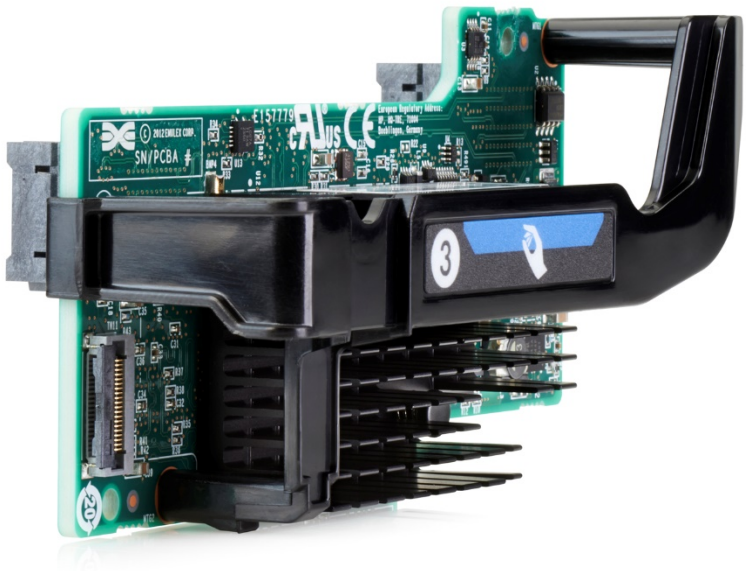
Overview

HPE FlexFabric 20Gb 2-port 650FLB Adapter

The HPE FlexFabric 20Gb 2-port 650FLB adapter for ProLiant server blades provides full-featured, high performance converged 20Gb Ethernet that accelerates IT services and increases data center efficiency across a broad range of I/O intensive enterprise, cloud and Telco workloads.

When connected to HPE Virtual Connect FlexFabric 20/40 F8 Modules, the HPE FlexFabric 650FLB adapter provides 20GbE performance. It offers a rich set of offload technologies including overlay network tunneling and storage, increasing virtualization performance and host efficiency. The HPE 650FLB is a dual-speed adapter that can also operate at 10GbE when connected to HPE Virtual Connect Flex-10/10D Module or HPE 6125XLG Ethernet Switch.

Combining both the FlexibleLOM and Mezzanine adapters in a single BladeSystem ProLiant server can provide up to 80Gb/s of converged bi-directional Ethernet bandwidth, helping to alleviate network bottlenecks.



HPE FlexFabric 20Gb 2-port 650FLB Adapter

Platform Information

Models

HPE FlexFabric 20Gb 2-port 650FLB Adapter 700763-B21

NOTE: This adapter on each server blade connects to a 20Gb interconnect in bays 1-2 (HPE BladeSystem c7000 Enclosure) or bay 1 (HPE BladeSystem c3000 Enclosure).
NOTE: This adapter requires a minimum of 2GB of server memory.
NOTE: This adapter supports linking at 10Gb/s when not connected to a Flex-20 device.

Kit Contents

HPE FlexFabric 20Gb 2-port 650FLB Adapter
Quick install card
Product warranty statement

Compatibility - Supported Servers

HPE ProLiant BL460c Gen9 Server
HPE ProLiant BL660c Gen9 Server
HPE ProLiant WS460c Gen9 Server
HPE ProLiant BL460c Gen10 Server
HPE ProLiant BL460c Gen9 Server
NOTE: This is a list of supported servers. Some may be discontinued.

Compatibility - Supported Interconnect Modules

HPE Virtual Connect FlexFabric-20/40 F8 Module for c-Class BladeSystem
HPE Virtual Connect FlexFabric-20/40 F8 Module for c-Class BladeSystem with TAA
HPE Virtual Connect FlexFabric 10Gb/24-port Module for c-Class BladeSystem
HPE Virtual Connect FlexFabric 10/24 Enterprise Edition BLc7000 Option
HPE Virtual Connect Flex-10/10D Module for c-Class BladeSystem
HPE Virtual Connect Flex-10/10D Module Enterprise Edition for BLc7000 Option
HPE Virtual Connect Flex-10 10Gb Ethernet Module for c-Class BladeSystem
HPE Virtual Connect Flex-10 Ethernet Module Enterprise Edition for BLc7000 Option
HPE 6127XLG Ethernet Blade Switch
HPE 6127XLG Ethernet Blade Switch with TAA
HPE 6125XLG Ethernet Blade Switch
HPE 6125XLG Ethernet Blade Switch with TAA
HPE 6125G/XG Ethernet Blade Switch
HPE 6125G/XG Ethernet Blade Switch with TAA
HPE 6125G Ethernet Blade Switch
HPE 6125G Ethernet Blade Switch with TAA
NOTE: Supported features with VC modules and Ethernet switches.

