FDR/EN 10/40Gb 2P 544M Adapter is also capable of dual 40 or 10 Gb Ethernet ports when connected to a supported Ethernet switch in the C7000 enclosure. The HP InfiniBand FDR/Ethernet 10/40Gb 2P 544M Mezzanine HCA card is designed for PCI Express 3.0 x8 connectors on HP BladeSystem c-Class Gen 8 server blades.

NOTE: The HP InfiniBand FDR/Ethernet 10/40Gb 2P 544M Adapter is designed for use with HP BLc7000 Platinum Enclosures. If used in FDR mode with earlier HP BLc7000 enclosure part numbers 507014-B21, 507015-B21, 507016-B21, 507017-B21 and 507019-B21 the card must be installed in mezzanine slot 1 of the blade server. In other modes it can be used in any mezzanine slot . The mezzanine is not supported on earlier enclosures

The HP IB QDR/Ethernet 10 Gb 2P 544M Mezzanine Adaptor for HP BladeSystem c-Class is based on the Mellanox ConnectX-3 IB technology. The QDR IB HCA delivers low-latency and up to 40Gbps (QDR) bandwidth (dual port) for performance-driven server and storage clustering applications in High-Performance Computing (HPC) and enterprise data centers. The HP IB QDR/EN 10 Gb 2P 544M Adaptor also is capable of dual 10 Gb Ethernet ports when connected to a supported Ethernet switch in the C7000 enclosure. The HP IB QDR/EN 10 Gb 2P 544M Mezzanine HCA card is designed for PCI Express 3.0 x8 connectors on HP BladeSystem c-Class Gen8 server blades and can be used in either mezzanine slot of the blade server.

NOTE: The HP InfiniBand QDR/Ethernet 10Gb 2P 544M Adapter is supported on the HP BLc7000 Platinum Enclosures and earlier HP BLc7000 enclosure part numbers 507014-B21, 507015-B21, 507016-B21, 507017-B21 and 507019-B21

InfiniBand host stack software (driver) is required to run on servers connected to the InfiniBand network. For mezzanine HCAs based on Mellanox technologies, HP supports Mellanox OFED Driver 1.5.3-3.0.0 or newer on Linux 64-bit operating systems, and Mellanox

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WinOF 4.4 or newer driver stack on Microsoft Windows server 2008 and 2012.

For the latest information on Mellanox OFED software, please refer to: http://www.mellanox.com/content/pages.php?pg=software_overview_ib&menu_section=34.

Mellanox Acceleration Software is available from HP and consists of Mellanox Messaging Accelerator (VMA) technology for minimum latency communication. VMA performs multicast, unicast and TCP acceleration using OS bypass, and is implemented via a BSD-socket compliant dynamically linked library so that no application changes are required.

The HP BLc 4X FDR IB Switch for HP BladeSystem c-Class is a double wide switch for the HP BladeSystem c7000 Platinum enclosure. It is based on the Mellanox Switch X technology. The FDR IB switch blade has 16 downlink ports to connect up to 16 server blades in the c7000 enclosure, and 18 QSFP uplink ports for inter-switch links or to connect to external servers. All ports are capable of supporting 56Gbps (FDR) bandwidth. A subnet manager has to be provided; see the paragraph on subnet managers for more details.

The HP BLc 4X FDR Managed IB Switch for HP BladeSystem c-Class is a double wide switch for the HP BladeSystem c7000 Platinum enclosure. It is based on the Mellanox Switch X technology. The FDR IB switch blade has 16 downlink ports to connect up to 16 server blades in the c7000 enclosure, and 18 QSFP uplink ports for inter-switch links or to connect to external servers. All ports are capable of supporting 56Gbps (FDR) bandwidth. The switch contains an integrated management module that is capable of managing a cluster of up to 648 nodes. A subnet manager has to be provided; see the paragraph on subnet managers for more details.

