

AMD Athlon™ MP Processor Benchmarking and Model Numbering Methodology

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Defining Performance

In 1981 the first x86 PC was offered for sale. As a result of its success, succeeding generations were quickly made available based on ever-higher performing engines: the 286, 386, and 486 microprocessors. With each new generation of processor, end users reaped the benefits of both better processor architectures and higher clock frequencies. Over the past 20 years end users have come to view higher performance (which is difficult to quantify) as being synonymous with higher frequency (which is much easier to quantify).

AMD believes that what people really care about, however, is not the frequency of their processor, but the performance it delivers from their applications. Consider the definition of microprocessor performance:

$$\textit{Processor Performance} = (\textit{Work Per Clock Cycle}) \times (\textit{Clock Speed})$$

As you can see, while processor frequency contributes to overall CPU performance, it is not the only factor.

So how did frequency come to be the sole indicator of performance to consumers? The answer is simple. The first several generations of PC microprocessors from both AMD and Intel (i.e. the 8086, 286, 386, and 486) were based on the same internal architecture and therefore performed nearly an identical amount of work per clock cycle. As a result, the only variable in the performance equation was frequency; therefore frequency really was the primary determinant of CPU performance.

Performance and Frequency

With the advent of the AMD Athlon™ processor and the Intel Pentium® 4 processor, the design architectures of these two companies fundamentally diverged.

This design divergence has resulted in a difference in work done per clock cycle. Thus, microprocessors operating at identical frequencies may offer dramatically different levels of performance. Consequently, frequency is no longer the most meaningful metric for judging relative microprocessor performance. Today's end users need a better

approach for comparing relative processor performance. This new approach must recognize that end users:

1. Care about the performance of the applications that they use and care less about the results of synthetic tests
2. Typically use a variety of application software
3. Care about the performance of the system that they purchase
4. Need the ability to easily and simply conduct comparative shopping

AMD plans to drive the True Performance Initiative (TPI)—a strategic initiative with industry leaders and consumer advocates to develop a reliable processor performance metric that PC users can trust.

Benchmarking Methodology

Until the new metric is available, AMD is committed to accurately indicating the application performance of our processors, and has assembled a suite of industry standard benchmarks and applications that we believe reflect typical end user applications.

Specifically, AMD has identified two usage models, that we believe best exemplify the workstation user PC experience: Single-Threaded and Multi-Threaded applications. The following benchmarks and applications are used to represent these end user experiences:

Single-Threaded

SPECviewperf® 6.12

AWadv-04, DRV-07, DX-06, Light-04, MedMCAD-01, ProCDRS-03

Indy3D™

MCAD-40, MCAD-150, Animation, Simulation

eTesting Labs, Inc. Business Winstone™ 2001, v1.0

*Microsoft® Office 2000 (Access, Excel, Frontpage, PowerPoint, Word),
Microsoft Project 98, Lotus Notes R5, NicoMak WinZip, Norton AntiVirus,
Netscape Communicator*

eTesting Labs Inc. Content Creation Winstone™ 2001, v1.0

*Adobe® Photoshop® 5.5, Adobe Premier 5.1, Macromedia Director 8.0,
Macromedia Dreamweaver 3.0, Netscape Navigator 4.73, Sonic Foundry
Sound Forge 4.5*

BAPCO™ SYSmark™ 2001, Office Productivity

*Microsoft Office 2000 (Access, Excel, Outlook, PowerPoint, Word),
Netscape Communicator 6.0, Dragon Naturally Speaking Preferred v.5,
WinZip 8.0, McAfee VirusScan 5.13*

BAPCO SYSmark 2001, Internet Content Creation

*Adobe Photoshop 6.0, Adobe Premier 6.0, Macromedia Dreamweaver 4.0,
Macromedia Flash 5, Microsoft Windows Media Encoder 7*

Winstone® 99 v1.3 Dual Processor Inspection Tests

High-End Microstation, High-End Photoshop, High-End Visual C++

ScienceMark

Cadalyst 99

OpenGL, Non-graphics, 2D Index

SoftImage XSI v.15

Cinema4D

Shading (Cinema4D, OpenGL), Ray Tracing (Single CPU)

Alias Wavefront/Maya

Multi-Threaded

BAPCO SYSmark 2001, Office Productivity

*Microsoft Office 2000 (Access, Excel, Outlook, PowerPoint, Word),
Netscape Communicator 6.0, Dragon Naturally Speaking Preferred v.5,
WinZip 8.0, McAfee VirusScan 5.13*

BAPCO SYSmark 2001, Internet Content Creation

*Adobe Photoshop 6.0, Adobe Premier 6.0, Macromedia Dreamweaver 4.0,
Macromedia Flash 5, Microsoft Windows Media Encoder 7*

Winstone 99 v1.3 Dual Processor Inspection Tests

High-End Photoshop, High-End Visual C++

ScienceMark

SoftImage XSI v.15

Cinema4D

Ray Tracing (Multiple CPU)

Alias Wavefront/Maya

The results of the individual tests¹ within a usage model are equally weighted and averaged together to create a relative performance score for that usage model (see Figure 1).

