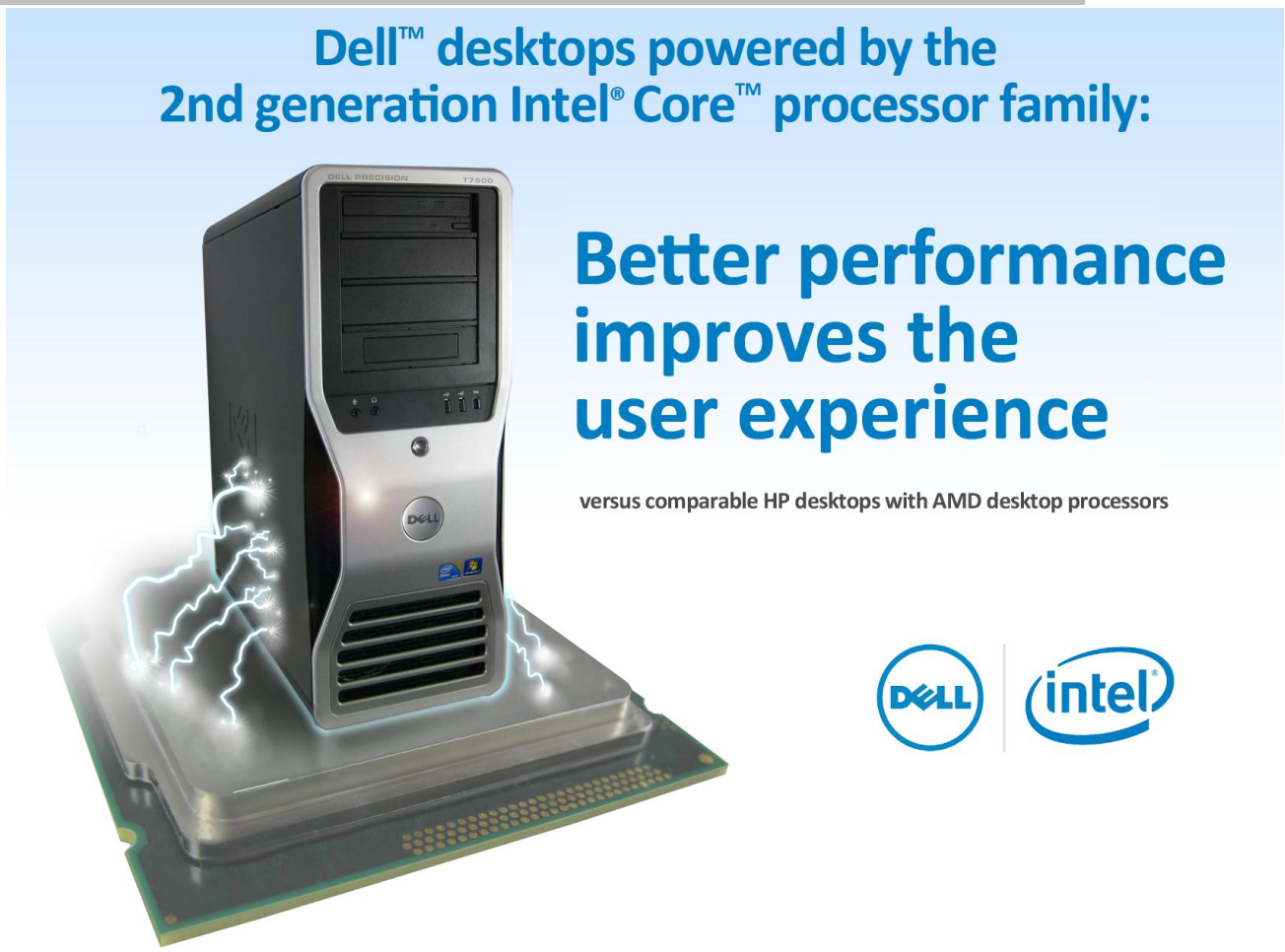
A PERFORMANCE COMPARISON OF DELL AND HP DESKTOP SYSTEMS



Workers can be only as productive as their tools allow them to be. On a sluggish system, the most basic office tasks can become exercises in frustration, lowering user productivity and morale.

Principled Technologies ran a series of industry-standard benchmarks to measure system performance. We tested two Dell desktops powered by 2nd generation Intel Core processors, a mid-range Dell Vostro™ 460 Mini Tower and a high-end Dell OptiPlex™ 990 Mini Tower, and two HP desktops powered by AMD processors, a mid-range HP Pavilion Slimline s5750z and a high-end HP Pavilion p6750z.

The Intel Core processor-based Dell systems consistently delivered higher benchmark scores—as much as 148.4 percent higher—than the corresponding HP Pavilion systems, making Dell a great choice for productivity in the workplace.

MAY 2011

A PRINCIPLED TECHNOLOGIES TEST REPORT

Commissioned by Dell Inc.

DELL AND INTEL DELIVER PERFORMANCE

Responsive performance enhances worker productivity. That's why, when choosing desktop systems for the workplace, it makes sense to purchase systems powerful enough to execute tasks quickly and efficiently.

In our tests, we found that the Intel Core processor-based Dell Vostro 460 Mini Tower and Dell OptiPlex 990 delivered considerably better performance than comparable AMD processor-based HP systems—with gains up to 148.4 percent. (To learn more about the systems we tested, see Appendix A. To learn more about how we tested, see Appendix B.)

SYSmark 2007 Preview v1.06 measures system performance in four workload scenarios: e-learning, office productivity, video creation, and 3D modeling. Figure 1 shows the SYSmark 2007 Preview performance for four desktop systems. The Dell Vostro 460 Mini Tower, with a score of 244, outperformed the HP Pavilion Slimline s5750z (which had a score of 144) by 69.4 percent. The Dell OptiPlex 990 Mini Tower's score of 276 was 69.3 percent higher than the HP Pavilion p6750z score of 163.

MAXON CINEBENCH consists of two main components. The first test sequence targets the computer's main processor. CINEBENCH plays a scene that makes use of various CPU-intensive features. During the first run, the benchmark uses only one CPU or CPU core to determine a reference value. On computers that have multiple CPUs or cores, CINEBENCH will run a second test using all available CPU power. The benchmark produces a single-CPU score for all computers, and a multiple-CPU score for those computers with multiple cores.

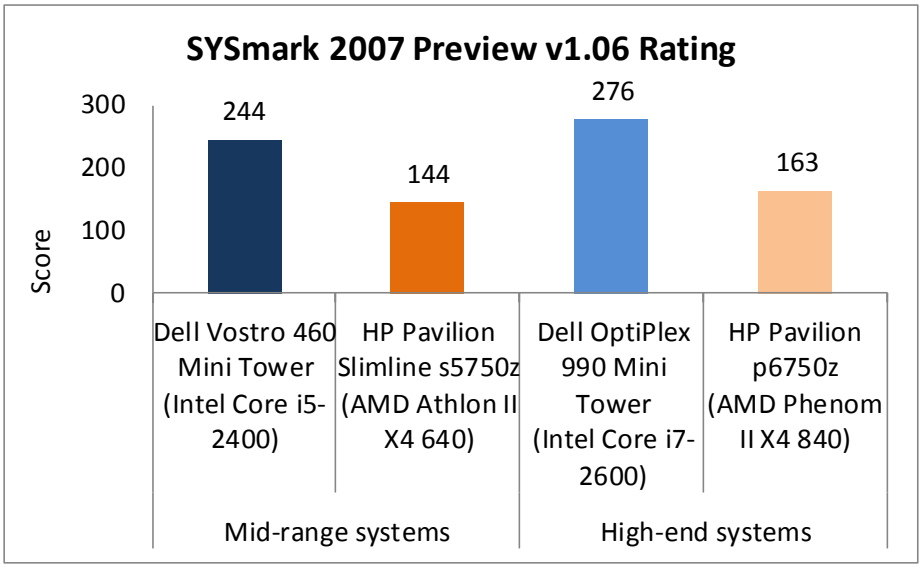


Figure 1: SYSmark 2007 Preview productivity results for our test systems. Higher numbers are better.

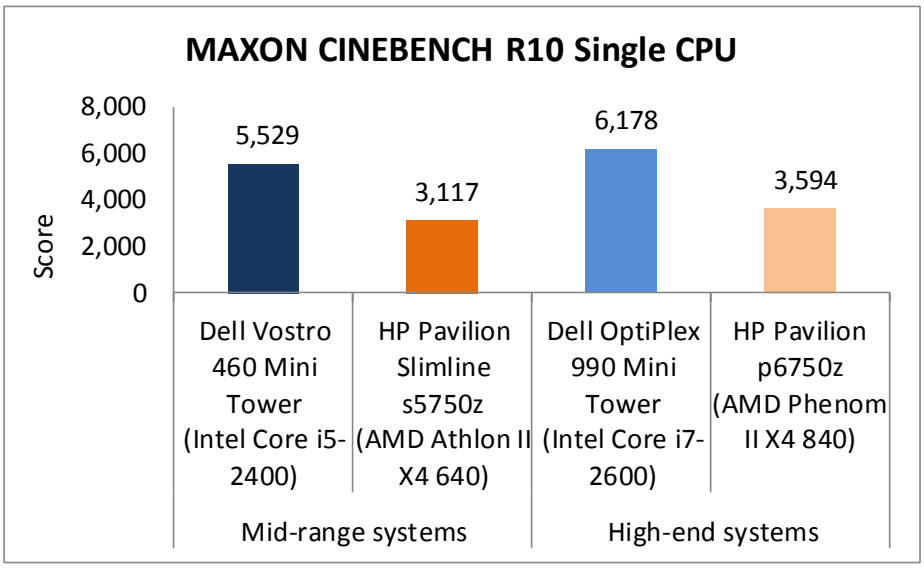


Figure 2: CINEBENCH R10 single CPU test results for our test systems. Higher numbers are better.

As Figure 2 shows, the Dell Vostro 460 Mini Tower, with a single-CPU score of 5,529, outperformed the HP Pavilion Slimline s5750z (which had a score of 3,117) by 77.4 percent. The Dell OptiPlex 990 Mini Tower's single-CPU score of 6,178 was 71.9 percent higher than the HP Pavilion p6750z score of 3,594.

