

### Overview

#### HPE FlexFabric 10Gb 2-port 533FLR-T Adapter

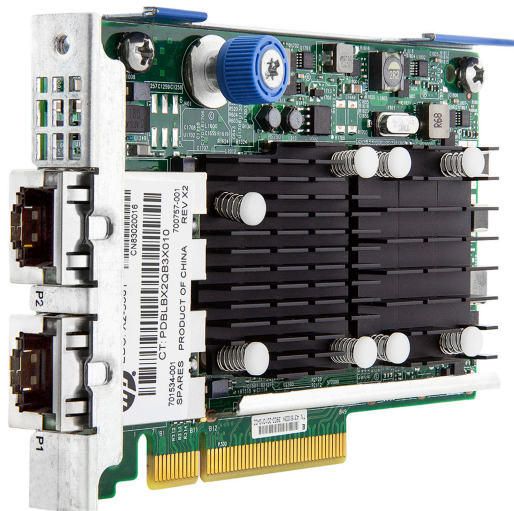
Recommended SKU - This adapter is a recommended option that has been selected by HPE experts to provide the right technology for a range of workloads and market segments offering the best combination of performance, value and availability.

Are you looking to reduce network congestion and improve cable management at the servers ?

The HPE FlexFabric 10Gb 2-port 533FLR-T Adapter is a dual-port 10GBASE-T adapter, featuring the 57810S 10 Gb Ethernet solution from QLogic in a PCIe 2.0 compliant form factor designed for HPE ProLiant servers. The HPE 533FLR-T Adapter delivers full line-rate Ethernet NIC performance across all ports with low power consumption, utilizing CAT 6A UTP cabling with distances up to 100 meters. Providing high performance Ethernet, iSCSI and FCoE connectivity, it is ideal for virtual server and cloud computing environments. It supports enterprise class features such as VLAN tagging, adaptive interrupt coalescing, MSI-X, NIC teaming (bonding), Tunneling offloads (NVGRE, VxLAN), Receive Side Scaling (RSS), jumbo frames, PXE boot) and virtualization features including SR-IOV, Network Partitioning (NPAR), VMware NetQueue and Microsoft VMQ.

For more effective utilization of the 10GbE bandwidth, the HPE 533FLR-T CNA offers Switch Independent Network Partitioning (NPAR) which enables segmentation of each 10GbE port into four virtual ports, with flexible allocation of bandwidth to each port. Allowing IT organizations to improve resource utilization while lowering infrastructure and operational costs.

The adapter's support for HPE Sea of Sensors 3D Technology enhances server performance by reducing energy consumption and expense.



**HPE FlexFabric 10Gb 2-port 533FLR-T Adapter**



Platform Information

<b>Models</b>	
HPE FlexFabric 10Gb 2-port 533FLR-T Adapter	700759-B21
HP FlexFabric 10Gb 2-port 533FLR-T FIO Adapter	700760-B21

<b>Kit Contents</b>	HPE FlexFabric 10Gb 2-port 533FLR-T Adapter
	Quick install card
	Product warranty statement

<b>Compatibility - Supported Servers</b>	HPE ProLiant DL20 Gen9 Server
	HPE ProLiant DL60 Gen9 Server
	HPE ProLiant DL80 Gen9 Server
	HPE ProLiant DL120 Gen9 Server
	HPE ProLiant DL160 Gen9 Server
	HPE ProLiant DL180 Gen9 Server
	HPE ProLiant DL360 Gen9 Server
	HPE ProLiant DL360 Gen10 Server
	HPE ProLiant DL380 Gen9 Server
	HPE ProLiant DL380 Gen10 Server
	HPE ProLiant DL560 Gen9 Server
	HPE ProLiant DL580 Gen9 Server
	HPE Apollo 2000 XL170r Gen9 Server
	HPE Apollo 2000 XL190r Gen9 Server
	HPE Apollo 4200 Gen9 Server
	HPE Apollo 4500-XL450 Gen9 Server
	HPE Apollo 6000 XL230a Gen9 Server
	HPE Apollo 6000 XL230b Gen9 Server
	HPE Apollo 6000 XL250a Gen9 Server

