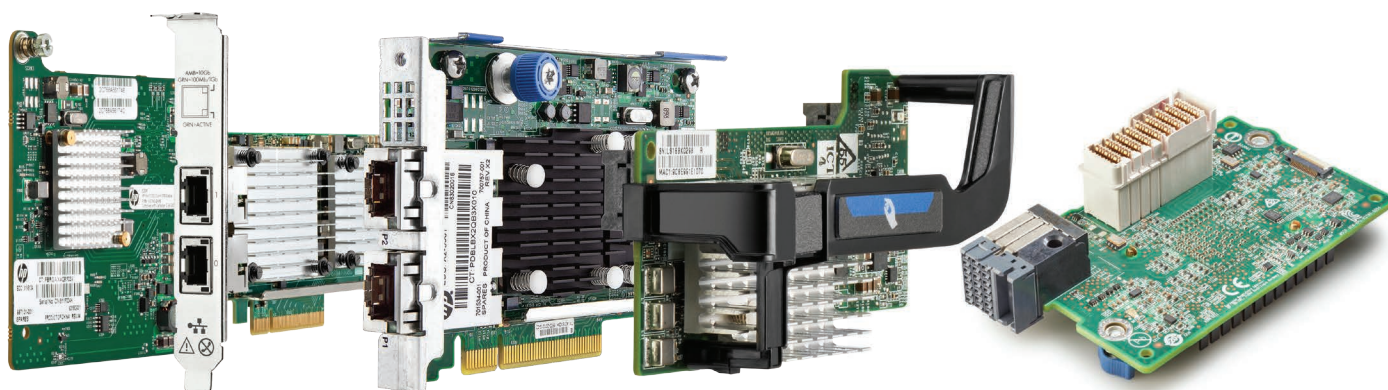


Flexible network adapters from Cavium

On HPE ProLiant, Apollo, and Synergy servers



HPE advantages

Industry leadership

- More than 13 generations of Ethernet design and development experience
- Market-tested Ethernet solutions

Increase energy efficiency

- Support for EEE
- Reduced energy consumption by up to 42 percent¹
- Support for HPE 3D Sea of Sensors for automated energy optimization
- Reduced operational expenditures (OPEX) and extended IT budgets

Simplify deployment and management

- Comprehensive product portfolio
- 10/20/25/50GbE solutions for HPE ProLiant, BladeSystem, Apollo, and HPE Synergy server family
- FlexibleLOM, network interface cards, and mezzanine form factors
- Tunnel Offload to support multi-tenant or physically separated network connectivity

¹ HPE white paper, "Choose the ideal adapter," hpe.com/h20195/v2/getdocument.aspx?docname=4AA4-0025ENW

The performance and flexibility needed in today's data center environments.

Meet modern data center demands

The demands on your network for reliability, bandwidth, low latency, and security are extreme, as are the pressures to simplify IT and reduced costs. Transforming the economics and expectations of your data center begins with HPE ProLiant, BladeSystem, Apollo, and HPE Synergy servers, with built-in intelligence to deliver maximum performance and reliability while simplifying management. But the server is only the beginning of the story when it comes to simplifying your IT infrastructure and reducing costs.

That's why Hewlett Packard Enterprise offers fast 10/20/25/50GbE networking solutions for the HPE ProLiant (BL, DL, ML), Apollo, and Synergy families of servers. Using Cavium 57810S, 57840S, QL41401 and QL45604 controllers, the portfolio of HPE Converged Network Adapters provides the highest throughput, lowest processor utilization, and the highest small packet performance for Ethernet connectivity. Full hardware offload of Fibre Channel over Ethernet (FCoE) and iSCSI storage protocols provide best-in-class performance for converged networking and storage data connectivity.

