

## Intel's Hyper-Threading Technology

Intel claims that Hyper-Threading Technology enables improved PC performance and an improved ability to perform multiple tasks at one time (multitasking).

### Hyper-Threading Reduces PC Performance

Industry standard benchmark tests show that Hyper-Threading does not provide consistent performance benefits on real-world desktop applications. Enabling Hyper-Threading can even worsen a Pentium® 4 processor's performance by as much as 10% on some applications.

#### Test: Hyper-Threading Performance



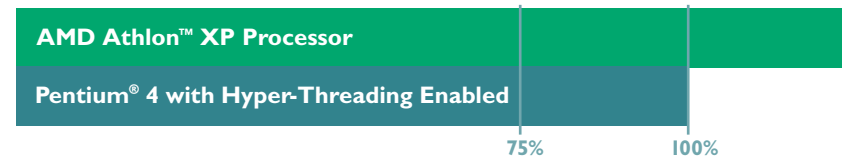
**Result: Up to 10% performance disadvantage** with Hyper-Threading enabled.

Based upon a compilation of results from all tests listed in the Benchmark Suites paragraph on the reverse side of this document.

### Hyper-Threading is not Required for Multitasking

The ability to perform multiple tasks at the same time has been supported by Microsoft® Windows®-based PCs for over eight years. When used for multitasking, the AMD Athlon™ XP processor often outperforms Intel's Pentium 4 processor with Hyper-Threading.

#### Test: Running Multiple Applications Simultaneously



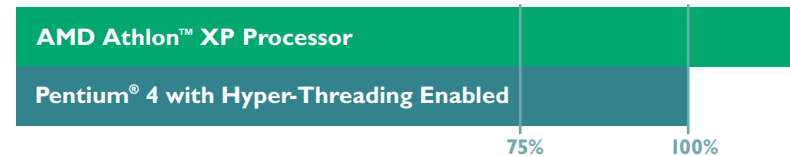
**Result: Up to 23% performance advantage** with AMD Athlon XP processor.

Based upon results from eTesting Labs Inc. Business Winstone™ 2002. v1.0.

### Superior Performance from AMD

AMD Athlon™ XP processors are designed to outperform comparable processors with Hyper-Threading in most real-world desktop applications. Industry standard benchmark tests show the AMD Athlon XP processor to have up to a 16% overall performance advantage when compared to the Intel Pentium 4 processor with Hyper-Threading.

#### Test: Overall Performance



**Result: Up to 16% performance advantage** with AMD Athlon XP processor.

Based upon a compilation of results from all tests listed in the Benchmark Suites paragraph on the reverse side of this document.

Results are based upon performance comparisons of the AMD Athlon XP processor 3000+ and the Pentium 4 3.06GHz processor in comparable configurations. Additional information is available from your AMD representative. AMD Athlon XP processor 3000+ with QuantiSpeed™ architecture operates at 2.17GHz

# PC Performance & Hyper-Threading: What you should know



**Benchmark System Configuration:** Microsoft® Windows® XP Professional – RTM (Build 2600. Service Pack 1 installed) DirectX 8.1 (4.08.01.0810)

**AMD Athlon™ XP processor 3000+<sup>1</sup>-based system: Hardware:** Motherboard: Asus A7N8X (revision 1.04), BIOS 1001.D, Chipset: NVIDIA nForce2 Chipset, Memory: Corsair CMX256A-3200C2, Qty. (2) 256MB DIMM Modules, 512MB total. Hard Drive: 120GB Western Digital Caviar UDMA 100 (Model WDI200) - (NTFS used to format the hard disk), Network Card: Intel Pro/100 M Desktop Adapter (integrated adapter disabled), Sound Card: Creative Labs SoundBlaster Live! 5.1 Digital, SB0200 (integrated adapter disabled), Video Card: NVIDIA GeForce4 TI 4600 (integrated adapter disabled). **Drivers:** AGP Miniport Driver: NVIDIA Corporation, v2.7.8.0, 9/6/2002, EIDE Driver: NVIDIA Corporation, v5.10.2600.307, 11/13/2002 (DMA enabled), Network Card: Intel Corporation v6.1.3.0, 2/25/2002, Sound Card: Creative Labs 5.12.2.252, 07/24/2002, Video Card: NVIDIA Corporation v41.09, 11/18/2002, 85Hz, 1024x768, 32-bit.

**Intel Pentium® 4 3.06GHz processor-based system: Hardware:** Motherboard: Intel D845GEBV2, BIOS RG84510A.86A.0022.P12, Chipset: Intel i845G Chipset, Memory: Corsair CMX256A-3200C2, Qty. (2) 256MB DIMM Modules, 512MB total. Hard Drive: 120GB Western Digital Caviar UDMA 100 (Model WDI200) - (NTFS used to format the hard disk), Network Card: Intel Pro/100 M Desktop Adapter (integrated adapter disabled), Sound Card: Creative Labs SoundBlaster Live! 5.1 Digital, SB0220 (integrated adapter disabled), Video Card: NVIDIA GeForce4 TI 4600 (integrated adapter disabled). **Drivers:** AGP Miniport Driver: Intel Corporation v4.0.1006.0, 2/1/2002, EIDE Driver: Intel Corporation v4.0.1001.0, 7/2/2001 (DMA enabled), Network Card: Intel Corporation v6.1.3.0, 2/25/2002, Sound Card: Creative Labs 5.12.2.252, 07/24/2002, Video Card: NVIDIA Corporation, v41.09, 11/18/2002, 85Hz, 1024x768, 32-bit.

<sup>1</sup>QuantISpeed™ architecture operates at 2.17GHz

## Benchmark Suites:

**Office Productivity:** BAPCO™ SYSmark™ 2001 Office Productivity\*, eTesting Labs Inc. Business Winstone™ 2001, v1.0.2, eTesting Labs Inc. Business Winstone 2002, v1.0™

**Digital Media:** BAPCO SYSmark 2001 Internet Content Creation, eTesting Labs Inc. Content Creation Winstone 2002, v1.0.1, Multimedia Content Creation Winstone 2003, v1.0

**3D Gaming:** AquaMark (1024x768x32), DroneZ Generic (1024x768x32), Evolva (1024x768x32), Expendable (1024x768x32), Half-Life Smokin' (1024x768x32), MDK2 (1024x768x32), QuakeIII Demo2 (640x480x16), Return to Castle Wolfenstein 3D (1024x768x32), Serious Sam: Second Encounter Demo Version (1024x768x32), 3D WinBench™ 2000, v1.1 (Hardware T&L and D3D Software), Madonion.com 3DMark™ 2001 (Hardware T&L and D3D Software)

<sup>1</sup>Updated Windows® Media Encoder Results contain a software update that enables already-present 3DNow!™ Professional technology in version 7.0 of Microsoft® Windows Media Encoder.

This software update is not publicly available. All subsequent versions of Microsoft Windows Media Encoder properly recognize 3DNow! Professional technology.

\*eTesting Labs Inc. Business Winstone 2002, v1.0 was used for the multitasking benchmark chart.