The HP BLc 4X QDR IB Switch for HP BladeSystem c-Class is a double wide switch for the P BladeSystem c7000 enclosure. It is based on the Mellanox InfiniScale IV technology. The QDR IB switch blade has 16 downlink ports to connect up to 16 server blades in the c7000 enclosure, and 16 QSFP uplink ports for inter-switch links or to connect to external servers. All ports are capable of supporting 40Gbps (QDR) bandwidth. A subnet manager has to be provided; see the paragraph on subnet managers for more details.

An InfiniBand fabric consists of one or more InfiniBand switches connected via inter-switch links. The most commonly deployed fabric topology is a fat tree or its variations. A subnet manager is required to manage and control an InfiniBand fabric. The subnet manager functionality can be provided by either the HP BLc 4X FDR Managed IB Switch or a rack-mount InfiniBand switch with an embedded fabric manager (aka internally managed switch) or host-based subnet manager software on a server connected to the fabric. OpenSM is a host-based subnet manager that runs on a server connected to the InfiniBand fabric. Mellanox OFED software stack includes OpenSM for Linux, and Mellanox WinOF includes OpenSM for Windows. For comprehensive management and monitoring capabilities, Mellanox Unified Fabric Manager™ (UFM) is recommended for managing the InfiniBand fabric based on Mellanox/ InfiniBand switch products and Mellanox based mezzanine HCA.

An embedded fabric manager is available on Mellanox internally managed 36-port 4X FDR switch, and modular QDR switches. Please refer to: http://h18000.www1.hp.com/products/quickspecs/13078_div/13078_div.html for information about InfiniBand rack switches.

The following InfiniBand products based on Inteltechnology are available for the HP BladeSystem c-Class from HP:

- Intel 4X QDR IB Mezzanine HCA for HP BladeSystem c-Class
- Intel BLc 4X QDR IB Switch for HP BladeSystem c-Class
- Intel BLc 4X QDR IB Management Module

NOTE: The above Intel based devices cannot be mixed with Mellanox based devices in a HP BladeSystem c7000 Enclosure.

The Intel 4X QDR IB Mezzanine HCA is based on the Intel TrueScale ASIC architecture which has a unique hardware architecture that delivers unprecedented levels of performance, reliability, and scalability, making it an ideal solution for highly scaled High Performance Computing (HPC) and high throughput, low-latency enterprise applications.

InfiniBand host stack software (driver) is required to run on servers connected to the InfiniBand fabric. For HCAs based on Intel technology, HP supports IntelOFED driver stacks on Linux 64-bit operating systems.

Overview

For the latest information on Intel® True Scale Fabric Host Channel Adapter Drivers and Software Stack please refer to: <http://www.intel.com/content/www/us/en/infiniband/hp-downloads.html>

The Intel BLc 4X QDR IB Switch for HP BladeSystem c-Class uses the Intel TrueScale ASIC architecture designed to cost-effectively link workgroup resources into a cluster or provide an edge switch option for a larger fabric. Customers have the ability to internally or externally manage the modular IB switch. The Intel BLc 4X QDR IB Switch also has an optional management module that includes an embedded subnet manager. This management module is an option for both the 32-port QDR BladeSystem switch and the 36-port QDR edge switch. When combined with the optional InfiniBand Fabric Suite software, users can manage up to a 288 node fabric using only the management capability of the unit, without requiring additional host processing. In a bladed environment this alleviates the need to use a node for fabric management.

An InfiniBand fabric is constructed with one or more InfiniBand switches connected via inter-switch links. The most commonly deployed fabric topology is a fat tree or its variations. A subnet manager is required to manage an InfiniBand fabric. OpenSM is a host-based subnet manager that runs on a server connected to the InfiniBand fabric. IntelOFED software stack includes OpenSM for Linux. For comprehensive management and monitoring capability, Intel InfiniBand Fabric Suite (IFS) is recommended for managing the InfiniBand fabric based on Intel InfiniBand products.

