

### Overview

#### HPE FlexFabric 10Gb 2-port 534FLR-SFP+ 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.

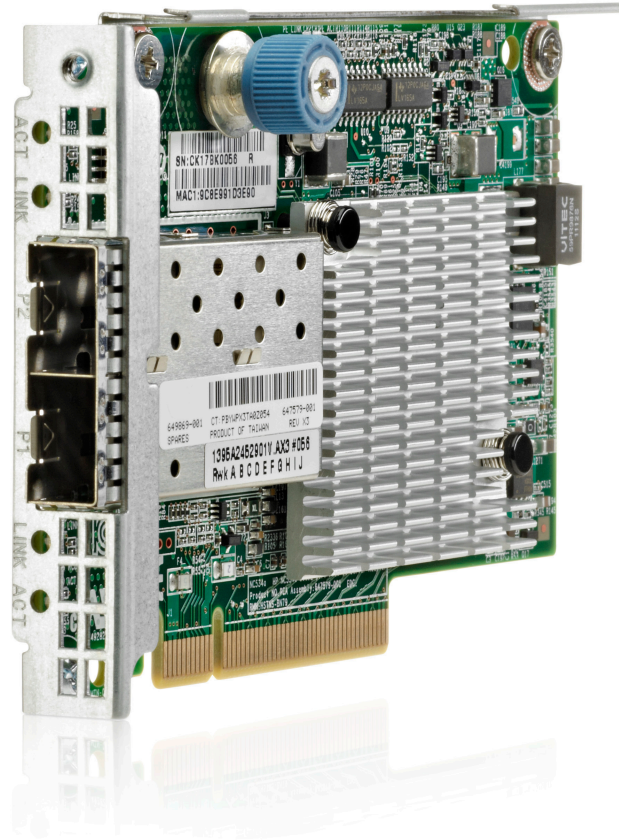
The HPE FlexFabric 10Gb 2-port 534FLR-SFP+ adapter is a fully featured Ethernet NIC that also support iSCSI and FCoE storage offloads if required. This adapter features the next generation of 10 Gb Ethernet offering in a single chip solution on a FlexibleLOM form factor, further reducing power requirements for 2 ports of 10 Gb Ethernet. It is designed for use with HPE ProLiant servers.

For more effective utilization of the 10GbE bandwidth, the HPE 534FLR-SFP+ Adapter 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 HPE 534FLR-SFP+ supports enterprise class features such as VLAN tagging, adaptive interrupt coalescing, MSI-X, NIC teaming (bonding), Tunnel offloads (NVGRE, VXLAN), TCP/Ip Stateless Offloads, Receive Side Scaling (RSS), jumbo frames and PXE boot. It also supports virtualization features such as SR-IOVVMware NetQueue and Microsoft VMQ.



Overview



HPE FlexFabric 10Gb 2-port 534FLR-SFP+ Adapter

## Platform Information

### Models

HPE FlexFabric 10Gb 2-port 534FLR-SFP+ Adapter	700751-B21
HPE FlexFabric 10Gb 2-port 534FLR-SFP+ FIO Adapter	700752-B21

<b>Kit Contents</b>	HPE Ethernet 10Gb 2-port 534FLR-SFP+ Adapter Quick install card Product warranty statement
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### Compatibility - Supported Servers

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 ProLiant DL560 Gen10 Server  
 HPE ProLiant DL580 Gen10 Server  
 HPE Apollo 2000 XL170r Gen9 Server  
 HPE Apollo 2000 XL190r Gen9 Server  
 HPE Apollo 2000 XL170r Gen10 Server  
 HPE Apollo 2000 XL190r Gen10 Server  
 HPE Apollo 4200 Gen9 Server  
 HPE Apollo 4500-XL450 Gen9 Server  
 HPE Apollo 4500-XL450 Gen10 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
- Up to 40 Gb/s bi-directional near-line rate throughput
- Hardware acceleration and offloads for stateless TCP/IP, TCP Offload Engine (TOE)
- Improved small packet performance
- Tunnel offload support (NVGRE, VxLAN)
- Low profile design shipping with standard height and low-profile brackets
- Optimized for virtual server environments with support for Network Partitioning (NPAR) and Single-Root I/O Virtualization (SR-IOV).
- Active Health Systems support via FW (OCBB), I2C capable
- PXE, Jumbo Frames, Checksum and Segmentation Offload, IPv6 and RSS
- On chip temperature monitor
- Standard server operating system support
- Standard NC series option kit warranty, support, services
- Field replaceable and upgradeable.
- Support for Preboot eXecution Environment (PXE)
- Integrated PHY and MAC
- IEEE 1588 (Time Synchronization)
- \* Storage personality must be disabled on NIC intended for DPDK workload. DPDK and Storage modes cannot be used concurrently on current generation CNA NICs. HPE Recommends using 2 separate NICs for Storage (Control Plane), and DPDK (Data Plane) workloads for the optimal high availability configuration.

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**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.

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**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.

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**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).

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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

## Standard Features

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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<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 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>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.

