

The Convey HC-1™: The World's First Hybrid-Core Computer



The HC-1 provides the performance of a hardware-based, application-specific design with the deployment ease of an x86-based development and operating environment.

If you're an engineer or an IT manager supporting a group of engineers, you know that getting the performance you need is a challenge. Stacking more boxes in the computer room might work, if you can figure out where to run the cables and how to cool the racks. And your software vendor promises the next release will leverage multi-core processors and scale better—if the memory bandwidth holds up.

What you really need is a way of getting a lot more performance with less hardware, less cabling, and less heat. And not just a few percentage points of performance, but an order of magnitude increase—with roughly the same heat and power requirements as one of the pizza box servers in your computer room.

Enter the Convey HC-1. The HC-1 introduces an innovative new way of obtaining extreme performance: hybrid-core computing. Hybrid-core computing is based on an asymmetric architecture that combines the economies and programmability of industry standard processors with the performance and efficiency of a hardware-based, application-specific design.

HARDWARE PERFORMANCE, COMMODITY ECONOMICS

The Convey HC-1 server employs a highly parallel coprocessor that augments the capabilities of a commodity processor with processing elements optimized for performance-critical operations. Instructions executed by the coprocessor appear as extensions to the x86 instruction set; applications can contain both x86 and coprocessor instructions in a single instruction stream.

The coprocessor is based on standard Field Programmable Gate Arrays (FPGAs) and is coupled with a standard multi-core Intel® Xeon® processor. While each processor has its own physical memory, logically memory is globally addressable and cache-coherent, making software development as easy as that of a standard x86 environment.

PERSONALITIES FOR PERFORMANCE

The Convey HC-1 coprocessor can be loaded with different personalities. Each personality includes a base instruction set—common to all personalities—plus a set of extended instructions designed for the particular workload. By creating an instruction set tailored specifically to each application, the HC-1 increases both performance and efficiency.

The World's First Hybrid-Core Computer.

LEARN MORE ABOUT THE WORLD'S FIRST HYBRID-CORE COMPUTER.
VISIT CONVEYCOMPUTER.COM OR CALL 1-866.338.1768

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MEMORY TO THE MAX

Complementing the highly parallel computational capabilities of the coprocessor is an extremely high-bandwidth memory subsystem. Based on 8 memory controllers, supporting 16 DDR2 memory channels, the subsystem provides over 80 GB/second of bandwidth, obliterating the bandwidth limitations of commodity multi-core processors.

OFF-THE-SHELF PROGRAMMING ENVIRONMENT

The Convey software environments are based on the Linux® operating system, making the Convey HC-1 systems easy to integrate into an existing clustered environment. Application development, including coding, debugging, and deployment, takes place using ANSI standard FORTRAN, C, and C++ development tools—reducing the need for any specialized talent to deploy or maintain applications.

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SYSTEM ARCHITECTURE

Dual-socket computer with one Intel® host processor and one Convey HC-1 custom coprocessor

HOST PROCESSOR

PROCESSOR Intel® Xeon® 2.13 GHz dual-core processor
HOST MEMORY DIMMs: minimum 4, maximum 16
 Max memory: 128GB
CHIPSET Intel® 5400 MCH (1066 MHz FSB)

CONVEY COPROCESSOR

PROCESSOR Based on Xilinx® Virtex® 5 FPGA
COPROCESSOR MEMORY DIMMs: minimum 8, maximum 16
 DIMM types: Standard PC-5300 DDR2 (max 128GB) ECC Convey Scatter-Gather SGDIMMs (max 32GB) ECC

DISK BAYS

3 x 3.5" SATA II bays

I/O

1 full-height PCI-Express Gen 2 x16
 Integrated ESB2-E 3Gb/s SATA
 1-3 hot swap SATA drives
 One slim-line IDE optical drive

NETWORK INTERFACE

Dual Gigabit Ethernet

POWER

Two non-redundant auto-switching 110/220 volt power supplies (1320 watts total)

CHASSIS

2U rack mountable
 Rack weight 25kg (55 lbs)

DIMENSIONS

H: 87.6mm (3.45"), W: 430mm (16.93"), D: 692mm (27.24")

OPERATING SYSTEM

Convey Linux®

WARRANTY

1 Year