Overview

Intel Accelerators for HPE Servers

Hewlett Packard Enterprise supports, on select HPE servers, computational accelerator modules based on Intel Field Programmable Gate Array (FPGA) technology.

An FPGA can be reprogrammed and updated with new algorithms for different workloads. This flexibility allows a single FPGA to accelerate many different workloads efficiently, and to support future applications without the need to change the hardware. For instance, a FPGA could handle one workload during the morning shift and a different workload during an evening shift. Programmability also allows FPGAs to stay abreast of evolving standards, such as networking protocols, and enables updates to maintain compliance when a standard is finalized—again, without having to re-spin the hardware.

HPE has teamed up with Intel to offer FPGA solutions on select **HPE ProLiant DL Gen10 servers** and on select **HPE Edgeline servers**. HPE servers also offer a unique **Silicon Root of Trust** to protect against firmware-based cybersecurity threats. The combination of HPE servers with Intel FPGAs provides flexible, industrial-strength compute solutions that can be tuned for specific workloads.

Intel has developed the Acceleration Stack for Intel Xeon CPU with FPGAs to provide a common developer interface for both application and accelerator function developers, and includes drivers, Application Programming Interfaces (APIs) and an FPGA Interface Manager. Together with acceleration libraries and development tools, Intel's Acceleration Stack enables developers to focus on the unique value-add of their solutions.
Intel has also open-sourced the Open Programmable Acceleration Engine (OPAE) technology, a software programming layer that provides a consistent API across Intel FPGA platforms. It is designed for minimal software overhead and latency, while providing an abstraction for hardware-specific FPGA resource details. OPAE is the default software stack for the Intel® Xeon® processor with both integrated and discrete FPGA devices.

The collaboration between **HPE and Intel** provides industrial-strength FPGA solutions that accelerate business-critical workloads. The supporting software ecosystem is developing at a rapid enough pace to be able to continuously add value to customers in an ever-expanding range of uses cases. The performance, adaptability and power efficiency of FPGAs serve to increase productivity and drive innovation—with rapid ROI and minimized TCO.

For further information, please visit the **Intel FPGA Acceleration Hub**.

Intel Accelerators Models	
Intel Arria 10 GX FPGA Accelerator	Q9B37A
Intel Arria 10 GX FPGA Accelerator	Q9B37C
Intel Stratix 10 SX FPGA Accelerator	R0X82A
HPE Intel FPGA PAC D5005 Accelerator	R0X82C

NOTE: Please see the HPE server QuickSpecs for the following servers for configuration rules, including requirements for enablement kits.

Standard Features

Description	Intel Arria 10 GX FPGA Accelerator
SKU	Q9B37A Q9B37C
Form Factor	Single-slot; ½ Height, ½ Length
On-Board Memory	8GB DDR4 with Error Correction Code
On-Chip Memory	53Mb
Logic Elements	1,150K
PCIe	Gen3 x8 electrical, x16 mechanical for stability
Power	60W TDP and 70W Peak Power Up to 45W FPGA Power Consumption
Thermal Specifications	Operating Temperature: 203 °F (95°C) Shutdown Temperature: 212°F (100°C)
Supported Servers | Operating System	Q9B37C HPE ProLiant DL360 Gen10, 1st and 2nd Gen Intel Xeon Scalable Processor | RHEL 7.4 HPE ProLiant DL380 Gen10, 1st and 2nd Gen Intel Xeon Scalable Processor | RHEL 7.6
Software	Acceleration Stack for Intel Xeon CPU with FPGAs FPGA Interface Manager
Interface	1x Quad Small Form Factor Pluggable+ (QSFP+) with 4x 10GbE or 40GbE support
	NOTE: Intel FPGA are supported only on 64-bit versions

Supported Cables

The Intel Programmable Acceleration Card (PAC) with Intel Arria 10 GX FPGA has a QSFP+ cage on the front panel which supports one 40GbE or four 10GbE. The table below details the Intel-supported connectors which are required for use with the PAC. Successful functioning of 40GbE and 10GbE requires appropriate physical medium attachment (PMA) settings. These settings may be set by your third-party Accelerator Functional Unit (AFU) provider. If not, or if you are developing your own AFU, run the provided PMA settings script as detailed in the 10Gbps Ethernet AFU Design Example User Guide or 40Gbps Ethernet AFU Design Example User Guide.

- **Running 10GbE PAC-to-PAC Test between two connected PACs in the 10Gbps Ethernet Accelerator Functional Unit (AFU) Design Example User Guide**
- **Running 40GbE PAC-to-PAC Test between two connected PACs in the 40Gbps Ethernet Accelerator Functional Unit (AFU) Design Example User Guide**

Intel Networking Cable
Intel® Ethernet QSFP+ Twinaxial Cable 1meter
Intel® Ethernet QSFP+ Twinaxial Cable 3meter
QSFP+ to SFP+ Breakout Cable 1meter
QSFP+ to SFP+ Breakout Cable 3meter
Intel® Ethernet QSFP+ Short Range Optics

NOTE: Contact your Sales/Account Representative for sourcing a network cable.

Standards Features

Description	Intel Stratix 10 SX FPGA Accelerator
SKU	R0X82A R0X82C
Form Factor	Dual-slot; Full Height, ¾ Length
On-Board Memory	4x 8GB DDR4 with Error Correction Code
On-Chip Memory	256KB
Logic Elements	2,753K
PCIe	Gen3 x16
Power	215W TDP Up to 189W FPGA Power Consumption
Thermal Specifications	Operating Temperature: 32°F to 113°F (0°C to 45°C) Shutdown Temperature: 212°F (100°C)
Supported Servers | Operating System	R0X82C HPE ProLiant DL380 Gen10, 2nd Gen Intel Xeon Scalable Processor | RHEL 7.6
Software	Acceleration Stack for Intel Xeon CPU with FPGAs FPGA Interface Manager
Interface	2x Quad Small Form Factor Pluggable+ (QSFP+) with 100GbE each support
	NOTE: Intel FPGA are supported only on 64-bit versions

Service and Support

Service and Support
If this is a qualified option, it is covered under the HPE Support Service(s) applied to the HPE ProLiant Server. 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 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 **http://www.hpe.com/support/hpesc**
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 3	Changed	Overview and Standard Features sections were updated
05-Aug-2019	Version 2	Changed	Overview, Models and Standard Features sections were updated.
03-Dec-2018	Version 1	New	New QuickSpecs

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