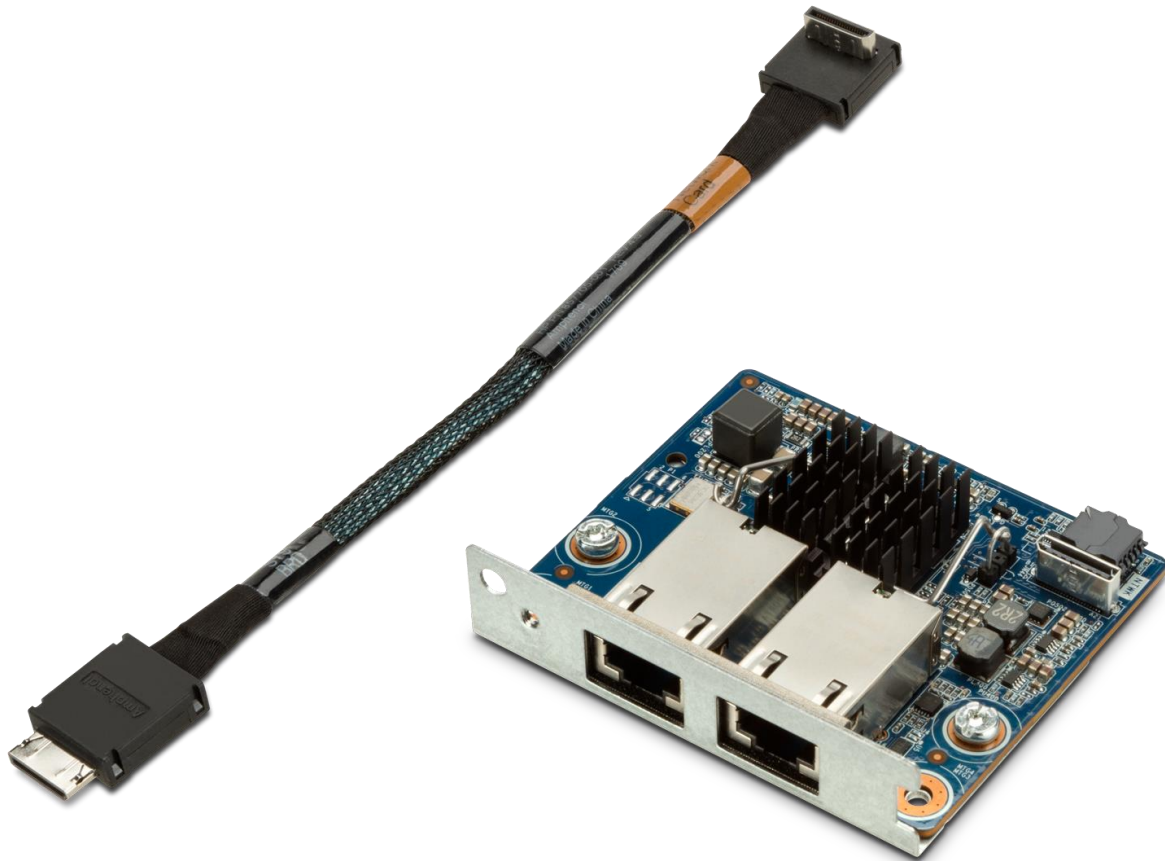


Overview

HP Z 10GbE Dual Port Module



Models

HP Z 10GbE Dual Port Module

Part Number:
1QI49AA

Introduction

The HP Z 10GbE Dual Port Module is a 10GBASE-T adapter utilizing the Intel® X722 MAC and X557-AT2 PHY pairing to deliver full line-rate performance, utilizing CAT 6A UTP cabling (or better) with distances up to 100 meters. Providing high performance Ethernet connectivity, it is ideal for use in workstation, virtual workstation 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 module was developed to be a low-cost option without the need of a PCIe slot, which can help with network transitions to 10G.

Performance and Features

- Industry-leading throughput and latency performance

Overview

- Operates at 1Gbps/10Gbps, auto-negotiation, on both ports
- 10GBASE-T connectivity supporting up to 100 meters with CAT 6A cabling (or better)
- Up to a theoretical 20Gbps bi-directional near line rate throughput per port (combined dual port throughput limited to 36Gbps)
- Remote Direct Memory Access (RDMA) using internet Wide Area RDMA Protocol (iWARP)
- SR-IOV capable in hardware (requires server FW, SW and OS support; 128 per device)
- 1,536 Transmit and Receive Queues per port
- PXE, Jumbo Frames, Checksum & Segmentation Offload, IPv6 and RSS (PXE allows the server to boot over the network and download software residing in the network.)
- Field replaceable and upgradeable
- Support for Preboot eXecution Environment (PXE)
- IEEE 1588 / IEEE 802.1as (Time Synchronization)
- Energy Efficient Ethernet (EEE) for low power consumption during periods of low data activity

Compatibility

The HP Z 10GbE Dual Port Module is compatible with the HP Z8 G4 and Z6 G4 Workstations. Additional support for other platforms is not possible due to the proprietary interface.

Service and Support

Maximum warranty of the HP Workstation in which it is installed, up to 3-years. Minimum one-year warranty. The system warranty applies to HP-installed components to include the HP Z 10GbE Dual Port Module.