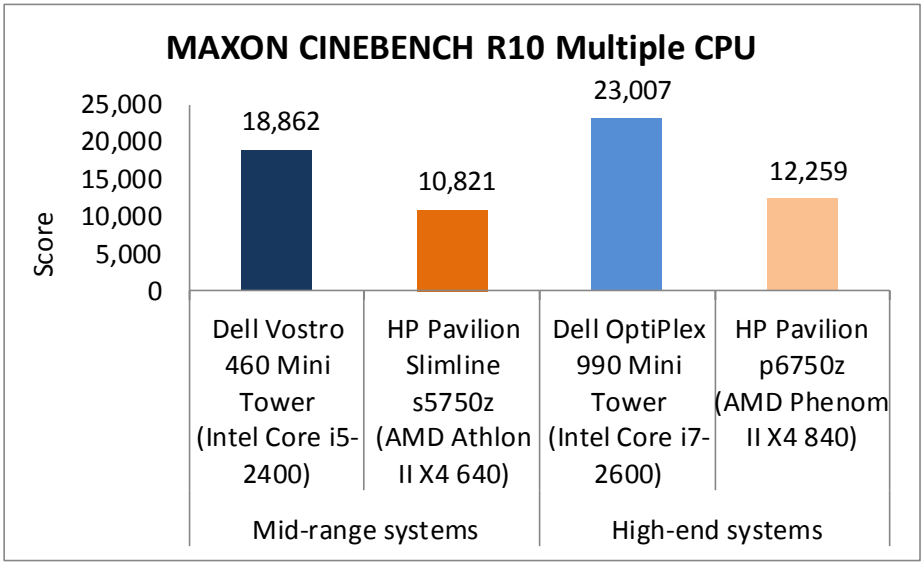


Figure 3: CINEBENCH R10 multiple CPU test results for our test systems. Higher numbers are better.

As Figure 3 shows, the Dell Vostro 460 Mini Tower, with a multiple -CPU score of 18,862, outperformed the HP Pavilion Slimline s5750z (which had a score of 10,821) by 74.3 percent. The Dell OptiPlex 990 Mini Tower's multiple-CPU score of 23,007 was 87.7 percent higher than the HP Pavilion p6750z score of 12,259.

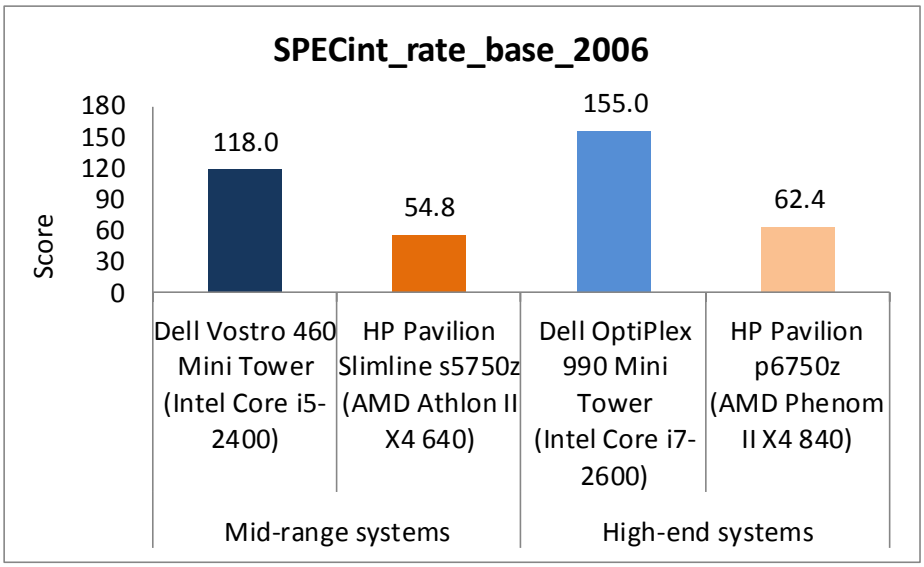


Figure 4: SPECint_rate_base_2006 test results for our test systems. Higher numbers are better.

As Figure 4 shows, the Dell Vostro 460 Mini Tower, with a SPECint score of 118.0, outperformed the HP Pavilion Slimline s5750z by 115.3 percent. The Dell OptiPlex 990 Mini Tower's multiple-CPU score of 155.0 was 148.4 percent higher than the HP Pavilion p6750z score of 62.4.

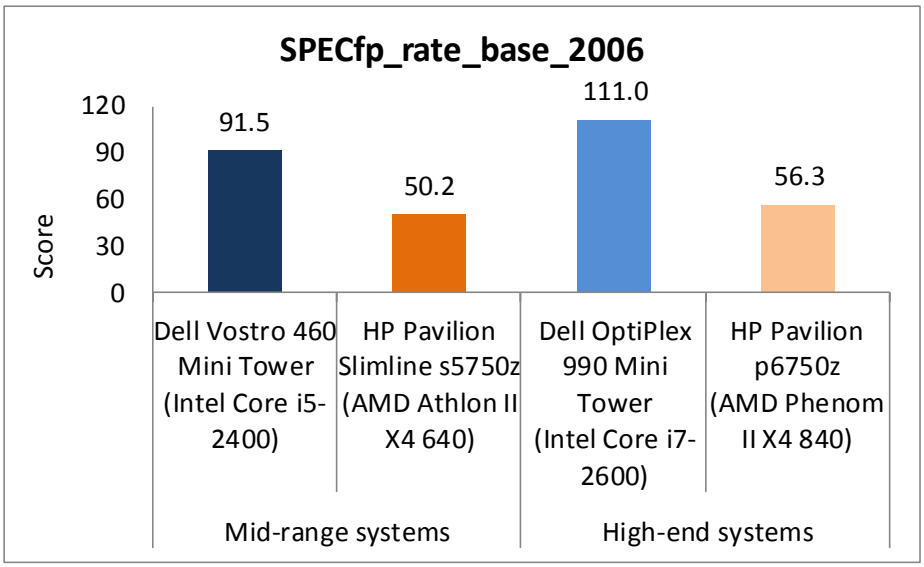


Figure 5: SPECfp_rate_base_2006 test results for our test systems. Higher numbers are better.

As Figure 5 shows, the Dell Vostro 460 Mini Tower, with a SPECfp score of 91.5, outperformed the HP Pavilion Slimline s5750z (which had a score of 50.2) by 82.3 percent. The Dell OptiPlex 990 Mini Tower's multiple-CPU score of 111.0 was 97.2 percent higher than the HP Pavilion p6750z score of 56.3.

TEST RESULTS

Figures 6 and 7 show a detailed breakdown of benchmark results for the four test systems. These results represent the median of three test runs. Appendix C presents the results from all three BAPCo SYSmark 2007 and MAXON CINEBENCH runs, and Appendix E presents detailed results for our SPEC CPU2006 testing.

Mid-range systems	Dell Vostro 460 Mini Tower (Intel Core i5-2400)	HP Pavilion Slimline s5750z (AMD Athlon II X4 640)	Percentage improvement with Dell Vostro 460 Mini Tower (Intel Core i5-2400)
BAPCo SYSmark 2007 Preview v1.06	244.0	144.0	69.4%
MAXON CINEBENCH R10 Single CPU	5,529.0	3,117.0	77.4%
MAXON CINEBENCH R10 Multiple CPU	18,862.0	10,821.0	74.3%
SPEC CPU2006 SPECint_rate_base_2006	118.0	54.8	115.3%
SPEC CPU2006 SPECfp_rate_base_2006	91.5	50.2	82.3%

Figure 6: Benchmark score for the mid-range systems. Higher numbers are better.

High-end systems	Dell OptiPlex 990 Mini Tower (Intel Core i7-2600)	HP Pavilion p6750z (AMD Phenom II X4 840)	Percentage improvement with Dell OptiPlex 990 Mini Tower (Intel Core i7-2600)
BAPCo SYSmark 2007 Preview v1.06	276.0	163.0	69.3%
MAXON CINEBENCH R10 Single CPU	6,178.0	3,594.0	71.9%
MAXON CINEBENCH R10 Multiple CPU	23,007.0	12,259.0	87.7%
SPEC CPU2006 SPECint_rate_base_2006	155.0	62.4	148.4%
SPEC CPU2006 SPECfp_rate_base_2006	111.0	56.3	97.2%

Figure 7: Benchmark score for the high-end systems. Higher numbers are better.

SUMMARY

Workers need desktop systems that allow them to do their jobs, in a timely manner and without the frustration and delays that underperforming systems cause. In our tests, we found that Dell desktops powered by the Intel Core processor family outperformed comparable HP desktops. With up to 148.4 percent increased performance over HP systems, Dell desktops are an excellent choice to meet workers' performance and productivity needs.

APPENDIX A – DETAILED SYSTEM CONFIGURATION INFORMATION

Figure 8 presents each test system and the details of its configuration.