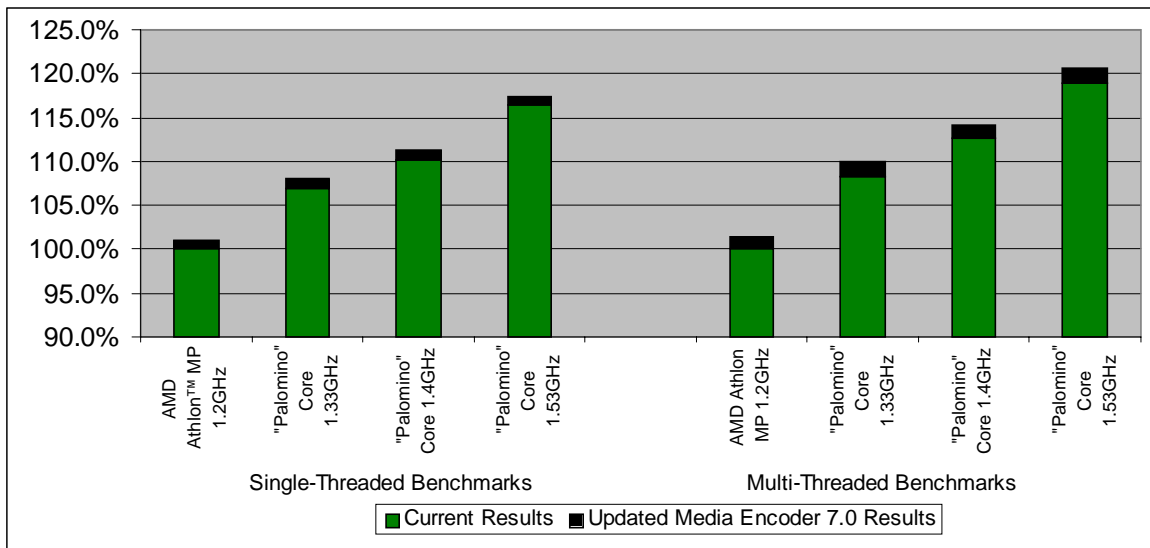


Figure 1: Overall Workstation Performance²

When viewing these benchmark results and attempting to analyze their meaning, a normalization process is useful. This normalization process provides a much easier way for the reader to compare the data and provides a simpler method for determining the significance or insignificance of any deltas in performance. Configurations for the AMD Athlon™ MP processor systems can be seen in Appendix E. Normalized and actual scores can be seen in the table in Appendix B and C, respectively.

¹ Please see “Appendix A - Individual Benchmarking Test Methodology” for detailed methodology used to generate individual tests.

² Updated Microsoft® Windows® Media Encoder results contain a software update that enables 3DNow!™ Professional technology in version 7.0 of Microsoft Windows Media Encoder. This software patch is not publicly available; however subsequent versions of Microsoft Windows Media Encoder are planned to enable support for 3DNow! Professional technology. Please see “Appendix D: Note on SYSmark™ 2001 Internet Content Creation” for detailed explanation of expected overall desktop performance.

Since frequency should no longer be the sole indicator of performance, additional information must be provided to the end user to better understand a processor’s performance capabilities. The most useful information is that which communicates relative real-world performance on a variety of software applications.

Model Number Approach

Workstation processors based on the “Palomino” core are marketed as the AMD Athlon MP processor. In the consumer segment, AMD has developed a model numbering convention as a way of communicating the performance improvements of the new AMD Athlon XP processor relative to the performance of the currently available AMD Athlon processor. Since both the AMD Athlon MP and AMD Athlon XP are based on the same “Palomino” core, the same model numbering convention is used in the workstation segment as is the desktop segment.