HP supports InfiniBand copper and fiber optic cables with QSFP to QSFP connectors. The QSFP to QSFP QDR copper cables range from 1M to 7M for HCA to switch, or inter-switch links at QDR speed (please note that Intel QDR switches only support up to 5 meters at QDR speed) . The QSFP to QSFP FDR copper cables range from 0.5M to 3M for HCA to switch, or inter-switch links at FDR speed. The QSFP to QSFP FDR optical cables range from 3M to 30M for HCA to switch, or inter-switch links at FDR speed.

Please refer to: http://h18000.www1.hp.com/products/quickspecs/13078_div/13078_div.html for more details on supported InfiniBand cables.

What's New

- HP Infiniband FDR 2-port 545M Mezzanine Adapter for HP BladeSystem c-Class
 - Next generation of Mellanox InfiniBand chip technology (Connect_IB)
 - Dual port FDR InfiniBand
 - PCI Express 3.0 x16

Models

Mellanox Connect-IB InfiniBand Mezzanine Adapters	<p>HP InfiniBand FDR 2-port 545M Adapter 702213-B21</p> <p>NOTE: Supported on - HP ProLiant BL460c Gen 8, HP ProLiant BL465c Gen 8, HP ProLiant BL660c Gen 8, HP ProLiant WS460c Gen 8</p> <p>NOTE: Designed for use with HP BLc7000 Platinum Enclosures. If used with HP BLc7000 enclosure part numbers 507014-B21, 507015-B21, 507016-B21, 507017-B21 and 507019-B21 must be installed in mezz slot 1. Not supported on earlier enclosures</p>
Mellanox CX-3 Dual Function Mezzanine Adapters	<p>HP FDR/EN InfiniBand 10/40Gb Dual Port 544M Adapter 644161-B22</p> <p>NOTE: Supported on - HP ProLiant BL420c Gen 8, HP ProLiant BL460c Gen 8, HP ProLiant BL465c Gen 8, HP ProLiant BL660c Gen 8, HP ProLiant WS460c Gen 8</p> <p>Note: Designed for use with HP BLc7000 Platinum Enclosures. If used with HP BLc7000 enclosure part numbers 507014-B21, 507015-B21, 507016-B21, 507017-B21 and 507019-B21 must be installed in mezz slot 1. Not supported on earlier enclosures</p>
	<p>HP QDR/EN InfiniBand 10Gb Dual Port 544M Adapter 644160-B21</p> <p>NOTE: Supported on - HP ProLiant BL420c Gen 8, HP ProLiant BL460c Gen 8, HP ProLiant BL465c Gen 8, HP ProLiant BL660c Gen 8, HP ProLiant WS460c Gen 8</p> <p>NOTE: Only supported on the HP BladeSystem c7000 Enclosures P/N's: 681840-B21, 681842-B21, 681844-B21, 507014-B21, 507015-B21, 507016-B21, 507017-B21 and 507019-B21</p>
	<p>Mellanox UFM 3yr 24x7 Flex Lic BD570A</p>
	<p>Mellanox UFM Advanced 1yr 24x7 Flex Lic BD571A</p>
	<p>Mellanox UFM Advanced 3yr 24x7 Flex Lic BD572A</p>
Mellanox Software License	<p>Mellanox Unified Fabric Manager 1yr 24x7 Updates and Technical Support Flex License BD569A</p>
	<p>Mellanox Unified Fabric Manager 3yr 24x7 Updates and Technical Support Flex License BD570A</p>
	<p>Mellanox Unified Fabric Manager Advanced 1yr 24x7 Updates and Technical Support Flex License BD571A</p>
	<p>Mellanox Unified Fabric Manager Advanced 3yr 24x7 Updates and Technical Support Flex License BD572A</p>
	<p>Mellanox Acceleration Software 1yr 24x7 Updates and Technical Support Flex License BD573A</p>
	<p>Mellanox Acceleration Software 3yr 24x7 Updates and Technical Support Flex License BD574A</p>
	<p>NOTE: These part numbers can be used to purchase multiple licenses with a single activation key. Each license is for one node (a.k.a. server). Customer will receive a printed end user entitlement certificate via physical shipment. The entitlement certificate must be redeemed online in order to obtain a license key and registration for one or three years of support depending on the part number.</p>
	<p>NOTE: Only one certificate is shipped for multiple-quantity licenses.</p>
	<p>NOTE: This is a perpetual license.</p>
Mellanox IB switch blades and options	<p>HP 4X FDR InfiniBand Managed Switch Module for c-Class BladeSystem 648311-B21</p>
	<p>HP 4X FDR InfiniBand Switch Module for c-Class BladeSystem 648312-B21</p>
	<p>HP 4X QDR InfiniBand Switch Module for c-Class BladeSystem 489184-B21</p>
	<p>NOTE: The HP BLc QDR and FDR IB Switches are only supported on the HP BladeSystem c7000 Enclosures P/N's: 681840-B21, 681842-B21, 681844-B21, 507014-B21, 507015-B21, 507016-B21, 507017-B21 and 507019-B21.</p>
	<p>NOTE: Please see the HP BladeSystem c7000 Enclosure QuickSpecs for additional information at:</p>
	<p>http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html (Worldwide)</p>

