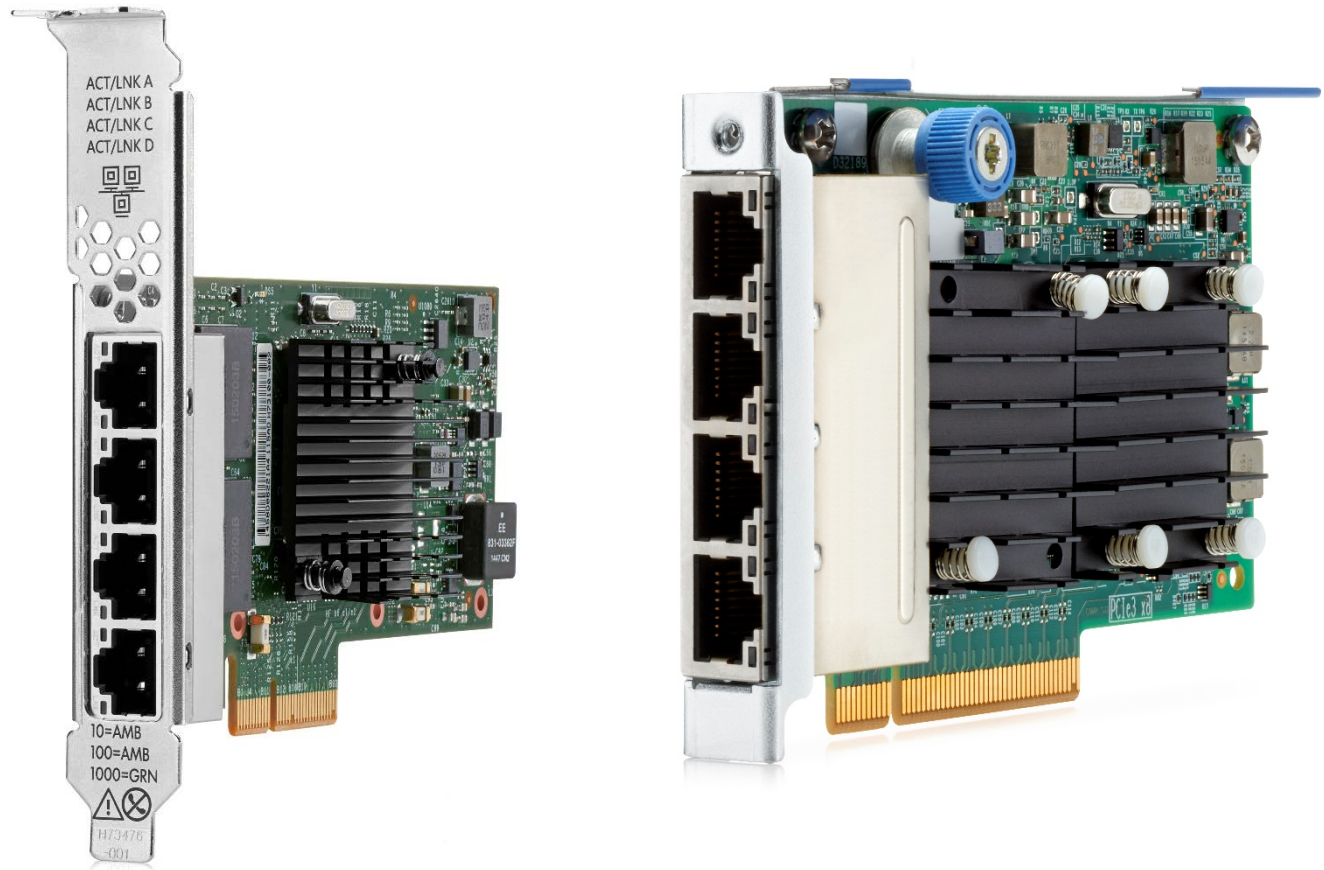## Overview

HPE Ethernet 1Gb Adapters

HPE ProLiant DL, ML & Apollo

The HPE Ethernet 1Gb adapters deliver full line-rate performance across all ports with low power consumption, providing Ethernet connectivity ideal for virtualization, security, server consolidation, and network segmentation.

