

The Truth **Behind**Processor **Performance**

"Megahertz alone is not a complete measure of a processor's performance."

Washington Post, Nov. 24, 2001

Clock speed isn't everything when it comes to processor performance. The truth is, the PC processor with the highest frequency isn't necessarily the most advanced, efficient, or bestperforming chip. Give your customers the true performance they expect with the AMD Athlon[™] XP processor.



Historically, the expectation has been set that work per clock cycle and frequency increase with each progressive processor generation. The Pentium 4 processor operates at higher clock speeds than previous processors, however, it delivers fewer instructions per clock cycle on average and reduces relative performance at a given clock speed.

^{6 6} This design effort [Pentium 4] focused on delivering an average instruction executed per clock (IPC) that was within approximately 10% to 20% of the P6 [Pentium 3] micro-architecture...⁹

Desktop Performance and Optimization for the Pentium 4 Processor Intel Corp., Feb. 2001

The following facts separate technology from mythology:

- Optimum performance can't be measured by clock speed alone
- Processor architecture and frequency are the underlying drivers for performance (Processor performance = (work done per clock cycle) x (clock speed))
- Objective industry standard performance measurements (application benchmarks) are the only current way of accurately measuring processor performance

Exposing the myth

Even on a benchmark used consistently by Intel to measure the performance of their own processors, an 800MHz processor-based platform can outperform an I800MHz processor-based platform.

If megahertz alone is an accurate measurement of processor performance, then why can an 800MHz processor-based system outperform an 1800MHz processor-based system?



Source: Standard Performance Evaluation Corporation (www.spec.org) * 800MHz Itanium – Dell Precision Workstation 730 ** I800MHz Pentium 4 – Dell Precision Workstation 340

Consumers need a better measurement of processor performance!

Intel Pentium[®] 4 processor work per clock cycle

⁶⁶AMD has broken out of the mold and proven that MHz/GHz is not all that one need consider when looking for serious performance."

www.SimHQ.com January 7, 2002

Delivering our performance promise

As a new way of communicating the performance advantage of the AMD Athlon XP processor over previous-generation AMD Athlon processors, AMD has developed a modeling number convention to give end users an accurate indicator of processor performance.



AMD Athlon[™] XP processor 2000+⁶ vs. Intel Pentium[®] 4 processor 2.0A GHz



DESKTOP OVERALL

Averages all data from the three below categories: 3D Gaming Overall Averages all data for: Half-Life Smokin', Expendable, Quake III, DroneZ Generic, Unreal Tournament, Evolva, MDK2, and Serious Sam, eTesting Labs Inc. 3D WinBench™ 2000, vI.I (Hardware T&L and D3D Software), and Madonion.com 3DMark™ 2001 (Hardware T&L and D3D Software)

Digital Media Overall Averages all data for: eTesting Labs Inc. Content Creation Winstone[™] 2001, vl.0 eTesting Labs Inc. Content Creation Winstone 2002, vI.0 BAPCO[™] SYSmark[™] 2001 Internet Content Creation Office Productivity Overall Averages all data for: eTesting Labs Inc. Business Winstone[™] 2001, vI.0 BAPCO SYSmark 2001 Office Productivity

Even Intel agrees on what determines true processor performance

⁶Contrary to a popular misconception, it is not clock frequency (MHz) or the number of instructions executed per clock (IPC) alone that equates to performance. True performance is a combination of both clock frequency (MHz) and IPC. (Performance = MHz x IPC)⁹⁹

Inside the NetBurst Micro-Architecture of the Intel Pentium 4 Processor, Revision I.0 Intel Corp. Nov. 2000

Show your customers the power of true processor performance

- Powerful performance is more than megahertz
- True processor performance is measured by both CPU architecture and frequency
- Give your customers the performance they deserve with systems powered by AMD Athlon XP processors

No matter how you look at it, the AMD Athlon XP processor delivers on its performance promise. MHz for MHz, the AMD Athlon XP processor gets more work done per clock cycle and outperforms the Intel Pentium 4 processor on a variety of applications.

QuantiSpeed architecture operates at ¹I.33GHz, ²I.4GHz, ³I.47GHz, ⁴I.53GHz, ⁵I.6GHz, and ⁶I.67GHz..

System Configuration: Operating System for both systems: Microsoft[®] Windows[®] XP Professional RTM (no service packs/updates installed (Build #2600, DirectX version 8.1 (4.08.01.0810) AMD Athlon[™] XP processor 2000+ system: Hardware: Motherboard: ASUS A7V266-E (Rev. I.07), BIOS Rev. 1004B, Chipset: Via KT266A Chipset, Memory: Corsair XMS2400 CM64SD256-2400C2, Qty. (I), 256MB DIMM Module, 256MB total, Hard Drive: IBM 41.0GB UDMA 100 (Model IC35L040AVER07-0) - (NTFS used to format hard disk. Disk Drive was attached to the Promise Controller and CD-ROM was attached to Secondary IDE), Network Card: Allied Telesyn AT-2700TX, I0/I00, Sound Card: Creative Labs SoundBlaster Live!, Model CT4670, Video Card: Leadtek Winfast GeForce3 Titanium 500, 64MB DDR. Drivers: AGP Miniport: Windows XP Professional - provided by operating system, EIDE Drivers: Windows XP Professional - provided by operating system, Network Card: Windows XP Professional - provided by operating system, Ultra IDE - provided by operating system, Sound Card: Windows XP Professional - provided by operating system, Video Card: NVIDIA, v5.13.01.2183, 1024x768, 9/14/2001, 32-bit, 100Hz. Intel Pentium 4 2.0A GHz processor-based system: Hardware: Motherboard: Intel D845BG, BIOS version PT84510A.86A.0012.P0I, Chipset: Intel i845 Chipset, Memory: Corsair XMS2400 CM64SD256-2400C2, Qty. (I), 256MB DIMM Module, 256MB total, Hard Drive: IBM 41.0GB UDMA 100 (Model IC35L040AVER07-0) - (NTFS used to format hard disk), Network Card: Allied Telesyn AT-2700TX 10/100, Sound Card: Creative Labs SoundBlaster Live!, Model CT4670, Video Card: Leadtek Winfast GeForce3 Titanium 500, 64MB DDR. Drivers: EIDE Drivers: Windows XP Professional - provided by operating system, Network Card: Windows XP Professional - provided by operating system, Sound Card: Windows XP Professional - provided by operating system, Video Card NVIDIA, v5.13.01.2183, 1024x768, 9/14/2001, 32-bit, 100Hz.

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15 industry-standard benchmarks - over 30 end user applications