Models

Intel IB mezzanine HCA card	HP 4X QDR Intel InfiniBand Dual Port Mezzanine HCA for c-Class BladeSystem NOTE: Supported on - HP ProLiant BL280c G6, HP ProLiant BL2x220c G6, HP ProLiant BL460c G6, HP ProLiant BL460c G7, HP ProLiant BL465c G7, HP ProLiant BL490c G6, HP ProLiant BL490c G7, HP ProLiant BL620c G7, HP ProLiant BL680c G7, HP ProLiant BL685c G7 Server Blades and HP ProLiant WS460c G6 Workstation Blade	583210-B21
Intel IB switch blade and options	HP 4X QDR Intel InfiniBand Switch Module for c-Class BladeSystem Intel InfiniBand 4X QDR Management Module for c-Class BladeSystem Intel InfiniBand Fabric Suite Fabric Flexible License NOTE: Right to use (RTU) License for Intel IFS, 1 per node for every node connected to the Intel InfiniBand fabric. NOTE: The Intel BLc 4X QDR IB Switch for HP BladeSystem c-Class is only supported on the HP BladeSystem c7000 Enclosures P/N's: 507014-B21, 507015-B21, 507016-B21, 507017-B21 and 507019-B21. NOTE: Please see the HP BladeSystem c7000 Enclosure QuickSpecs for additional information at: http://h18000.www1.hp.com/products/quickspecs/12810_div/12810_div.html (Worldwide)	505958-B21 505959-B21 QL470A

