

### Overview

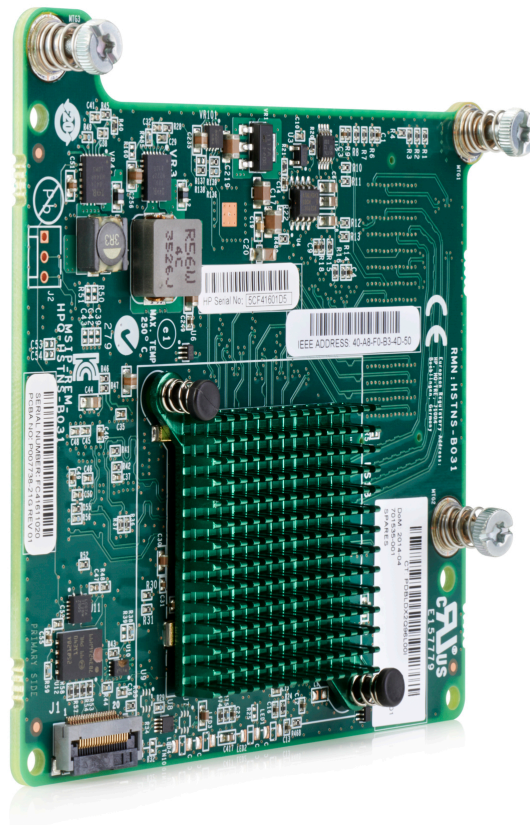
#### HPE FlexFabric 20Gb 2-port 650M Adapter

Extended SKU - This adapter is part of an extended catalog of products tailored for customers in specific markets or with specific workloads, requiring the utmost in performance or value, but typically have a longer lead-time.

The HPE FlexFabric 20Gb 2-port 650M 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 Hewlett Packard Enterprise Virtual Connect FlexFabric 20/40 F8 Modules, the HPE FlexFabric 650M 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 650M is a dual-speed adapter that can also operate at 10GbE when connected to Hewlett Packard Enterprise 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 650M Adapter

## Platform Information

### Models

HP FlexFabric 20Gb 2-port 650M Adapter

700767-B21

**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.

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**Kit Contents** HPE FlexFabric 20Gb 2P 650M Adapter  
Quick install card  
Product warranty statement

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**Compatibility - Supported Servers** HPE ProLiant BL460c Gen9 Server  
HPE ProLiant BL660c Gen9 Server  
HPE ProLiant WS460c Gen9 Server  
HPE ProLiant BL460c Gen10 Server

**NOTE:** This is a list of supported servers. Some may be discontinued.

### Compatibility - Supported Interconnect Modules

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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**

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

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

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## 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 – supports NIC + FCoE on one port, and NIC + iSCSI on the other
- Concurrent Storage – concurrently supports NIC, FCoE, and iSCSI storage functions on the same port (NIC + FCoE + iSCSI)
- Industry-leading throughput and latency performance
- Supports HPE's 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 to 10Gb/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

### 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 eight physical function NICs per adapter. 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.

## Standard Features

VLANs increase security by isolating traffic between users. Limiting the broadcast traffic to within the same VLAN domain also improves performance.

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### 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 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.

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### 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.

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### iSCSI/FCoE

This adapter supports accelerated iSCSI or iSCSI boot and FCoE.

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### 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.

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### Management Support

This adapter ships with agents that can be managed from HPE Systems Insight Manager or other management application that support SNMP.

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### Message Signaled Interrupt (Extended) (MSI-X)

Message Signaled Interrupt (Extended) provides performance benefits for multi-core servers by load balancing interrupts between CPUs/cores.

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### 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.

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### Optimized for Virtualization

I/O Virtualization support for VMware NetQueue and Microsoft VMQ helps meet the performance demands of consolidated virtual workloads.

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### 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

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## Standard Features

management/ deployment server at another location on the network. Additionally, PXE enables decentralized software distribution and remote troubleshooting and repairs.

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### 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.

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### TCP/UDP/IP

For overall improved system response, this adapter supports standard TCP/IP offloading techniques including: 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.

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### 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.

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### 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>**

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## 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.

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### 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.

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### 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.

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### 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.

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### For more information

Visit the Hewlett Packard Enterprise Service and Support [website](#).

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## Technical Specifications

<b>General Specifications</b>	<b>Network Processor</b>	Emulex XE-104
	<b>Data Rate</b>	Two ports, each at 40Gb/s bi-directional; 80Gb/s aggregate bi-directional theoretical bandwidth
	<b>Bus type</b>	PCI Express 3.0 (Gen 3) x8
	<b>Form Factor</b>	Type A mezzanine adapter (works in Type A and Type B mezzanine slots)
	<b>IEEE Compliance</b>	802.3ae, 802.1Q, 802.3x, 802.1p, 802.3ad/LACP, 802.1AB (LLDP), 802.1Qbg, 802.1Qbb, 802.1Qaz, 802.3ap

<b>Power and Environmental Specifications</b>	<b>Power</b>	7.5W typical, 8.6W maximum
	<b>Temperature - Operating</b>	0° to 55°C (32° to 131°F)
	<b>Humidity - Operating</b>	15% to 80% non-condensing
	<b>Agency Approvals</b>	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
	<b>RoHS Compliance</b>	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
- Red Hat Enterprise Linux (RHEL) 5.9, 5.10, 6.4, 6.5, 6.7, 7.0 (x86, x64)
- Red Hat Enterprise Linux (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.hp.com/us/en/enterprise/servers/supportmatrix/redhat\\_linux.aspx#.V4e8tPkrJD8](http://h17007.www1.hp.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 not supported on XenServer

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## Technical Specifications

- **UEFI is not supported for Xenserver**

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### **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.

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## Summary of Changes

Date	Version History	Action	Description of Change
05-Feb-2018	Version 10	Changed	Overview section was updated
11-Jul-2017	Version 9	Changed	Compatibility section was updated
10-Feb-2017	Version 8	Changed	Overview, Compatibility, Standard Features, and Related Options sections were updated.
		Removed	Obsolete SKU was removed: 516733-B21.
16-Dec-2016	Version 7	Changed	Overview, Compatibility, Standard Features, and Related Options sections were updated.
		Removed	Obsolete SKUs were deleted: 700741-B21, 652500-B21, 647590-B21, 631884-B21.
20-May-2016	Version 6	Changed	Sections in QuickSpecs were updated.
02-Oct-2015	Version 5	Changed	Compatibility and Related Options sections were updated.
17-Dec-2014	Version 4	Added	SKUs Added on HPE 10/20Gb interconnects: 737230-B21, 737226-B21, 658247-B21, 737220-B21, 406740-B21.
		Changed	Compatibility 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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