

### Overview

#### HPE Ethernet 10Gb 2-port 561T Adapter

Extended SKU - This adapter is part of an extended catalog of products tailored for customers in specific markets or with specific workloads, requiring the utmost in performance or value, but typically have a longer lead-time.

The HPE Ethernet 10Gb 2-port 561T Adapter is a dual-port 10GBASE-T adapter, featuring the Intel X540 10Gb Ethernet solution in a PCIe 2.1 compliant form factor designed for HPE ProLiant rack and tower servers. The HPE 561T adapter delivers full line-rate performance across all, utilizing CAT 6A UTP cabling (or better) 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 (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).

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



HPE Ethernet 10Gb 2-port 561T Adapter

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## Platform Information

### Models

HP Ethernet 10Gb 2-port 561T Adapter	716591-B21
HP Ethernet 10Gb 2-port 561T Adapter for Integrity Servers	B9F25A

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<b>Kit Contents</b>	HPE Ethernet 10Gb 2-port 561T Adapter Quick install card Product warranty statement
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<b>Compatibility - Supported Servers</b>	HPE ProLiant DL20 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 HPE ProLiant ML30 Gen9 HPE ProLiant ML110 Gen9 HPE ProLiant ML150 Gen9 HPE ProLiant ML350 Gen9 HPE Apollo 4500 XL450 Gen9 HPE Apollo 6500 XL270d Gen9
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**NOTE:** This is a list of supported servers. Some may be discontinued.

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## Standard Features

### At a Glance Features

- Operates at 100 Mbps/1 Gbps/10 Gbps, auto-negotiation, on both ports
- 10GBASE-T connectivity supporting up to 100 meters with CAT 6A cabling (or better)
- Hardware acceleration TCP/IP/UDP stateless offloads Superior small packet performance
- Industry-leading throughput and latency performance
- Up to 40 Gb/s bi-directional near line rate throughput
- Low profile design shipping with standard height and low-profile brackets
- On chip temperature monitor (Sea of Sensors)
- Support for Preboot eXecution Environment (PXE)
- SR-IOV capable in hardware (requires server FW, SW and OS support)
- Active Health System support
- PXE, Jumbo Frames, Checksum & Segmentation Offload, IPv6 and RSS
- Field replaceable and upgradeable
- IEEE 1588 (Time Synchronization) ready
- Support MACsec

<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 to reduce energy usage. A significant improvement lies in the ability to apply fan speed increases only to the

## Standard Features

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.

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<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 9,500 byte (KB) transmission unit (MTU) when running Ethernet I/O traffic. This is over six 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>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>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>TCP/UDP/IP</b>	For overall improved system response, this adapter supports standard TCP/IP offloading techniques including:

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## Standard Features

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.

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### **Precision Time Protocol (IEEE 1588 PTP)**

Synchronization of system clocks throughout a network, achieving clock accuracy in the sub-microsecond range, making it suitable for measurement and control systems.

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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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## Technical Specifications

<b>General Specifications</b>	<b>Network Processor</b> <b>Data Rate</b>	Intel X540 Two ports, each at 20 Gb/s bi-directional; 40 Gb/s aggregate bi-directional theoretical bandwidth.
	<b>Bus type</b> <b>Form Factor</b>	PCIe 2.1 (Gen 2) x8 Standard and low profile adapter compliant with the PCIe standard
	<b>IEEE Compliance</b>	802.3, 802.3x, 802.3ad, 802.1Qaz, 802.1Qau, 802.1Qbb, 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 (or better) are 100 meters (328 feet).
		<b>NOTE:</b> The HPE 561T 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, CAT6a cable is recommended. Cabling details: CAT6 UTP or better twisted-pair 22-26 AWG, 100? @ 1 MHz EIA/TIA 568-B.2-10b
<b>Power and Environmental Specifications</b>	<b>Power</b> <b>Temperature - Operating</b> <b>Humidity - Operating</b> <b>RoHS Compliance</b>	19W maximum 0° to 55°C (32° to 131°F) 5% to 95% non-condensing 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-Feb-2018	Version 8	Changed	Overview was updated
23-Oct-2017	Version 7	Changed	Technical Specification-OS, Services and support and Parts and Materials sections were updated.
21-Oct-2016	Version 6	Changed	Add DPDK support and update servers
26-Aug-2016	Version 5	Changed	Standard Features section was updated.
		Removed	Obsolete SKUs were deleted from document: 593717-B21, 614203-B21, 629135-B21, 629138-B21, 629142-B21.
06-May-2016	Version 4	Changed	Overview, Standard Features, and Related Options sections were updated. Rebranding applied to document
		Removed	Obsolete SKUs were deleted: 503746-B21, 412648-B21, 435508-B21, 394793-B21, 394791-B21, 458492-B21.
01-Dec-2014	Version 3	Changed	Models, Compatibility and Related Options sections were updated
		Removed	Obsolete SKUs removed: 468332-B21, 489892-B21, 581201-B21.
11-Jul-2014	Version 2	Removed	HPE ProLiant DL980 G7 was removed from Servers.
10-Sep-2013	Version 1	New	Initial version.



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