System	Dell Vostro 460 Mini Tower (Intel Core i5-2400)	Dell OptiPlex 990 Mini Tower (Intel Core i7-2600)	HP Pavilion Slimline s5750z (AMD Athlon II X4 640)	HP Pavilion p6750z (AMD Phenom II X4 840)
General				
Number of processor packages	1	1	1	1
Number of cores per processor	4	4	4	4
Number of hardware threads per core	4	8	4	4
System power management policy	Dell	Dell	Balanced	Balanced
Processor power-saving option	Enhanced Intel SpeedStep® Technology	Enhanced Intel SpeedStep Technology	AMD PowerNow!™ Technology (Cool'n'Quiet™ Technology)	AMD PowerNow! Technology (Cool'n'Quiet Technology)
System dimensions (length x width x height)	17.5" x 7" x 14.25"	16.5" x 7" x 14.25"	15.25" x 4.5" x 12.25"	16.5" x 7" x 15.75"
System weight (lbs.)	22	20	13	18
CPU				
Vendor	Intel	Intel	AMD	AMD
Name	Core i5	Core i7	Athlon II X4	Phenom II X4
Model number	2400	2600	640	840
Stepping	D2	D2	PH-E0	PH-E0
Socket type and number of pins	Socket 1155 LGA	Socket 1155 LGA	Socket AM3 (938)	Socket AM3 (938)
Core frequency (GHz)	3.10	3.40	3.00	2.90
Bus frequency	5 GT/s	5 GT/s	4,000 MHz HyperTransport™ Technology	2,000 MHz HyperTransport Technology
L1 cache	32 KB + 32 KB (per core)	32 KB + 32 KB (per core)	64 KB + 64 KB (per core)	64 KB +64 KB (per core)
L2 cache	1 MB (256 KB per core)	1 MB (256 KB per core)	2 MB (512 KB per core)	2 MB (512 KB per core)
L3 cache	6 MB	8 MB	N/A	6 MB
Platform				
Vendor	Dell	Dell	FOXCONN	FOXCONN

System	Dell Vostro 460 Mini Tower (Intel Core i5-2400)	Dell OptiPlex 990 Mini Tower (Intel Core i7-2600)	HP Pavilion Slimline s5750z (AMD Athlon II X4 640)	HP Pavilion p6750z (AMD Phenom II X4 840)
Motherboard model number	OY2MRG	06D7TR	2B1	2AB1
Motherboard chipset	H67	ID1C4E	AMD 785G	AMD 785G
BIOS name and version	Dell A03 (02/15/2011)	Dell Inc. A02 (02/26/2011)	American Megatrends Inc. 6.06 (03/22/2011)	American Megatrends Inc. 6.06 (03/22/2011)
Memory module(s)				
Vendor and model number	Micron Tech. 8JTF25664AZ-1G4D1	Samsung M378B5273DH0-CH9	Samsung M378B5773CH0-CH9	Hyundai HMT125U6TFR8C-H9
Type	PC3-10600	PC3-10600	PC3-10600	PC3-10600
Speed (MHz)	1,333	1,333	1,333	1,333
Speed running in the system (MHz)	1,333	1,333	1,333	1,333
Timing/Latency (tCL-tRCD-tRP-tRASmin)	9-9-9-24	9-9-9-24	9-9-9-24	9-9-9-24
Size (MB)	4,096	8,192	4,096	8,192
Number of memory module(s)	2 x 2,048 MB	2 x 4,096 MB	2 x 2,048 MB	4 x 2,048 MB
Chip organization (single-sided/double-sided)	Single-sided	Double-sided	Single-sided	Double-sided
Channel (single/dual)	Dual	Dual	Dual	Dual
Hard disk				
Vendor and model number	Western Digital WD5000AAKX-753CA0	Seagate ST3500413AS	Western Digital WD50000AAKS-60Z1A0	Seagate ST315003 41AS
Number of disks in system	1	1	1	1
Size (GB)	500	500	500	1,500
Buffer size (MB)	16	16	16	32
RPM	7,200	7,200	7,200	7,200
Type	SATA 3Gb/s	SATA 3Gb/s	SATA 3Gb/s	SATA 3Gb/s
Controller	Intel H67	Intel ID1C4E	AMD SB700	AMD SB700
Driver	Intel 10.0.0.1046 (09/13/2010)	Intel 10.1.0.1008 (11/06/2010)	AMD 1.2.1.238 (10/08/2010)	AMD 1.2.1.238 (10/08/2010)
Operating system				
Name	Windows® 7 Ultimate	Windows 7 Ultimate	Windows 7 Ultimate	Windows 7 Ultimate
Build number	7600	7600	7600	7600

System	Dell Vostro 460 Mini Tower (Intel Core i5-2400)	Dell OptiPlex 990 Mini Tower (Intel Core i7-2600)	HP Pavilion Slimline s5750z (AMD Athlon II X4 640)	HP Pavilion p6750z (AMD Phenom II X4 840)
Service Pack	SP1 (for SPEC CPU2006 testing only)	SP1 (for SPEC CPU2006 testing only)	SP1 (for SPEC CPU2006 testing only)	SP1 (for SPEC CPU2006 testing only)
File system	NTFS	NTFS	NTFS	NTFS
Kernel	ACPI x64 – based PC	ACPI x64 – based PC	ACPI x64 – based PC	ACPI x64 – based PC
Language	English	English	English	English
Microsoft DirectX® version	DirectX 11	DirectX 11	DirectX 11	DirectX 11
Graphics				
Vendor and model number	AMD Radeon™ HD 6450	2 x AMD Radeon HD 6450	AMD Radeon HD 4200	AMD Radeon HD 6570
Type	Discrete	Discrete	Discrete	Discrete
Chipset	ATI Radeon HD 6450	ATI Radeon HD 6450	ATI Radeon HD 4200	ATI Radeon HD 6570
BIOS version	113-AD00200-101-PE	113-C2640500-100	BR34448.bin	113-AC89900-102-PE
Total available graphics memory (MB)	2,807	4,851	1,919	4,083
Dedicated video memory (MB)	1,024	2,048	256	1,024
System video memory (MB)	0	0	0	0
Shared system memory (MB)	1,783	2,803	1,663	3,059
Resolution	1,280 x 1,024 x 32-bit	1,280 x 1,024 x 32-bit	1,280 x 1,024 x 32-bit	1,280 x 1,024 x 32-bit
Driver	ATI Technologies Inc. 8.812.0.0 (01/04/2011)	ATI Technologies Inc. 8.783.2.2000 (11/16/2010)	ATI Technologies Inc. 8.733.0.0 (05/11/2010)	ATI Technologies Inc. 8.784.1.0 (11/23/2010)
Sound card/subsystem				
Vendor and model number	Realtek High Definition Audio	Realtek High Definition Audio	Realtek High Definition Audio	Creative SB X-Fi
Driver	Realtek Semiconductor Corp. 6.0.1.6141 (06/22/2010)	Realtek Semiconductor Corp. 6.0.1.5883 (09/14/2010)	Realtek Semiconductor Corp. 6.0.1.6196 (09/07/2010)	Creative 6.0.1.6 (03/05/2010)
Ethernet				

System	Dell Vostro 460 Mini Tower (Intel Core i5-2400)	Dell OptiPlex 990 Mini Tower (Intel Core i7-2600)	HP Pavilion Slimline s5750z (AMD Athlon II X4 640)	HP Pavilion p6750z (AMD Phenom II X4 840)
Vendor and model number	Broadcom NetLink Gigabit	Intel 82579LM Gigabit	Realtek PCIe FE Family	Realtek PCIe FE Family
Driver	Broadcom 14.2.0.7 (07/20/2010)	Intel 11.8.81.0 (10/28/2010)	Realtek 7.26.902.2010 (09/02/2010)	Realtek 7.26.902.2010 (09/02/2010)
Optical drive(s)				
Vendor and model number	HL-DT-ST CH20N	TSSTcorp TS-H653H	HP DH16ABLH	HP DH16ABLH
Type	BD-ROM	CD/DVD-RW	CD/DVD-RW	CD/DVD-RW
USB ports				
Number	8	10	6	6
Type	2.0	2.0	2.0	2.0
Other	eSATA, HDMI, Media Card Reader	eSATA	Media Card Reader	Media Card Reader
Monitor				
LCD type	Optiquest® Q7	Optiquest Q7	Optiquest Q7	Optiquest Q7
Screen size	17”	17”	17”	17”
Refresh rate (Hz)	60	60	60	60

Figure 8: Configuration information for the four test systems.

APPENDIX B – ABOUT OUR TESTING

SYSmark 2007 Preview v1.06

SYSmark 2007 Preview is a performance metric BAPCo created to measure system performance. SYSmark 2007 Preview determines its overall rating from the mean result from four workload scenarios: e-learning, office productivity, video creation, and 3D modeling. SYSmark 2007 Preview records the time the system takes to complete each individual operation in each scenario.

SYSmark 2007 Preview consists of the following applications and corresponding tasks: Adobe® After® Effects 7 (e-learning), Adobe Illustrator® CS2 (video creation), Adobe Photoshop® CS2 (video creation), AutoDesk® 3ds Max® 8 (3D modeling), Macromedia® Flash 8 (e-learning), Microsoft® Excel® 2003 (office productivity), Microsoft Outlook® 2003 (office productivity), Microsoft PowerPoint® 2003 (office productivity), Microsoft Word 2003 (office productivity), Microsoft Project 2003 (office productivity), Microsoft Windows Media™ Encoder 9 series (video creation), Sony® Vegas 7 (video creation), SketchUp 5 (3D modeling), and WinZip® 10.0 (office productivity).

To learn more, visit http://www.bapco.com/support/sysmark2007preview/Help/Help.html.

MAXON CINEBENCH R10

CINEBENCH is a free, real-world cross platform test suite designed to evaluate and compare the CPU and graphics performance across various systems and platforms. Based on MAXON CINEMA 4D software, which creates 3D content, the benchmark consists of two main components: the graphics-card performance test, and the CPU performance test.

CINEBENCH uses the processing power of a system to render 3D scenes that stress all available processor cores, and reports performance in points (pts). Higher scores are better, as they indicate a faster processor.

To learn more, visit http://www.maxon.net.

SPEC CPU 2006

The SPEC CPU2006 workload includes two benchmark suites: CINT2006 and CFP2006. (Note: SPEC and SPECint are trademarks of the Standard Performance Evaluation Corporation.) The CINT2006 benchmark focuses on measuring and comparing compute-intensive integer performance, while CFP2006 measures and compares compute-intensive floating-point performance. We ran both benchmarks.

Figure 9 lists the 12 applications that compose the CINT2006 benchmark. SPEC wrote nine of the applications in C and three (471.omnetpp, 473.astar, 483.xalancbmk) in C++. A CINT2006 run performs each of the 12 applications three times and reports the median for each. It also calculates the geometric mean of those 12 results to produce an overall score.

Name	Application area
400.perlbench	Programming language
401.bzip2	Compression
403.gcc	C compiler
429.mcf	Combinatorial optimization
445.gobmk	Artificial intelligence: Go
456.hmmer	Search gene sequence
458.sjeng	Artificial intelligence: chess
462.libquantum	Physics/quantum computing
464.h264ref	Video compression
471.omnetpp	Discrete event simulation
473.astar	Path-finding algorithms
483.xalancbmk	XML processing

Figure 9: The applications that make up the CINT2006 benchmark.