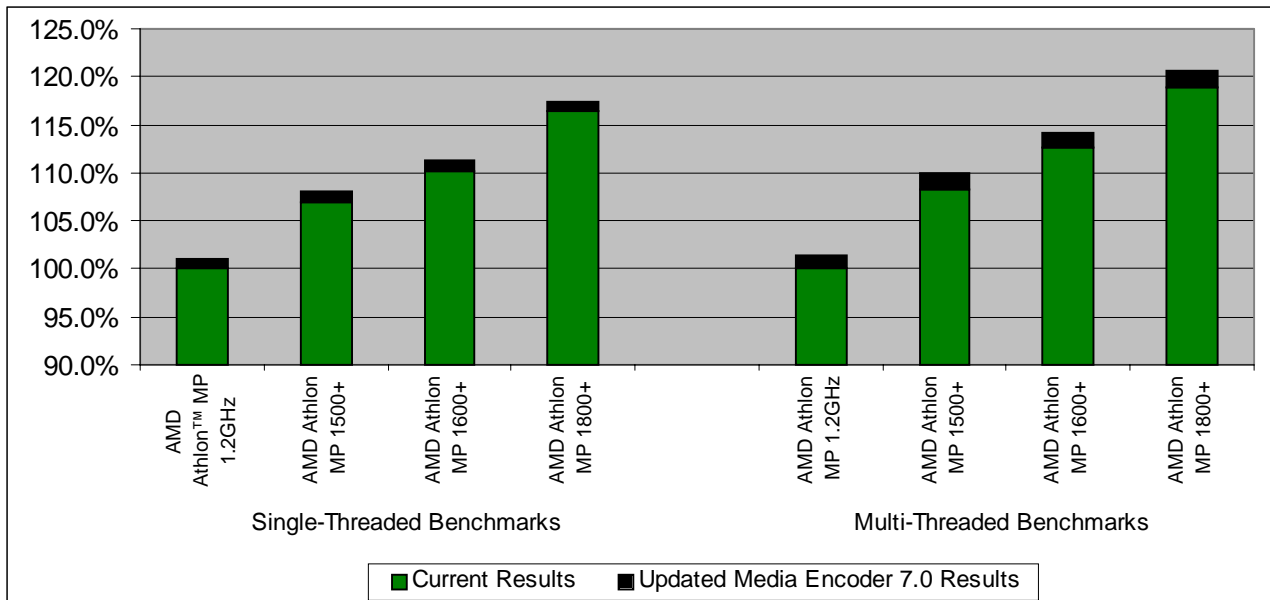


Figure 2: Overall Workstation Performance with Model Numbers²

² Updated Microsoft® Windows® Media Encoder results contain a software update that enables 3DNow!™ Professional technology in version 7.0 of Microsoft Windows Media Encoder. This software patch is not publicly available; however subsequent versions of Microsoft Windows Media Encoder are planned to enable support for 3DNow! Professional technology. Please see “Appendix D: Note on SYSmark™ 2001 Internet Content Creation” for detailed explanation of expected overall desktop performance.

The initial AMD Athlon MP processor models and their corresponding frequencies are shown below.

<u>Processor and Model Number</u>	<u>Core Operating Frequency</u>
AMD Athlon™ MP 1500+	1.33 GHz
AMD Athlon™ MP 1600+	1.40 GHz
AMD Athlon™ MP 1800+	1.53 GHz

The relative application performance improvement between different members of the AMD Athlon MP processor family is supported in the benchmark graph shown in Figure 2.

Competitive Comparison

It is also important to consider how AMD Athlon MP processors perform relative to competitive PC processors. In order to provide an accurate comparison between systems based on the AMD Athlon MP processor and systems based on the Pentium 4 processor, system configurations were kept as similar as possible. The details of the system configurations utilized in this analysis are listed in Appendix E. For the purposes of this comparison, AMD has used the “best of breed” system configurations for both the AMD and Intel processor-based systems.

All results have been normalized to an Athlon MP processor running at 1.2GHz. Again, when viewing benchmark results and attempting to analyze their meaning, a normalization process is useful. Normalized and actual scores can be seen in the table in Appendix B and C, respectively. The chart shown in Figure 3 summarizes these results.

The AMD Athlon MP processor clearly provides a performance advantage in the varying system price bands relative to competitive PC processors available on the market. The previous chart demonstrates the different relative performance of AMD Athlon MP processors and Pentium 4 processors.