Standard Features

Product Features

- **InfiniBand mezzanine HCAs based on Mellanox technology for Gen 8 blades**
 - HP Infiniband FDR 2-port 545M Adapter
 - Mellanox Connect-IB technology
 - Dual port FDR InfiniBand
 - x16 PCI Express 3.0 interface for increased throughput
 - Improved message rate
 - Designed for use with HP BLc7000 Platinum enclosures
 - HP InfiniBand FDR/Ethernet 10Gb/40Gb 2P 544M adapter
 - Mellanox ConnectX-3 technology
 - Dual-port FDR InfiniBand in HP BLc7000 Platinum Enclosures
 - Dual-port QDR InfiniBand
 - Dual-port 40 Gb Ethernet
 - Dual-port 10 Gb Ethernet
 - Support Mellanox OFED Linux driver stack and Microsoft Windows Server (see Operating Systems Support for details)
- **InfiniBand mezzanine HCA based on Intel technology for G7 Blades**
 - Intel 4X QDR IB Dual Port Mezzanine HCA for HP BladeSystem c-Class
 - Dual-port 4X QDR InfiniBand PCI Express G2 Mezzanine Card
 - Full support for Intel OFED including all standard OFED transport protocols, plus optional value-added components to improve management and performance
- **Mellanox Acceleration Software for Mellanox network adaptors (VMA)**
 - Requires ConnectX-3 based 544 FlexibleNetwork Adapter
 - 56G InfiniBand and 10/40Gb Ethernet support
 - PCI Express 3.0 support
 - Comprehensive support for UDP/TCP socket API
 - TCP and UDP unicast and multicast offload
- **InfiniBand switch blades based on Mellanox technology**
 - HP BLc 4X FDR IB Switch for HP BladeSystem c-Class
 - Double wide switch blade for the Platinum c7000 enclosure with 16 downlink ports to connect server blades via the midplane, and 18 QSFP unlink ports for the inter-switch links or to connect to external servers. All ports are capable of supporting 56Gbps (FDR) bandwidth. All uplink ports support copper and fiber optic cables. One version of the switch is externally managed, i.e. a subnet manager has to be provided on the fabric (see the subnet manager discussion above). The other version of the switch contains a management module and can run the subnet manager.
- **HP BLc 4X QDR IB Switch for HP BladeSystem c-Class**
 - Double wide switch blade for the c7000 enclosure with 16 downlink ports to connect server blades via the midplane, and 16 QSFP unlink ports for the inter-switch links or to connect to external servers. All ports are capable of supporting 40Gbps (QDR) bandwidth. All uplink ports support copper and fiber optic cables. The switch is externally managed, i.e. a subnet manager has to be provided on the fabric (see the subnet manager discussion above)
- **InfiniBand switch blades based on Intel technology**
 - Intel BLc 4X QDR IB Switch for HP BladeSystem c-Class
 - Double wide switch blade for the c7000 enclosure with 16 downlink ports to connect server blades via the midplane, and 16 QSFP unlink ports for the inter-switch links or to connect to external servers. All ports are capable of supporting 40Gbps (QDR) bandwidth. All uplink ports support copper and fiber optic cables
- Optional Management Module with an embedded subnet manager and management of up to 288 nodes

Standard Features

Performance

Bandwidth:

- All ports on 4X FDR HCA cards and switch are capable of supporting 56Gbps signaling rate, with a peak data rate of 52 Gbps in each direction.
 - All ports on 4X QDR HCA card and switch are capable of supporting 40Gbps signaling rate, with a peak data rate of 32 Gbps in each direction.
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Scalability and Reliability Standards support:

- Dual port 4X FDR mezzanine HCA 545M: PCI Express revision 3.0x16 compliant
 - Dual-port 4X FDR mezzanine HCA 544M: PCI Express revision 3.0x8 compliant
 - Dual-port 4X QDR mezzanine HCA 544M: PCI Express revision 3.0x8 (compliant
 - IBTA version 1.2 compatible
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Operating systems support

- Mellanox OFED 2.0 For Linux (64 bit)
 - Red Hat Enterprise Linux 6 Server (x86-64)U2, U3, U4
 - SUSE Linux Enterprise Server 11 SP1, SP2, SP3
- Mellanox OFED 1.5.3_3.0.0 for Linux (64 bit)
 - Red Hat Enterprise Linux 5 Server (x86-64), U5, U6, U7 in G7 servers U7, U8, U9, U10, in Gen8 servers
 - Red Hat Enterprise Linux 6Server (x86-64) U1, U2, U3
 - SUSE Linux Enterprise Server 10 SP4,
 - SUSE Linux Enterprise Server 11 SP1, SP2
- Mellanox WinOF 4.55
 - Microsoft Windows Server 2012 R2 (64 bit)
 - Mellanox WinOF 4.4
 - Microsoft Windows Server 2012 (64 bit)
 - Microsoft Windows Server 2008 R2 (64 bit)
 - Microsoft Windows Server 2008 R2 SP1 (64 bit)
- Mellanox OFED for VMware (InfiniBand Only) 1.9.9.0
 - VMware ESX5.1
 - VMware ESX 5.5
 - Mellanox OFED for VMware (InfiniBand Only) 1.9.9
 - VMware ESXi 5.1
- Ethernet drivers (from VMware)
 - VMware ESXi 5.1
 - VMware ESXi 5.5
 - Mellanox EN (Ethernet only) 2.0
 - Red Hat Enterprise Linux 6 Server (x86-64) U2, U3, U4
- Mellanox EN (Ethernet only) 1.5.10
 - Red Hat Enterprise Linux 5 Server (x86-64) U8, U9, U10
 - Red Hat Enterprise Linux 6 Server (x86-64) U2, U3
 - SUSE Linux Enterprise Server 11 (64 bit) SP1, SP2
- Mellanox EN (Ethernet only) 1.5.09
 - Red Hat Enterprise Linux 5 Server (x86-64) U5, U6, U7, U8
 - Red Hat Enterprise Linux 6 Server (x86-64) U1, U2, U3
 - SUSE Linux Enterprise Server10 (64 bit) SP4