Figure 10 lists the 17 applications that compose the CFP2006 benchmark. SPEC wrote six of the applications in FORTRAN, three using C, four using both FORTRAN and C, and four in C++.

A CFP2006 run performs each of the 17 application (tasks) three times and reports the median for each. It also calculates the geometric mean of those 17 results to produce an overall score.

Name	Application area
410.bwaves	Fluid Dynamics
416.gamess	Quantum Chemistry
433.mic	Physics/Quantum Chromodynamics
434.zeusmp	Physics/CFD
435.gromacs	Biochemistry/Molecular Dynamics
436.cactusADM	Physics/General Relativity
437.leslie3d	Fluid Dynamics
444.namd	Biology/Molecular Dynamics
447.dealII	Finite Element Analysis
450.soplex	Linear Programming, Optimization
453.povray	Image Ray-tracing
454.calculix	Structural Mechanics
459.GemsFDTD	Computational Electromagnetics
465.tonto	Quantum Chemistry
470.lBM	Fluid Dynamics
481.wrf	Weather
482.sphinx3	Speech recognition

Figure 10: The applications that make up the CFP2006 benchmark.

Measuring performance with BAPCo SYSmark 2007 Preview v1.06

Setting up the test

1. Reset the system to the base test image.
2. Disable the User Account Control.
    a. Click Start→Control Panel.
    b. At the User Accounts and Family Safety settings screen, click Add or remove user account.
    c. At the User Account Control screen, click Continue.
    d. Click Go to the main User Accounts page.
    e. At the Make changes to your user account screen, click Turn User Account Control on or off.
    f. At the User Account Control screen, click Continue.
    g. Uncheck Use User Account Control to help protect your computer, and click OK.
    h. At the You must restart your computer to apply these changes screen, click Restart Now.
3. Purchase and install SYSmark 2007 Preview v1.05 from https://www.bapcostore.com/store/product.php?productid=16165&cat=251&page=1.
4. At the Welcome to InstallShield Wizard screen, click Next.
5. At the License Agreement screen, select I accept the terms in the License Agreement, and click Next.
6. At the Choose Destination Location screen, click Next.
7. At the Ready to Install the Program screen, click Install.
8. When the installation is complete, click Finish.

Running the test

1. Launch SYSmark 2007 Preview by double-clicking the desktop icon.
2. Click Run.

3. Select Official Run, choose 3 Iterations, check the box beside run conditioning run, and enter a name for that run.
4. When the benchmark completes and the main SYSmark 2007 Preview menu appears, click Save FDR to create a report.

Record the results for each iteration.

Measuring performance with MAXON CINEBENCH R10

Setting up the test

1. Reset the system to the base test image.
2. Download CINEBENCHR10.zip from http://www.maxon.net/en/downloads/downloads/cinebench.html.
3. Right-click the CINEBENCH ZIP file, and choose Extract All.
4. Click Extract.

Running the test

1. Launch CINEBENCH R10 by double-clicking the CINEBENCH R10.exe file in the CINEBENCH R10 folder.
2. Enter the MHz frequency of the processor in the MHz (real freq.) field.
3. Enter a name in the Tester field.
4. Click the Start all tests button.
5. When the picture finishes rendering in multi-processor mode, save the results.
   a. Click the To Clipboard button.
   b. Launch notepad and paste the results into an empty notepad document.
   c. Save the results in the format system_run_N.txt.
6. Close CINEBENCH R10.
7. Reboot the system.
8. Repeat steps 1 through 7 two times, and report the median.

Measuring performance with SPEC CPU2006

SPEC CPU2006 configuration

For the Intel processor -based desktop workstations, we used the latest version of the Intel C/C++ and Fortran compiler. We followed SPEC's standard instructions for building the CINT2006 and CFP2006 executables. After studying the best results for this benchmark on the SPEC Web site, we chose the following software tools:

- Intel C/C++ Compiler 12.0.3.163
- Intel Fortran Compiler 12.0.3.163
- MicroQuill SmartHeap v10 (Multi-Core)

The benchmark requires configuration files. PT used a custom configuration file based on similar tests online. From the SPEC Web site, we chose the most recent (as of the testing for this report) SPEC CPU2006 results that used the above compiler. We used these configuration files, along with modifications to reflect the

appropriate system information about the system under test, in our testing. The configuration files we used appear in Appendix D.

To begin the benchmark, we performed the following steps:

- Open a command prompt.
- Change to the c:\cpu2006 directory.
- Type `shrc.bat` at the command prompt.
- Type the `runspec` command as recommended in the configuration file for the system you are testing.

When the run completes, the benchmark puts the results in the directory c:\cpu2006\result. The result file names are of the form CFP2006.<number>.<suffix> and CINT2006.<number>.suffix. The suffixes are html, asc, raw, and pdf. The number is three digits and associates a result file with its log, e.g., CFP2006.002.asc and log.002.

Appendix E provides the SPECint_rate_base2006 and SPECfp_rate_base2006 output results for the test systems.

APPENDIX C – DETAILED RESULTS

Figures 11 and 12 present the detailed test results for the systems. For detailed SPEC CPU2006 results, see Appendix E.

Mid-range systems	Dell Vostro 460 Mini Tower (Intel Core i5-2400)			HP Slimline s5750z (AMD Athlon II X4 640)		
	Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
BAPCo SYSmark 2007 Preview v1.06						
SYSmark 2007 Preview v1.06 - E-Learning	211	218	216	111	113	113
SYSmark 2007 Preview v1.06 - VideoCreation	282	297	291	228	233	236
SYSmark 2007 Preview v1.06 - Productivity	225	227	219	105	103	104
SYSmark 2007 Preview v1.06 - 3D	256	256	255	158	158	158
MAXON CINEBENCH R10						
CB Single	5,529	5,551	5,495	3,156	3,117	3,106
CB Dual	18,993	18,862	18,821	11,020	10,821	10,748
Open GL	7,153	7,184	7,174	2,585	2,585	2,582
Multiprocessor Speedup	3.44	3.40	3.43	3.49	3.47	3.46

Figure 11: Benchmark results for the two mid-range desktop systems. Higher numbers are better.

High-end systems	Dell OptiPlex 990 Mini Tower (Intel Core i7-2600)			HP Pavilion p6750z (AMD Phenom II X4 840)		
	Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
BAPCo SYSmark 2007 Preview v1.06						
SYSmark 2007 Preview v1.06 - E-Learning	229	241	240	133	135	136
SYSmark 2007 Preview v1.06 - VideoCreation	321	324	330	228	236	242
SYSmark 2007 Preview v1.06 - Productivity	254	265	254	128	134	133
SYSmark 2007 Preview v1.06 - 3D	294	293	292	171	170	170
MAXON CINEBENCH R10						
CB Single	5,955	6,186	6,178	3,615	3,581	3,594
CB Dual	22,666	23,112	23,007	12,444	12,259	11,996
Open GL	7,988	8,019	7,955	6521	6,466	6,474
Multiprocessor Speedup	3.81	3.74	3.72	3.44	3.42	3.34

Figure 12: Benchmark results, for the two high-end desktop systems. Higher numbers are better.

APPENDIX D – SPEC CPU2006 CONFIGURATION FILES

Dell Vostro 460 Mini Tower (Intel Core i5-2400)

```
# Invocation command line:
# C:\CPU200~1.APR\bin\runspec --rate 4 -c cpu2006.i5-2400.cfg -T base --flagsurl=Intel-ic12-win32-
revB.xml,Intel-Windows-Platform-Settings.xml -o asc int
# output_root was not used for this run
############################################################################

# This is a sample config file. It was tested with:
#
#      Compiler name/version:       Intel Compiler 12, MS VS 2008
#      Operating system version:    Windows Vista (64-bit)
#      Hardware:                    Intel processors supporting
#                                   AVX instructions
#
# If your platform uses different versions, different
# hardware or operates in a different mode (for
# example, 32- vs. 64-bit mode), there is the possibiliy
# that this configuration file may not work as-is.
#
# Note that issues with compilation should be directed
# to the compiler vendor. Information about SPEC technical
# support can be found in the techsupport document in the
# Docs directory of your benchmark installation.
#
# This config file uses the SmartHeap library and if you
# do not have a licensed copy, please remove all
# instances of shlW32M.lib from this config file.
#
# Also note that this is a sample configuration. It
# is expected to work for the environment in which
# it was tested; it is not guaranteed that this is
# the config file that will provide the best performance.
#
#
# Note that you might find a more recent config file for
# your platform with the posted results at
# http://www.spec.org/cpu2006
############################################################################
# SPEC CPU2006 Intel Windows Vista64/Win7-64 config file
# October 26 2010.
# Intel Compiler 12
# Visual Studio 2010
############################################################################
action      = validate
tune        = base
ext         = ic12.winx64.avx.rate.i5-2400.exe
PATHSEP     = /
check_md5=1
reportable=1

# Works only on Vista32, Server2003 and all x64 Windows operating systems.
# Does *not* work on Windows XP32
submit= specperl -e "system sprintf qq{start /b /wait /affinity %x %s}, (1<<$SPECCOPYNUM), q{
$command } "

############################################################
#
# These are listed as benchmark-tuning-extension-machine
#
############################################################
```

```
# Compiler section
############################################################
CC  = icl -Qvc9 -Qstd=c99
CXX = icl -Qvc9
FC  = ifort
OBJ = .obj

int=default:
EXTRA_LDFLAGS     = /F512000000

fp=default:
EXTRA_LDFLAGS     = /F1000000000

############################################################
# Portability section
############################################################
fp=default:
PORTABILITY       = -DSPEC_CPU_P64

403.gcc=default=default=default:
CPORTABILITY      = -DSPEC_CPU_WIN32
EXTRA_CFLAGS      = -Dalloca=_alloca

410.bwaves=default:
FPORTABILITY      = -names:lowercase

436.cactusADM=default=default=default:
FPORTABILITY      = /names:lowercase /assume:underscore

444.namd=default=default=default:
CXXPORTABILITY    =  /TP

447.dealII=default:
CXXPORTABILITY    = -DDEAL_II_MEMBER_VAR_SPECIALIZATION_BUG

453.povray=default=default=default:
CXXPORTABILITY    = -DSPEC_CPU_WINDOWS_ICL

454.calculix=default=default=default:
FPORTABILITY      = /names:lowercase
CPORTABILITY      = -DSPEC_CPU_NOZMODIFIER

464.h264ref=default=default=default:
CPORTABILITY      = -DWIN32 -DSPEC_CPU_NO_INTTYPES

481.wrf=default:
CPORTABILITY      = -DSPEC_CPU_WINDOWS_ICL

483.xalancbmk=default=default=default:
CXXPORTABILITY    = -Qoption,cpp,--no_wchar_t_keyword
############################################################
# Library Tuning Flags
############################################################
471.omnetpp,473.astar,483.xalancbmk=default:
EXTRA_LIBS=  c:\cpu2006\shlW32M.lib
LDOUT=          -Fe$@ -link /FORCE:MULTIPLE


############################################################
# Baseline Tuning Flags
# default baseline for int and fp 2006
############################################################
int=base=default=default:
```

```
OPTIMIZE=       -QxAVX  -Qipo -O3 -Qprec-div- -Qopt-prefetch
CXXOPTIMIZE=    -Qcxx-features


fp=base=default=default:
OPTIMIZE=       -QxAVX  -Qipo -O3 -Qprec-div- -Qansi-alias
COPTIMIZE=      -Qauto-ilp32
CXXOPTIMIZE=    -Qcxx-features -Qauto-ilp32
EXTRA_CXXLIBS=  c:\cpu2006\shlW64M.lib
LDOUT=          -Fe$@ -link /FORCE:MULTIPLE

fp=peak:
COPTIMIZE=      -Qauto-ilp32
CXXOPTIMIZE=    -Qauto-ilp32
EXTRA_CXXLIBS=  c:\cpu2006\shlW64M.lib
LDOUT=          -Fe$@ -link /FORCE:MULTIPLE

############################################################
# Peak Tuning Flags
# default peak for int and fp 2006
############################################################
```

