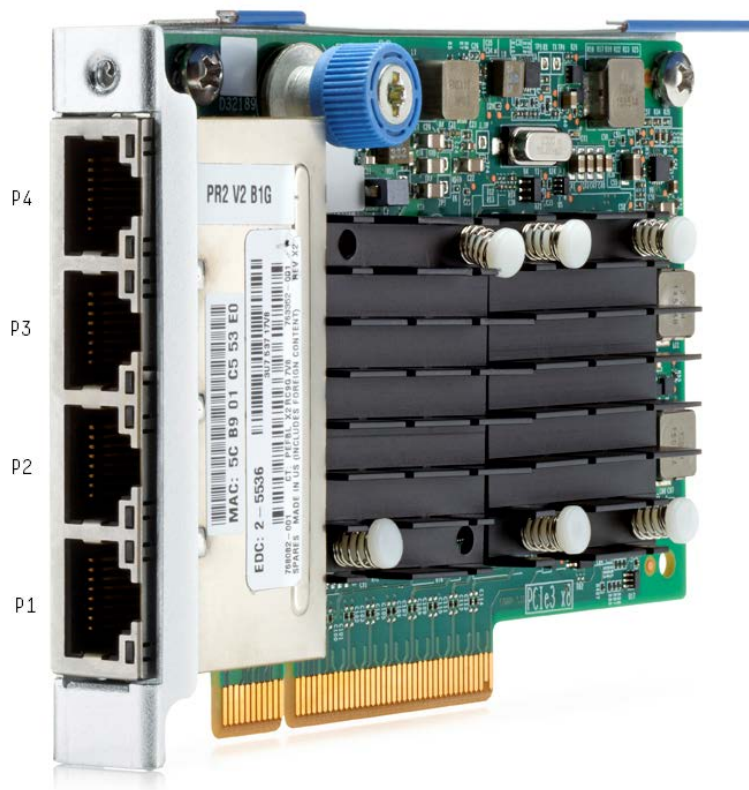


### Overview

#### HPE FlexFabric 10Gb 4-port 536FLR-T Adapter

The HPE FlexFabric 10Gb 4-port 536FLR-T Adapter is a 4-port 10GBASE-T adapter, featuring the 57840S 10 Gb Ethernet controller from Qlogic in a PCIe 3.0 compliant form factor designed for HPE ProLiant Gen9 rack servers. The HPE 536FLR-T Adapter delivers full line-rate performance across all ports with low power consumption, utilizing CAT 6A UTP cabling with distances up to 100 meters. Providing high performance Ethernet 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), Receive Side Scaling (RSS), jumbo frames, PXE boot) and virtualization features (VMware NetQueue and Microsoft VMQ), Single-Root I/O Virtualization (SR-IOV) and Tunnel Offloads (NVGRE, VXLAN).

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



The HPE FlexFabric 10Gb 4-port 536FLR-T Adapter is a 4-port 10GBASE-T adapter which port numbering shown on above.

### Models

HPE FlexFabric 10Gb 4-port 536FLR-T Adapter

764302-B21

HPE FlexFabric 10Gb 4-port 536FLR-T FIO Adapter

764303-B21

### Kit Contents

- HPE FlexFabric 10Gb 4-port 536FLR-T Adapter
- Quick install card
- Product warranty statement

## Compatibility

### Servers

#### ProLiant DL (rack-optimized):

- HPE ProLiant DL20 Gen9
- HPE ProLiant DL60 Gen9
- HPE ProLiant DL80 Gen9
- HPE ProLiant DL120 Gen9
- HPE ProLiant DL160 Gen9
- HPE ProLiant DL180 Gen9
- HPE ProLiant DL360 Gen9
- HPE ProLiant DL380 Gen9
- HPE ProLiant DL560 Gen9
- HPE ProLiant DL580 Gen9

#### Apollo

- Apollo 2000 Gen 9
- Apollo 4200 Gen 9
- Apollo 4500 Gen 9
- Apollo 4510 Gen 9

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

## Standard Features

### Product Features

- Industry-leading throughput and latency performance
- FlexibleLOM adapter
- Operates at 1Gbps/10Gbps, auto-negotiation, on four ports
- 10GBASE-T connectivity supporting up to 100 meters with CAT 6A cabling
- Up to 80Gb/s bi-directional near line rate throughput
- Hardware acceleration TCP/IP/UDP stateless offloads, as well as for TCP Offload Engine (TOE)
- Superior small packet performance
- 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)

### 4-port 10 Gigabit Ethernet Throughput

The HPE 536FLR-T adapter delivers 20 Gbps full duplex Ethernet transfer rate per port, providing the network performance needed to improve response times and alleviate bottlenecks that impact performance of next generation data centers. 10Gb Ethernet bandwidth is ideal for high performance computing, database clusters, and more.

