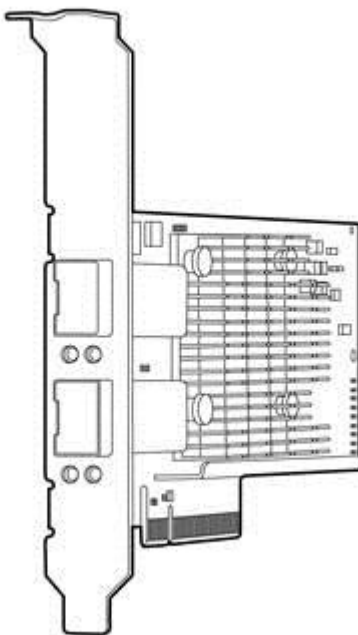## Overview

HP Ethernet 10G 2-port 546SFP+ Adapter

The HP Ethernet 10Gb 2-port 546SFP+ adapter for ProLiant Gen9 rack servers are designed to optimize Cloud efficiency, and improve performance and security of applications – especially where I/O, block storage and database performance are critical and the need for maximum VM density and up-scalability are greatest.

The HP Ethernet 546SFP+ can provide up to 40Gbps of converged bi-directional Ethernet bandwidth, helping to alleviate network bottlenecks

HP Ethernet 10G 2-port 546SFP+ Adapter

Models

HP Ethernet10Gb 2-port 546SFP+ Adapter	779793-B21
	727060-B21

Kit Contents
- HP Ethernet 10Gb 2-port 546SFP+ Adapter
- Quick install card
- Product warranty statement

Compatibility

HP ProLiant Server Support	• HP ProLiant DL580 Gen8 • HP ProLiant DL380 Gen9 • HP ProLiant DL360 Gen9 • HP ProLiant DL180 Gen9 • HP ProLiant DL160 Gen9 • HP ProLiant DL120 Gen9 • HP ProLIant DL80 Gen9 • HP ProLiant DL60 Gen9 • HP ProLiant ML350 Gen9 • HP ProLiant ML150 Gen9 • HP ProLiant ML110 Gen9 • HP Apollo 6000 Gen9 • HP Apollo 2000 Gen9
Tape Drive	Nearline Tape Products: • D2D • VLS • ESL libraries • EML libraries • ESL G3 library • MSL G3 libraries (2024, 4048, 8096)

Standard Features

Product Features	• Dual 10Gb ports provide up to 40Gb bi-directional per adapter • Converges RoCE with LAN traffic on a single 10 GbE wire • Tunnel Offload support for VXLAN and NVGRE • RDMA over Converged Ethernet (RoCE) for greater server efficiency and lower latency • Advanced storage offload processing freeing up valuable CPU cycles • Supports UEFI and legacy boot options • Industry-leading throughput and latency performance • Over eight million small packets/s, ideal for web/mobile applications, mobile messaging, and social media • FlexibleLOM Adapter • Greater bandwidth with PCIe 3.0 • Includes 128MB of onboard memory • Jumbo Frames support • Supports Wake On LAN (WOL) • Support for Preboot eXecution Environment (PXE) • Supports receive-side scaling (RSS) for the efficient distribution of network receive processing across multiple CPUs in multiprocessor systems • Support for Windows SMB Direct • Supports VMWare NetQueue, Microsoft Virtual Machine Queue (VMQ) for Windows • Optimized host virtualization density with SR-IOV support
Dual-port 10 Gigabit Ethernet Throughput (theoretical bandwidth)	The 20,000 Mbps bi-directional Ethernet transfer rate per port (40 Gbps aggregate bi-directional), providing the network performance needed to improve response times and alleviate bottlenecks. 10Gb Ethernet bandwidth is ideal for high performance computing, database clusters.
PCI Express Interface	The HP 546SFP+ is designed with an eight lane (x8) PCI Express bus based on the PCIe 3.0 standard. The adapter is backward compatible with four lane (x4) PCI Express, automatically auto-sensing between x8 and x4 slots.
Jumbo Frames	The HP 546SFP+ adapter supports Jumbo Frames, permitting up to a 9,200 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 lower CPU utilization. These attributes are particularly useful for storage, database transfer and tape backup operations.
MSI-X	Message Signaled Interrupt (Extended) provides performance benefits for multi-core servers by load balancing interrupts between CPUs/cores.
Hardware iSCSI or FCoE with Full Offload	The 546SFP+ is the only network option for HP Gen9 rack servers that supports hardware FCoE or iSCSI with full protocol offload.
TCP/IP Stateless Offloading	For overall improved system response, the HP 546SFP+ adapter supports standard TCP/IP offloading techniques including: TCP/IP 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.
RDMA (RoCE)	RoCE is an accelerated I/O delivery mechanism that allows data to be transferred directly from the user memory of the source server to the user memory of the destination server bypassing the operating system (OS) kernel. Because the RDMA data transfer is performed by the DMA engine on the adapter's network processor, the CPU is not used for the data movement, freeing it to perform other tasks such as hosting more virtual workloads (increased VM density). RDMA also bypasses the host's