Dell OptiPlex 990 Mini Tower (Intel Core i7-2600)

```
# Invocation command line:
# C:\CPU200~1.APR\bin\runspec --rate 8 --define smt-on --define cores=4 -c cpu2006.i5-2600.cfg -T
base --flagsurl=Intel-ic12-win32-revB.xml,Intel-Windows-Platform-Settings.xml -o asc int
# output_root was not used for this run
############################################################################

# This is a sample config file. It was tested with:
#
#      Compiler name/version:       Intel Compiler 12, MS VS 2008
#      Operating system version:    Windows Vista (64-bit)
#      Hardware:                    Intel processors supporting
#                                   AVX instructions
#
# If your platform uses different versions, different
# hardware or operates in a different mode (for
# example, 32- vs. 64-bit mode), there is the possibiliy
# that this configuration file may not work as-is.
#
# Note that issues with compilation should be directed
# to the compiler vendor. Information about SPEC technical
# support can be found in the techsupport document in the
# Docs directory of your benchmark installation.
#
# This config file uses the SmartHeap library and if you
# do not have a licensed copy, please remove all
# instances of shlW32M.lib from this config file.
#
# Also note that this is a sample configuration. It
# is expected to work for the environment in which
# it was tested; it is not guaranteed that this is
# the config file that will provide the best performance.
#
#
# Note that you might find a more recent config file for
# your platform with the posted results at
# http://www.spec.org/cpu2006
############################################################################
# SPEC CPU2006 Intel Windows Vista64/Win7-64 config file
```

```
# October 26 2010.
# Intel Compiler 12
# Visual Studio 2010
############################################################################
action      = validate
tune        = base
ext         = ic12.winx64.avx.rate.i5-2600.exe
PATHSEP     = /
check_md5=1
reportable=1

# Works only on Vista32, Server2003 and all x64 Windows operating systems.
# Does *not* work on Windows XP32
submit= specperl -e "system sprintf qq{start /b /wait /affinity %x %s}, (1<<$SPECCOPYNUM), q{
$command } "

####################################################################
#
# These are listed as benchmark-tuning-extension-machine
#
####################################################################
# Compiler section
####################################################################
CC  = icl -Qvc9 -Qstd=c99
CXX = icl -Qvc9
FC  = ifort
OBJ = .obj

int=default:
EXTRA_LDFLAGS     = /F512000000

fp=default:
EXTRA_LDFLAGS     = /F1000000000

####################################################################
# Portability section
####################################################################
fp=default:
PORTABILITY       = -DSPEC_CPU_P64

403.gcc=default=default=default:
CPORTABILITY      = -DSPEC_CPU_WIN32
EXTRA_CFLAGS      = -Dalloca=_alloca

410.bwaves=default:
FPORTABILITY      = -names:lowercase

436.cactusADM=default=default=default:
FPORTABILITY      = /names:lowercase /assume:underscore

444.namd=default=default=default:
CXXPORTABILITY    =  /TP

447.dealII=default:
CXXPORTABILITY    = -DDEAL_II_MEMBER_VAR_SPECIALIZATION_BUG

453.povray=default=default=default:
CXXPORTABILITY    = -DSPEC_CPU_WINDOWS_ICL

454.calculix=default=default=default:
FPORTABILITY      = /names:lowercase
CPORTABILITY      = -DSPEC_CPU_NOZMODIFIER
```

```
464.h264ref=default=default=default:
CPORTABILITY      = -DWIN32 -DSPEC_CPU_NO_INTTYPES

481.wrf=default:
CPORTABILITY      = -DSPEC_CPU_WINDOWS_ICL

483.xalancbmk=default=default=default:
CXXPORTABILITY    = -Qoption,cpp,--no_wchar_t_keyword
######################################################################
# Library Tuning Flags
######################################################################
471.omnetpp,473.astar,483.xalancbmk=default:
EXTRA_LIBS=  c:\cpu2006\shlW32M.lib
LDOUT=          -Fe$@ -link /FORCE:MULTIPLE


######################################################################
# Baseline Tuning Flags
# default baseline for int and fp 2006
######################################################################
int=base=default=default:
OPTIMIZE=       -QxAVX  -Qipo -O3 -Qprec-div- -Qopt-prefetch
CXXOPTIMIZE=    -Qcxx-features


fp=base=default=default:
OPTIMIZE=       -QxAVX  -Qipo -O3 -Qprec-div- -Qansi-alias
COPTIMIZE=      -Qauto-ilp32
CXXOPTIMIZE=    -Qcxx-features -Qauto-ilp32
EXTRA_CXXLIBS=  c:\cpu2006\shlW64M.lib
LDOUT=          -Fe$@ -link /FORCE:MULTIPLE

fp=peak:
COPTIMIZE=      -Qauto-ilp32
CXXOPTIMIZE=    -Qauto-ilp32
EXTRA_CXXLIBS=  c:\cpu2006\shlW64M.lib
LDOUT=          -Fe$@ -link /FORCE:MULTIPLE

######################################################################
# Peak Tuning Flags
# default peak for int and fp 2006
######################################################################
```

HP Pavilion Slimline s5750z (AMD Athlon II X4 640) and HP Pavilion p6750z (AMD Phenom II X4 840)

```
# Invocation command line:
# C:\CPU200~1.IC1\bin\runspec --rate 4 -c cpu2006.phenom.cfg -T base --flagsurl=Intel-ic11.0-win32-
revA.xml,Intel-Win32-Platform.xml -o asc int
# output_root was not used for this run
############################################################################
############################################################################
# This is a sample config file. It was tested with:
#
#      Compiler name/version:       Intel Compiler 11.0 , MS VS 2008
#      Operating system version:    Windows Vista (32-bit and 64-bit)
#      Hardware:                    Intel processors supporting
#                                   Streaming SIMD Extensions 2
#
# If your platform uses different versions, different
# hardware or operates in a different mode (for
# example, 32- vs. 64-bit mode), there is the possibiliy
# that this configuration file may not work as-is.
```

```
#
# Note that issues with compilation should be directed
# to the compiler vendor. Information about SPEC technical
# support can be found in the techsupport document in the
# Docs directory of your benchmark installation.
#
# This config file uses the SmartHeap library and if you
# do not have a licensed copy, please remove all
# instances of shlW32M.lib from this config file.
#
# Also note that this is a sample configuration. It
# is expected to work for the environment in which
# it was tested; it is not guaranteed that this is
# the config file that will provide the best performance.
#
#
# Note that you might find a more recent config file for
# your platform with the posted results at
# http://www.spec.org/cpu2006
############################################################################
# SPEC CPU2006 Intel Windows XP/Vista32 config file
# Oct 03 2008. Intel Compiler 11.0 Visual Studio 2008
############################################################################
action      = validate
tune        = base
ext         = cpu2006.1.0.ic11.0.win32.sse2.rate.exe
PATHSEP     = /
check_md5=1
reportable=1
flagsurl000 = http://www.spec.org/cpu2006/flags/Intel-ic11.0-win32-revA.xml

# Works only on Vista32, Server2003 and all x64 Windows operating systems.
# Does *not* work on Win XP32
submit= specperl -e "system sprintf qq{start /b /wait /affinity %x %s}, (1<<$SPECCOPYNUM), q{
$command } "

#####################################################################
#
# These are listed as benchmark-tuning-extension-machine
#
#####################################################################
# Compiler section
#####################################################################
CC  = icl -Qvc9 -Qc99
CXX = icl -Qvc9
FC  = ifort
OBJ = .obj

int=default:
EXTRA_LDFLAGS     = /F512000000

fp=default:
EXTRA_LDFLAGS     = /F1000000000

#####################################################################
# Portability section
#####################################################################
403.gcc=default=default=default:
CPORTABILITY      = -DSPEC_CPU_WIN32
EXTRA_CFLAGS      = -Dalloca=_alloca

436.cactusADM=default=default=default:
FPORTABILITY      = -Qlowercase /assume:underscore
```

```
444.namd=default=default=default:
CXXPORTABILITY    =  -TP

447.dealII=default=default=default:
PORTABILITY       = -DDEAL_II_MEMBER_VAR_SPECIALIZATION_BUG

453.povray=default=default=default:
CXXPORTABILITY    = -DSPEC_CPU_WINDOWS_ICL

454.calculix=default=default=default:
PORTABILITY      = -Qlowercase -DSPEC_CPU_NOZMODIFIER

464.h264ref=default=default=default:
PORTABILITY       = -DSPEC_CPU_NO_INTTYPES -DWIN32

481.wrf=default:
CPORTABILITY     = -DSPEC_CPU_WINDOWS_ICL

483.xalancbmk=default=default=default:
CXXPORTABILITY   = -Qoption,cpp,--no_wchar_t_keyword

######################################################################
# Library Tuning Flags
######################################################################
all_cpp=default:
EXTRA_LIBS=     c:\cpu2006\shlW32M.lib
LDOUT=          -Fe$@ -link /FORCE:MULTIPLE

######################################################################
# Baseline Tuning Flags
# default baseline for int and fp 2006
######################################################################
int=base=default=default:
OPTIMIZE=       /arch:SSE2 -Qipo -O3 -Qprec-div- -Qopt-prefetch
CXXOPTIMIZE=    -Qcxx-features
sw_base_ptrsize = 32-bit

fp=base=default=default:
OPTIMIZE=       /arch:SSE2 -Qipo -O3 -Qprec-div- -Qopt-prefetch
CXXOPTIMIZE=    -Qcxx-features

######################################################################
# Peak Tuning Flags
# default peak for int and fp 2006
######################################################################
```

