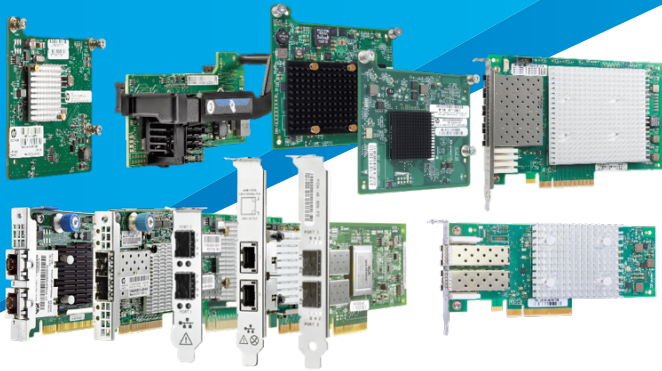


HPE Adapters from Cavium

Cavium Adapters Power HPE's ProLiant, Apollo, Integrity, Synergy, and BladeSystem Servers



- Cavium is the leading supplier to Hewlett Packard Enterprise (HPE®) for FC and Enterprise Ethernet Adapters.
- Proven, robust FC and iSCSI stack and unified drivers provide *install it and forget it* reliability.
- Ethernet Adapters that support network partitioning and RDMA, making them ideal for use in low-latency and virtual server environments.
- Adapters that offer superior real-world application performance and are optimized for virtual server environments.
- Full hardware offload delivers faster application performance and denser server virtualization.

OVERVIEW

With the advances in server technology and the rapid growth in server virtualization, networks need more reliability, bandwidth, and security to keep up with current workloads. In addition, the emergence of *cloud computing* is forcing networks to support a broad ecosystem of applications, hypervisors, and OSes. These requirements force administrators to optimize network infrastructure and reduce costs.

Cavium offers a **full portfolio** of network and storage adapters—from 10Gb Ethernet (10GbE), 25Gb Ethernet (25GbE), and 50Gb Ethernet (50GbE) Adapters to industry-standard 8Gb, 16Gb, and 32Gb Fibre Channel (FC) Adapters, 10GbE CNAs, and 10/20GbE FlexFabric® Adapters—for HPE's ProLiant®, Apollo®, Integrity®, Synergy®, and BladeSystem® servers.

FIBRE CHANNEL HOST BUS ADAPTERS

The HPE StoreFabric SN1100Q HBA, HPE Synergy 3830C, and QMH2672 Mezzanine Cards are Gen 5 16GFC Adapters that provide storage networking infrastructure capable of supporting the most demanding virtualized and cloud-enabled environments, while fully leveraging the capabilities of high-performance 16GFC. The HPE StoreFabric SN1600Q HBAs are Gen 6 (32Gb) FC adapters that provide even more performance and efficiency for shared storage connectivity. These Gen 5 and Gen 6 FC adapters are ideal for shared storage environments requiring high bandwidth and I/O intensive applications such as server virtualization, media streaming, backup and recovery, data warehousing, and online

transaction processing (OLTP). All of these adapters also fully support HPE Smart SAN for 3PAR®.

These HPE FC adapters support StorFusion technology, which means they integrate with Brocade® Gen 5 and Gen 6 FC fabric designed to address the needs of IT organizations that require reliability, security, and guaranteed network performance. Key benefits of StorFusion technology include rapid deployment and orchestration, advanced diagnostics, and improved resiliency and QoS.

HPE 81Q/82Q/84Q FC Adapters, as well as QMH2572 FC Mezzanine Cards, are powered with a high-performance 8GFC controller. These adapters use minimal power, require no additional cooling, and are extremely reliable.

QLogic® FC Adapters from Cavium are legendary for reliability, ease of use, and interoperability. All HPE-branded QLogic adapters offer full port isolation for enterprise-class reliability (Figure 1). In addition, a single common driver per OS for multiple generations of FC Adapters (32Gb, 16Gb, 8Gb, and 4Gb) simplifies deployment and upgrading existing FC infrastructure. QLogic drivers are supported across all major OSES and hypervisors.

