



Product Brief
High-Performance Computing
Cluster Platforms

Entry-level Intel® Processor-based High-performance Computing Cluster Platforms

Economical High-performance Computing (HPC)
Platforms with Outstanding Reliability and Value



With the introduction of more powerful multi-core processors and the move towards clustering, high-performance computing (HPC) is expanding from large-scale computing machines toward workgroups and departmental clusters in many research and science industries. Breakthroughs in absolute performance and price/performance have made it possible for single processor platforms to enter new, low-end HPC applications.



Cost-effective Clustering and Personal Supercomputing

Dual-Core Intel® Pentium® D processor-based server platforms are ideal for building small, cost sensitive, high density, yet powerful HPC clusters that create high-performance, personal supercomputing solutions and workgroup clusters. Based on Intel Netburst® microarchitecture and Intel® E7230 chipset, these platforms offer balanced computing that enables fast time-to-solution for complex, data-intensive problems.

- Dependable server platform with dual-core, 64-bit computing based on Intel Pentium D processors delivers up to 12.9 Gflops⁵ of computing power to solve your applications or simulations quickly.
- Up to 1066 MHz front-side bus for fast throughput solutions.
- Up to 8 GB of dual-channel, DDR2 667 MHz ECC memory delivers bandwidth to reduce or eliminate memory bottlenecks.
- PCI Express* I/O supports HPC high-bandwidth/low-latency interconnects.
- High performance, high density, and low-cost operation.
- Gigabit Ethernet LAN connectivity (Intel® PRO/1000 PM/PL network connections) for cost-effective networking.
- 4 channels of Serial ATA deliver high-speed disk access and large capacity.
- Intel® Matrix Storage Technology³ boosts hard drive performance and provides data protection with RAID 1, 5, and 10.
- Intel® Active Management Technology⁴ simplifies system management.

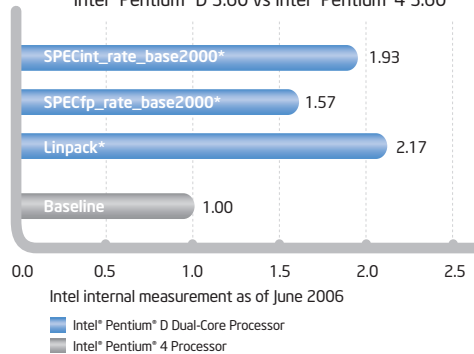


Personal or workgroup clusters based on the Intel Pentium D processor offer an alternative for scientists and researchers who normally have to share supercomputer or large-scale computing power within a laboratory or a company. Personal or workgroup clusters allow scientists and researchers to be more productive by allowing them to complete tasks down to their desk-side more efficiently and conveniently than with larger computer clusters. In addition to both convenience and productivity, scientists and researchers gain performance capability to process their applications or simulations at a fraction of the cost of a full-scale supercomputer.

Intel® Pentium® D Processor with Intel® E7230 Chipset Performance

Integer and Floating Point Performance

Intel® Pentium® D 3.60 vs Intel® Pentium® 4 3.60



SPECint_rate_base2000

Baseline Platform Configuration: Intel® Server Pre-Production System SE7230CA1-E with 64-bit Intel® Pentium® 4 processor 3.73 GHz with 2 MB L2 Cache and 1066 MHz system bus 4x1024 MB DDR-2 DIMMs; Red Hat Enterprise Linux® AS release 4 2.6.9-16 EL x86_64 GNU/Linux Workload. Nanhant Update Beta 2.

New Platform Configuration: Intel® Server Pre-Production System SE7230CA1-E with 64-bit Intel® Pentium® D Dual-Core processor (Presler) C1 3.6 GHz with 2x2 MB L2 Cache, Mukilteo Chipset, 800 MHz FSB; 4x1GB DDR2-667; Hyper Threading OFF. Red Hat Enterprise Linux AS release 4 2.6.9-16 EL x86_64 GNU/Linux Workload. Nanhant Update Beta 2.

SPECfp_rate_base2000

Baseline Platform Configuration: Intel SE7230CA1-E Platform with 64-bit Intel® Pentium® 4 processor 3.73 GHz with 2 MB L2 Cache and 1066 MHz system bus 4x1024 MB DDR-2 DIMMs; Red Hat Enterprise Linux AS release 4 2.6.9-16 EL x86_64 GNU/Linux Workload. Nanhant Update Beta 2.