### Jumbo Frames

The HPE 536FLR-T adapter supports jumbo frames (also known as extended frames), permitting up to a 9K byte (KB) transmission unit (MTU) when running Ethernet I/O traffic. This is over 5X the size of a standard 1500-byte Ethernet frame. With jumbo frames, networks can achieve higher throughput performance and improve CPU utilization. These attributes are particularly useful for database transfer and tape backup operations.

### DPDK

The HPE 536FLR-T adapter supports DPDK with benefit for packet processing acceleration and use in NFV deployments.

### TCP/IP Stateless Offloading

TCP, IP, UDP checksum offload, Large Send Offload (LSO), TCP Segmentation Offload (TSO). These features optimize host efficiency, leaving the CPU available for other duties.

The HPE 536FLR-T adapter offers TCP/IP stateless offloading capability.

### 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 network scale with minimal impact to performance. HPE Tunnel Offloading increases I/O throughput, reduces CPU utilization, and lowers power consumption. NVGRE tunnel offload supports Microsoft OS environments and VxLAN supports select VMware and Linux (RHEL and SUSE) environments.

### iSCSI/FCoE

The HPE 536FLR-T adapter supports accelerated iSCSI or iSCSI boot and FCoE for storage connectivity.

### MSI and MSI-X

Message Signaled Interrupt (Extended) provides performance benefits for multi-core servers by load balancing interrupts between CPUs/cores. The HPE 536FLR-T supports MSI and MSI-X.

### 802.1Q VLANs

IEEE 802.1Q virtual local area network (VLAN) protocol allows each physical port of the HPE 536FLR-T 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. The HPE 536FLR-T provides support for 802.1Q (VLAN).

### TOE

TCP/IP Offload Engine (TOE) shifts the processing of data in the TCP protocol stack from the server CPU to the

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## Standard Features

adapter's processor, freeing server CPU cycles for other operations.

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### Optimized for Virtualization

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

The HPE 536FLR-T adapter is compliant (SR-IOV), accommodating multiple Virtual Machines (VMs) to share single PCIe resources. For full implementation, SR-IOV requires OS support in addition to support by the adapter.

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### Checksum & Segmentation Offload

Normally the TCP Checksum is computed by the protocol stack. By selecting one of the "Checksum Offload" parameters, the checksum can be computed by the adapter.

Segmentation Offload is a 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).

The HPE 536FLR-T adapter has Checksum and Segmentation Offload capabilities.

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### IPv6

IPv6 uses 128-bit addressing allowing for more devices and users on the Internet. IPv4 supported 32-bit addressing. The HPE 536FLR-T adapter supports IPv6.

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### 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.

The HPE 536FLR-T adapter has RSS capabilities.

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### Time synchronization 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.

The HPE 536FLR-T adapter supports Precision Time Protocol-ready (PTP).

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## Network Management

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### Management Support

The HPE 536FLR-T adapter can be administered from HPE Systems Insight Manager (SIM). The adapters can be managed individually or in teams, providing SNMP based statistics for reporting purposes. The HPE 536FLR-T adapter can also be managed by other applications with SNMP support.

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### Server Integration

The HPE 536FLR-T 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. The HPE 536FLR-T adapter is also HPE Oneview-ready.

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.

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### Configuration Utilities

Each HPE 536FLR-T 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.

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## Standard Features

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**LED Indicators** The colored LEDs on each port of the HPE 536FLR-T adapter indicate link status and link activity.

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**Preboot eXecution Environment (PXE)** PXE allows the server to boot over the network and download software residing in the network.