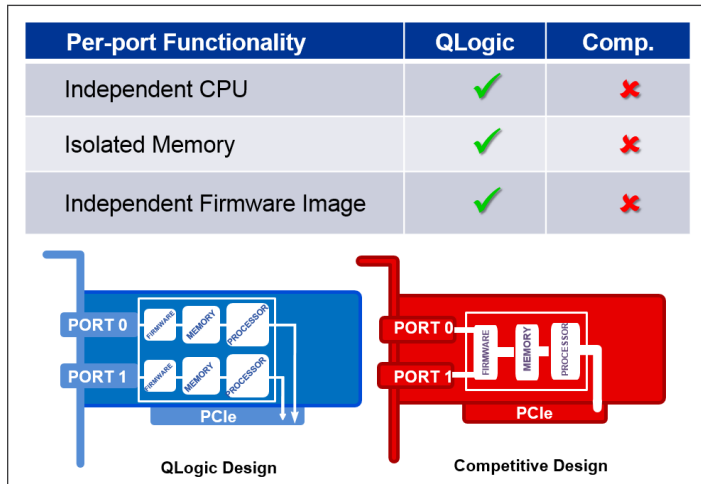


Figure 1. QLogic Design Provides Reliable Full-port Isolation

FLEXFABRIC CNAS AND ETHERNET ADAPTERS

Customers using HPE’s ProLiant, Apollo, Synergy, or BladeSystem servers can achieve 10GbE/20GbE/25GbE/50GbE network connectivity with the HPE Ethernet 520/530/620/630 Series Adapters, HPE Synergy 2820C/3820C CNAs, HPE Ethernet Synergy 6810C Adapters, and HPE StoreFabric CN1100R Series CNAs. These adapters from Cavium provide high-performance networking connectivity. Select adapters support remote direct memory access (RDMA) for low latency connectivity. Customers looking for converged connectivity supporting FCoE, iSCSI, and NIC protocols can leverage the HPE FlexFabric 534/536 Series, HPE Synergy 2820C/3820C Series, and HPE StoreFabric CN1100R Series CNAs from Cavium. These high-performance adapters are available in standard PCIe® and HPE Mezzanine, Flexible LOM Rack (FLR), and Flexible LOM Blade (FLB) form factors. PCIe and FLR versions also support both SFP+ and 10GBASE-T connection options.

The HPE Synergy 25/50GbE 6810C Adapter provides up to 200Gbps bidirectional, dual port, server-to-server connectivity. This adapter supports RDMA over Converged Ethernet (RoCE) and RoCEv2. It is also capable of supporting Internet wide area RDMA protocol (iWARP). With RDMA, this adapter can support iSCSI over Ethernet with RDMA or iSER. For customers with applications requiring small packet acceleration, this adapter supports the Data Plane Developer Kit (DPDK), with up to 68-million packet per second processing capability.

The HPE Ethernet 4x25Gb 1-port 620QSFP28 Adapter provides four ports of 25GbE connectivity across a single PCIe slot. This adapter also supports DPDK libraries for small-packet acceleration and RoCE/RoCEv2 for low-latency application environments. Like the HPE Synergy 6810C, DPDK performance is up to 68 million packets-per-second in a single PCIe slot, with bidirectional, full-duplex bandwidth of 200Gbps. This Ethernet adapter is ideal for telecommunications, financial, High Performance Computing (HPC), and scientific computational environments that need a combination of high performance and low-latency network connectivity.

HPE-branded 530/630 Series Adapters and HPE StoreFabric CN1100R Series CNAs from Cavium support network partitioning (NPAR). NPAR enables a single 10GbE or 20GbE port of the adapter to be presented to the OS as four independent physical functions. Therefore, a single dual-port adapter can be presented to the OS as eight individual adapters. NPAR enables administrators to split up the 10/20GbE connection to divide and allocate bandwidth and resources as needed at the adapter level. Working with Cavium, HPE provides 10/20GbE NPAR in the ProLiant Gen8, Gen9, and Gen10 server families, giving IT organizations enhanced flexibility and capacity as they migrate to higher speed networks. These adapters are also designed to work in next-generation HPE servers as well.