Feature	VC FF20/40 F8	VC FF 10/24	VC Flex-10/10D	VC Flex-10	HPE 6125	HPE 6127
20G	X	-	-	-	-	X
10G	X	X	X	X	X	X
Tunnel Offload	X	X	X	X	X	X
FCoE	X	X	X	-	X	X

This adapter also supports 1Gb or 10Gb connections with the following modules:

HPE 10GbE Ethernet Pass-Thru Module for c-Class BladeSystem
HPE 1Gb Ethernet Pass-Thru Module for c-Class BladeSystem

Platform Information

HPE Cisco B22HP Fabric Extender with 16 FET for BladeSystem c-Class

Standard Features

At a Glance Features	Dual 20Gb ports provide up to 80Gb bi-directional per adapter Multi-speed adapter operates at either 20GbE or 10GbE Converges FCoE Tunnel Offload support for VXLAN and NVGRE Advanced storage offload processing freeing up valuable CPU cycles Supports UEFI and legacy boot options Mixed Storage â " supports NIC + FCoE on one port, and NIC + iSCSI on the other Concurrent Storage â " concurrently supports NIC, FCoE, and iSCSI storage functions on the same port (NIC + FCoE + iSCSI) Industry-leading throughput and latency performance Supports the HPE Flex-20 blade interconnect technology Over eight million small packets/s, ideal for web/mobile applications, mobile messaging, and social media User configurable bandwidth settings when combined with the 20Gb Flex-20 Virtual Connect module. From 100Mb/s to10Gb/s on up to four "Physical Function" NICs per port, in increments of 100Mb/s for NIC. The combined bandwidth of NICs cannot exceed port bandwidth i.e. 20Gb/s. Greater bandwidth with PCIe 3.0 Jumbo Frames support Support for Preboot eXecution Environment (PXE) Support for Microsoft Windows SMB Direct Optimized host virtualization density with SR-IOV support Supports Wake-on-LAN (WoL) CNU Support
Virtual Connect FlexFabric 20 Gb Ethernet Module for the c-Class BladeSystem	Evolve 20 Gb at your own speed! When paired with the HPE Virtual Connect FlexFabric 20 Gb Ethernet Modules, take advantage of four Flex Nics, which are PCI Physical Function devices that are OS/ Hypervisor independent. In addition take advantage of new storage I/O functionality making it a full-Converged Network Adapter (CNA). Server ROM recognizes them as individual NICs Speeds can be set per NIC from 100 Mb/s to 20 Gb/s in 100 Mb/s increments Three fold increase in number of network connections per port and up to four physical function NICs per port. Ideal for virtualized server environments, especially for dedicated bandwidth applications like virtual machine migration from one physical server to another physical server.
Throughput-Theoretical Bandwidth	This adapter delivers 40 Gb/s bi-directional Ethernet transfer rate per port (80 Gb/s per adapter), providing the network performance needed to improve response times and alleviate bottlenecks.
802.1p QoS Tagging	IEEE quality of service (QoS) 802.1p tagging allows the adapter to mark or tag frames with a priority level across a QoS-aware network for improved traffic flow.
802.1Q VLANs	IEEE 802.1Q virtual local area network (VLAN) protocol allows each physical port of this adapter to be separated into multiple virtual NICs for added network segmentation and enhanced security and performance. VLANs increase security by isolating traffic between users. Limiting the broadcast traffic to within the same VLAN domain also improves performance.
Converged Network Utility (CNU)	This adapter supports Converged Network Utility (CNU) a manageability application to configure converged network adapters (CNAs) and Ethernet adapters on HPE servers. This host based utility supports for both GUI and Command Line Interface (scriptable), and can be used to configure Ethernet, FCoE, iSCSI and NPAR related features/functionality on multiple OS platforms including Windows and