Standard Features

	TCP/IP stack, in favor of upper layer InfiniBand protocols implemented in the adapter's network processor. The bypass of the TCP/IP stack and the removal of a data copy step reduce overall latency to deliver accelerated performance for applications such as Microsoft Hyper-V Live Migration, Microsoft SQL and Microsoft SharePoint with SMB Direct.
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. HP Tunnel Offloading increases I/O throughput, reduces CPU utilization, and lowers power consumption. Tunnel Offload supports VMware's VXLAN and Microsoft's NVGRE solutions.
Interrupt Coalescing	Interrupt coalescing (interrupt moderation) groups multiple packets, thereby reducing the number of interrupts sent to the host. This process optimizes host efficiency, leaving the CPU available for other duties.
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 the HP 546SFP+ 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.

Network Management

Management Support	Like all HP ProLiant server adapters, the HP 546SFP+ adapter ships with agents that can be managed from HP Systems Insight Manager or other management application that support SNMP.
Server Integration	The HP 546SFP+ adapter is a validated, tested, and qualified solution that is optimized for HP ProLiant servers. HP validates a wide variety of major operating systems drivers with the full suite of web-based enterprise management utilities including HP Intelligent Provisioning and HP Systems Insight Manager that simplify network management. This approach provides a more robust and reliable networking solution than offerings from other venders and provides users with a single point of contact for both their servers and their network adapters.
Configuration Utilities	Each HP 546SFP+ 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.
LED Indicators	Bracket LED indicators show link integrity and network activity for easy troubleshooting.
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.
Warranty	Maximum: The remaining warranty of the HP 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://h18004.www1.hp.com/products/servers/platforms/warranty/index.html

Service and Support

NOTE: Ethernet adapters are supported as a part of the HP Server Infrastructure, unless specified otherwise. No separate carepacks are needed to be purchased.

HP Technology Services for Enterprise Servers

HP Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to HP to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time.

Protect your business beyond warranty with HP Care Pack Services
HP Care Pack Services enable you to order the right service level, length of coverage and response time as you purchase your new server, giving you full entitlement for the term you select.

Get connected to HP to improve your support experience	Connecting products to HP will help prevent problems with 24x7monitoring, prefailure alerts, automatic call logging, and parts dispatch. With Connected products, you can have a dashboard to manage your IT anywhere, anytime, from any device.
HP Support Center	Personalized online support portal with access to information, tools and experts to support HP business products. Submit support cases online, chat with HP experts, access support resources or collaborate with peers. Learn more http://www.hp.com/go/hpsc
	HP's 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.
	HP Insight Remote Support and HP Support Center are available at no additional cost with a HP warranty, HP Care Pack or HP contractual support agreement.
	*HP' Support Center Mobile App is subject to local availability
Parts and materials	HP will provide HP-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 HP due to malfunction.
Warranty / Service Coverage	For ProLiant servers and storage systems, this service covers HP-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 HP 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 HP 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.

Service and Support

For more information   To learn more on services for HP ESSN Options, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: http://www.hp.com/services/proliant or www.hp.com/services/bladesystem

Technical Specifications

Direct Attach Cable	HP BladeSystem c-Class 10GbE SFP+ to SFP+ 0.5m Direct Attach Copper Cable	487649-B21
	HP BladeSystem c-Class 10GbE SFP+ to SFP+ 1m Direct Attach Copper Cable	487652-B21
	HP BladeSystem c-Class 10GbE SFP+ to SFP+ 3m Direct Attach Copper Cable	487655-B21
	HP BladeSystem c-Class 10GbE SFP+ to SFP+ 5m Direct Attach Copper Cable	537963-B21
	HP X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
	HP X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
	HP X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
	HP X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
	HP X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
	NOTE: Direct Attach Cable (DAC) must be purchased separately for copper environments.	