Models

HPE Ethernet 1Gb 4-port FLR-T BCM5719 Adapter	629135-B22
HPE Ethernet 1Gb 4-port BASE-T BCM5719 Adapter	647594-B21
HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 Adapter	665240-B21
HPE Ethernet 1Gb 4-port BASE-T I350-T4V2 Adapter	811546-B21
HPE Ethernet 1Gb 2-port BASE-T BCM5720 Adapter	615732-B21
HPE Ethernet 1Gb 2-port BASE-T I350-T2V2 Adapter	652497-B21

Overview

Platform Information

Kit Contents

Table 1				
SKU	629135-B22	647594-B21	665240-B21	811546-B21
Description	HPE Ethernet 1Gb 4-port FLR-T BCM5719 Adapter	HPE Ethernet 1Gb 4-port BASE-T BCM5719 Adapter	HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 Adapter	HPE Ethernet 1Gb 4-port BASE-T I350-T4V2 Adapter
Quick install card	√	√	√	√
Product warranty statement	√	√	√	√
Low profile bracket		√		√

Table 2		
SKU	615732-B21	652497-B21
Description	HPE Ethernet 1Gb 2-port BASE-T BCM5720 Adapter	HPE Ethernet 1Gb 2-port BASE-T I350-T2V2 Adapter
Quick install card	√	√
Product warranty statement	√	√
Low profile bracket	√	√

Overview

Servers Support

Table 1				
SKU	629135-B22	647594-B21	665240-B21	811546-B21
Description	HPE Ethernet 1Gb 4-port FLR-T BCM5719 Adapter	HPE Ethernet 1Gb 4-port BASE-T BCM5719 Adapter	HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 Adapter	HPE Ethernet 1Gb 4-port BASE-T I350-T4V2 Adapter
HPE ProLiant DL20 Gen9 HPE ProLiant DL360 Gen9 HPE ProLiant DL380 Gen9	√	√	√	√
HPE Apollo 4200 Gen9		√	√	√
HPE Apollo 6500 XL270d Gen9		√		√
HPE ProLiant DL20 Gen10	√		√	√
HPE ProLiant DL120 Gen10	√	√	√	√
HPE ProLiant DL160 Gen10	√	√	√	√
HPE ProLiant DL180 Gen10	√	√	√	√
HPE ProLiant DL325 Gen10	√	√	√	√
HPE ProLiant DL360 Gen10	√	√	√	√
HPE ProLiant DL380 Gen10	√	√	√	√
HPE ProLiant DL385 Gen10	√	√	√	√
HPE ProLiant DL560 Gen10	√	√	√	√
HPE ProLiant DL580 Gen10	√	√	√	√
HPE Apollo 2000 XL170r Gen10	√	√	√	√
HPE Apollo 2000 XL190r Gen10	√	√	√	√
HPE Apollo 4500 XL450 Gen10	√	√	√	√
HPE ProLiant ML30 Gen10		√		√
HPE ProLiant ML110 Gen10		√		√
HPE ProLiant ML350 Gen10		√		√
HPE Apollo 6000 XL230k Gen10		√		√

Overview

Table 2		
SKU	615732-B21	652497-B21
Description	HPE Ethernet 1Gb 2-port BASE-T BCM5720 Adapter	HPE Ethernet 1Gb 2-port BASE-T I350-T2V2 Adapter
HPE ProLiant DL20 Gen9 HPE ProLiant DL360 Gen9 HPE ProLiant DL380 Gen9	√	√
HPE Apollo 4200 Gen9	√	√
HPE Apollo 6500 XL270d Gen9	√	√
HPE ProLiant DL20 Gen10	√	√
HPE ProLiant DL120 Gen10	√	√
HPE ProLiant DL160 Gen10	√	√
HPE ProLiant DL180 Gen10	√	√
HPE ProLiant DL325 Gen10	√	√
HPE ProLiant DL360 Gen10	√	√
HPE ProLiant DL380 Gen10	√	√
HPE ProLiant DL385 Gen10	√	√
HPE ProLiant DL560 Gen10	√	√
HPE ProLiant DL580 Gen10	√	√
HPE Apollo 2000 XL170r Gen10	√	√
HPE Apollo 2000 XL190r Gen10	√	√
HPE Apollo 4500 XL450 Gen10	√	√
HPE ProLiant ML30 Gen10	√	√
HPE ProLiant ML110 Gen10	√	√
HPE ProLiant ML350 Gen10	√	√
HPE Apollo 6000 XL230k Gen10	√	√

