Overview

HPE Ethernet 10Gb 2-port 521T 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 521T Adapter for ProLiant servers is a dual-port 10GBASE-T adapters featuring Cavium QL41401 Controller in a Stand up form factor. These adapters delivers full line-rate performance across all ports 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.

The HPE Ethernet 10Gb 2-port 521T Adapter can provide up to 40Gbps of bi-directional Ethernet bandwidth, helping to alleviate network bottlenecks.

Overview

HPE Ethernet 10Gb 2-port 521T Adapter

Platform Information

Models

HPE Ethernet 10Gb 2-port 521T Adapter   867707-B21

Kit Contents	HPE Ethernet 10Gb 2-port 521T Adapter Quick install card Product warranty statement Low-profile bracket
Compatibility - Supported Servers	HPE ProLiant DL120 Gen10 Server HPE ProLiant DL160 Gen10 Server HPE ProLiant DL180 Gen10 Server HPE ProLiant DL360 Gen10 Server HPE ProLiant DL380 Gen10 Server HPE ProLiant DL385 Gen10 Server HPE ProLiant DL560 Gen10 Server HPE ProLiant DL580 Gen10 Server HPE Apollo 2000 - XL170r Gen10 Server HPE Apollo 2000 - XL190r Gen10 Server HPE Apollo 4500 - XL450 Gen10 Server HPE Apollo 6000 - XL230k Gen10 Server HPE ProLiant ML110 Gen10 Server HPE ProLiant ML350 Gen10 Server **NOTE:** This is a list of supported servers. Some may be discontinued.

Standard Features

At a Glance Features
- Dual 10Gb ports provide up to 40Gb of bi-directional Ethernet bandwidth
- Jumbo Frame
- Stand up
- HPE Sea of Sensors 3D
- Tunnel Offload(NVGRE and VxLAN)
- RDMA over Conveerged Ethernet (RoCEv2, RoCEv1)
- Single-root input/output virtualizaton (SR-IOV)
- IPv6 Acceleration
- Preboot eXecution Environment (PXE)
- Checksum & Segmentation Offload
- VMware NetQueue and Microsoft Virtual Machine Queue (VMQ)
- Precision Time Protocol (PTP)
- Receive-Side Scaling (RSS)
- Receive-Side Coalescing (RSC)
- Data Plane Development Kit (DPDK)
- Active Health Systems support
- Authentication of digitally signed firmware
- Additional Security features include: UEFI Secure Boot, Sanitization, Audit Logs and Device-level Firewall
- Full RDMA –enable the iWARP stacks on adapters in addition to the ROCE capability. (No iWarp and ROCE on the same port)

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.

Audit Logs

Audit Logs are a forensics capability that provides traceability into authenticated firmware updates by capturing changes in standard system logs.

Authenticated Updates

Authenticated Updates brings cryptographic keys onto the NIC (for HW Authentication) to protect user and configuration data from unauthorized access and verify digitally signed firmware.

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).

Device-level Firewall

Device-level Firewall blocks any unmanaged access to memory or storage. This ensures that on-device firmware and configuration data can only be accessed by authorized agents.

Standard Features

Form Factor	This adapter series offers Stand up.
HPE Sea Of Sensors 3D	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.
IPv6	IPv6 uses 128-bit addressing allowing for more devices and users on the internet. IPv4 supported 32-bit addressing.
Jumbo Frames	This adapter supports Jumbo Frames (also known as extended frames), permitting up to a 9,600 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.
Management Support	This adapter ships with agents that can be managed from HPE Systems Insight Manager or other management application that support SNMP.
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.
RoCE v2	This adapter supports RoCE v1 and v2. RoCE v2, also sometimes called "Routable RoCE" which adds Concurrent RoCE v1 and v2 support, SR-IOV support, QoS with hierarchical TX scheduling, ECN-based congestion control for RoCE v2. 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 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.
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.

Standard Features

Sanitization	Sanitization (Secure User Data Erase) renders User and configuration data on the NIC irretrievable so that NICs can be safely repurposed or disposed.
Secure Boot	Secure Boot safeguards the system and ensures no rogue drivers are being executed on start-up.
Server Integration	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. 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.
Single-Root I/O Virtualization	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.
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.
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.
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.
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**

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.
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.
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.
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.
For more information	Visit the Hewlett Packard Enterprise Service and Support **website**.

Technical Specifications

General Specifications	Network Processor	Cavium QL41402
	Data Rate	Two ports, each at 20 Gbps bi-directional; 40 Gbps bi-directional theoretical bandwidth.
	Bus type	PCIe 3.0 x8
	Form Factor	Stand up
	IEEE Compliance	802.1Qaz, 802.1Qbb, 802.3az 802.1AS, 802.3ad, 1588, 802.3-2012, 802.3by-2016, 802.1q, 802.1p
	Connector	RJ-45 (two)

Power and Environmental Specifications	Power	18.5 W typical, 20.7 W maximum
	Temperature - Operating	5° to 60° C (41° to 140° F)
	Temperature - Non-Operating	-40°C to 70°C / -40°F to 158°F
	Humidity - Operating	System relative humidity: Minimum to be the higher (more moisture) of -12°C (10.4°F) dew point or 8% relative humidity. Maximum to be the lower (less moisture) of 24°C (75.2°F) dew point or 90% relative humidity. non-condensing.
	Humidity - Non-operating	5 to 95% relative humidity, non-condensing.
	Other	PCIe 3.0 RoHS compliance 6 of 6 IPv4, IPv6 CE Microsoft WHQL (Windows Hardware Quality Labs)

Operating System and Virtualization Support	The Operating Systems supported by this adapter are based on the server OS support. Please refer to the OS Support Matrix at **https://www.hpe.com/us/en/servers/server-operating-systems.html**.

Environment-friendly Products and Approach - End-of-life Management and Recycling	Hewlett Packard Enterprise offers end-of-life **product return, trade-in, and recycling programs**, 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 **Hewlett Packard Enterprise web site**. 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 6	Changed	General Specifications section was updated
05-Feb-2018	Version 5	Changed	Overview section was updated
18-Dec-2017	Version 4	Changed	Product Information- Compatibility was updated
06-Nov-2017	Version 3	Changed	Overview section was updated.
16-Oct-2017	Version 2	Changed	Overview, Standard features-At a glance were updated.
25-Sep-2017	Version 1	Created	New QuickSpecs.

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