APPENDIX E – DETAILED SPEC CPU2006 RESULTS

Mid-range systems

Dell Vostro 460 Mini Tower (Intel Core i5-2400)

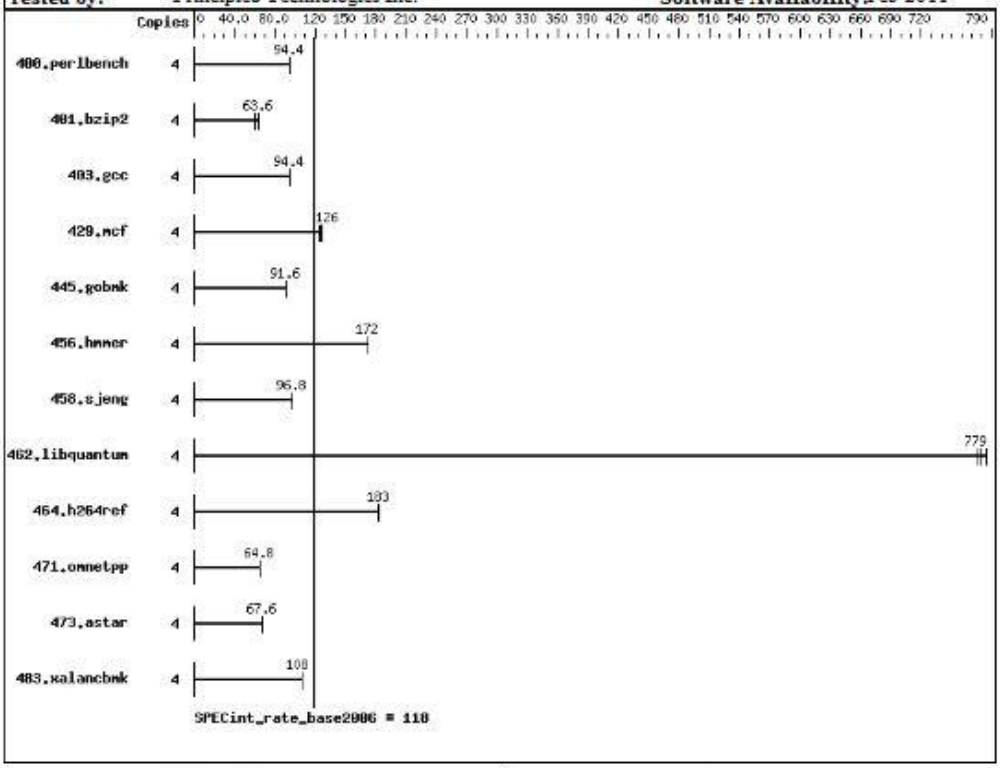
SPEC® CINT2006 Result

Dell Inc.
Dell Vostro 460 (Intel Core i5-2400)

SPECint®_rate2006 =Not Run
SPECint_rate_base2006 = 118

CPU2006 license: 3184
Test sponsor: Dell Inc.
Tested by: Principled Technologies Inc.

Test date: May-2011
Hardware Availability: Jan-2011
Software Availability: Feb-2011



Hardware

CPU Name:	Intel Core i5-2400
CPU Characteristics:	Intel Turbo Boost Technology up to 3.4 GHz
CPU MHz:	3100
FPU:	Integrated
CPU(s) enabled:	4 cores, 1 chip, 4 cores/chip
CPU(s) orderable:	1 chip
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	6 MB I+D on chip per chip
Other Cache:	None
Memory:	4 GB (2x2 GB PC3-10600)
Disk Subsystem:	Western Digital 500 GB SATA, 7200 RPM
Other Hardware:	None

Software

Operating System:	Windows 7 Ultimate w/ SP1 (64-bit)
Compiler:	Intel C++ Compiler XE for IA32 and Intel 64 Version 12.0.4.196 Build 20110427 Microsoft Visual Studio 2008 Professional SP1 (for libraries)
Auto Parallel:	No
File System:	NTFS
System State:	Default
Base Pointers:	32/64-bit
Peak Pointers:	32/64-bit
Other Software:	SmartHeap Library Version 10 (Multi-Core) from http://www.microquill.com/

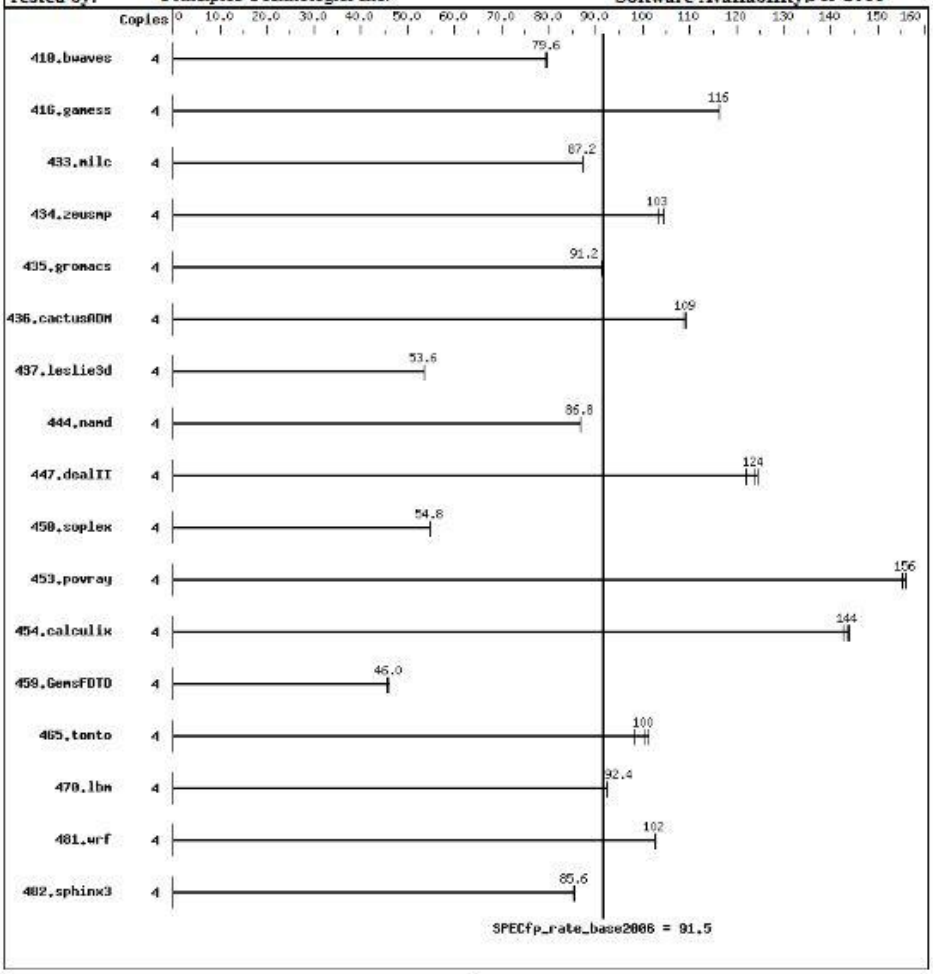
SPEC® CFP2006 Result

Dell Inc.
Dell Vostro 460 (Intel Core i5-2400)

SPECfp®_rate2006 = Not Run
SPECfp_rate_base2006 = 91.5

CPU2006 license: 3184
Test sponsor: Dell Inc.
Tested by: Principled Technologies Inc.

