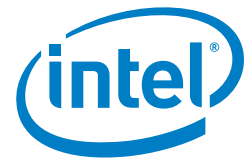


# Product Brief

## Expert Workbench

Intel® Xeon® processor 5600 Series



# Bring Digital Prototyping to the Desktop with Intel® Xeon® Processor 5600 Series-based Workstations

Move beyond CAD with powerful workstations that let you create, test and modify products before building costly physical prototypes.

The latest Intel® Xeon® processor 5600 series-based workstations bring unprecedented performance and flexibility to the desktop. Not only can designers and engineers do complex tasks faster, they can do multiple tasks at the same time to truly accelerate development. Imagine running Microsoft Windows\*-based design tools and complex Linux\*-based simulation applications concurrently, securely and at full speed. The ability to test multiple "what-if" scenarios per day without slowing interactive design tasks brings innovation to life faster than ever before.

## Extreme Performance that Adapts to Your Workloads

A single workstation with two Intel Xeon processors 5600 series now provides near-supercomputing capacity, with up to 12 computational cores, 24 threads and memory configurations as large as 192 GB<sup>1</sup>. This processor family helps you get the most out of these resources by intelligently allocating processing power where you need it most.

- **Intel® Hyper-Threading Technology®** doubles the number of execution threads to increase performance for many complex workloads (simulation-based design, ray tracing, rendering, etc.).
- **Intel® Turbo Boost Technology<sup>®</sup>** increases core frequencies beyond rated values to push performance even higher for your most demanding workloads.
- **Intel® Smart Cache** dynamically allocates cache resources based on the demands of each core so data is managed more efficiently to optimize execution across all 12 cores.

With this intelligent performance, you can multitask with ease and be more productive than ever, whether you're creating innovative product designs, compelling graphics or blockbuster visual effects.

## Enhanced Reliability, Predictability and Security

Intel® processor-based workstations are the most widely deployed 64-bit workstation platforms in the world. You can count on them to deliver the stability and scalability you need to move your business forward. The Intel Xeon processor 5600 series takes reliability and security to new heights.

## Transform the way you work with an Intel® Expert Workbench

Near-supercomputing performance and professional visualization

- Up to 38 percent better performance than previous-generation workstations for digital content creation<sup>2</sup>
- Massive resources with up to 12 cores, 24 execution threads and 192 GB<sup>1</sup> of memory
- Supports the most demanding workflow and graphics requirements

Run concurrent, multi-OS workloads securely and at full speed

- Near-native performance with Intel® Virtualization Technology
- Fully accelerated graphics with Intel® Virtualization Technology for Directed I/O

- **Superior data integrity and enhanced workstation reliability.** As engineering models continue to get larger, more complex and more time-consuming, memory footprints and the probability of memory errors increase proportionally. Since a single error can crash a system or corrupt results, it is essential to mitigate this risk. Intel Xeon processor-based workstations support Error-Correcting Code Memory (ECC Memory), which automatically detects and corrects up to 99.9998 percent of memory errors. With this protection, you can have full confidence in your data, even as you build massive 64-bit models and designs to visualize trends and identify interferences more effectively.
- **Stronger security for your systems and data.** Intel® Trusted Execution Technology<sup>1</sup> (Intel® TXT) prevents rootkits and other malware from being inserted at boot up to protect your workstations and your valuable intellectual property more effectively against today's increasingly sophisticated attacks.



## Breakthrough Flexibility with High-Performance Virtualization

Intel® Virtualization Technology<sup>A</sup> (Intel® VT) gives you complete control over your workstation resources by enabling near-native compute performance and full graphics acceleration in virtual machines. Add virtualization software and a 64-bit host OS and you can access all your 64-bit and 32-bit data and applications from a single workstation, run multiple workloads concurrently and switch instantly among environments without rebooting. Do unexpected business requests sometimes leave you searching for resources? Deploy new applications instantly in virtual machines or cluster workstation resources to run large simulations on demand, without waiting for HPC batch jobs or slowing interactive design tasks.

## Better IT Support and Lower TCO

With such power and flexibility on the desktop, even the most demanding users will no longer need multiple workstations or a separate PC, so you can consolidate desktop systems to reduce energy and IT support costs per user. You can also standardize on a single operating system, while supporting legacy environments and unstable applications securely in virtual machines. This can greatly simplify migrations to Windows\* 7.

