

Overview

HPE FlexFabric 10Gb 2-port 536FLB Adapter

The HPE FlexFabric 10Gb 2-port 536FLB adapter features the next generation of 10 Gb Ethernet offering in a single chip solution on a FlexibleLOM form factor, further reducing power requirements for 2 ports of 10 Gb Ethernet. It is designed for use with HPE BladeSystem c-Class Gen9 servers.

It provides full duplex high performance Ethernet connectivity with support for HPE Virtual Connect FlexFabric blade interconnect technology, allowing each 10GbE port to be divided into four physical NICs and optimize bandwidth management for virtualized servers. The HPE 536FLB FlexFabric network adapter, in conjunction with HPE Virtual Connect FlexFabric technology, helps to extend the benefits of virtualization beyond the server and into the rest of the infrastructure.

The HPE 536FLB supports enterprise class features such as VLAN tagging, adaptive interrupt coalescing, MSI-X, NIC teaming (bonding), Tunnel offload(NVGRE,VXLAN) Receive Side Scaling (RSS), jumbo frames and PXE boot. It also supports virtualization features such as SR-IOV, VMware NetQueue and Microsoft VMQ.



HPE FlexFabric 10Gb 2-port 536FLB Adapter

Compatibility

Compatibility

Models

HPE FlexFabric 10Gb 2-port 536FLB Adapter 766490-B21

HPE FlexFabric 10Gb 2-port 536FLB FIO Adapter 766491-B21

NOTE: This adapter on each server blade connects to a 10 Gb interconnect in bays 1-2 (HPE BladeSystem c7000 Enclosure) or bay 1 (HPE BladeSystem c3000 Enclosure).

NOTE: This adapter requires a minimum of 2 GB of server memory.

NOTE: This adapter supports linking at 1000 Mbps or 10000 Mbps when not connected to a Flex-10 device.

NOTE: This adapter will only support 1000 Mbps when connected to a 1 Gb Ethernet interconnect.

Kit Contents HPE FlexFabric 10Gb 2-port 536FLB Adapter
Quick install card
Product warranty statement

Compatibility - Supported Servers HPE ProLiant BL460c Gen9
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 FlexFabric 10Gb/24-port Module
HPE Virtual Connect Flex-10/10D Module for BladeSystem c-Class
HPE 6120XG Blade Switch
HPE 6120G/XG Blade Switch
HPE 6125G/XG Ethernet Blade Switch
HPE 6125G Ethernet Blade Switch
HPE 6125XLG Blade Switch
HPE 6127XLG Ethernet Blade Switch
HPE 1:10Gb Ethernet BL-c Switch
Cisco Catalyst 3120G Blade Switch for HPE
Cisco Catalyst 3120X Blade Switch for HPE
Cisco Catalyst 3020 Blade Switch
HPE GbE2c Layer 2/3 Ethernet Blade Switch

HPE FlexFabric 536FLB Adapter also supports 1 Gb or 10 Gb connections with the following modules:
HP 10GbE Ethernet Pass-Thru Module for c-Class BladeSystem
HP 1Gb Ethernet Pass-Thru Module for c-Class BladeSystem
HP Cisco B22HP Fabric Extender with 16 FET for BladeSystem c-Class

Standard Features

At a Glance Features

- Full hardware offload of iSCSI and FCoE storage protocol processing for highest performance converged Ethernet data and storage networks.
- Dual-port 10GbE Flex-10 FlexibleLOM network adapter that provides the flexibility to choose the type of LOM to meet growing infrastructure needs
- Hardware acceleration and offloads for stateless TCP/IP
- Industry-leading throughput and latency performance
- Up to 40Gb/s bi-directional near line rate throughput
- Improved small packet performance
- Support for Tunnel Offload (NVGRE, VxLAN)
- Integrated PHY and MAC
- Support for Preboot eXecution Environment (PXE)
- Data Plane Development Kit (DPDK)
- IEEE 1588 Precision Time Protocol (PTP)
- Active Health Systems Support
- Jumbo Frame
- Checksum & Segmentation Offload
- IPv6 Acceleration
- Receive-Side Scaling (RSS)
- HPE Sea of Sensors 3D
- Optimized for virtual server environments with support for HPE Flex-10 Technology, Network Partitioning (NPAR) and Single-Root I/O Virtualization (SR-IOV) User configurable bandwidth settings when combined with the 10Gb Flex-10 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. 10 Gb.
- Note: DPDK and Virtual Connect can't be used at the same time.

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

Evolve 10 Gb at your own speed! When paired with the HPE Virtual Connect FlexFabric 10 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 iSCSI and FCoE storage offload capability making it a full-Converged Network Adapter (CNA).

Server ROM recognizes them as individual NICs.

Speeds can be set per NIC from 100 Mb to 10 Gbs in 100 Mb increments.

Three fold increase in number of network connections per port.

Up to four physical function NICs per port.

Ideal for virtualized server environment, especially for dedicated bandwidth applications like virtual machine migration from one physical server to another physical server.