Standard Features

	Linux. CNU is able to configure multiple HPE adapters from various network controllers at the same time. Users can benefit easier setup steps, shorter re-boot time, and one-stop solution for multiple adapters via CNU.
HPE Sea Of Sensors 3D	Support for the HPE Sea of Sensors which is a collection of 32 sensors that automatically track thermal activity - heat - across the server. When temperatures get too high, sensors can initiate fans and make other adjustments to reduce energy usage. A significant improvement lies in the ability to apply fan speed increases only to the portion of the system that is rising in temperature, rather than all six fans in unison, which reduces the amount of energy used for cooling.
iSCSI/FCoE	This adapter supports accelerated iSCSI or iSCSI boot and FCoE.
Jumbo Frames	This adapter supports Jumbo Frames (also known as extended frames), permitting up to a 9,200 byte (KB) transmission unit (MTU) when running Ethernet I/O traffic. This is over five times the size of a standard 1500-byte Ethernet frame. With Jumbo Frames, networks can achieve higher throughput performance and greater CPU utilization. These attributes are particularly useful for database transfer and tape backup operations.
Management Support	This adapter ships with agents that can be managed from HPE Systems Insight Manager or other management application that support SNMP.
Message Signaled Interrupt (Extended) (MSI-X)	Message Signaled Interrupt (Extended) provides performance benefits for multi-core servers by load balancing interrupts between CPUs/cores.
Network Adapter Teaming	This adapter support for NIC teaming helps IT administrators increase network fault tolerance and increased network bandwidth, the team of adapters can work together as a single virtual adapter, providing support for several different types of teaming enabling IT administrators to optimize availability, improve performance and help reduce costs.
Optimized for Virtualization	I/O Virtualization support for VMware NetQueue and Microsoft VMQ helps meet the performance demands of consolidated virtual workloads.
Preboot eXecution Environment (PXE)	Support for PXE enables automatic deployment of computing resources remotely from anywhere. It allows a new or existing server to boot over the network and download software, including the operating system, from a management/ deployment server at another location on the network.Additionally, PXE enables decentralized software distribution and remote troubleshooting and repairs.
RoCE	RoCE is an accelerated I/O delivery mechanism that allows data to be transferred directly from the user memory of the source server to the user memory of the destination server bypassing the operating system (OS) kernel. Because the RDMA data transfer is performed by the DMA engine on the adapter's network processor, the CPU is not used for the data movement, freeing it to perform other tasks such as hosting more virtual workloads (increased VM density). RDMA also bypasses the host's TCP/IP stack, in favor of upper layer InfiniBand protocols implemented in the adapter's network processor. The bypass of the TCP/IP stack and the removal of a data copy step reduce overall latency to deliver accelerated performance for applications such as Microsoft Hyper-V Live Migration, Microsoft SQL and Microsoft SharePoint with SMB Direct.
Single-Root I/O Virtualization	Single-Root I/O Virtualization (SR-IOV) provides a mechanism to bypass the host system hypervisor in virtual environments providing near metal performance and server efficiency. SR-IOV provides mechanism to create multiple Virtual Functions (VFs) to share single PCIe resources. The device is capable of SR-IOV, and requires Server BIOS support, controller firmware, and OS support.
TCP/UDP/IP	For overall improved system response, this adapter supports standard TCP/IP offloading techniques including:

Standard Features

	TCP/IP, UDP checksum offload (TCO) moves the TCP and IP checksum offloading from the CPU to the network adapter. Large send offload (LSO) or TCP segmentation offload (TSO) allows the TCP segmentation to be handled by the adapter rather than the CPU.
Tunnel Offload	Minimize the impact of overlay networking on host performance with tunnel offload support for VXLAN and NVGRE. By offloading packet processing to adapters, customers can use overlay networking to increase VM migration flexibility and virtualized overlay networks with minimal impact to performance. HPE Tunnel Offloading increases I/O throughput, reduces CPU utilization, and lowers power consumption. Tunnel Offload supports VMware's VXLAN and Microsoft's NVGRE solutions.
Warranty	Maximum: The remaining warranty of the HPE product in which it is installed (to a maximum three-year, limited warranty). Minimum: One year limited warranty. **NOTE:** Additional information regarding worldwide limited warranty and technical support is available at: **http://h17007.www1.hpe.com/us/en/enterprise/servers/warranty/index.aspx#.V4e3tPkrJhE**

Service and Support

Service and Support	**NOTE:** This adapter is covered under HPE Support Services/ Service Contract applied to the HPE ProLiant Server or enclosure. No separate HPE Support Services need to be purchased. Most HPE branded options sourced from HPE that are compatible with your product will be covered under your main product support at the same level of coverage, allowing you to upgrade freely. Additional support is required on select workload accelerators, switches, racks and UPS options 12KVA and over. Coverage of the UPS battery is not included under HPE support services; standard warranty terms and conditions apply.
Warranty and Support Services	Warranty and Support Services will extend to include HPE options configured with your server or storage device. The price of support service is not impacted by configuration details. HPE sourced options that are compatible with your product will be covered under your server support at the same level of coverage allowing you to upgrade freely. Installation for HPE options is available as needed. To keep support costs low for everyone, some high value options will require additional support. Additional support is only required on select high value workload accelerators, fibre switches, InfiniBand and UPS options 12KVA and over. Coverage of the UPS battery is not included under TS support services; standard warranty terms and conditions apply.
Protect your business beyond warranty with HPE Support Services	HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to HPE to help prevent problems and solve issues faster. HPE Support Services enable you to choose the right service level, length of coverage and response time as you purchase your new server, giving you full entitlement to the support you need for your IT and business. Protect your product, beyond warranty.
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.
For more information	Visit the Hewlett Packard Enterprise Service and Support **website**.