The HPE 521/522/621/622 Series 10/25/50Gb Ethernet Adapters for HPE ProLiant and Apollo servers support 10GbE, 25GbE, and 50GbE connectivity along with Universal RDMA (support for concurrent RoCE and/ or iWARP) and DPDK support. The HPE 522FLR-T and 622FLR-SFP28 CNAs support iSCSI and FCoE storage offloads. All 25GbE adapters utilize Cavium SmartAN™ technology, which allows the adapter to be automatically configured when switching between 10GbE and 25GbE network switch ports. This technology eliminates the System Administrator’s job of reconfiguring the adapter when upgrading from 10GbE to 25GbE connectivity.

All these HPE flexible network adapters also support network virtualization using generic routing encapsulation (NVGRE) and virtual extensible LAN (VXLAN) tunnel offloads. This support allows IT administrators to accommodate increasingly large quantities of virtual LANs (VLANs) and to isolate physical L2 networks. In addition, these adapters support precision time protocol (PTP), which synchronizes the server system clocks in the Internet computing infrastructure. PTP is documented in IEEE 1588-2002 PTPv1 and enhancement 802.1as/1588-2008 PTPv2.

HPE FC Adapters from Cavium					
	81Q/82Q/84Q	QMH2672	SN1100Q	SN1600Q	HPE Synergy 3830C
Physical Specifications					
Port Count	1/2/4	2	1/2	1/2	2
Port Connector	SFP+	N/A	SFP+	SFP+	N/A
Host Bus Interface Specifications					
Bus Type	PCIe 2.0, x4/x8	PCIe 3.0, x4	PCIe 3.0, x8	PCIe 3.0, x8	PCIe 3.0, x4
Data Path	FC	FC	FC	FC	FC
Port Speed	8GFC	16GFC	16GFC	32GFC	16GFC
FC Specifications					
Auto-negotiation	8/4/2GFC	16/8/4GFC	16/8/4GFC	32/16/8GFC	16/8/4GFC
IOPS (per port)	200,000	600,000	650,000	650,000	600,000
Topology	FC-AL, FC-AL-2, point to point, switched fabric				
Protocols	FCP-3-SCSI, FC-Tape (FCP-2)				
Advanced Features					
HPE Smart SAN-optimized Support	FC ping, FC traceroute, enhanced FDMI, RDP	D_Port, FC ping, FC traceroute, enhanced FDMI, RDP, CS_CTL, FA-WWN, F-BLD	D_Port, FC ping, FC traceroute, enhanced FDMI, RDP, LCB, FEC, CS_CTL, FA-WWN, F-BLD, BB-CR	D_Port, FC ping, FC traceroute, enhanced FDMI, RDP, LCB, FEC, CS_CTL, FA-WWN, F-BLD, BB-CR	D_Port, FC ping, FC traceroute, enhanced FDMI, RDP, CS_CTL, FA-WWN, F-BLD
Support and Management					
Management	HPE SIM ¹ , HPE SUM ² , QCC ³				
OS Support ⁴	Microsoft® Windows®, RHEL®, SLES®, Oracle® UEK, Solaris®, VMware®, and Citrix® XenServer®	Microsoft Windows, RHEL, SLES, Oracle UEK, VMware, and Citrix XenServer	Microsoft Windows, RHEL, SLES, Oracle UEK, VMware, and Citrix XenServer	Microsoft Windows, RHEL, SLES, VMware	Microsoft Windows, RHEL, SLES, VMware
Server Support	ProLiant G5–G7, Gen8, Gen9 ⁵	Gen8, Gen9, Gen10 blade servers	ProLiant Gen9, Gen10	ProLiant Gen9, Gen10	HPE Synergy Gen9, Gen10
Ordering Information					
Part Number	AK344A/AJ764A/P9D91A	710608-B21	P9D93A/P9D94A	P9M75A/P9M76A	777452-B21

1 SIM = System Insight Manager

2 SUM = Smart Update Manager

3 QCC = QConvergeConsole®

4 For more Linux® OS support and certification information, see HPE's Single Point of Connectivity Knowledge (SPOCK) Web site, <https://h20272.www2.hpe.com/SPOCK/>