Standard Features

Standard Features Tables

Table 1				
SKU	629135-B22	647594-B21	665240-B21	811546-B21
Description	HPE Ethernet 1Gb 4-port FLR-T BCM5719 Adapter	HPE Ethernet 1Gb 4-port BASE-T BCM5719 Adapter	HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 Adapter	HPE Ethernet 1Gb 4-port BASE-T I350-T4V2 Adapter
Active Health System	√	√	√	√
Auto-negotiation	√	√	√	√
Configuration Utilities	√	√	√	√
DMA Coalescing				
HPE Sea Of Sensors 3D	√	√	√	√
Jumbo Frame	9,000 KB	9,000 KB	9,500 KB	9,500 KB
LED Indicators	√	√	√	√
Load Balancing	√	√		
Message Signaled Interrupt (Extended) (MSI-X)	√	√	√	√
Network Adapter Teaming	√	√	√	√
Optimized for Virtualization	√	√	√	√
Preboot eXecution Environment (PXE)	√	√	√	√
TCP/UDP/IP	√	√	√	√
Precision Time Protocol (IEEE 1588 PTP)	√	√	√	√
Server Integration	√	√	√	√
VMware NetQueue and Microsoft Virtual Machine Queue (VMQ)	√	√		
Wake-on-LAN	√			

Standard Features

Table 2		
SKU	615732-B21	652497-B21
Description	HPE Ethernet 1Gb 2-port BASE-T BCM5720 Adapter	HPE Ethernet 1Gb 2-port BASE-T I350-T2V2 Adapter
Active Health System	√	√
Auto-negotiation	√	√
Configuration Utilities	√	√
DMA Coalescing		√
HPE Sea Of Sensors 3D	√	√
Jumbo Frame	9,000 KB	9,500 KB
LED Indicators	√	√
Load Balancing	√	√
Message Signaled Interrupt (Extended) (MSI-X)	√	√
Network Adapter Teaming	√	√
Optimized for Virtualization	√	√
Preboot eXecution Environment (PXE)	√	√
TCP/UDP/IP	√	√
Precision Time Protocol (IEEE 1588 PTP)	√	√
Server Integration	√	√
VMware NetQueue and Microsoft Virtual Machine Queue (VMQ)	√	√
Wake-on-LAN		√

Standard Features

Active Health System
Supports HPE Active Health System - monitors and records changes in the server hardware and configuration enabling customers to have accurate information that will assist in diagnosing problems and delivering rapid resolution when server failures occur.

Auto-negotiation
Automatically senses the speed of the device to which it is attached. It also automatically configures for half or full duplex, depending on the duplex mode of the switch, hub, or router connected to the adapter.

Configuration Utilities
The 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.

DMA Coalescing
Supports DMA Coalescing, the incoming data packets and interrupts associated with these DMA calls are intelligently batched to keep the system devices in lower power states.

HPE Sea of Sensors3D
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.

Jumbo Frames
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 five 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.

LED Indicators
LED indicators show link integrity and network activity for easy troubleshooting.

Load Balancing
Transmit Load Balancing (TLB) and Switch-assisted Load Balancing (SLB) are two advanced features that customers can use to build a bigger pipe for improved networking bandwidth. These port-bonding techniques enable users to install up to four dual-port HPE 361T adapters (total of 8 ports) in a HPE ProLiant server and aggregate their throughput up to a theoretical maximum of 16 Gigabits per second full-duplex transmissions.

Message Signaled Interrupt (Extended)(MSI-X)
Message Signaled Interrupt (Extended) provides performance benefits for multi-core servers by load balancing interrupts between CPUs/cores.

Network Adapter Teaming
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.

Network Fault Tolerance (NFT)
Network Fault Tolerance, sometimes called "failover" or "NIC Redundancy," allows for the installation of multiple server adapters so that the active device can be backed up by a redundant adapter to improve availability. The Hewlett Packard Enterprise teaming utility also allows users to specify that when a failed adapter is fixed and replaced, the original adapter resumes its function as the primary network connection.

Standard Features

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

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.

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.

Server Integration
The 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.

TCP/UDP/IP
TCP/IP offloading techniques including: 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.

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. 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.

