FPGAs Accelerate Selected Intel® Xeon® Scalable Processors, ASIC, or ASSPs via High-Bandwidth and Coherent Interfaces

Boost your server or embedded system performance with Intel® Stratix® 10 DX FPGAs when combined with selected Intel Xeon® Scalable Processors and Intel Optane™ DC persistent memory DIMMs, or other compatible CPUs, ASICs, or ASSP devices.

Technology Leadership Extends to Intel Coherent Interfaces

Innovation and technology leadership helps Intel maintain its position as one of the top semiconductor company worldwide. By using the Intel Ultra Path Interconnect (UPI) chip-to-chip coherent protocol, server-based systems can exchange workloads or process/store critical information between Intel FPGAs and selected Intel Xeon Scalable Processors much faster.

- 37% lower latency vs. PCI Express® (PCIe®) protocol†
- 2.6X more bandwidth vs. PCIe only interfaces†

When using the UPI interface for memory expansion, the Intel CPUs can access additional memory attached to the Intel FPGA, increasing the total memory available for processing any workload.

- Expanded memory is addressable by the Intel CPU, host operating system, or any virtual machines running on the host
- Memory transactions are simple, without needing PCIe drivers or DMA transfers.
- Access to selected Intel FPGA available memories: on-die SRAM, in-package HBM2 DRAM stacks, external DDR4 or selected Intel Optane DC Persistent Memory DIMMs or non-volatile SSDs, and so on

With a migration path from UPI to next generation industry standard Compute Express Link® (CXL) coherent accelerator, count on additional performance and more innovation helping your system accomplish bigger and better things in the future.

Industry Standard Performance

Intel Stratix 10 DX FPGAs deliver awesome PCI Express Gen4, x16 performance for interfacing to any PCI-SIG® compliant device for increased levels of data throughput. Take advantage of the FPGAs new virtualization features for easier integration with cloud managed services.

- SR-IOV with eight physical functions and 2,048 virtual functions
- VirtIO, shared virtual memory, scalable-IOV
Increase Server TCO with FPGA Accelerators

FPGAs are silicon devices that can be dynamically reprogrammed with a datapath that exactly matches your workloads, such as:

- Database analytics queries
- In-memory database delta merge and index recoding
- Image inference
- Storage encryption/decryption and/or compression/decompression
- RCP or zero-copy acceleration
- FPGA-as-a-Service

This versatility enables the provisioning of a faster processing, more power efficient, and lower latency service – lowering total cost of ownership (TCO), and maximizing compute capacity within the power, space, and cooling constraints of data centers.

Embedded Systems Adopt PCI Express

High-performance embedded systems have long utilized FPGAs for their ability to bridge between different chipsets using industry standard interfaces based on general purpose I/O (or transceiver I/Os) combined with customized state machines. Ethernet is commonly used for peer-to-peer communication within embedded systems. As the need to handle increasingly large amounts of data (i.e. industrial image processing for smart factories) pushes up the performance requirements for embedded system, PCIe has migrated from use within computing systems (PCs and servers) into the embedded segment. Intel Stratix 10 DX FPGAs provide multiple, high-performance PCIe and Ethernet ports to satisfy the most demanding embedded system requirements.

Where to Get More Information

For more information, visit www.intel.com/stratix10