Throughput-Theoretical Bandwidth

This adapter delivers 20 Gb/s bi-directional Ethernet transfer rate per port (40 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.

Standard Features

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.
DPDK	This adapter supports DPDK with benefit for packet processing acceleration and use in NFV deployments.
HPE Sea Of Sensors	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 kick on fans and make other adjustments to reduce energy usage. What makes it better is the upgrade from all six fans kicking on at one time to a new system where only one kicks on - the one in proximity of the area that started heating up - thus reducing 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 9,000 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.

Standard Features

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.
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: 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.
Checksum & Segmentation Offload	Normally the TCP Checksum is computed by the protocol stack. Segmentation Offload is technique for increasing outbound throughput of high-bandwidth network connections by reducing CPU overhead. The technique is also called TCP segmentation offload (TSO) when applied to TCP, or generic segmentation offload (GSO).
IPv6	IPv6 uses 128-bit addressing allowing for more devices and users on the internet. IPv4 supported 32-bit addressing.
Time Sync Implementations (PTP)	Synchronization of system clocks throughout a network, achieving clock accuracy in the sub-microsecond range, making it suitable for measurement and control systems.
Receive Side Scaling (RSS)	RSS resolves the single-processor bottleneck by allowing the receive side network load from a network adapter to be shared across multiple processors. RSS enables packet receive-processing to scale with the number of available processors.
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.

Standard Features

NOTE: Additional information regarding worldwide limited warranty and technical support is available at:

[http://h17007.www1.hp.com/us/en/enterprise/servers/warranty/index.aspx#
V4e3tPkrJhE](http://h17007.www1.hp.com/us/en/enterprise/servers/warranty/index.aspx#V4e3tPkrJhE)

Service and Support

General Specifications	Network Processor	QLogic BCM 57840S with integrated MAC/PHY
	Data Rate	Two ports, each at 20 Gb/s bi-directional; 40 Gb/s aggregate bi-directional theoretical bandwidth.
	Onboard Memory	900 MB (distributed memory)
	Bus type	PCI Express 3.0 (Gen3) x8
	Form Factor	Type A mezzanine adapter (works in Type A and Type B mezzanine slots)
	IEEE Compliance	802.3, 802.1ab, 802.3x, 802.3ad, 802.3p, 802.1q, 802.3ae, 802.1Qau, 802.3ap

Power and Environmental Specifications	Power	<12W
	Temperature - Operating	0° to 55°C (32° to 131°F)
	Humidity - Operating	10% to 90% non-condensing
	Emissions Classification	FCC Class A
	Agency approvals	USA: FCC Part 15 Class A Canada: ICES-003, Issue 4 Japan: VCCI V3 (2010.04) Class A International: EN55022:2006 + A1:2007 Class A International: EN55024:1998+A1:2011+A2; EN61000-3-2:2006, EN61000-3-3:2008 Taiwan: BSMI, CNS13438 (2006) Class A Australia/New Zealand (AS/NZS): EN55022:2006+A12007 class A Korea: KN22 Class A, KN24
	RoHS Compliance	6 of 6
	Safety	UL Mark (USA and Canada) CE Mark EN 60590

Operating System and Virtualization Support

- Microsoft Windows Server 2008 SP2, R2 w/SP1 (x86 and x64)
- Microsoft Windows Server 2008 SP2, R2 w/SP1 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 and 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

Technical Specifications

NOTE: For more operating system support & 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

NOTE: For RHEL 7.x, RHEL 7.2 is the minimum version for FCoE Boot from SAN support

NOTE: vSphere 5.5 is the minimum version of VMware for 20 Gb support and SRIOV support

NOTE: vSphere 6.0 is the minimum version of VMware for UEFI FCoE Boot from SAN support

NOTE: Boot from SAN via the iSCSI offload path is not supported for VMware

NOTE: Networking only support for Solaris and Citrix XenServer

NOTE: UEFI is not supported for Xenserver

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
27-Mar-2017	From Version 6 to 7	Changed	Overview and Standard Features were updated.
21-Oct-2016	From Version 6 to 6	Changed	Add DPDK, update servers and add SKU 455880-B21
29-Apr-2016	From Version 4 to 5	Changed	Compatibility, Related Options, and Technical Specifications sections were updated.
		Added	SKUs added in Related Options section: 787635-B21, 787635-B22.
17-Dec-2015	From Version 3 to 4	Changed	Overview, Compatibility, Standard Features, Service and Support, and Technical Specifications sections were updated.
19-Jun-2015	From Version 2 to 3	Changed	Overview, compatibility, standard features, and technical specifications sections were updated.
28-Nov-2014	From Version 1 to 2	Changed	Compatibility, Standard Features and Related Options sections were updated
		Added	SKUs Added on HPE 10/20Gb interconnects: 691367-B21, 691367-B22, 571956-B21, 605865-B21, 638526-B21, 662048-B21, 737230-B21, 737226-B21, 658247-B21, 737220-B21, 406740-B21, 657787-B21
		Removed	Obsolete SKUs removed: 455880-B21



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