5 84Q supported on select ProLiant Gen9 servers only

HPE 10/20GbE CNAs and Intelligent Ethernet Adapters from Cavium					
	HPE FlexFabric 534FLR-SFP+ and CN1100R	HPE FlexFabric 534FLB/534M/536FLB (10GbE) 630FLB/630M (20GbE), HPE Synergy 2820C/3820C	HPE Ethernet 521T, HPE 522FLR-T CNA	HPE Ethernet 530FLR-SFP+, and 530SFP+	HPE Ethernet 530T and HPE FlexFabric 533FLR-T, 536FLR-T, and CN1100R-T CNA
Physical Specifications					
Port Count	2	2	2	2	2/4 ¹
Port Connector	SFP+	N/A	RJ-45	SFP+	RJ-45
Host Bus Interface Specifications					
Bus Type	PCIe 2.0, x8	PCIe 2.0, x8 (10GbE) PCIe 3.0, x8 (20GbE)	PCIe 3.0 x 16	PCIe 2.0, x8	PCIe 2.0, x8; PCIe 3.0, x8 ¹
Data Path	Converged Ethernet	Converged Ethernet	Ethernet (521T) Converged Ethernet (522FLR-T)	Ethernet	Ethernet (530T) Converged Ethernet (533FLR-T, 536FLR-T, and CN1100R-T CNA)
Port Speed	10Gbps	10Gbps/20Gbps	10Gbps	10Gbps	10Gbps
Ethernet Specifications					
Jumbo Frames	Yes	Yes	Yes	Yes	Yes
Hardware iSCSI Offload	Yes	Yes	Yes ²	No	Yes ²
Hardware FCoE Offload	Yes	Yes	Yes ²	No	Yes ²
MSI/MSI-X	Yes	Yes	Yes	Yes	Yes
Checksum and Segmentation Offload	Yes	Yes	Yes	Yes	Yes
Receive Side Scaling (RSS)	Yes	Yes	Yes	Yes	Yes
802.1Q VLAN Tagging	Yes	Yes	Yes	Yes	Yes
IEEE 1588 PTP	Yes	Yes	Yes	Yes	Yes
NPAR	Yes ³	Yes ^{3, 4}	No	Yes ³	Yes ³ , No ⁴
SR-IOV	Yes	Yes	Yes	Yes	Yes
Overlay Network Support (NVGRE, VXLAN, GRE)	Yes	Yes	Yes	Yes	Yes
VMware NetQueue and Microsoft VMQ	Yes	Yes	Yes	Yes	Yes
Pre-Boot Execution Environment (PXE)	Yes	Yes	Yes	Yes	Yes
ProLiant Heterogeneous Teaming Driver	Yes	Yes	Yes	Yes	Yes
RDMA (RoCE, RoCEv2)	No	No	Yes	No	No
DPDK	Yes	Yes	Yes	Yes	Yes

HPE 10/20GbE CNAs and Intelligent Ethernet Adapters from Cavium					
	HPE FlexFabric 534FLR-SFP+ and CN1100R	HPE FlexFabric 534FLB/534M/536FLB (10GbE) 630FLB/630M (20GbE), HPE Synergy 2820C/3820C	HPE Ethernet 521T, HPE 522FLR-T CNA	HPE Ethernet 530FLR-SFP+, and 530SFP+	HPE Ethernet 530T and HPE FlexFabric 533FLR-T, 536FLR-T, and CN1100R-T CNA
Support and Management					
Management	QCS ⁵ CLI, QCC ⁵ GUI, UEFI				
OS Support	Microsoft Windows, RHEL, SLES, VMware, and Citrix	Microsoft Windows, RHEL, SLES, VMware, and Citrix	Microsoft Windows, RHEL, SLES, VMware, and Citrix	Microsoft Windows, RHEL, SLES, VMware, and Citrix	Microsoft Windows, RHEL, SLES, VMware, and Citrix
Server Support	ProLiant/Apollo Gen8, Gen9	Gen8, Gen9, Gen10 Synergy and BladeSystem servers ⁶	ProLiant/Apollo Gen10	ProLiant/Apollo Gen8, Gen9 ⁶	ProLiant/Apollo Gen8, Gen9
Ordering Information					
Part Number	526FLR-SFP+: 629138-B21; 534FLR-SFP+: 700751-B21 CN1100R: QW990A	2820C: 794538-B21 3820C: 777430-B21 534FLB: 700741-B21 534M: 700748-B21 536FLB: 766490-B21 630FLB: 700065-B21 630M: 700076-B21	521T: 867706-B21 522FLR-T: 867331-B21	530FLR-SFP+: 647581-B21 530SFP+: 652503-B21 NC523SFP: 593717-B21	530T: 656596-B21 533FLR-T: 700759-B21 536FLR-T: 764302-B21 CN1100R-T CNA: N3U52A