Standard Features

- SUSE Linux Enterprise Server 11 (64 bit) SP1, SP2
- Intel® True Scale Fabric Host Channel Adapter Drivers and Software Stack OFED+ 1.5.4 for Linux (64 bit)
 - Red Hat Enterprise Linux 5 Server (x86-64) , U8, U9
 - Red Hat Enterprise Linux 6 Server (x86-64)U2, U3, U4
 - SUSE Linux Enterprise Server
 - SUSE Linux Enterprise Server 11 SP2, SP3

PCI-Express Mezzanine connectors

- The HP QDR and FDR IB HCA Gen 8 mezzanine cards are specified to run on PCI Express Gen3 connectors.
- The QDR IB HCA G7 mezzanine card from Intel is specified to run on PCI Express Gen2 connectors.

NOTE: Depending on the server blade models, multiple HCAs per server blade may be supported; please refer to server blades specification for more details.

Interconnect Bays on c-Class enclosure

HP IB switch blades are designed to fit into the double wide switch bays on the c-Class enclosures. Depending on the mezzanine connectors used for IB HCA mezzanine cards, the IB switch blade has to be inserted into corresponding interconnect bays .

- The FDR switch may be installed in interconnect bays 3 and 4, 5 and 6, 7 and 8 in the HP BLc7000 Platinum enclosure (P/N's: 681840-B21, 681842-B21, 681844-B21) .
- The FDR switch must be installed in interconnect bays 3 and 4 when used with enclosure P/N's: 507014 -B21, 507015-B21, 507016-B21, 507017-B21 and 507019-B21
- Other enclosure part numbers do not support FDR switches.
- At QDR speeds Interconnect bays 3 and or 5 and 6 or 7 and 8 can be used when installed in the HP BladeSystem c7000 Enclosures P/N's: 681840-B21, 681842-B21, 681844-B21, 507014 -B21, 507015-B21, 507016-B21, 507017-B21 and 507019-B21.

InfiniBand Fabric Management

Auto-negotiation/self-discovery:

InfiniBand FDR or QDR ports support auto-negotiation down to lower frequencies. For example, external uplink ports of a FDR switch blade will negotiate down to QDR or DDR speed if they are connected to a device which can only operate at those speeds.

Self-discovery is supported by subnet manager. Check the documents of the specific subnet manager for more details <http://www.docs.hp.com>.

Management Support:

Mellanox OFED and Intel OFED+ include drivers and utilities to configure and manage the HCA in a Linux environment and Mellanox WinOF includes drivers and utilities to configure and manage the HCA in the Microsoft Windows server HPC 2008 environment.

InfiniBand fabric has to be set up with a subnet manager: see the subnet manager discussion above.

Standard Features

Warranty

HP branded hardware options qualified for BladeSystem c-Class and p-Class servers are covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. The HP branded hardware option diagnostic support and repair is available for one year from date of purchase, or the length of the server they are attached to, whichever is greater. 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.

Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

Service and Support

Service and Support

HP Technology Services

HP Technology Services offers you consultants and support experts to solve your most complex infrastructure problems. We help keep your business running, boost availability and avoid downtime.

Protect your business beyond warranty with HP Care Pack Services

When you buy HP Options, it's also a good time to think about what level of service you may need. HP Care Pack services provide total care and support expertise with committed response choices designed to meet your IT and business need.