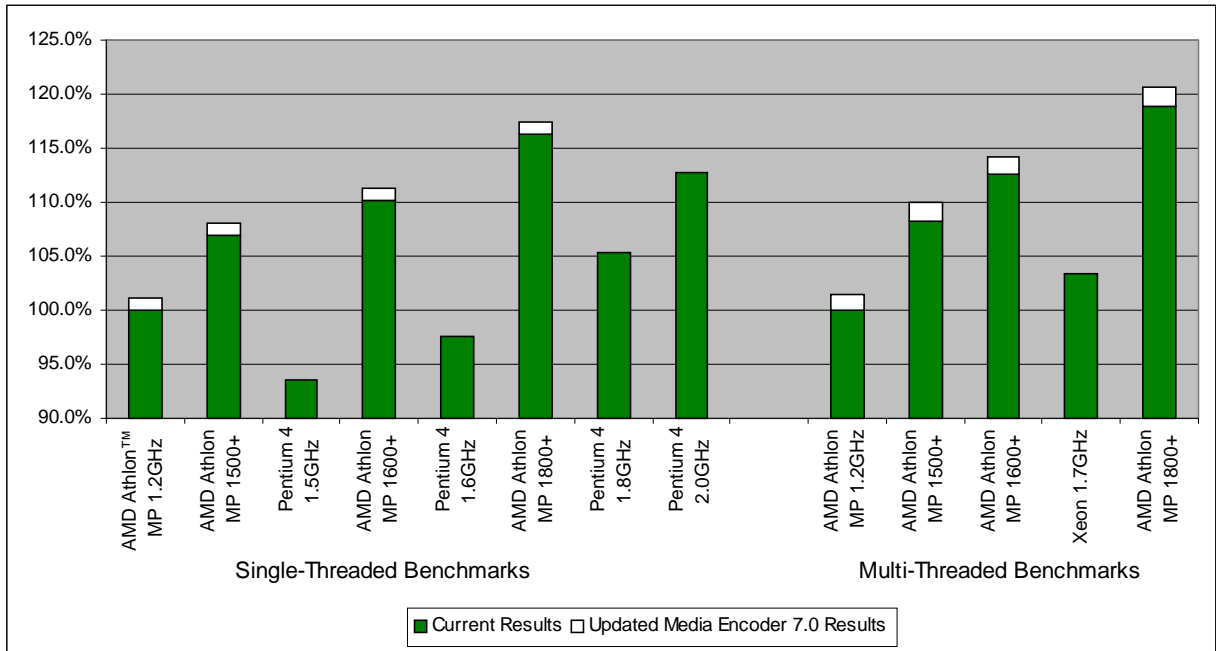


Figure 3: Normalized Competitive Benchmark Results²

Summary

Over the past 20 years, processor frequency has been used as the sole indicator for comparing system performance. The use of frequency by itself to determine processor performance has become antiquated due to the fundamental architectural differences that exist between Intel and AMD processors. AMD processors benchmarked in this comparison outperform their Intel counterparts by a noticeable margin.

AMD believes that the idea of solely using a processor’s frequency to compare performance between AMD and Intel processors needs to be replaced by a new approach to measure processor performance.

² Updated Microsoft® Windows® Media Encoder results contain a software update that enables 3DNow!™ Professional technology in version 7.0 of Microsoft Windows Media Encoder. This software patch is not publicly available; however subsequent versions of Microsoft Windows Media Encoder are planned to enable support for 3DNow! Professional technology. Please see “Appendix D: Note on SYSmark™ 2001 Internet Content Creation” for detailed explanation of expected overall desktop performance.

Appendix A – Individual Benchmarking Test Methodology

The PC is a dynamic environment and the asynchronous nature of how a PC performs a specific task leads to small inconsistencies in benchmark results. For example, every time a benchmark (or any application) is run, changes are made to the location of data on the hard drive. These changes (called fragmentation) can result in minor differences in the score of benchmarks that depend on disk performance (e.g. Business Winstone 2001). With that in mind, AMD designed the following procedure to ensure consistency and accuracy for all of our individual benchmark results.

