



## Product Brief

### Intel® Core™2 Extreme Quad-Core Processor

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## Overview

The Intel® Core™2 Extreme processor is the world's first quad-core desktop processor, delivering the latest in cutting edge processor technology. Bringing unprecedented performance across a wide range of applications and benchmarks, the Intel Core 2 Extreme processor provides another giant leap forward on the road to multi-core and parallel computing.

This processor was designed for PC enthusiasts and gamers. Today's multimedia applications, such as 3D modeling and video/audio editing and rendering, focus on threaded computing for performance and demonstrate amazing scalability with quad-core processors.

For the avid or casual gamer, physics, Artificial Intelligence (AI), rendering, and general game play can all be improved while maintaining frame rates, making games more immersive and compelling. With unprecedented capabilities in four separate processing cores, users can expect games to become even more realistic in the future.

## Multitasking Monster

The Intel Core 2 Extreme Quad-Core processor is a multitasking monster, so users can do more in less time. Significant improvements in system responsiveness are possible because certain tasks can be off-loaded to specific cores. Users can now take on several tasks at the same time such as rendering a video, playing a game, or working on basic productivity software because additional processor resources are free to handle other tasks.

## Platform Support

The Intel® 975X Express Chipset based platform, as well as others, supports the Intel Core 2 Extreme Quad-Core processor. This combination of processor and chipset offers an array of exciting capabilities including dual graphics, and delivers an impressive level of performance for demanding users.



## Features and Benefits of the Intel® Core™2 Extreme Quad-Core Processor

Features	Benefits
<b>Quad-Core Processing</b>	Provides four independent cores in a single package with 8 MB of L2 cache and a 1066 MHz Front Side Bus. Four dedicated physical threads help operating systems and applications deliver additional performance, so end users can experience better multitasking and multi-threaded performance across many types of applications and workloads.
<b>Intel® Wide Dynamic Execution</b>	Improves execution speed and efficiency, delivering more instructions per clock cycle. Each core can complete up to four full instructions simultaneously.
<b>Intel® Smart Memory Access</b>	Optimizes the use of the data bandwidth from the memory subsystem to accelerate out-of-order execution. A newly designed prediction mechanism reduces the time in-flight instructions have to wait for data. New pre-fetch algorithms move data from system memory into fast L2 cache in advance of execution. These functions keep the pipeline full, improving instruction throughput and performance.
<b>Intel® Advanced Smart Cache<sup>1</sup></b>	Dynamically allocates the shared L2 cache to each processor core based on workload. This efficient, dual-core optimized implementation increases the probability that each core can access data from fast L2 cache, significantly reducing latency to frequently used data and improving performance.
<b>Intel® Advanced Digital Media Boost</b>	Accelerates the execution of Streaming SIMD Extension (SSE) instructions to significantly improve the performance on a broad range of applications. These include video, audio, image and photo processing, multimedia, encryption, financial, engineering, and scientific applications. The 128-bit SSE instructions are now issued at a throughput rate of one per clock cycle effectively doubling their speed of execution on a per clock basis over previous generation processors.
<b>Intel® Virtualization Technology (Intel® VT)<sup>2</sup></b>	Allows one hardware platform to function as multiple “virtual” platforms. Intel VT improves manageability, limiting downtime and maintaining worker productivity by isolating computing activities into separate partitions.
<b>Intel® 64<sup>3</sup></b>	Allows the processor to access larger amounts of memory. With appropriate 64-bit hardware and software, platforms based on an Intel processor supporting Intel 64 can allow the use of extended virtual and physical memory.
<b>Execute Disable Bit<sup>4</sup></b>	Provides enhanced virus protection when deployed with a supported operating system. Memory can be marked as executable or non-executable, allowing the processor to raise an error to the operating system if malicious code attempts to run in non-executable memory. This prevents the code from infecting the system.
<b>Intel Designed Thermal Solution for Boxed Processors</b>	Includes a 4-pin connector for fan speed control to help minimize the acoustic noise levels generated from running the fan at higher speeds for thermal performance <sup>5</sup> . Fan speed control technology is based on actual CPU temperature and power usage.

<sup>1</sup> **Warning:** Altering clock frequency and/or voltage may (i) reduce system stability and useful life of the system and processor; (ii) cause the processor and other system components to fail; (iii) cause reductions in system performance; (iv) cause additional damage; and (v) affect system data integrity. Intel has not tested, and does not warrant, the operation of the processor beyond its specifications.

<sup>2</sup> For the Intel® Core™2 Extreme Quad-Core processor, shared L2 cache refers to 4 MB of L2 cache per core pair resulting in a total L2 cache size of 8 MB.

<sup>3</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>4</sup> 64-bit computing on Intel architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel® 64 architecture-enabled BIOS. Performance will vary depending on your hardware and software configurations. Consult with your system vendor for more information.

<sup>5</sup> Enabling Execute Disable Bit functionality requires a PC with a processor with Execute Disable Bit capability and a supporting operating system. Check with your PC manufacturer on whether your system delivers Execute Disable Bit functionality.

<sup>6</sup> The acoustic benefits of the 4-pin header are reliant on a properly designed motherboard. Consult your board manufacturer for compatibility.

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For the added technical flexibility experienced enthusiasts want, the processor bus ratio locks (overspeed protection) have been removed in the Intel Core 2 Extreme Quad-Core processor. This delivers the ability to tune the system, taking it beyond the specification limits<sup>1</sup>.

### Better Acoustics

Intel Core 2 Extreme Quad-Core processors are equipped with a new Digital Thermal Sensor (DTS) to enable more efficient processor and platform thermal control. Thermal sensors located within the processor measure the maximum temperature on the die at any given time. The acoustic benefit of temperature monitoring is that system fans spin only as fast as needed to cool the system, and slower spinning fans generate less noise.