Technical Specifications

General Specifications	**Network Processor**	Emulex XE-104
	Data Rate	Two ports, each at 40Gb/s bi-directional; 80Gb/s aggregate bi-directional theoretical bandwidth.
	Bus type	PCI Express 3.0 (Gen 3) x8
	Form Factor	FlexibleLOM
	IEEE Compliance	802.3ae, 802.1Q, 802.3x, 802.1p, 802.3ad/LACP, 802.1AB(LLDP), 802.1Qbg, 802.1Qbb, 802.1Qaz, 802.3ap
Power and Environmental Specifications	**Power**	7.6W typical, 8.7W maximum
	Temperature Operating	- 0°C to 55°C / 32°F to 131°F
	Humidity - Operating	15% to 80% non-condensing
	Agency Approvals	USA: FCC (CFR Title 47 Part 15) and UL 60950-1:2007 Canada: ICES-003:2012 Japan: VCCI:2012 Korea: MSIP - KN22, KN24 Australia: AS/NZS EN55022:2010 / CISPR22:2009+A1, EN55024:2010 / CISPR24:2010 European Union: EN55022:2010 (CISPR 22), EN55024:2010, and IEC60950-1:2007 2nd Edition Taiwan: BSMI - CNS 13438:2006
	RoHS Compliance	6 of 6

Operating System and Virtualization Support

Microsoft Windows Server 2008 SP2, R2 w/SP1 (x86, x64)
Microsoft Windows Server 2012 and 2012 R2
Microsoft Windows Server 2016
Red Hat Enterprise Linux (RHEL) 5.9, 5.10, 6.4, 6.5, 6.7, 7.0 (x86 and x64)
Red Hat Enterprise Linus (RHEL) 7.1, 7.2 (x64)
SUSE Linux Enterprise Server (SLES) 11, SP2. SP3 (x86, x64)
SUSE Linux Enterprise Server (SLES) 11 SP4 (x64)
SUSE Linux Enterprise Server (SLES) 12, SP1 (x64)
Solaris 10 U10
Solaris 11 x64
VMware ESXi 5.0 U3, 5.1 U2
VMware vSphere 5.5, 6.0

NOTE: For more operating system support and certification information, please visit:
http://h17007.www1.hpe.com/us/en/enterprise/servers/supportmatrix/redhat_linux.aspx#.V4e8tPkrJD8

NOTE:

Minimum Linux versions for FCoE support include RHEL 6.4 and SLES 11 SP3
For RHEL 7.x, RHEL 7.2 is the minimum version for FCoE Boot from SAN support
vSphere 5.5 is the minimum version of VMware for 20Gb support and SRIOV support
vSphere 6.0 is the minimum version of VMware for UEFI FCoE Boot from SAN support
Boot from SAN via the iSCSI offload path is not supported for VMware
Networking only support for Solaris and Citrix XenServer
FCoE is supported on XenServer
UEFI is not supported for Xenserver

Technical Specifications

Environment-friendly Products and Approach - End-of-life Management and Recycling	Hewlett Packard Enterprise offers end-of-life **product return, trade-in, and recycling programs**, in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner. The EU WEEE Directive (2012/19/EU) 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**. These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change
17-Sep-2019	Version 13	Changed	Operating System and Virtualization Support section updated
05-Feb-2018	Version 12	Changed	Overview was updated
11-Jul-2017	Version 11	Changed	Compatibility section was updated.
10-Feb-2017	Version 10	Changed	Compatibility, Standard Features, Related Options, and Technical Specifications sections were updated.
		Removed	Obsolete SKU was deleted: 516733-B21
05-Dec-2016	Version 9	Changed	Standard Features and Technical Specifications sections were updated.
30-Sep-2016	Version 8	Changed	Operating System Support notes were updated.
22-Jul-2016	Version 7	Changed	QuickSpecs sections were updated.
20-May-2016	Version 6	Changed	Sections were updated in QuickSpecs.
02-Oct-2015	Version 5	Changed	Compatibility and Related Options sections were updated.
05-Feb-2018	Version 4	Added	SKUs Added on HPE 10/20Gb interconnects: 737230-B21, 737226-B21, 658247-B21, 737220-B21.
		Changed	Overview section was updated
30-Sep-2014	Version 3	Changed	Updates to Standard Features and Technical Specifications sections.
12-Sep-2014	Version 2	Changed	Small changes made to Standard Features and Technical Specifications sections.
09-Sep-2014	Version 1	New	Initial version.

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