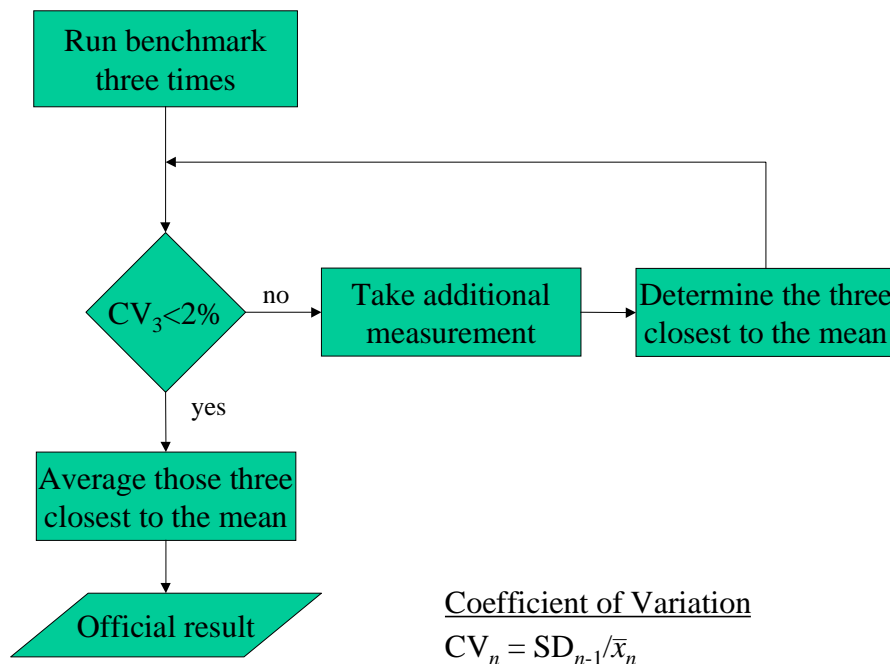


Figure 1: AMD Benchmarking Value Test Flowchart

The coefficient of variation is a measure of the relative dispersion of the data points. Designing the test to yield three data points so that their coefficient of variation is less than one percent means the data points are grouped together very tightly, thus the test is designed to reveal repeatable and accurate results.

Appendix B: Normalized Benchmarking Data

	AMD Athlon™ MP 1.2GHz	AMD Athlon MP 1500+	AMD Athlon MP 1600+	AMD Athlon MP 1800+	Pentium 4 1.5GHz	Pentium 4 1.6GHz	Pentium 4 1.8GHz	Pentium 4 2.0GHz	Weight
SPECviewperf® 6.12 AWadv-04	100.0%	100.2%	100.3%	103.7%	91.0%	93.4%	97.3%	98.3%	1.67
SPECviewperf 6.12 DRV-07	100.0%	101.9%	102.7%	106.7%	133.9%	137.9%	141.5%	143.1%	1.67
SPECviewperf 6.12 DX-06	100.0%	100.3%	102.0%	106.7%	86.4%	89.6%	95.1%	100.0%	1.67
SPECviewperf 6.12 Light-04	100.0%	105.0%	106.9%	112.6%	103.6%	107.8%	115.0%	121.0%	1.67
SPECviewperf 6.12 MedMCAD-01	100.0%	100.8%	101.3%	101.2%	112.2%	112.8%	113.1%	114.2%	1.67
SPECviewperf 6.12 ProCDRS-03	100.0%	99.6%	99.6%	98.6%	99.5%	99.5%	99.6%	99.6%	1.67
Indy3D™ MCAD-40	100.0%	101.3%	101.0%	101.5%	98.4%	99.7%	100.1%	100.6%	2.50
Indy3D MCAD-150	100.0%	100.6%	100.9%	100.4%	102.6%	102.5%	102.9%	103.4%	2.50
Indy3D Animation	100.0%	102.0%	102.7%	104.2%	112.8%	114.8%	117.5%	120.0%	2.50
Indy3D Simulation	100.0%	100.7%	101.4%	101.7%	96.5%	97.4%	98.4%	99.7%	2.50
Business Winstone™ 2001	100.0%	107.9%	109.6%	118.9%	85.5%	89.3%	95.0%	102.6%	5.00
Content Creation Winstone™ 2001	100.0%	106.0%	108.6%	112.7%	85.7%	89.1%	96.6%	101.7%	5.00
Winstone® 99 v1.3 High-end Microstation	100.0%	105.7%	109.8%	115.4%	85.3%	86.0%	93.8%	101.4%	3.33
Winstone 99 v1.3 High-end Photoshop	100.0%	108.9%	112.1%	121.3%	105.5%	110.9%	122.1%	131.0%	3.33
Winstone 99 v1.3 High-end Visual C++	100.0%	104.7%	105.0%	111.6%	85.3%	90.4%	97.8%	98.4%	3.33
SYSmarm™ 2001Office Productivity	100.0%	108.2%	112.0%	118.9%	93.3%	98.9%	105.8%	114.0%	5.00
SYSmarm 2001Internet Content Creation	100.0%	110.0%	114.3%	124.8%	119.6%	125.9%	140.0%	152.3%	5.00
ScienceMark	100.0%	110.2%	115.4%	125.2%	82.1%	87.5%	97.7%	107.8%	10.00
Cadalyst 99 OpenGL	100.0%	101.3%	101.9%	104.6%	109.6%	110.6%	115.3%	119.5%	3.33
Cadalyst 99 Non-Graphics	100.0%	108.7%	112.1%	120.0%	88.1%	92.9%	102.6%	111.2%	3.33
Cadalyst 99 2D Index	100.0%	105.8%	108.8%	115.5%	90.7%	94.7%	100.6%	106.7%	3.33
SoftImage XSI v.15	100.0%	110.8%	116.0%	121.6%	82.8%	87.8%	97.5%	109.5%	10.00
Cinema 4D Shading (Cinema4D)	100.0%	109.4%	113.6%	121.4%	93.7%	98.9%	108.0%	118.3%	3.33
Cinema4D Shading (Open GL)	100.0%	109.3%	113.7%	121.7%	90.6%	95.7%	105.4%	114.8%	3.33
Cinema4D Ray Tracing (Single CPU)	100.0%	110.9%	116.0%	127.0%	86.2%	91.2%	103.1%	114.6%	3.33
Alias Wavefront/Maya	100.0%	108.7%	112.6%	119.4%	92.8%	97.9%	107.4%	117.6%	10.00
Weighted Average	100.0%	107.0%	110.1%	116.4%	93.5%	97.6%	105.3%	112.7%	100.00
Updated Media Encoder 7 SYSmarm 2001 Internet Content Creation	121.3%	133.2%	138.1%	147.9%					
Updated Media Encoder 7 Weighted Avg.	101.1%	108.1%	111.3%	117.5%					

