Overview

NEC Vector Engine Accelerators

Hewlett Packard Enterprise supports, on selected HPE ProLiant and Apollo servers, computational modules based on the NEC Vector Engine technology.

The NEC Vector Engine Accelerator Module with its unmatched memory bandwidth per core offers a balanced architecture for applications bounded by insufficient Byte per FLOPS characteristics.
Extremely large amount of data can be processed per cycle thanks to the native vector architecture.
Moreover, users can easily exploit these capabilities via a standard development environment leveraged from the vector supercomputers era. Applications don't have to be migrated to a new programming environment. Existing Fortran and C/C++ codes will simply have to be recompiled for the Vector Engine processor.
Full software environment is available with compilers, libraries and tools. Compilers are able to vectorize and auto-parallelize loops. Parallelization with OpenMP and MPI is supported.

The NEC Vector Engine Accelerator Module is offered in a PCIe form factor, to be hosted by an HPE supported server running a standard Linux® operating system as the user front end.
It has been developed using 16nm FinFET process technology for extreme high performance and low power consumption.
An outstanding memory bandwidth of 1.2 TB/s is leveraged from the exceptional integration of six HBM2 memory modules and a multi-core vector processor using Chip-on-Wafer-on-Substrate technology.
The eight cores share a Last-Level-Cache, facilitating shared memory parallelization.

NEC Vector Engine Models

HPE NEC Vector Engine Accelerator Module Q7G75A

NOTE: Q7G75A is to be used with HPE Apollo 6500 Gen10. Please see the server QuickSpecs for configuration rules, including requirements for enablement kits.

HPE NEC Vector Engine Accelerator Module Q7G75C

NOTE: Q7G75C is to be used with HPE ProLiant DL380 Gen10. Please see the server QuickSpecs for configuration rules, including requirements for enablement kits.

Standard Features

Description	HPE NEC Vector Engine Accelerator Module		
HPE NEC Vector Engine Accelerator Module	Q7G75A or Q7G75C		
Image			
HPE NEC Vector Engine Accelerator Module (VE) offers the best memory bandwidth per core to accelerate AI and HPC real applications. Its record Bytes per FLOPS ratio unleashes applications that are memory bandwidth bounded on current architectures. High sustained application performance of Vector Supercomputers is now available in this PCIe card form factor, at a fraction of the power consumption.			
Performance	2.15 TFLOPS DP | 4.3 TFLOPS SP		
Memory Size	48 GB HBM2 Stacked Memory		
Memory Bandwidth	1.2 TB/s to HBM2 Stacked Memory		
Bytes/FLOPS	0.56		
Cores	8 Vector Cores Each core with 3 FMA units, 1 Scalar unit, 64 registers of 16,384 bits (256 elements) - 128kB p. core		
Peer to Peer via PCIe	x16 PCIe Gen3		
Power	<300W		
Cooling	Passive Cooling		
Form Factor	Double-width, Full Height, Full Length		
Supported Servers and Operating Systems	**Supported Servers**	**Maximum number of VE cards per Server**	**Server supported Operating Systems**
	HPE ProLiant DL380 Gen10	Up to 3	RHEL and CentOS 7.4, 7.5
	HPE Apollo 6500 Gen10	Up to 8	RHEL and CentOS 7.4, 7.5
Software (order separately)	NEC Fortran (2003, 2008), C (11), C++ (14) compilers. OpenMP 4.5. NEC MPI 3.1. BLAS, FFT, libc, Lapack, etc libraries. Stencil library. GNU profiler (gprof). GNU debugger (gdb) and Eclipse parallel tools platform (PTP). FtraceViewer, PROGINF tools.		

NOTE: HPE ProLiant DL380 Gen10 servers must be equipped with several options to receive the HPE NEC Vector Engine. For example, High Performance Heatsink Kit, High Performance Temperature Fan Kit, Graphics Cable Kit. Only a selection of HPE ProLiant DL380 Gen10 server models are supported with the HPE NEC Vector Engine Accelerator Module. Please see the HPE ProLiant DL380 Gen10 server QuickSpecs for configuration rules.

NOTE: NEC Software Licenses are available from HPE on a per project basis.

Standard Features

Performance of the Vector Engine 1.0 Type 10B-P

- The Vector Engine 1.0 Type 10B-P PCIe module is built for HPC and AI.
- 8 vector cores.
- 16MB last-level-cache shared by all the cores at 3TB/s (400GB/s per core).
- Each core has 64 registers of 16,384 bits (256 elements) for a total of 128kB per core.
- Three Fused Multiply-Add (FMA), one Scalar and a few other functional units are available per core.
- 2.15 TFLOPS of double-precision performance.
- 4.30 TFLOPS of single-precision performance.
- 48GB HBM2 at 1.2 TB/s.
- Power consumption: less than 300W.
- x16 PCIe Gen 3.0 maximizes bandwidth between the HPE ProLiant server and the vector processors. The whole application being run on the Vector Engine, it is less subject to PCIe bottleneck than codes offloading functions to accelerators and transferring data constantly.
- Vector processors can communicate directly when placed under the same root complex. Up to 8 VEs in an Apollo 6500 Gen10.

Service and Support

Service and Support

NOTE: This option is covered under HPE Support Services / Service Contract applied to the HPE ProLiant Server. 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. Please check HPE ProLiant Server documentation for more details on the services for this particular option.

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 channel switches, InfiniBand and UPS batteries over 12KVA.
See the specific high value options that require additional support **here**

Protect your business beyond warranty with HPE Support Services

HPE Pointnext provides a comprehensive portfolio including Advisory and Transformational, Professional, and Operational Services to help accelerate your digital transformation. From the onset of your transformation journey, Advisory and Transformational Services focus on designing the transformation and creating a solution roadmap. Professional Services specializes in creative configurations with flawless and on-time implementation, and on-budget execution. Finally, operational services provides innovative new approaches like Flexible Capacity and Datacenter Care, to keep your business at peak performance. HPE is ready to bring together all the pieces of the puzzle for you, with an eye on the future, and make the complex simple.

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.

HPE Support Center

The HPE Support Center is a personalized online support portal with access to information, tools and experts to support HPE business products. Submit support cases online, chat with HPE experts, access support resources or collaborate with peers.

Learn more **https://support.hpe.com/hpesc/public/home**

HPE's Support Center Mobile App* allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime.
HPE Insight Remote Support and HPE Support Center are available at no additional cost with a HPE warranty, HPE Support Service or HPE contractual support agreement.
NOTE:*HPE Support Center Mobile App is subject to local availability.

For more information

Visit the Hewlett Packard Enterprise Service and Support **website.**

Summary of Changes

Date	Version History	Action	Description of Change
02-Dec-2019	Version 2	Changed	Overview and Standard Features sections were updated. Q7G75C addition to be used with HPE ProLiant DL380 Gen10
02-Apr-2019	Version 1	New	New QuickSpecs

Sign up for updates

a00059759enw - 16363 - WorldWide - V2 - 02-December-2019