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**HPE Sea of Sensors 3D** Support for HPE's 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.

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**VMware NetQueue and Microsoft Virtual Machine Queue (VMQ)** VMware NetQueue is technology that significantly improves performance of 10 Gigabit Ethernet network adapters in virtualized environments.

Microsoft Virtual Machine Queue (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.

The HPE 536FLR-T adapter supports VMware NetQueue and Microsoft Virtual Machine Queue.

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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.  
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>

## Service and Support

### Service and Support

#### HPE Technology Services

HPE Technology Services offers you technical consultants and support expertise to solve your most complex infrastructure problems. We help keep your business running, boost availability, and avoid downtime.

#### Protect your business beyond warranty with HPE Care Pack Services

When you buy HPE Options, it's also a good time to think about what level of service you may need. HPE Care Pack services provide total care and support expertise with committed response choices designed to meet your IT and business need.

HPE Foundation Care services deliver scalable support-packages for Hewlett Packard Enterprise industry-standard servers and software. You can choose the type and level of service that is most suitable for your business needs. New to this portfolio is HPE Collaborative Support. If you are running business critical environments, Hewlett Packard Enterprise offers Proactive Care or Critical Advantage. These services help you deliver high levels of application availability through proactive service management and advanced technical response.

Here is the support service recommendation from the Foundation Care and Proactive Care portfolio. For customized support service solution, Hewlett Packard Enterprise can work with you to tailor a service solution for your unique support requirements using broader services portfolio of Foundation Care and Proactive Care.

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## Recommended HPE Care Pack Services for optimal satisfaction with your HPE product

### Recommended Services

#### 3-Year HPE 24x7 4 hour Response, Hardware Support Onsite Service

Provides you with rapid remote support and if required an Hewlett Packard Enterprise Authorized representative who will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged.

<http://h20566.www2.hp.com/portal/site/hpsc?ac.admitted=1467740454177.125225703.1938120508>

OR

#### 3-Year HPE 24x7 4 hour Response, HPE Collaborative Support

Offers customers a single point of contact for server problem diagnosis, hardware problem resolution, and basic software problem diagnosis, fault isolation, and resolution if available to Hewlett Packard Enterprise. If the problem is with HPE HW, the representative will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged. In case, the issue is with Hewlett Packard Enterprise or supported third-party software product and cannot be resolved by applying known fixes, Hewlett Packard Enterprise will contact the third-party vendor and create a problem incident on your behalf.

#### HPE ProLiant Server Hardware Installation

Provides for the basic hardware installation of Hewlett Packard Enterprise branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner

<https://www.hp.com/h20195/v2/GetDocument.aspx?docname=5981-9356EN>

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## Related HPE Care Pack Services to enhance your HPE product experience

### Related Services

#### 3-Year HPE 24x7 4 hour Response, Proactive Care or Critical Advantage

Helps optimize your systems and delivers high levels of application availability through proactive service management and advanced technical response. A skilled Technical Manager will own your query or issue end to end until resolved, delivering a single point of contact for you

<http://h20566.www2.hp.com/portal/site/hpsc?ac.admitted=1467740454177.125225703.1>

## Service and Support

OR

### 3-Year HPE 6-hour Onsite Call-to-Repair, HPE Collaborative Support

Offers customers a single point of contact for server problem diagnosis, hardware problem resolution to return the hardware in operating condition within 6 hours of the initial service request to the HPE Global Solution Center, and basic software problem diagnosis, fault isolation, and resolution if available to Hewlett Packard Enterprise. In case, the issue is with Hewlett Packard Enterprise or supported third-party software product and cannot be resolved by applying known fixes, Hewlett Packard Enterprise will contact the third-party vendor and create a problem incident on your behalf.

### HPE Proactive Select Service

Provides a flexible way to purchase Hewlett Packard Enterprise best-in-class consultancy and technical services. You can buy Proactive Select Service Credits when you purchase your hardware and then use the credits over the next 12 months. <https://www.hpe.com/h20195/v2/GetDocument.aspx?docname=4AA3-8855ENW>

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#### Insight Remote Support

Provides 24 X 7 remote monitoring, proactive notifications, and problem resolution. Learn more <http://h20564.www2.hpe.com/hpsc/doc/public/display?docId=c04844073>

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#### HPE Support Center

Personalized online support portal with access to information, tools and experts to support Hewlett Packard Enterprise business products. Submit support cases online, chat with Hewlett Packard Enterprise experts, access support resources or collaborate with peers. Learn more <https://www.hpe.com/us/en/support.html>

The HPE Support Center Mobile App allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime.