	AMD Athlon MP 1.2GHz	AMD Athlon MP 1500+	AMD Athlon MP 1600+	AMD Athlon MP 1800+	Xeon 1.7GHz	Weight
Winstone 99 v1.3 High-end Photoshop	100.0%	107.4%	109.7%	116.1%	112.4%	1
Winstone 99 v1.3 High-end Visual C++	100.0%	103.1%	106.4%	107.4%	94.1%	1
SYSmarm 2001Office Productivity	100.0%	106.9%	111.2%	116.0%	105.3%	1
SYSmarm 2001Internet Content Creation	100.0%	109.6%	114.1%	121.4%	124.4%	1
ScienceMark	100.0%	109.4%	115.1%	124.6%	90.7%	1
SoftImage XSI v.15	100.0%	111.2%	116.2%	120.1%	101.2%	1
Cinema4D Ray Tracing (Multiple CPU)	100.0%	111.0%	116.7%	126.6%	101.9%	1
Alias Wavefront/Maya	100.0%	107.7%	111.2%	119.0%	96.7%	1
Weighted Average	100.0%	108.3%	112.6%	118.9%	103.4%	8
Updated Media Encoder 7 SYSmarm 2001 Internet Content Creation	111.7%	123.2%	127.6%	136.3%		
Updated Media Encoder 7 Weighted Avg.	101.5%	110.0%	114.3%	120.8%		

Appendix C: Actual Benchmark Data

	AMD Athlon™ MP 1.2GHz	AMD Athlon MP 1500+	AMD Athlon MP 1600+	AMD Athlon MP 1800+	Pentium 4 1.5GHz	Pentium 4 1.6GHz	Pentium 4 1.8GHz	Pentium 4 2.0GHz
SPECviewperf® 6.12 AWadv-04	114.7	114.9	115.0	118.9	104.4	107.2	111.6	112.8
SPECviewperf 6.12 DRV-07	19.6	20.0	20.2	20.9	26.3	27.1	27.8	28.1
SPECviewperf 6.12 DX-06	38.5	38.6	39.3	41.1	33.3	34.5	36.6	38.5
SPECviewperf 6.12 Light-04	7.9	8.3	8.5	8.9	8.2	8.5	9.1	9.6
SPECviewperf 6.12 MedMCAD-01	33.3	33.6	33.7	33.7	37.4	37.6	37.7	38.1
SPECviewperf 6.12 ProCDRS-03	39.5	39.3	39.3	38.9	39.3	39.3	39.3	39.3
Indy3D™ MCAD-40	97.8	99.1	98.8	99.2	96.2	97.5	97.9	98.4
Indy3D MCAD-150	36.4	36.6	36.7	36.6	37.3	37.3	37.5	37.6
Indy3D Animation	48.3	49.2	49.6	50.3	54.4	55.4	56.7	57.9
Indy3D Simulation	74.9	75.4	75.9	76.1	72.2	73.0	73.7	74.6
Business Winstone™ 2001	55.5	59.9	60.9	66.0	47.5	49.6	52.7	57.0
Content Creation Winstone™ 2001	72.9	77.3	79.2	82.2	62.5	64.9	70.4	74.1
Winstone®99 v1.3 High-end Microstation	6.5	6.8	7.1	7.5	5.5	5.6	6.1	6.6
Winstone 99 v1.3 High-end Photoshop	11.6	12.6	13.0	14.1	12.2	12.9	14.2	15.2
Winstone 99 v1.3 High-end Visual C++	10.6	11.1	11.2	11.9	9.1	9.6	10.4	10.5
SYSmark™ 2001Office Productivity	150.0	162.3	168.0	178.3	140.0	148.3	158.7	171.0
SYSmark 2001Internet Content Creation	142.7	157.0	163.0	178.0	170.7	179.7	199.7	217.3
Updated Media Encoder 7 SYSmark 2001 Internet Content Creation	173.0	190.0	197.0	211.0				
ScienceMark	112.5	124.0	129.9	140.9	92.4	98.5	110.0	121.3
Cadalyt 99 OpenGL	70.3	71.2	71.6	73.5	77.0	77.7	81.0	83.9
Cadalyt 99 Non-Graphics	56.6	61.6	63.5	68.0	49.9	52.6	58.1	63.0
Cadalyt 99 2D Index	15.0	15.9	16.4	17.4	13.6	14.3	15.1	16.1
SoftImage XSI v.15	44.2	39.9	38.1	36.4	53.4	50.4	45.4	40.4
Cinema 4D Shading (Cinema4D)	12.3	13.5	14.0	15.0	11.6	12.2	13.3	14.6
Cinema4D Shading (Open GL)	21.6	23.6	24.5	26.3	19.6	20.7	22.7	24.8
Cinema4D Ray Tracing (Single CPU)	16.7	18.6	19.4	21.2	14.4	15.3	17.2	19.2
Alias Wavefront/Maya	125.0	115.0	111.0	104.7	134.7	127.7	116.3	106.3