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

## Standard Features

### At a Glance Features

- Industry-leading throughput and latency performance
- FlexibleLOM adapter for Ethernet NIC, iSCSI or FCoE connectivity
- Operates at 1 Gbps/10 Gbps, auto-negotiation, on both ports
- 10GBASE-T connectivity supporting up to 100 meters with CAT 6A cabling
- Up to 40 Gb/s bi-directional near line rate throughput
- Hardware acceleration TCP/IP/UDP stateless offloads, as well as for TCP Offload Engine (TOE)
- iSCSI and FCoE hardware offloads
- Tunnel offload support (NVGRE, VXLAN)
- Improved small packet performance
- Optimized for virtual server environments with support for Network Partitioning (NPAR) and Single-Root I/O Virtualization (SR-IOV)
- Active Health Systems support
- PXE, Jumbo Frames, Checksum & Segmentation Offload, IPv6 and RSS
- On chip temperature monitor (Sea of Sensors)
- Field replaceable and upgradeable
- Support for Preboot eXecution Environment (PXE)
- Converged Network Utility (CNU)

<b>Throughput-Theoretical Bandwidth</b>	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.
<b>802.1Q VLANs</b>	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.
<b>Checksum &amp; Segmentation Offload</b>	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).
<b>Configuration Utilities</b>	This adapter ships with a suite of operating system-tailored configuration utilities that allow the user to enable initial diagnostics and configure adapter teaming. This includes a patented teaming GUI for Microsoft Windows operating systems. Additionally, support for scripted installations of teams in a Microsoft Windows environment allow for unattended OS installations.
<b>DPDK</b>	This adapter supports DPDK with benefit for packet processing acceleration and use in NFV deployments.
<b>HPE Sea Of Sensors 3D</b>	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

## Standard Features

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.

<b>iSCSI/FCoE</b>	This adapter supports accelerated iSCSI or iSCSI boot and FCoE.
<b>IPv6</b>	IPv6 uses 128-bit addressing allowing for more devices and users on the internet. IPv4 supported 32-bit addressing.
<b>Jumbo Frames</b>	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.
<b>LED Indicators</b>	LED indicators show link integrity and network activity for easy troubleshooting.
<b>Management Support</b>	This adapter ships with agents that can be managed from HPE Systems Insight Manager or other management application that support SNMP.
<b>Message Signaled Interrupt (Extended) (MSI-X)</b>	Message Signaled Interrupt (Extended) provides performance benefits for multi-core servers by load balancing interrupts between CPUs/cores.
<b>Network Adapter Teaming</b>	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.
<b>Network Partitioning (NPAR)</b>	This adapter supports Network Partitioning (NPAR) allowing administrators to configure a 10 Gb port as four separate partitions or physical functions. Each PCI function is associated with a different virtual NIC. To the OS and the network, each physical function appears as a separate NIC port.
<b>Optimized for Virtualization</b>	I/O Virtualization support for VMware NetQueue and Microsoft VMQ helps meet the performance demands of consolidated virtual workloads.
<b>Preboot eXecution Environment (PXE)</b>	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.

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<b>Receive Side Scaling (RSS)</b>	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.
<b>Server Integration</b>	<p>This adapter is a validated, tested, and qualified solution that is optimized for HPE ProLiant servers. Hewlett Packard Enterprise validates a wide variety of major operating systems drivers with the full suite of web-based enterprise management utilities including HPE Intelligent Provisioning and HPE Systems Insight Manager that simplify network management.</p> <p>This approach provides a more robust and reliable networking solution than offerings from other vendors and provides users with a single point of contact for both their servers and their network adapters.</p>
<b>TCP/UDP/IP</b>	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.
<b>Precision Time Protocol (IEEE 1588 PTP)</b>	Synchronization of system clocks throughout a network, achieving clock accuracy in the sub-microsecond range, making it suitable for measurement and control systems.
<b>TOE</b>	TCP/IP Offload Engine (TOE) shifts the processing of data in the TCP protocol stack from the server CPU to the adapter's processor, freeing server CPU cycles for other operations.
<b>Tunnel Offload</b>	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.
<b>VMware NewQueue and Microsoft Virtual Machine Queue (VMQ)</b>	<p>VMware NetQueue is technology that significantly improves performance of 10 Gigabit Ethernet network adapters in virtualized environments.</p> <p>Windows Hyper-V VMQ (VMQ) is a feature available on servers running Windows Server 2008 R2 with VMQ-enabled Ethernet adapters. VMQ uses hardware packet filtering to deliver packet data from an external virtual machine network directly to virtual machines, which reduces the overhead of routing packets and copying them from the management operating system to the virtual machine.</p>
<b>Warranty</b>	<p>Maximum: The remaining warranty of the HPE product in which it is installed (to a maximum three-year, limited warranty).</p> <p>Minimum: One year limited warranty.</p>