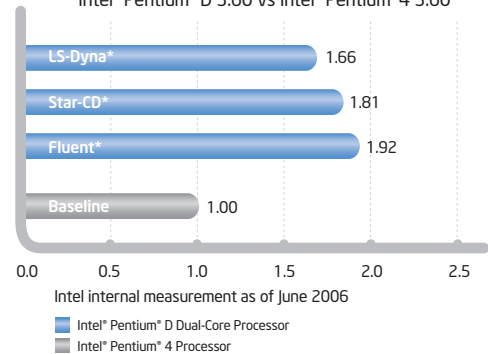
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⁵ Linpack

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HPC Performance

Intel® Pentium® D 3.60 vs Intel® Pentium® 4 3.60



LS-Dyna mpp970.5434a (3 cars wkld@30 ms, jobs/day)

Collision simulation for manufacturing vertical. Workload Version: mpp970.5434a (64bit) Custom Workload: 3 cars @ 30 ms.

Star-CD v3.22 (Engine wkld, jobs/day)

Computational Fluid Dynamic modeling for manufacturing vertical; Workload Version: V3.22 (64 bit); Custom Workload: Engine.

Fluent 6.2 (geomean 8 wklds, jobs/day)

Computational Fluid Dynamic modeling for manufacturing vertical. Workload Version: 6.2 (64 bit). Custom Workload: eight of nine standard workloads, small and medium sets and two from large set.

Common System Configuration

Baseline Platform Configuration: Intel® Server Pre-Production System SE7230CA1-E with 64-bit Intel Pentium 4 processor 3.73 GHz with 2 MB L2 Cache, 1066 MHz FSB; 4 GB DDR2-667 memory; Red Hat Enterprise Linux AS release 4 2.6.9-16 EL x86_64 GNU/Linux Workload. Nanhant Update Beta 2.

New Platform Configuration: Intel Server Pre-Production System SE7230CA1-E with 64-bit Intel Pentium D Dual-Core processor (codename Presler) C1 3.6 GHz with 2x2 MB L2 Cache, Mukilteo Chipset, 800 MHz FSB; 4x1GB DDR2-667; Hyper Threading OFF. Red Hat Enterprise Linux AS release 4 2.6.9-16 EL x86_64 GNU/Linux Workload. Nanhant Update Beta 2.



Intel Entry-level HPC High-density Server Board Solution

Combine the Intel Pentium D processor with an Intel® Server Board SE7230CA1 -E to deliver exceptional performance and reduced footprint for essential applications requiring high density and performance.

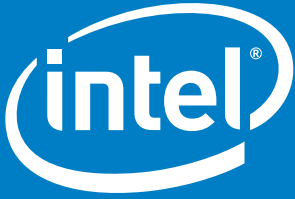
The Server Board SE7230CA1 -E, with its unique footprint, makes it ideal for cost-effective high performance computing and other high density applications, as well as scalable web and applications server deployments. The unique form factor enables double board density over existing boards in 1U chassis and adds added flexibility and horsepower in small form factor designs.

You Can Rely on Intel Processor-based HPC Solutions

Intel's leadership across the full range of server technologies is continually pushing the limits of performance, affordability, and choice for HPC. The majority of the world's 500 most powerful supercomputers now run on Intel® processors.⁵ And, with a 20-year track record of delivering proven performance worldwide, you can count on Intel to deliver superior quality and reliability to drive your HPC solutions—large and small.

For more information visit www.intel.com/go/hpc





www.intel.com/go/hpc

1. Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor_number for details.
2. Intel® EM64T requires a computer system with a processor, chipset, BIOS, operating system, device drivers, and applications enabled for Intel EM64T. Processor will not operate (including 32-bit operation) without an Intel EM64T-enabled BIOS. Performance will vary depending on your hardware and software configurations. See www.intel.com/info/em64t for more information, including details on which processors support Intel EM64T or consult with your system vendor for more information.
3. Intel® Matrix Storage Technology requires a motherboard with the Intel® 82801FR (ICH6R or Intel® 82801GR (ICH7R) I/O Controller Hub System. The system must also have the RAID controller in the BIOS enabled and the Intel Matrix Storage Technology software driver installed. Please consult your system vendor for more information.
4. Intel® Active Management Technology requires a system with an Intel® E7230 Chipset or Intel® 955 Express Chipset or Intel® 945 Express Chipset; an Intel® PRO/1000 PM Network Connection; and appropriate third-party software. The system must be plugged into a power source and connected to a LAN.
5. Source: Top 500 Supercomputer Sites, published November 2005, www.top500.org.

Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information on performance tests and on the performance of Intel products, visit www.intel.com/performance/resources/limits.htm or call (U.S.) 1-800-628-8686 or 1-916-356-3104.

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