Best reliability and performance

- 2.5 million FCoE IOPS—250 percent faster than the nearest CNA competitor²
- 1.5 million iSCSI IOPS—100 percent faster than the nearest CNA competitor³
- Full line-rate throughput performance—up to 37,000 Mbps across two 10GbE full-duplex ports and up to 194,000 Mbps across four 25GbE full-duplex ports
- Low CPU utilization—as low as 12 percent
- Single Root I/O Virtualization support
- Support for Jumbo Frames larger than 1,500 bytes at 10GbE and larger than 9,600 bytes at 25GbE

Increase asset utilization

- Network bandwidth tuned at the server edge
- Each 10/20GbE port partitions into four independent ports via NPAR support
- Bandwidth allocated when and where needed



The HPE Flexible Network Adapters from Cavium are available in all major form factors, including standard PCIe CNA, innovative HPE FlexibleLOM, and mezzanine card formats. Cavium network controllers, with more than 13 generations of Ethernet design and development experience, are the most reliable market-tested solutions available.

These HPE Flexible Network Adapters are available for standard Ethernet or converged Ethernet connectivity for HPE ProLiant, HPE BladeSystem, Apollo, and Synergy servers. Models compatible with HPE BladeSystem and HPE Synergy servers support HPE Flex-10 or Flex-20 virtualization and can be managed with HPE's Virtual Connect or HPE OneView management utilities. The 630 and 3820C series adapters support the industry's first⁴ 20 Gb Converged Ethernet connectivity, giving HPE BladeSystem and HPE Synergy customers twice the bandwidth available in most other blade environments.

Select 10/25GbE Ethernet adapters from HPE and Cavium have advanced features including RDMA over Converged Ethernet (ROCE), Internet Wide Area RDMA (iWARP), and support for DPDK. RoCE is ideal for customers requiring low latency, such as those in the high-performance compute (HPC) and financial industries. iWARP provides customers more scalability for low latency applications, allowing RDMA to work on existing networks and across the WAN. iWARP is ideal for applications like Microsoft Storage Spaces Direct. With DPDK, these adapters can be optimized to deliver accelerated small packet performance of greater than 85 million packets-per-second bi-directional at 512 byte blocks. This benefits customers who have custom applications that deal with small block data like in the telco, oil and gas, and financial segments.

The 10/20GbE HPE Flexible Network Adapters from Cavium adapters also support Network Partitioning (NPAR). These adapters provide the ability to segment a single physical 10GbE or 20GbE port into four virtual ports. This is ideal for customers in virtual server environments by allowing them to segment the high performance connection and provide the right amount of network bandwidth to the applications.

All HPE Flexible Network Adapters from Cavium adapters also support Single Root I/O Virtualization (SR-IOV) and Tunnel Offloads including NVGRE and VXLAN. These advanced features optimize I/O performance in virtual server environments and provide additional VLAN flexibility and scalability across the full HPE Server portfolio including HPE ProLiant (BL, DL, ML), HPE Apollo, and HPE Synergy servers.

^{2, 3} Demartek Labs, May 2014

⁴ HP (now Hewlett Packard Enterprise) Internal analysis, February 2014: HPE delivers native 20 Gb performance per port or aggregate 40 Gb performance in a dual-port adapter. Industry-available solutions deliver performance via aggregate and/or multiple 1/10 Gb ports on single or multiple adapters in a teamed fashion. 20 Gb per port is 2x over current 10 Gb per port.