## Intel® Expert Workbench Overview

Features	Benefits
Massive Resources for Demanding and Concurrent Workloads	<ul style="list-style-type: none"> <li>Two Intel® Xeon® processors 5600 series; up to 12 processing cores with 24 execution threads, up to 12 MB cache per processor, and support for up to 192 GB<sup>1</sup> memory.</li> </ul>
Intel® Hyper-Threading Technology <sup>9</sup>	<ul style="list-style-type: none"> <li>Two execution threads per core for higher throughput and reduced latency.</li> </ul>
Intel® Turbo Boost Technology <sup>5</sup>	<ul style="list-style-type: none"> <li>Increases performance when you need it most, by increasing core frequencies beyond rated values for peak workloads.</li> </ul>
Intel® Smart Cache Technology	<ul style="list-style-type: none"> <li>Accelerates data access by dynamically optimizing cache allocations across all 12 cores.</li> </ul>
Intel® Virtualization Technology <sup>A</sup> (Intel® VT)	<ul style="list-style-type: none"> <li>Enables near-native performance for compute-intensive applications in virtual machines.</li> </ul>
Intel® Virtualization Technology for Directed I/O	<ul style="list-style-type: none"> <li>Enables full graphics acceleration through direct assignment of graphics cards to virtual machines.</li> </ul>
Intel® Trusted Execution Technology <sup>f</sup> (Intel® TXT)	<ul style="list-style-type: none"> <li>Ensures host OSs and hypervisors boot into “known good states” to prevent insertion of rootkits and other malware.</li> </ul>
Error-Correcting Code (ECC) Memory	<ul style="list-style-type: none"> <li>Protects data and uptime by self correcting 99.9998% of memory errors.</li> </ul>

For more information, visit [www.intel.com/go/workstation](http://www.intel.com/go/workstation)

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](http://www.intel.com/products/processor_number) for details.

<sup>9</sup> Hyper-Threading Technology requires a computer system with a processor supporting Hyper-Threading Technology and an HT Technology enabled chipset, BIOS and operating system. Performance will vary depending on the specific hardware and software you use. See [www.intel.com/info/hyperthreading/](http://www.intel.com/info/hyperthreading/) for more information including details on which processors support HT Technology.

<sup>5</sup> Intel® Turbo Boost Technology requires a platform with a processor with Intel Turbo Boost Technology capability. Intel Turbo Boost Technology performance varies depending on hardware, software and overall system configuration. Check with your platform manufacturer on whether your system delivers Intel Turbo Boost Technology. For more information, see <http://www.intel.com/technology/turboboost>.

<sup>f</sup> No computer system can provide absolute security under all conditions. Intel® Trusted Execution Technology is a security technology under development by Intel and requires for operation a computer system with Intel® Virtualization Technology, an Intel Trusted Execution Technology-enabled processor, chipset, BIOS, Authenticated Code Modules, and an Intel or other compatible measured virtual machine monitor. In addition, Intel Trusted Execution Technology requires the system to contain a TPM v1.2 as defined by the Trusted Computing Group and specific software for some uses. See <http://www.intel.com/technology/security/> for more information.

<sup>A</sup> Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, virtual machine monitor (VMM) and, for some uses, certain platform software enabled for it. Functionality, performance or other benefits will vary depending on hardware and software configurations and may require a BIOS update. Software applications may not be compatible with all operating systems. Please check with your application vendor.

<sup>1</sup> Current design supports up to 192 GB of memory using 16 GB DIMMS and up to 96 GB using 8 GB DIMMS.

<sup>2</sup> Benchmark: DCC MegaTasking v 3.0

**Baseline Configuration and Score on Benchmark:** Intel® W3EA2 SDP (Baseboard Supermicro X8DAI, Intel® 5520 B2 chipset) with two Quad-Core Intel® Xeon® processor W5590 (3.33 GHz, 8 MB L3 Cache, 6.4GT/s QPI, D0 stepping, HT enabled, Turbo enabled, EIST enabled), BIOS version 10/14/2009, 24 GB (6x4 GB DDR3-1333 ECC RDIMM) Memory, one nVidia Quadro® FX5800, nVidia graphic driver version 191.78 (using 3D APP-Default Global Settings, vertical sync off), one external 21" LCD Display (1280x1024, 32-bit color quality, 75 Hz), one 74 GB 10000RPM SATA 3.0 Gb/s Hard Disk, Microsoft Windows XP® Professional x64 Edition SP2 OS. Source: Intel internal testing as of January 2010.

**New Configuration and Score on Benchmark:** Intel® W3EB1 SDP (Baseboard Supermicro X8DAI, Intel® 5520 C2 chipset) with two Six-Core Intel® Xeon® processor X5680 (3.33 GHz, 12 MB L3 Cache, 6.4 GT/s QPI, B0 stepping, 130W TDP, HT enabled, Turbo enabled, EIST enabled, C1E enabled), BIOS version 1/7/2010, 24 GB (6x4 GB DDR3-1333 ECC RDIMM) Memory, one nVidia Quadro® FX5800, nVidia graphic driver version 191.78 (using 3D APP-Default Global Settings, vertical sync off), one external 21" LCD Display (1280x1024, 32-bit color quality, 75Hz), one 74 GB 10000RPM SATA 3.0 Gb/s Hard Disk, Microsoft Windows XP® Professional x64 Edition SP2 OS. Source: Intel internal testing as of January 2010.

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