Test date: May-2011
Hardware Availability: Jan-2011
Software Availability: Feb-2011



Hardware

CPU Name:	Intel Core i5-2400
CPU Characteristics:	Intel Turbo Boost Technology up to 3.4 GHz
CPU MHz:	3100
FPU:	Integrated
CPU(s) enabled:	4 cores, 1 chip, 4 cores/chip
CPU(s) orderable:	1 chip
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	6 MB I+D on chip per chip
Other Cache:	None
Memory:	4 GB (2x2 GB PC3-10600)
Disk Subsystem:	Western Digital 500 GB SATA, 7200 RPM
Other Hardware:	None

Software

Operating System:	Windows 7 Ultimate w/ SP1 (64-bit)
Compiler:	Intel C++ Compiler XE for Intel 64 Version 12.0.4.196 Build 20110427 Intel Visual Fortran Compiler XE for Intel 64 Version 12.0.4.196 Build 201110427 Microsoft Visual Studio 2008 Professional SP1 (for libraries)
Auto Parallel:	No
File System:	NTFS
System State:	Default
Base Pointers:	64-bit
Peak Pointers:	64-bit
Other Software:	SmartHeap Library Version 10 (Multi-Core) from http://www.microquill.com/

HP Pavilion Slimline s5750z (AMD Athlon II X4 640)

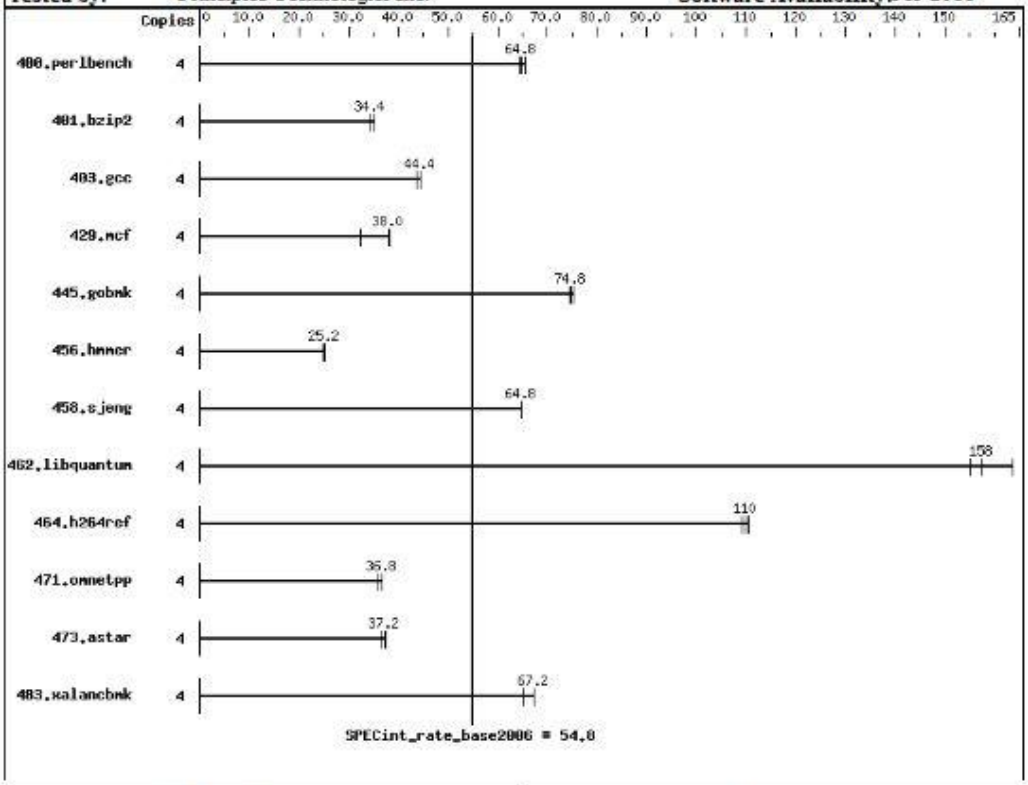
SPEC® CINT2006 Result

Hewlett-Packard Company
HP Pavilion Slimline s5750z (AMD Phenom II X4 640)

SPECint®_rate2006 =Not Run
SPECint_rate_base2006 = 54.8

CPU2006 license: 3184
Test sponsor: Dell Inc.
Tested by: Principled Technologies Inc.

Test date: May-2011
Hardware Availability: Feb-2011
Software Availability: Feb-2011



Hardware

CPU Name:	AMD Phenom II X4 640
CPU Characteristics:	
CPU MHz:	3000
FPU:	Integrated
CPU(s) enabled:	4 cores, 1 chip, 4 cores/chip
CPU(s) orderable:	1 chip
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core
L3 Cache:	None
Other Cache:	None
Memory:	4 GB (2x2GB PC3-10600)
Disk Subsystem:	Western Digital 500 GB SATA, 7200RPM
Other Hardware:	None

Software

Operating System:	Windows 7 Ultimate w/ SP1 (64-bit)
Compiler:	Intel C++ Compiler XE for IA32 Version 12.0.4.196 Build 20110427 Microsoft Visual Studio 2008 Professional SP1 (for libraries)
Auto Parallel:	No
File System:	NTFS
System State:	Default
Base Pointers:	32-bit
Peak Pointers:	32-bit
Other Software:	SmartHeap Library Version 10 (Multi-Core) from http://www.microquill.com/

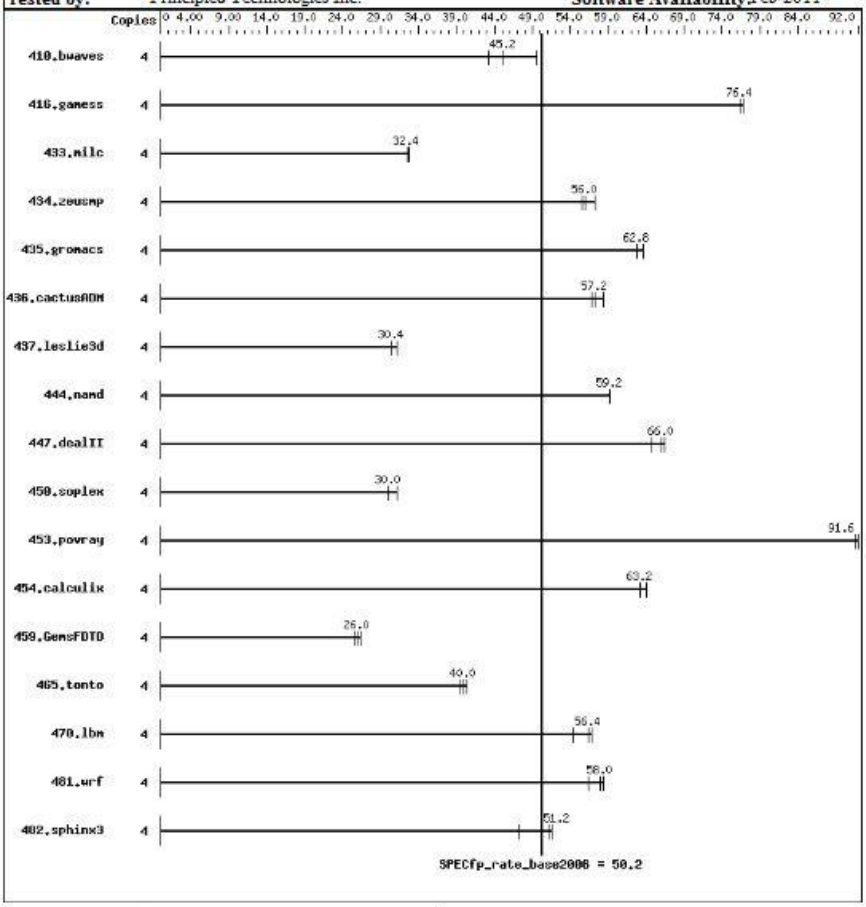
SPEC® CFP2006 Result

Hewlett-Packard Company
HP Pavilion Slimline s5750z (AMD Phenom II X4 640)

SPECfp®_rate2006 = Not Run
SPECfp_rate_base2006 = 50.2

CPU2006 license: 3184
Test sponsor: Dell Inc.
Tested by: Principled Technologies Inc.

Test date: May-2011
Hardware Availability: Feb-2011
Software Availability: Feb-2011



Hardware

CPU Name:	AMD Phenom II X4 640
CPU Characteristics:	
CPU MHz:	3000
FPU:	Integrated
CPU(s) enabled:	4 cores, 1 chip, 4 cores/chip
CPU(s) orderable:	1 chip
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core
L3 Cache:	None
Other Cache:	None
Memory:	4 GB (2x2GB PC3-10600)
Disk Subsystem:	Western Digital 500 GB SATA, 7200RPM
Other Hardware:	None

Software

Operating System:	Windows 7 Ultimate w/ SP1 (64-bit)
Compiler:	Intel C++ Compiler XE for IA32 Version 12.0.4.196 Build 20110427 Intel Visual Fortran Compiler XE for IA32 Version 12.0.4.196 Build 20110427 Microsoft Visual Studio 2008 Professional SP1 (for libraries)
Auto Parallel:	No
File System:	NTFS
System State:	Default
Base Pointers:	32-bit
Peak Pointers:	32-bit
Other Software:	SmartHeap Library Version 10 (Multi-Core) from http://www.microquill.com/

High-end systems

Dell OptiPlex 990 Mini Tower (Intel Core i7-2600)

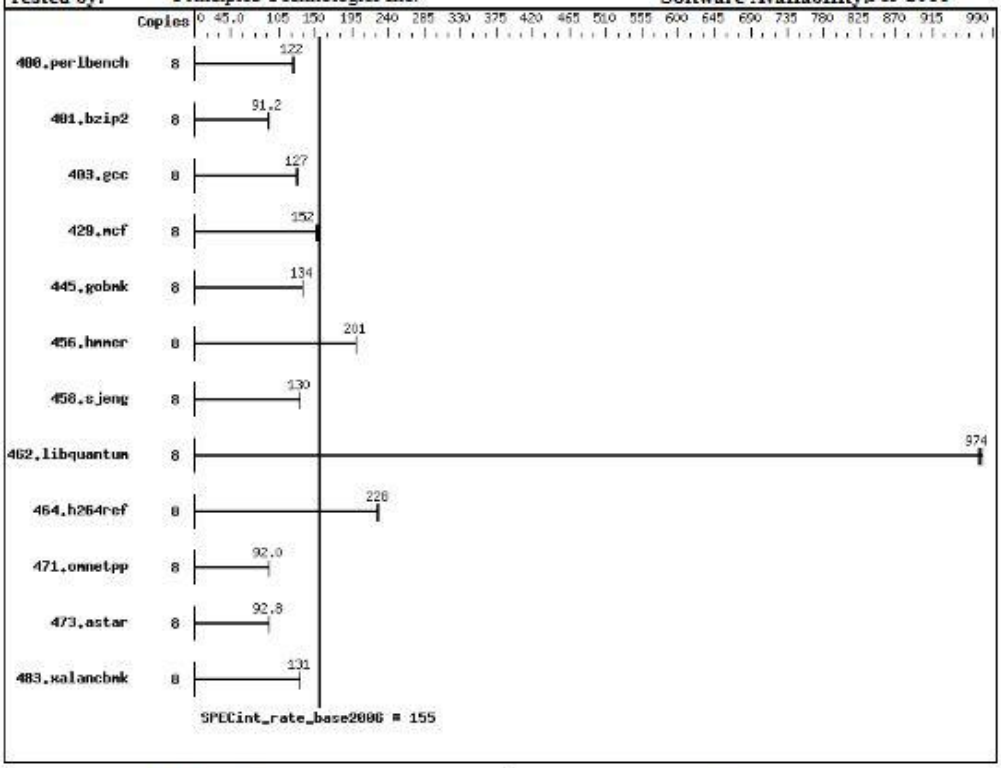
SPEC® CINT2006 Result

Dell Inc.
Dell OptiPlex 990 (Intel Core i7-2600)

SPECint® rate2006 =Not Run
SPECint_rate_base2006 = 155

CPU2006 license: 3184
Test sponsor: Dell Inc.
Tested by: Principled Technologies Inc.