Adapter model number	Part number	Details	Server support
HPE 530SFP+	652503-B21	10GbE Network Adapter (NIC) Form Factor: PCIe Gen 2x8 Connection Type: SFP+	Select ProLiant DL, ML, Apollo
HPE 530T	656596-B21	10GbE Network Adapter (NIC) Form Factor: PCIe Gen 2x8 Connection Type: RJ45 10GBase-T	Select ProLiant DL, ML, Apollo
HPE 533FLR-T	700759-B21	10GbE FlexFabric Adapter (NIC, iSCSI, FCoE) Form Factor: PCIe Gen 2x8, FlexibleLOM Connection Type: RJ45 10GBase-T	Select ProLiant DL, ML, Apollo
HPE 534FLR-SFP+	700751-B21	10GbE FlexFabric Adapter (NIC, iSCSI, FCoE) Form Factor: PCIe Gen 2x8, FlexibleLOM Connection Type: SFP+	Select ProLiant DL, ML, Apollo
HPE 536FLR-T	764302-B21	10GbE FlexFabric Adapter (NIC, iSCSI, FCoE) Form Factor: PCIe Gen 3x8, FlexibleLOM Connection Type RJ45 10GBase-T	Select ProLiant DL, ML, Apollo
HPE StoreFabric CN1100R	QW990A	10GbE Converged Network Adapter (NIC, iSCSI, FCoE) Form Factor: PCIe Gen 2x8 Connection Type: SFP+	Select ProLiant DL, ML, Apollo
HPE StoreFabric CN1100R 10GBASE-T	N3U52A	10GbE Converged Network Adapter (NIC, iSCSI, FCoE) Form Factor: PCIe Gen 2x8 Connection Type: RJ45 10GBase-T	Select ProLiant DL, ML, Apollo
HPE 536FLB	766490-B21	10GbE FlexFabric Adapter Form Factor: PCIe Gen 3x8, FlexibleLOM Blade	ProLiant BL servers—Gen 9 and Gen 10 only
HPE 534M	700748-B21	10GbE FlexFabric Adapter Form Factor: PCIe Gen 2x8, HPE Mezzanine	ProLiant BL servers
HPE 620SFP28	817762-B21	4x25GbE Ethernet Adapter Form Factor: PCIe Gen 3x16 Connection Type: QSFP+	ProLiant DL, Apollo servers—Gen 9 and Gen 10 only
HPE 630FLB	700065-B21	20GbE FlexFabric Adapter Form Factor: PCIe Gen 3x8, FlexibleLOM Blade	ProLiant BL servers
HPE 630M	700076-B21	20GbE FlexFabric Adapter Form Factor: PCIe Gen 3x8, HPE Gen8/Gen9 Mezzanine	ProLiant BL servers
HPE Synergy 2820C	794538-B21	10GbE Converged Network Adapter (NIC, iSCSI, FCoE) Form Factor: PCIe Gen 3x8, Mezzanine	HPE Synergy Servers
HPE Synergy 3820C	777430-B21	10/20GbE Converged Network Adapter (NIC, iSCSI, FCoE) Form Factor: PCIe Gen 3x8, Mezzanine	HPE Synergy Servers
HPE Synergy 6810C	867322-B21	25/50GbE Converged Network Adapter (NIC, iSCSI, FCoE) Form Factor: PCIe Gen 3x8, Mezzanine	HPE Synergy Servers
HPE 521T	867707-B21	10GbE Network Adapter (NIC) Form Factor: PCIe Gen 3x8, Connection Type: RJ45 10GBase-T	Select ProLiant DL, ML, Apollo—Gen10
HPE 522FLR-T	867331-B21	10GbE Converged Network Adapter (NIC, iSCSI, FCoE) Form Factor: PCIe Gen 3x8, FlexibleLOM Connection Type: RJ45 10GBase-T	Select ProLiant DL, ML, Apollo—Gen10
HPE 621SFP28	867328-B21	10/25GbE Network Adapter (NIC) Form Factor: PCIe Gen 3x8, Connection Type: SFP28	Select ProLiant DL, ML, Apollo—Gen10
HPE 622FLR-SFP28	867334-B21	10/25GbE Converged Network Adapter (NIC, iSCSI, FCoE) Form Factor: PCIe Gen 3x8, FlexibleLOM Connection Type: SFP28	Select ProLiant DL, ML, Apollo—Gen10




HPE Flexible Network adapters

Powered by Cavium network controllers for HPE ProLiant, BladeSystem, Apollo, and HPE Synergy servers