1 HPE 536FLR-T is a 4-port adapter with a PCIe 3.0, x8 bus type
 2 522FLR-T and 622FLR-SFP+
 3 NPAR is supported in Windows, VMware, RHEL, and SLES OSes
 4 NPAR is not supported on the 536FLR-T, or HPE Synergy 2820C or 3820C.
 5 QCS = QLogic Control Suite, QCC = QConvergeConsole®. Available from the download pages on www.cavium.com.
 6 See HPE Server QuickSpecs for limitations

HPE 10/25/50GbE CNAs and Intelligent Ethernet Adapters from Cavium			
	HPE Synergy 6810C	HPE Ethernet 4x25 1-port 620QSFP28	HPE Ethernet 621SFP28 and HPE 622FLR-SFP28 CNA
Physical Specifications			
Port Count	2	4	2
Port Connector	N/A	QSFP28	SFP28
Host Bus Interface Specifications			
Bus Type	PCIe 3.0, x16	PCIe 3.0, x16	PCIe 3.0, x16
Data Path	Ethernet	Ethernet	Ethernet (621SFP28) Converged Ethernet (622FLR-SFP28)
Port Speed	2x25Gbps/50Gbps	4x25Gbps	10Gbps/25Gbps
Ethernet Specifications			
Jumbo Frames	Yes	Yes	Yes
Hardware iSCSI Offload	No	No	Yes ¹
Hardware FCoE Offload	No	No	Yes ¹
MSI/MSI-X	Yes	Yes	Yes
Checksum and Segmentation Offload	Yes	Yes	Yes
Receive Side Scaling (RSS)	Yes	Yes	Yes
802.1Q VLAN Tagging	Yes	Yes	Yes
IEEE 1588 PTP	Yes	Yes	Yes
NPAR	No	No	No
SR-IOV	Yes	Yes	Yes
Overlay Network Support (NVGRE, VXLAN, GRE)	Yes	Yes	Yes
VMware NetQueue and Microsoft VMQ/VMMQ	Yes	Yes	Yes
Pre-Boot Execution Environment (PXE)	Yes	Yes	Yes
ProLiant Heterogeneous Teaming Driver	Yes	Yes	Yes
RDMA (RoCE, RoCEv2)	Yes	Yes	Yes
DPDK	Yes	Yes	Yes

HPE 10/25/50GbE CNAs and Intelligent Ethernet Adapters from Cavium			
	HPE Synergy 6810C	HPE Ethernet 4x25 1-port 620QSFP28	HPE Ethernet 621SFP28 and HPE 622FLR-SFP28 CNA
Support and Management			
Management	QCS ² CLI, QCC ² GUI, UEFI		
OS Support	Microsoft Windows, RHEL, SLES, VMware	Microsoft Windows, RHEL, SLES, VMware	Microsoft Windows, RHEL, SLES, VMware and Citrix
Server Support	ProLiant/Apollo Gen9, Gen10	ProLiant/Apollo Gen9, Gen10	ProLiant/Apollo Gen10
Ordering Information			
Part Number	6810C: 867322-B21	620QSFP28: 817762-B21	621SFP28: 867328-B21 622FLR-SFP28: 867333-B21

1 522FLR-T and 622FLR-SFP+
 2 QCS = QLogic Control Suite. QCC = QConvergeConsole. Available from the download pages on www.cavium.com.

RESOURCES

See the following Web sites for more information:

- www.hpe.com/storage/san
- www.hpe.com/servers/proliantnics
- www.cavium.com/info/hpe

For questions or enquiries, e-mail hpesolutions@cavium.com



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