HPE Insight Remote Support and HPE Support Center are available at no additional cost with a Hewlett Packard Enterprise warranty, HPE Care Pack or Hewlett Packard Enterprise contractual support agreement.

**NOTE:** HPE Support Center Mobile App is subject to local availability

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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. Supplies and consumable parts will not be provided as part of this service; standard warranty terms and conditions apply. Parts and components that have exceeded their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual or the technical product data sheet will not be provided, repaired or replaced as part of this service.

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#### Warranty / Service Coverage

For ProLiant servers and storage systems, this service covers HPE-branded hardware options qualified for the server, purchased at the same time or afterward, internal to the enclosure, as well as external monitors up to 22" and tower UPS products; these items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been exceeded. Coverage of the UPS battery is not included; standard warranty terms and conditions apply.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction. It does not apply to any exchange of Disk or SSD/Flash Drives that have not failed. SSD/Flash Drives that are specified by Hewlett Packard Enterprise as consumable parts and/or that have exceeded maximum supported lifetime and/or the maximum usage limit as set forth in the manufacturer's operating manual or the technical data sheet are not eligible for the defective media retention service feature option.

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#### For more information

To learn more on services for HPE ESSN Options, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Or visit: <https://www.hpe.com/us/en/servers>

## Technical Specifications

<b>General Specifications</b>	<b>Network Processor</b>	QLogic 57840S chipset
	<b>Data Rate</b>	Four ports, each at 20 Gbps full duplex; 80 Gbps aggregate full duplex theoretical adapter bandwidth.
	<b>Bus Type</b>	PCIe v3.0 (Gen 3) 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 (Four)

<b>Power and Environmental Specifications</b>	<b>Operating</b>	Temperature	32° to 131° F (0° to 55° C)
		Humidity	5% to 95% non-condensing
	<b>Power</b>	9W maximum	
	<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 Support</b>	Microsoft Windows Server 2008 R2 w/SP1 64-bit
	Microsoft Windows Server 2012, R2 64-bit
	Windows Hyper-V Server 2012, R2 64-bit
	RHEL6.7 64-bit
	RHEL7.2 64-bit
	SLES11 SP4 64-bit
	SLES12 64-bit
	VMware ESXi 5.5 U3
	VMware ESXi 6.0 U1 and newer
	Solaris 11.1,11.2
	Citrix XenServer 6.5, XenServer 7.0
	Ubuntu 14.04.2, 12.04.5

### NOTES:

- For more Linux OS support & certification information, please visit our the ProLiant & BladeSystem Server Linux matrix: [http://h17007.www1.hp.com/us/en/enterprise/servers/supportmatrix/redhat\\_linux.aspx#](http://h17007.www1.hp.com/us/en/enterprise/servers/supportmatrix/redhat_linux.aspx#)
- RHEL7.2 is the minimum version for FCoE Boot from SAN support
- vSphere 6.0 U1 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, Citrix XenServer, and Ubuntu.
- uEFI is not supported for XenServer.



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## Technical Specifications

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**Environment-  
friendly Products  
and Approach****End-of-life  
Management and  
Recycling**

Hewlett Packard Enterprise offers end-of-life Hewlett Packard Enterprise product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: <http://www8.hp.com/us/en/hpe/HPE-information/livingprogress/> To recycle your product, please go to: <http://www8.hp.com/us/en/hpe/HPE-information/livingprogress/> or contact your nearest Hewlett Packard Enterprise sales office. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) 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 at: <http://www8.hp.com/us/en/hpe/HPE-information/livingprogress/> 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
21-Oct-2016	From Version 2 to 3	Changed	Add DPDK
07-Oct-2016	From Version 1 to 2	Changed	Change to VMware ESXi 6.0 U1 and newer
26-Sep-2016	Version 1	Created	New QuickSpecs



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