HP Foundation Care services deliver scalable support-packages for HP industry-standard servers and software. You can choose the type and level of service that is most suitable for your business needs. New to this portfolio is HP Collaborative Support. If you are running business critical environments, HP offers Proactive Care or Critical Advantage. These services help you deliver high levels of application availability through proactive service management and advanced technical response.

Here is the support service recommendation from the Foundation Care and Proactive Care portfolio. For customized support service solution, HP can work with you to tailor a service solution for your unique support requirements using broader services portfolio of Foundation Care and Proactive Care.

Recommended Services

Recommended HP Care Pack Services for optimal satisfaction with your HP product

3-Year HP 24x7 4 hour Response, Hardware Support Onsite Service

Provides you with rapid remote support and if required an HP authorized representative who will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EEE.pdf>

3-Year HP 24x7 4 hour Response, HP Collaborative Support

Offers customers a single point of contact for server problem diagnosis, hardware problem resolution, and basic software problem diagnosis, fault isolation, and resolution if available to HP. If the problem is with HP HW, the representative will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged. In case, the issue is with HP or supported third-party software product and cannot be resolved by applying known fixes, HP will contact the third-party vendor and create a problem incident on your behalf.

HP ProLiant Server Hardware Installation

Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf>

Service and Support

Related Services

Related HP Care Pack Services to enhance your HP product experience

3-Year HP 24x7 4 hour Response, Proactive Care or Critical Advantage

Helps optimize your systems and delivers high levels of application availability through proactive service management and advanced technical response. A skilled Technical Manager will own your query or issue end to end until resolved, delivering a single point of contact for you.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-2140ENW.pdf>

3-Year HP 6-hour Onsite Call-to-Repair, HP Collaborative Support

Offers customers a single point of contact for server problem diagnosis, hardware problem resolution to return the hardware in operating condition within 6 hours of the initial service request to the HP Global Solution Center, and basic software problem diagnosis, fault isolation, and resolution if available to HP. In case, the issue is with HP or supported third-party software product and cannot be resolved by applying known fixes, HP will contact the third-party vendor and create a problem incident on your behalf.

HP Proactive Select Service

Provides a flexible way to purchase HP 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.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-3842ENN.pdf>

Insight Remote Support

Provides 24 X 7 remote monitoring, proactive notifications, and problem resolution. Learn more <http://www.hp.com/go/insightremotesupport>

Related Options

Cabling Options

FDR Cables

HP 0.5M FDR Quad Small Form Factor Pluggable InfiniBand Copper Cable	670759-B21
HP 1M FDR Quad Small Form Factor Pluggable InfiniBand Copper Cable	670759-B22
HP 1.5M FDR Quad Small Form Factor Pluggable InfiniBand Copper Cable	670759-B23
HP 2M FDR Quad Small Form Factor Pluggable InfiniBand Copper Cable	670759-B24
HP 3M FDR Quad Small Form Factor Pluggable InfiniBand Copper Cable	670759-B25
HP 3M FDR Quad Small Form Factor Pluggable InfiniBand Optical Cable	670760-B21
HP 5M FDR Quad Small Form Factor Pluggable InfiniBand Optical Cable	670760-B22
HP 7M FDR Quad Small Form Factor Pluggable InfiniBand Optical Cable	670760-B23
HP 10M FDR Quad Small Form Factor Pluggable InfiniBand Optical Cable	670760-B24
HP 12M FDR Quad Small Form Factor Pluggable InfiniBand Optical Cable	670760-B25
HP 15M FDR Quad Small Form Factor Pluggable InfiniBand Optical Cable	670760-B26
HP 20M FDR Quad Small Form Factor Pluggable InfiniBand Optical Cable	670760-B27
HP 30M FDR Quad Small Form Factor Pluggable InfiniBand Optical Cable	670760-B28