	HPE Ethernet 10 Gb 530 Series Adapters	HPE FlexFabric 10 Gb 53x Series Adapters	HPE FlexFabric 10/20 Gb 630/28x0C/38x0C Series Adapters	HPE Ethernet 25Gb 620 Series Adapters	HPE Ethernet 10Gb 52x Series Adapters	HPE Ethernet 10/25Gb 62x Series Adapters
Speed	10 Gb	10 Gb	10/20 Gb	25 Gb	10 Gb	10/25 Gb
HPE model numbers	530SFP+, 530T, 530M, 530FLR, 530FLB,	534FLR, CN1100R, CN1100R-T, 534M, 534FLB, 536FLB, 533FLR-T, 536FLT-T	630FLB, 630M, 2820C, 3830C	620QSFP28	521T, 522FLR-T	621SFP28, 622FLR-SFP28
Controller part number	Cavium 57810S	Cavium 57810S/57840S	Cavium 57840S	Cavium QL45604	Cavium QL41401	Cavium QL41401
Supported protocols	L2 Networking	L2 Networking, FCoE, iSCSI	L2 Networking, FCoE, iSCSI	L2 Networking	L2 Networking, FCoE, iSCSI	L2 Networking, FCoE, iSCSI
Ports	2	2/4	2	4	2	2
RDMA	No	No	No	RoCE, RoCEv2	RoCE, RoCEv2, iWARP	RoCE, RoCEv2, iWARP
DPDK Support	No	No	No	Yes	Yes	Yes
ISER				Yes	Yes	Yes
Form factors available	PCIe card, FlexibleLOM Mezzanine	PCIe card, FlexibleLOM Mezzanine	FlexibleLOM Blade, Mezzanine, Synergy Mezzanine	PCIe card	PCIe Card, FlexibleLOM	PCIe Card, FlexibleLOM
Network Partitioning	Yes	Yes	Yes	Future	Future	Future
Tunnel Offload (NVGRE, VXLAN)	Yes	Yes	Yes	Yes	Yes	Yes
HPE ProLiant servers supported⁵	DL, SL, ML, XL, BL, and Apollo Servers	DL, SL, ML, XL, and BL and Apollo Servers	BL servers, HPE Synergy Servers	DL, and Apollo Servers	DL, ML, and Apollo Servers	DL, ML, and Apollo Servers
OS support	Microsoft® Windows Server® 2008 and 2012, Red Hat® RHEL 5.x 6.x and 7.x, SUSE SLES 10, 11 and 12 vSphere 5.x, 6.x and vSphere 2016 Citrix® XenServer 6.x (NIC function only) and Solaris 10/11.					
Technical specifications	10GbE adapters: Two or four ports, each at 10 GbE (20 Gbps full duplex; 40 Gbps aggregate full duplex) 20GbE adapters: Two ports, each at 20 GbE (40 Gbps full duplex; 80 Gbps aggregate full duplex) 4x25GbE adapters: One port, 4 lanes at 25GbE (50 Gbps full duplex; 200 Gbps aggregate, full duplex) 10/25GbE adapters: Two ports, each up to 25GbE (50 Gbps full duplex; 100 Gbps aggregate, full duplex) 25/50GbE adapters: Two port each up to 50GbE (100 Gbps full duplex, 20 Gbps aggregate, full duplex) Stateless offload—TCP, IP UDP checksum offload, LSO, TSO Support for VMware® NetQueue, Microsoft VMQ, and Network Partitioning (NPAR) SR-IOV support Tunnel Offloads (NVGRE, VXLAN) Receive Side Scaling (RSS) Jumbo Frame support Preboot Execution Environment (PXE Boot) IEEE 1588—Precision Time Protocol-ready (PTP) IEEE 802.1q—Virtual LAN (VLAN) tagging IEEE 802.3x—Flow control, IEEE 802.3az—Energy Efficient Ethernet IPv4 and IPv6 offload Teaming support MSI-X supports independent queues RoCE, RoCEv2, iWARP, ISER RDMA ⁶ DPDK ⁶					

⁵ Certain G7 DL servers are also supported, please check the adapter QuickSpecs for the latest list of servers supported.

⁶ Supported on select FlexFabric adapters



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