Wake-on-LAN
A system that supports Wake-on-LAN can remain available to the systems administrator during its normal downtime. Once the machine is awakened, the systems administrator can remotely control, audit, debug, or manage the 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.
Notes: 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

Notes: 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

Technical Specifications Tables

Table 1				
SKU	629135-B22	647594-B21	665240-B21	811546-B21
Description	HPE Ethernet 1Gb 4-port FLR-T BCM5719 Adapter	HPE Ethernet 1Gb 4-port BASE-T BCM5719 Adapter	HPE Ethernet 1Gb 4-port FLR-T I350-T4V2 Adapter	HPE Ethernet 1Gb 4-port BASE-T I350-T4V2 Adapter
Bus Type	PCIe 2.0X4	PCIe 2.0X4	PCIe 2.0X4	PCIe 2.0
Data Rate	4 port, each at 1Gb (Also support 10/100Mbps)	4 port, each at 1Gb (Also support 10/100Mbps)	4 port, each at 1Gb (Also support 10/100Mbps)	4 port, each at 1Gb (Also support 10/100Mbps)
Form Factor	FlexibleLOM	Stand up	FlexibleLOM	Stand up
IEEE Compliance	802.3, 802.3ab, 802.3u, 802.3x, 802.3ad, 802.1q, 802.3az, 1588, 802.1as	802.3, 802.3ab, 802.3u, 802.3x, Dynamic 802.3ad, 802.1q, 802.3az, 1588, 802.1as	802.3, 802.3ab, 802.3u, 802.3x, 802.3ad, 802.1q, 802.3az, 1588, 802.1as	802.3, 802.3ab, 802.3u, 802.3x, 802.3ad, 802.1q, 802.3az, 1588, 802.1as, 802.1p
Network Processor	Broadcom BCM5719 (BCM5719A0KFBG)	Broadcom BCM5719 (BCM5719A0KFBG)	Intel® I350 (I350-T4V2)	Intel® I350 (I350-T4V2)
Power	5.5W max	4.3W max 1.0W min	5.5W max	5.5W max
Temperature	**Operating** 0° to 55°C (32° to 131°F) **Non-Operating** -65° to 85° C (-85° to 185° F)			
Humidity	**Operating** 10% to 90% non-condensing **Non-operating** 5% to 95% non-condensing			

Technical Specifications

Table 2		
SKU	615732-B21	652497-B21
Description	HPE Ethernet 1Gb 2-port BASE-T BCM5720 Adapter	HPE Ethernet 1Gb 2-port BASE-T I350-T2V2 Adapter
Bus Type	PCIe 2.0x1	PCIe 2.0
Data Rate	2 port, each at 1Gb (Also support 10/100Mbps)	2 port, each at 1Gb (Also support 10/100Mbps)
Form Factor	Stand up	Stand up
IEEE Compliance	802.3, 802.3ab, 802.3u, 802.3x, 802.3ad, 802.1q, 802.3az, 1588, 802.1as, 802.1p	802.3, 802.3u, 802.3x, 802.3ab, 802.3ad, 802.1p, 802.1Q, 802.3az, 1588
Network Processor	Broadcom BCM5720 (BCM5720A0KFBG)	Intel® Ethernet I350 Controller (I350-T2V2)
Power	2.2W max 1.7W min	3.2W min 4.2W max
Temperature	**Operating** 0° to 55°C (32° to 131°F) **Non-Operating** -65° to 85° C (-85° to 185° F)	
Humidity	**Operating** 10% to 90% non-condensing **Non-operating** 5% to 95% non-condensing	

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
17-Aug-2020	Version 9	Changed	SKUs Descriptions were updated
20-Jan-2020	Version 8	Changed	Platform Information section was updated
06-May-2019	Version 7	Changed	Update table format, general glossary and technical specification
04-Feb-2019	Version 6	Changed	Add support 10/100Mbps
05-Nov-2018	Version 5	Changed	Technical Specifications Section was updated
15-Oct-2018	Version 4	Changed	Platform Information, Standard Features & Technical Specifications Sections were updated
01-Oct-2018	Version 3	Changed	Platform Information & Standard Features Sections were updated
13-Aug-2018	Version 2	Changed	Platform Information Section was Updated
02-Jul-2018	Version 1	New	New QuickSpecs

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