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**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

<b>Service and Support</b>	<p><b>NOTE:</b> 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.</p> <p>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.</p>
<b>Warranty and Support Services</b>	<p>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.</p>
<b>Protect your business beyond warranty with HPE Support Services</b>	<p>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.</p> <p>Protect your product, beyond warranty.</p>
<b>Parts and Materials</b>	<p>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.</p>
<b>For more information</b>	<p>Visit the Hewlett Packard Enterprise Service and Support <a href="#">website</a>.</p>

## Technical Specifications

<b>General Specifications</b>	<b>Network Processor</b>	Cavium 57810S chipset
	<b>Data Rate</b>	Two ports, each at 20 Gb/s bi-directional; 40 Gb/s aggregate bi-directional theoretical bandwidth.
	<b>Onboard Memory</b>	PCI Express 2.0 (Gen 2) x 8
	<b>Form Factor</b>	Standard and low profile adapter compliant with the PCIe standard
	<b>IEEE Compliance</b>	802.3, 802.3x, 802.2x, 802.3ad, 802.1Qaz, 802.1Qau, 802.1Qbb, 802.1Qbg, 802.1ax
	<b>Connector</b>	RJ-45 (Two)
	<b>Wiring</b>	CAT6 UTP or better twisted-pair cabling
	<b>Cable Distance</b>	Maximum distances for CAT6 cable are 30 meters (98 feet). Maximum distances for CAT6a are 100 meters (328 feet).
<b>NOTE: The HPE 533FLR-T adapter can use existing UTP CAT6 (or better) cable to deliver Gigabit Ethernet over copper, according to the IEEE 802.3an specifications. For new installations, CAT6 cable is recommended. Cabling details:</b> <b>CAT6 UTP or better twisted-pair</b> <b>22-26 AWG, 100 @ 1 MHz</b> <b>EIA/TIA 568-B.2-10b</b>		
<b>Power and Environmental Specifications</b>	<b>Temperature - Operating</b>	0° to 55°C (32° to 131°F)
	<b>Humidity - Operating</b>	5% to 95% non-condensing
	<b>Agency Approvals</b>	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, 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
	<b>RoHS Compliance</b>	6 of 6
<b>Operating System and Virtualization Support</b>	The Operating Systems supported by this adapter are based on the server OS support. Please refer to the OS Support Matrix at <a href="https://www.hpe.com/us/en/servers/server-operating-systems.html">https://www.hpe.com/us/en/servers/server-operating-systems.html</a> .	
<b>Environment-friendly Products and Approach - End-of-life Management and Recycling</b>	Hewlett Packard Enterprise offers end-of-life <b>product return, trade-in, and recycling programs</b> 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 <b>Hewlett Packard Enterprise web site</b> . 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
05-Mar-2018	Version 14	Changed	General Specifications section was updated
05-Feb-2018	Version 13	Changed	Overview section was updated
06-Nov-2017	Version 12	Changed	Technical specifications-OS and Virtualization Support section was updated.
16-Oct-2017	Version 11	Changed	Overview and Technical specifications-OS sections were updated.
11-Jul-2017	Version 10	Changed	Compatibility section was updated.
10-Feb-2017	Version 9	Changed	Overview, Compatibility, Standard Features and Technical Specifications sections were updated.
21-Oct-2016	Version 8	Changed	Add DPDK support and update servers
23-Sep-2016	Version 7	Changed	QuickSpecs sections were updated.
22-July-2016	Version 6	Changed	QuickSpecs sections were updated and URLs upgraded to hpe.com
08-Apr-2016	Version 5	Changed	Overview, Compatibility, Standard Features, and Related Options sections were updated.
		Removed	Obsolete SKUs deleted: 503746-B21
19-Jun-2015	Version 4	Removed	Obsolete SKUs deleted: 412648-B21, 435508-B21, 394793-B21, 394791-B21, 458492-B21, 581201-B21
		Changed	Overview, compatibility, standard features, and technical specifications sections were updated.
28-Nov-2014	Version 3	Changed	Changes made throughout the QS.
09-May-2014	Version 2	Changed	Changes made throughout the QS.
10-Sep-2013	Version 1	New	QuickSpecs created.



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