



# HP Intel Xeon Phi Coprocessor Starter Kit

Seize the strength of Coprocessor computing



## The HP Intel Xeon Phi Coprocessor Starter Kit speeds time to productivity

Many customers understand the benefits of Coprocessors but don't know how to get started. HP and Intel® have teamed up on an easy to acquire and easy to use starter kit that has everything needed to accelerate development and get into production quickly.

The starter kit is based on the HP ProLiant SL250s Gen8 server. The HP ProLiant SL250s Gen8 is specifically designed to deliver maximum performance of up to three accelerators. Many options exist for interconnect like the innovative 56 Gb/s FDR InfiniBand FlexibleLOM for maximum scalability. Multi-node density and efficiency are the hallmarks of the S6500 chassis with enhanced, simple front serviceability shared power and cooling and available rack level power management. HP's iLO management engine (iLO 4) provides the basis for industry leading management with the optional single pane of glass management for an entire cluster and Cluster Management Utility software.



## The Coprocessor that has the industry talking

With up to 60 IA cores/1.053 GHz/240 threads, 8 GB memory, and 352 GB/s bandwidth, the x86-compatible Intel® Xeon Phi™ Coprocessor is a supercomputer on a chip that offers optimized performance for your most highly parallel technical computing workloads. This x86 compatibility provides your developers with:

1. The ability to reuse an immense amount of existing software IP;
2. Commonality with existing development toolsets; and
3. A more rapid learning curve

## A nondisruptive way to deploy a groundbreaking, disruptive technology

Even before its release, the Intel Xeon Phi Coprocessor was hailed throughout the industry as a disruptive technology in high-performance computing (HPC). But that doesn't mean you have to disrupt your HPC environment in order to enjoy this Coprocessor's full, groundbreaking benefits:

- More than 1 TeraFlop/s double-precision peak performance<sup>1</sup>
- Up to 2.2x higher memory bandwidth than on an Intel Xeon processor E5 family-based server<sup>2</sup>
- Up to 4x greater performance per watt than with an Intel Xeon processor E5 family-based server<sup>3</sup>

“Unparalleled productivity... most of this software does not run on a GPU”

— Robert Harrison, NICS, ORNL

<sup>1</sup> Peak DP FLOPS claim based on calculated theoretical peak double-precision performance capability for a single Coprocessor. 16 DP FLOPS/clock/core\*60 cores\*1.053 GHz=1.0108 TeraFlop/s.

<sup>2</sup> Two socket Intel Xeon processor E5-2600 product family server vs. Intel Xeon Phi Coprocessor (2.2x: Measured by Intel October 2012. 2 socket E5-2670 (8 core, 2.6 GHz) vs. 1 Intel Xeon Phi Coprocessor SE10P (61 cores, 1.1 GHz) on STREAM Triad benchmark 79.5 GB/s vs. 175 GB/s) (TR 2012B)

<sup>3</sup> Two socket Intel Xeon processor E5-2670 server vs. a single Intel Xeon Phi Coprocessor SE10P (Intel measured DGEMM perf/watt score 309 GF/s @ 335W vs. 829 GF/s @ 195W) (TR 2028B)

## Deploy quickly and easily with the HP Intel Xeon Phi Coprocessor Starter Kit



For starter kit quotes, please write to [Hpc-sales@hp.com](mailto:Hpc-sales@hp.com).

Starter kit configuration	Value to customer
1 HP ProLiant DL380 control node: E5-2670 8 core 2.6 GHz 115W CPUs, 64 GB RAM, 2x 600 GB HDD	Provides management and the rapid deployment of Linux clusters.
1 HP ProLiant SL6500 Scalable System enclosure with 4 HP ProLiant SL250s Gen8 2U server trays with E5-2670 8 core 2.6 GHz 115W CPUs, 64 GB RAM, 600 GB HDD	Designed for extreme scale-out deployments, these high-efficiency servers deliver high density, power-saving and cost-reduction features. HP ProLiant SL6500 system includes a 4U modular power and cooling chassis, front I/O cabling, and independently-serviceable server nodes.
Each of the 4 SL250s servers includes 2 Intel Xeon Phi Coprocessor 5110P Coprocessor modules	An advanced, purpose built HPC server that delivers a balanced compute solution in a 2U half-width tray, focused on high-performance Coprocessor computing.
Mellanox InfiniBand QDR 36 port managed switch and HP Networking 2910 24 port Ethernet switch	InfiniBand provides ultra-high bandwidth, low latency, and excellent scalability capabilities.
Red Hat Enterprise Linux with HP Insight CMU (Cluster Management Utility)	HP Insight CMU simplifies the management and the rapid deployment of Linux clusters. Integration with HP iLO 4 Management Engine enables HP Agentless Management reducing the burden on CPU performance.
Adaptive Workload Optimization Pack with Adaptive Computing MOAB HPC Suite for job scheduling	The Moab product family provides leading self-optimizing dynamic self-managing intelligent HPC environments optimized for HP ProLiant Servers and includes Intel® MPI Library.
Intel® Cluster Studio XE suite	High performance MPI hybrid cluster development tools with industry leading MPI latency and scalability. Includes Intel's high performance C++ & Fortran compilers, performance libraries, and analysis tools that are standards driven and scalable from multicore to many core systems.
Rack and infrastructure with Hardware/Software integration	End-to-end HPC services provide a single point of accountability, enabling a simple, successful implementation.
Partner offers with free trials or discounts from Rogue Wave TotalView, Allinea DDT	Compliments the Intel Cluster Studio XE environment with parallel source code, memory debuggers and analyzers.

🔍 Code Analysis

- Intel® Advisor XE
- Intel® VTune™ Amplifier XE
- Intel® Inspector XE

📚 Libraries & Compilers

- Intel® Math Kernel Library
- Intel® Integrated Performance Primitives
- Intel® Composer XE Fortran and C++

💻 Programming Models

- Intel® Cilk™ Plus
- Intel® Threading Building Blocks
- Intel MPI Library, OpenMP®, OpenCL™

## Optimizing your code with Intel Xeon Phi Coprocessor

Perhaps the most appealing benefit of all is that, unlike with accelerators on the market, you don't have to completely rewrite your code. With the Intel Xeon Phi Coprocessor, you just need to optimize your code to ensure that it is easier than a port, vectorized and parallelized to scale appropriately (given the Coprocessor's highly parallel architecture and wide vector widths). The Intel Cluster Studio XE—included in the HP Intel Xeon Phi Coprocessor Starter Kit—can help do that for you by profiling and analyzing your code, utilizing high-performance libraries and compilers and scaling with standards-driven programming models.

With the Intel Xeon Phi Coprocessor 5110P, getting extreme performance from highly parallel applications just became a lot easier. Now you can think “reuse” rather than “recode” with x86 compatibility. Languages, tools, and applications run smoothly across the full spectrum of Intel Xeon processor family-based platforms. For developer information, please visit [software.intel.com/mic-developer](http://software.intel.com/mic-developer).



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