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## Standard Features

<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.
<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>Single-Root I/O Virtualization</b>	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.
<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.

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## Standard Features

### 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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### VMware NewQueue and Microsoft Virtual Machine Queue (VMQ)

VMware NetQueue is technology that significantly improves performance of 10 Gigabit Ethernet network adapters in virtualized environments.

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.

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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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## Related Options

<b>Cables - Direct Attach</b>	HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
	HPE FlexNetwork X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
	HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A
	HPE X242 10G SFP+ to SFP+ 1m Direct Attach Copper Cable	J9281B
	HPE X242 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	J9283B
	HPE X242 10G SFP+ to SFP+ 7m Direct Attach Copper Cable	J9285B

**NOTE:** Direct Attach Cable (DAC) must be purchased separately for copper environments.

<b>Cables - Fiber Optic</b>	HPE LC to LC Multi-mode OM3 2-Fiber 0.5m 1-Pack Fiber Optic Cable	AJ833A
	HPE LC to LC Multi-mode OM3 2-Fiber 1.0m 1-Pack Fiber Optic Cable	AJ834A
	HPE LC to LC Multi-mode OM3 2-Fiber 5.0m 1-Pack Fiber Optic Cable	AJ836A
	HPE LC to LC Multi-mode OM3 2-Fiber 15.0m 1-Pack Fiber Optic Cable	AJ837A
	HPE LC to LC Multi-mode OM3 2-Fiber 30.0m 1-Pack Fiber Optic Cable	AJ838A
	HPE LC to LC Multi-mode OM3 2-Fiber 50.0m 1-Pack Fiber Optic Cable	AJ839A

**NOTE:** Fiber transceivers and cables must be purchased separately for fiber-optic environments.

<b>Transceivers</b>	HPE BladeSystem c-Class 10Gb SFP+ SR Transceiver	455883-B21
	HPE BladeSystem c-Class 10Gb SFP+ LR Transceiver	455886-B21

**NOTE:** Fiber transceivers and cables must be purchased separately for fiber-optic environments.

## Technical Specifications

<b>General Specifications</b>	<b>Network Processor</b> <b>Data Rate</b>	QLogic 57810S chipset Two ports, each at 20 Gb/s bi-directional; 40 Gb/s aggregate bi-directional theoretical bandwidth.
	<b>Onboard Memory</b> <b>Form Factor</b> <b>IEEE Compliance</b>	PCI Express 2.0 (Gen 2) x8 Standard and low profile adapter compliant with the PCIe standard. 802.3, 802.3ae, 802.3x, 802.2x, 802.3ad, 802.1Qaz, 802.1Qau, 802.1Qbb, 802.1Qbg, 802.1ax
<b>Power and Environmental Specifications</b>	<b>Power</b> <b>Temperature - Operating</b> <b>Temperature - Non-Operating</b> <b>Humidity - Operating</b> <b>Humidity - Non-operating</b> <b>Emissions Classification</b> <b>Agency Approvals</b>	9W maximum 0° to 55°C (32° to 131°F) -65° to 85° C (-85° to 185° F) 10% to 90% non-condensing 5% to 95% non-condensing Class A 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> <b>Safety</b>	6 of 6 UL Mark (USA and Canada) CE Mark EN 60590
<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-Feb-2018	Version 13	Changed	Overview section was updated
04-Dec-2017	Version 12	Changed	Standard Features-At a Glance Features section was updated.
06-Nov-2017	Version 11	Changed	Technical Specifications-OS and Virtualization sections were updated.
16-Oct-2017	Version 10	Changed	Overview and Technical Specifications-OS sections were updated.
11-Jul-2017	Version 9	Changed	Compatibility section was updated.
10-Feb-2017	Version 8	Changed	Compatibility, Standard Features, and Related Options sections were updated.
21-Oct-2016	Version 7	Changed	Add DPDK support and update servers.
23-Sep-2016	Version 6	Changed	Overview, Compatibility, Standard Features, Related Options, and Technical Specifications sections were updated.
		Removed	Obsolete SKUs were deleted: 503746-B21, 593717-B21, 614203-B21, 629135-B21, 665240-B21, 647581-B21, 665243-B21, 700699-B21, 629138-B21, 700759-B21.
19-Jun-2015	Version 5	Removed	Obsolete SKUs removed: 412648-B21, 435508-B21, 394793-B21, 394791-B21, 458492-B21, 581201-B21.
		Changed	Overview, Compatibility, Standard Features, Technical Specifications, Related Options sections were updated.
28-Nov-2014	Version 4	Changed	Overview, Compatibility, Standard Features and Technical Specifications sections were updated.
		Added	Section Fiber Optic Modules added on Related Options, SKUs added on this section: 455883-B21, 455886-B21.
13-Aug-2014	Version 3	Changed	Graphic was changed. Broadcom was replaced by QLogic. iSCSI/FCoE sub-section added in Standard Features.
09-May-2014	Version 2	Changed	Product name was revised throughout.
10-Sep-2013	Version 1	New	QuickSpecs created.



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