QDR Cables

HP 0.5M 4X DDR/QDR Quad Small Form Factor Pluggable InfiniBand Copper Cable	498385-B26
HP 1M 4X DDR/QDR Quad Small Form Factor Pluggable InfiniBand Copper Cable	498385-B21
HP 1.5M 4X DDR/QDR Quad Small Form Factor Pluggable InfiniBand Copper Cable	498385-B27
HP 2M 4X DDR/QDR Quad Small Form Factor Pluggable InfiniBand Copper Cable	498385-B22
HP 3M 4X DDR/QDR Quad Small Form Factor Pluggable InfiniBand Copper Cable	498385-B23
HP 5M 4X DDR/QDR Quad Small Form Factor Pluggable InfiniBand Copper Cable	498385-B24
HP 7M 4X DDR/QDR Quad Small Form Factor Pluggable InfiniBand Copper Cable	498385-B25
HP 3M 4X DDR/QDR Quad Small Form Factor Pluggable InfiniBand Optical Cable	498386-B23
HP 5M 4X DDR/QDR Quad Small Form Factor Pluggable InfiniBand Optical Cable	498386-B24
HP 10M 4X DDR/QDR Quad Small Form Factor Pluggable InfiniBand Optical Cable	498386-B25
HP 15M 4X DDR/QDR Quad Small Form Factor Pluggable InfiniBand Optical Cable	498386-B26
HP 20M 4X DDR/QDR Quad Small Form Factor Pluggable InfiniBand Optical Cable	498386-B27
HP 30M 4X DDR/QDR Quad Small Form Factor Pluggable InfiniBand Optical Cable	498386-B28

HP Ethernet Interconnect Modules

HP 6120XG Blade Switch	516733-B21
HP GbE2c Layer 2/3 Ethernet Blade Switch	438030-B21
HP 10GbE Ethernet Pass-Thru Module for c-Class BladeSystem	538113-B21
Mellanox SX1018HP Ethernet Switch for c-Class BladeSystem	689638-B21

Technical Specifications

Compliance	Mezzanine:	Dual port FDR Connect-IB HCA: PCI Express 3.0 ROHS-R6 Dual-port QDR/FDR CX-3 HCA: PCI Express 3.0 ROHS-R6 Dual-port QDR Intel HCA: PCI Express 2.0 ROHS-R6
	Switches:	IBTA version 1.2 compatible ROHS-R6
General Specifications	Communications Processor	Mezzanine: Dual Port FDR HCA: Mellanox Connect-IB Dual-port FDR HCA: Mellanox ConnectX-3 Dual-port QDR HCA: Mellanox ConnectX-3 Dual-port QDR HCA: Mellanox ConnectX-2 Intel QDR HCA: Intel TrueScale
	Dimensions (LxW)	FDR switch: Mellanox Switch X QDR switch: MT48436A1-FCC-Q, InfiniScale IV Intel QDR switch: QLogic TrueScale G7 Mezzanine HCA: HP type 1; 4.5 x 4.0 in Gen 8 Mezzanine HCA: HP Type A 3.5 x 3.9 in
Power and Environmental Specifications	Operating Temperature	Mezzanine HCA: 32° to 131° F (0° to 55° C) Switch module: 32° to 104° F (0° to 40° C)
	Humidity (non-condensing)	Mezzanine HCA: 5% to 85% Switch module: 5% to 85%
Power requirement	Mezzanine HCAs:	Dual-port FDR Connect-IB HCA: max 14.7W Dual-port FDR CX-3 HCA: max 11.2W Dual-port QDR CX-3 HCA: max 9.2W Intel QDR HCA: max 8.4W
	Switch blades:	FDR switch: 150W @ 12V QDR switch: 10.8A at 12V Max (130W) Intel QDR switch: 150W @ 12V Intel Management Module: 1.5W @ 12V
Emissions Classifications	HCA and Switches:	FCC CFR 47 Part 15 Class A CISPR 22 Class A ICES-003 Class A VCCI Class A ACA CISPR 22 Class A
	Switches:	MIC Korea "EMC Registration Regulation" Class A

Technical Specifications

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