Technical Specifications

Dual-port 10 Gigabit Ethernet Throughput

The HP Z 10GbE Dual Port Module delivers 20 Gbps full duplex Ethernet transfer rate per individual 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 workstation computing, virtual workstations, database access, and more.

On the HP Z8 G4 and Z6 G4 Workstations, the HP Z 10GbE Dual Port Module will operate with a combined theoretical throughput of 36 Gbps full duplex when both ports are actively transferring at maximum capacity.

Jumbo Frames

The HP Z 10GbE Dual Port Module supports jumbo frames (also known as extended frames), permitting up to a 9.5K 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.

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 HP Z 10GbE Dual Port Module offers TCP/IP stateless offloading capability.

RDMA with iWARP

With the Intel® C620 series chipset, the HP Z 10GbE Dual Port Module natively supports a form of Remote Direct Memory Access (RDMA) using Internet Wide Area RDMA Protocol (iWARP). The Intel® iWARP support enables three performance-enhancing features: Kernel Bypass – which allows software applications to bypass the OS and directly access the Ethernet adapter resources, Direct Data Placement – which allows data to be written directly into user space, bypassing buffers, and Transport Acceleration – where the TCP/IP and iWARP protocols are accelerated in silicon relative to host software stacks. All of these features equate to reducing latency, freeing up processor cycles, and increasing memory bandwidth.

MSI and MSI-X

Message Signaled Interrupt (Extended) provides performance benefits for multi-core servers by load balancing interrupts between CPUs/cores. The HP Z 10GbE Dual Port Module supports MSI and MSI-X.

802.1Q VLANs

IEEE 802.1Qbg virtual local area network (VLAN) protocol allows each physical port of the HP Z 10GbE Dual Port Module 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 HP Z 10GbE Dual Port Module provides support for 802.1Q (VLAN) as well as the IEEE 802.1Qbg for VLAN Bridging.

Optimized for Virtualization

I/O Virtualization support for VMware NetQueue and Microsoft VMQ help meet the performance demands of consolidated virtual workloads. Compliant with Single-Root I/O Virtualization (SR-IOV), accommodating up to 256 Virtual Machines (VMs) to share single PCIe resources. Network virtualization can be taken a step further with support of Network Service Headers (NSH), Geneve, VXLAN, and NVGRE. The HP Z 10GbE Dual Port Module is SR-IOV ready, requiring firmware, software and OS support.

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.

Technical Specifications

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 HP Z 10GbE Dual Port Module has Checksum and Segmentation Offload capabilities.

IPv6

IPv6 uses 128-bit addressing allowing for more devices and users on the Internet. IPv4 supported 32-bit addressing. The HP Z 10GbE Dual Port Module supports IPv6, in addition to IPv4.

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 HP Z 10GbE Dual Port Module has RSS capabilities with support from Microsoft or Scalable I/O on Linux®.

Time Synchronization implementation (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 HP Z 10GbE Dual Port Module supports Precision Time Protocol-ready (PTP).

Network Adapter Teaming

The HP Z 10GbE Dual Port Module provides support for NIC teaming, which helps IT administrators increase network fault tolerance and increased network bandwidth, The team of adapters can work together as a single virtual adapter. The HP Z 10GbE Dual Port Module provides support for several different types of teaming enabling IT administrators to optimize availability, improve performance and help reduce costs. Teaming can be accomplished through Intel's Advanced Network Software (ANS), which can be found with HP-released Intel® Wired Networking software packages. Please note that certain releases of Intel® drivers and Microsoft Windows 10 builds may not support ANS and/or Teaming and VLAN functionality.

Operating Temperature	32° to 131° F (0° to 55° C)
Operating Humidity	5% to 90% non-condensing
Dimensions (H x W x D)	Module dimensions only, not including motherboard interface cable: 0.875 x 3 x 2.75 in
Supported Operating Systems	Windows 10, Windows Server 2012 R2, Windows Server 2012, Windows Server 2008 R2, Windows 7, Windows Server 2008 R2, Linux® Stable Kernel version 3.x, 2.6.32, Red Hat® Enterprise Linux® 6.5/7.0, SUSE Linux® Enterprise Server 11SP3/12, FreeBSD 9/10, VMware ESXi5.5. Note: Not all OS's supported on all HP Z Workstations.
Operating System Driver Support	The HP driver release is a unified package for supported OS and supported Intel® network adapters, which includes the X722 drivers use with the HP Z 10GbE Dual Port Module. The HP Z 10GbE Dual Port Module uses the same driver as the onboard LOM port for the Intel® X722 for 1GbE. Currently, HP.com includes drivers for Win7-x64 and Win10-x64 in support of the HP Z8 G4 and the HP Z6 G4 Workstations.
Abbreviated List of IEEE Protocols Supported	IEEE 802.3, IEEE 802.3ad (Link aggregation control), IEEE 802.1Q (VLAN), IEEE 802.3 2005 (Flow control), IEEE 802.1as/1588 (Time sync), IEEE P802.3az (Energy Efficient Ethernet), and many other standards and sub-standards associated with the aforementioned features and functionality
Kit Contents	HP Z 10GbE Dual Port Module, Rear I/O Label, Installation guide, Warranty card.

Summary of Changes

Date of change:	Version History:		Description of change:
	From v1 to v2		

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