	AMD Athlon MP 1.2GHz	AMD Athlon MP 1500+	AMD Athlon MP 1600+	AMD Athlon MP 1800+	Xeon 1.7GHz
Winstone 99 v1.3 High-end Photoshop	17.2	18.4	18.8	19.9	19.3
Winstone 99 v1.3 High-end Visual C++	14.0	14.5	14.9	15.1	13.2
SYSmark 2001Office Productivity	158.3	169.3	176.0	183.7	166.7
SYSmark 2001Internet Content Creation	208.7	228.7	238.0	253.3	259.7
Updated Media Encoder 7 SYSmark 2001 Internet Content Creation	233.0	257.0	266.3	284.3	
ScienceMark	221.6	242.5	255.1	276.1	201.0
SoftImage XSI v.15	25.1	22.6	21.6	20.9	24.8
Cinema4D Ray Tracing (Multiple CPU)	28.4	31.5	33.1	35.9	28.9
Alias Wavefront/Maya	79.3	73.7	71.3	66.7	82.0

Appendix D: Note on SYSmark™ 2001 Internet Content Creation

The SYSmark™ 2001 Internet Content Creation benchmark has as one of its components a subtest for Microsoft® Windows® Media Encoder version 7.0. Working with Microsoft, AMD has discovered that the version of Windows Media Encoder used by the SYSmark 2001 is optimized for 3DNow!™ Professional technology, but does not properly recognize the AMD Athlon™ MP processor as including this performance enhancing feature and therefore does not enable its use.

AMD and Microsoft have generated and tested a software update that correctly recognizes the AMD Athlon MP processor, and which is planned to be integrated into the next release of Windows Media Encoder. The tests in the previous graphs show a significant performance improvement when Media Encoder is updated, which is more indicative of the performance benefits that an end user would see. This change is planned to be available in a forthcoming release from Microsoft which end users will have access to after the launch of Windows XP.

Appendix E: Benchmark System Configurations

AMD Athlon™ MP Processor System Configurations

Operating System	Microsoft® Windows® 2000
Version:	Service Pack 2
Build #:	5.00.2195
DirectX Version:	8a
Processor	AMD Athlon™ MP 1800+ AMD Athlon MP 1600+ AMD Athlon MP 1500+
Motherboard	Tyan Thunder K7
BIOS Info:	2.07a (publicly available)
Chipset:	AMD-760™ MP
Memory	Samsung PC2100 DDR CAS2, ECC Enabled
Quantity & Size:	256MB x 2 (512MB Total)
Hard Drive	Cheetah
Model Number:	ST318451LW
Hard Drive Size:	18 Gigabytes
Transfer Mode:	Ultra 160
Network Card	Allied Telesyn
Model Number:	Penet FAST + AT-2700TX
Sound Card	Creative Labs
Model Number:	Sound Blaster Live!
Version Number:	CT4830
Video Card	Fire GL2
Memory Size (MB) and Type:	64MB
Drivers	
AGP Miniport:	Publisher Name: AMD Version: 522s
EIDE:	Publisher Name: AMD Version: 140a, DMA Enabled: N/A
Network Card:	Publisher Name: Microsoft Version: 4.8.0.0
SCSI Drivers:	Publisher Name: AMI Version: 5.21
Sound Card:	Publisher Name: Microsoft Version: 5.0.2184.1
Video Card:	Publisher Name: ATI Version: 2078
	BIOS Version: 1.22 (1.14 for SPECviewperf 6.12, Indy3D, Cadalyst 99)
	Graphics Resolution: 1024x768 (1280x1024 for SPECviewperf 6.12, Cadalyst 99, SoftImage XSI v.15, SPECapc for Unigraphics V15)
	Color Depth: 32 bit, Refresh Rate: 100hz (75hz for SPECviewperf 6.1.2; 85Hz for Cadalyst 99, SoftImage XSI v.15), AGP Aperature Size: 256MB
Other: (Specify any other special conditions or enhancements that are made to the system.)	Fat32 File system Uniprocessor Kernel for 1P Benchmarks