Fiber Optic Modules	HP BladeSystem c-Class 10Gb SFP+ SR Transceiver	455883-B21
	NOTE: Fiber transceivers and cables must be purchased separately for fiber-optic environments.	

Fiber Optic Cables	HP LC to LC Multi-mode OM3 2-Fiber 0.5m 1-Pack Fiber Optic Cable	AJ833A
	HP LC to LC Multi-mode OM3 2-Fiber 1.0m 1-Pack Fiber Optic Cable	AJ834A
	HP LC to LC Multi-mode OM3 2-Fiber 5.0m 1-Pack Fiber Optic Cable	AJ836A
	HP LC to LC Multi-mode OM3 2-Fiber 15.0m 1-Pack Fiber Optic Cable	AJ837A
	HP LC to LC Multi-mode OM3 2-Fiber 30.0m 1-Pack Fiber Optic Cable	AJ838A
	HP 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.	
	NOTE: For additional information on 10Gb cable specifications go to: http://www.hewlett-packard.com/rnd/pdfs/10gig_cabling_technical_brief.pdf	

Additional Supported Cables (Plug into HPN5900)	HP X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
	HP X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
	HP X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
	HP X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
	HP X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
	HP X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
	HP X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A

Additional Supported Cables (Plug into HPN6600)	HP X242 10G SFP+ to SFP+ 1m Direct Attach Copper Cable	J9281B
	HP X242 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	J9283B
	HP X242 10G SFP+ to SFP+ 15m Direct Attach Copper Cable	J9287B

General Specifications	**Network processor**	Mellanox Connect X-3 ProEmulex XE-102
	Data rate	Two ports, each at 20 Gbps bi-directional; 40 Gbps aggregate bi-directional theoretical bandwidth.
	Onboard memory	128MB
	Bus type	PCI Express v3.0 (Gen 3) x8
	Form factor	FlexibleLOMStand-up card
	IEEE Compliance	802.3ae, 802.1Q, 802.3x, 802.1p, 802.3ad/LACP, 802.1AB(LLDP), 802.1Qbg,

Technical Specifications

802.1Qbb, 802.1Qaz

Power and Environmental Specifications	**Operating**	**Temperature**	0°C to 55°C / 32°F to 131°F
		Humidity	15% to 80% non-condensing
	Non-operating	**Temperature**	-40°C to 70°C / -40°F to 158°F
		Humidity	10% to 90% non-condensing
	Power requirement	8.4 W typical, 9.7 W maximum	
	Emissions classification	FCC Class A, VCCI Class A, BSMI Class A, CISPR 22 Class A, ACA Class A, EN55022 Class A, EN55024-1, ICES-003 Class A, MIC Class A	
	Safety	UL Mark (USA and Canada) CE Mark En 60590-1	
	Other	PCIe 3.0 RoHS compliance 6 of 6 IPv4, IPv6 CE ACPI 1.1a Microsoft WHQL (Windows Hardware Quality Labs) Server Design Guide version 3.0 (SDG 3.0)	

Operating System Support

Windows:
Microsoft Windows Server 2012, 2012 R2, 2008 R2 w/ SP1 (x64)
Microsoft Windows Hyper-V 2008 R2 w/SP1, 2012, 2012 R2

Linux:
Red Hat Enterprise Linux 6.5, 6.6, 7.0
SUSE Linux Enterprise Server 11, SP3 (x64)
SUSE Linux Enterprise Server 12

HyperVisors:
VMware ESXi 5.1 U3, 5.5 U2
Citrix XenServer 6.5 (Creedence)
Citrix XenServer (Naples) (x64)

NOTE: For more operating system support & certification information, please visit:
http://h10018.www1.hp.com/wwsolutions/index.html

Environment-friendly Products and Approach

End-of-life Management and Recycling

Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP 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

Technical Specifications

Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.