Intel Pentium® 4 Processor System Configurations

Operating System	Microsoft® Windows® 2000
Version:	Service Pack 2
Build #:	5.00.2195
DirectX Version:	8a
Processor	Pentium® 4 1.5GHz Pentium 4 1.6GHz Pentium 4 1.8GHz Pentium 4 2.0GHz
Motherboard	Intel 850MD
BIOS Info:	P02 (publicly available)
Chipset:	Intel i850
Memory	Samsung PC800 RDRAM, ECC Enabled
Quantity & Size:	256MB x 2 (512MB Total)
Hard Drive	Cheetah
Model Number:	ST318451LW
Hard Drive Size:	18 Gigabytes
Transfer Mode:	Ultra 160
Network Card	Allied Telesyn
Model Number:	Pcnet FAST + AT-2700TX
Sound Card	Creative Labs
Model Number:	Sound Blaster Live!
Version Number:	CT4830
Video Card	Fire GL2
Memory Size (MB) and Type:	64MB
Drivers	
AGP Miniport:	Publisher Name: Intel Version: 3.20.1005
EIDE:	Publisher Name: Intel Version: 6.10, DMA Enabled: N/A
Network Card:	Publisher Name: Microsoft Version: 4.8.0.0
SCSI Drivers:	Publisher Name: AMI Version: 5.21
Sound Card:	Publisher Name: Microsoft Version: 5.0.2184.1
Video Card:	Publisher Name: ATI Version: 2078
	BIOS Version: 1.22
	Graphics Resolution: 1024x768 (1280x1024 for SPECviewperf 6.12, Cadalyst 99, SoftImage XSI v.15, SPECcapc for Unigraphics V15)
	Color Depth: 32 bit, Refresh Rate: 100hz (75hz for SPECviewperf 6.1.2; 85Hz for Cadalyst 99, SoftImage XSI v.15), AGP Aperature Size: 256MB
Other: (Specify any other special conditions or enhancements that are made to the system.)	Fat32 File system

Intel Xeon Processor System Configuration

Operating System	Microsoft® Windows® 2000
Version:	Service Pack 2
Build #:	5.00.2195
DirectX Version:	8a
Processor	Xeon 1.7GHz
Motherboard	Dell 530MT i860
BIOS Info:	A02 (publicly available)
Chipset:	Intel i860
Memory	Samsung PC800 RDRAM, ECC Enabled
Quantity & Size:	256MB x 2 (512MB Total)
Hard Drive	Cheetah
Model Number:	ST318451LW
Hard Drive Size:	18 Gigabytes
Transfer Mode:	Ultra 160
Network Card	Allied Telesyn
Model Number:	Pcnet FAST + AT-2700TX
Sound Card	Creative Labs
Model Number:	Sound Blaster Live!
Version Number:	CT4830
Video Card	Fire GL2
Memory Size (MB) and Type:	64MB
Drivers	
AGP Miniport:	Publisher Name: Dell Version: 2.80.008, a06 (5/22/01)
EIDE:	Publisher Name: Dell Version: 2.80.008,a06 (5/22/01), DMA Enabled: N/A
Network Card:	Publisher Name: Microsoft Version: 4.8.0.0
SCSI Drivers:	Publisher Name: AMI Version: 5.21
Sound Card:	Publisher Name: Microsoft Version: 5.0.2184.1
Video Card:	Publisher Name: ATI Version: 2078
	BIOS Version: 1.22
	Graphics Resolution: 1024x768 (1280x1024 for SPECviewperf 6.12, Cadalyst 99, SoftImage XSI v.15, SPECapc for Unigraphics V15)
	Color Depth: 32 bit, Refresh Rate: 100hz (75hz for SPECviewperf 6.1.2; 85Hz for Cadalyst 99, SoftImage XSI v.15), AGP Aperature Size: 256MB
Other: (Specify any other special conditions or enhancements that are made to the system.)	Fat32 File system Uniprocessor Kernel for 1P Benchmarks

AMD Overview

AMD is a global supplier of integrated circuits for the personal and networked computer and communications markets with manufacturing facilities in the United States, Europe, Japan, and Asia. AMD, a Fortune 500 and Standard & Poor's 500 company, produces microprocessors, Flash memory devices, and support circuitry for communications and networking applications. Founded in 1969 and based in Sunnyvale, California, AMD had revenues of \$4.6 billion in 2000. (NYSE: AMD).

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