Test date: May-2011
Hardware Availability: Mar-2011
Software Availability: Feb-2011



Hardware

CPU Name:	Intel Core i7-2600
CPU Characteristics:	Intel Turbo Boost Technology up to 3.8 GHz
CPU MHz:	3400
FPU:	Integrated
CPU(s) enabled:	4 cores, 1 chip, 4 cores/chip, 2 threads/core
CPU(s) orderable:	1 chip
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	8 MB I+D on chip per chip
Other Cache:	None
Memory:	8 GB (2x4GB PC3-10600)
Disk Subsystem:	Seagate 500 GB SATA, 7200 RPM
Other Hardware:	None

Software

Operating System:	Windows 7 Ultimate w/ SP1 (64-bit)
Compiler:	Intel C++ Compiler XE for IA32 and Intel 64 Version 12.0.4.196 Build 20110427 Microsoft Visual Studio 2008 Professional SP1 (for libraries)
Auto Parallel:	No
File System:	NTFS
System State:	Default
Base Pointers:	32/64-bit
Peak Pointers:	32/64-bit
Other Software:	SmartHeap Library Version 10 (Multi-Core) from http://www.microquill.com/

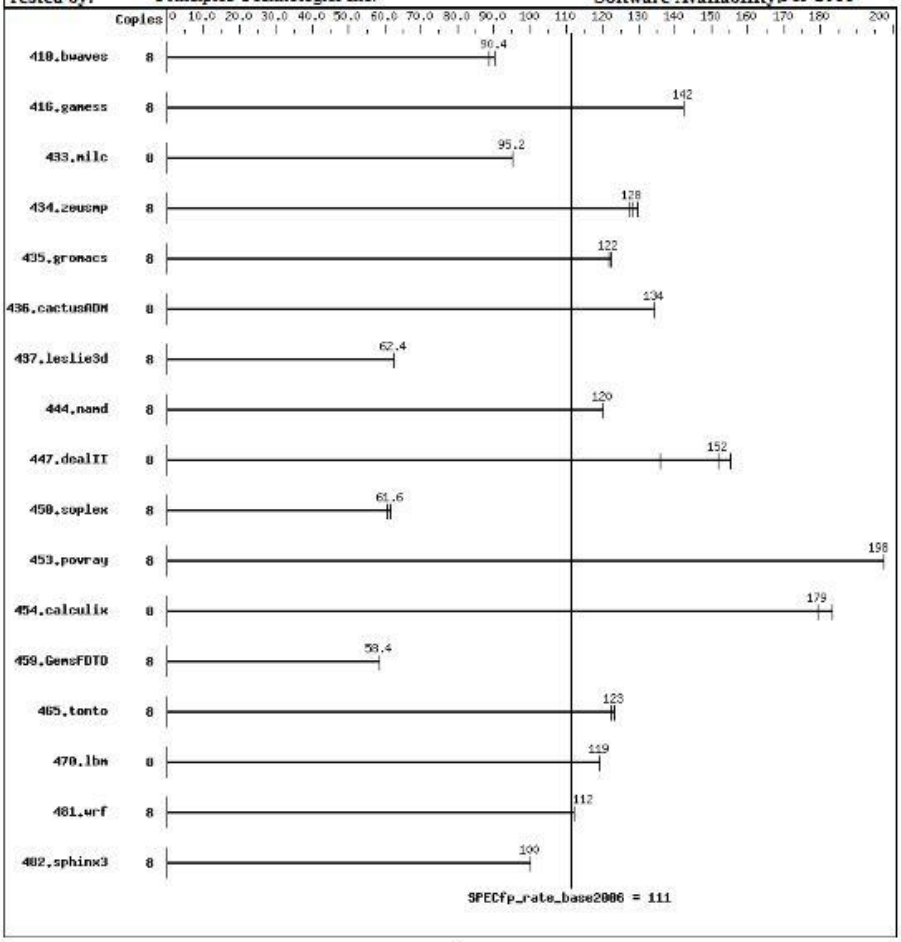
SPEC® CFP2006 Result

Dell Inc.
Dell OptiPlex 990 (Intel Core i7-2600)

SPECfp®_rate2006 = Not Run
SPECfp_rate_base2006 = 111

CPU2006 license: 3184
Test sponsor: Dell Inc.
Tested by: Principled Technologies Inc.

Test date: May-2011
Hardware Availability: Mar-2011
Software Availability: Feb-2011



Hardware

CPU Name:	Intel Core i7-2600
CPU Characteristics:	Intel Turbo Boost Technology up to 3.8 GHz
CPU MHz:	3400
FPU:	Integrated
CPU(s) enabled:	4 cores, 1 chip, 4 cores/chip, 2 threads/core
CPU(s) orderable:	1 chip
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	8 MB I+D on chip per chip
Other Cache:	None
Memory:	8 GB (2 x 4 GB PC3-10600)
Disk Subsystem:	Seagate 500 GB SATA, 7200 RPM
Other Hardware:	None

Software

Operating System:	Windows 7 Ultimate w/ SP1 (64-bit)
Compiler:	Intel C++ Compiler XE for Intel 64 Version 12.0.4.196 Build 20110427 Intel Visual Fortran Compiler XE for Intel 64 Version 12.0.4.196 Build 20110427 Microsoft Visual Studio 2008 Professional SP1 (for libraries)
Auto Parallel:	No
File System:	NTFS
System State:	Default
Base Pointers:	64-bit
Peak Pointers:	64-bit
Other Software:	SmartHeap Library Version 10 (Multi-Core) from http://www.microquill.com/

HP Pavilion p6750z (AMD Phenom II X4 840)

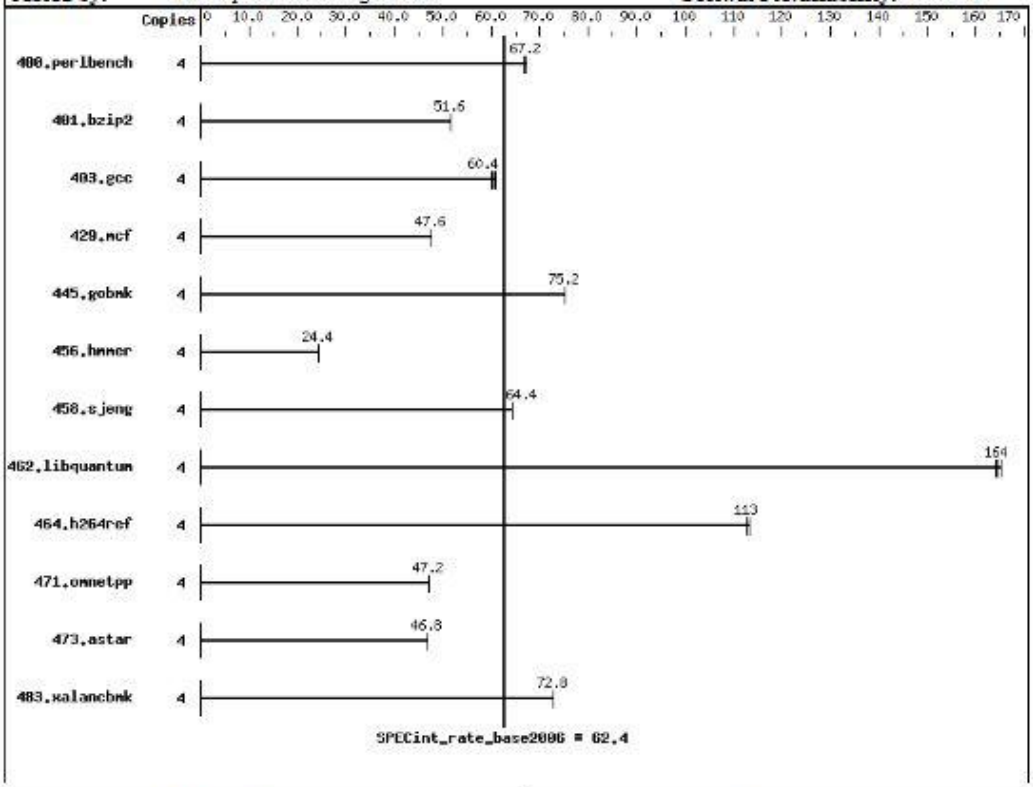
SPEC® CINT2006 Result

Hewlett-Packard Company
HP Pavilion p6750z (AMD Phenom II X4 840)

SPECint® rate2006 =Not Run
SPECint_rate_base2006 = 62.4

CPU2006 license: 3184
Test sponsor: Dell Inc.
Tested by: Principled Technologies Inc.

Test date: May-2011
Hardware Availability: Jan-2011
Software Availability: Feb-2011



Hardware

CPU Name:	AMD Phenom II X4 840
CPU Characteristics:	
CPU MHz:	2900
FPU:	Integrated
CPU(s) enabled:	4 cores, 1 chip, 4 cores/chip
CPU(s) orderable:	1 chip
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core
L3 Cache:	6 MB I+D on chip per chip
Other Cache:	None
Memory:	8 GB (4x2GB PC3-10600)
Disk Subsystem:	Seagate 1500 GB SATA, 7200RPM
Other Hardware:	None

Software

Operating System:	Windows 7 Ultimate w/ SP1 (64-bit)
Compiler:	Intel C++ Compiler XE for IA32 Version 12.0.4.196 Build 20110427 Microsoft Visual Studio 2008 Professional SP1 (for libraries)
Auto Parallel:	No
File System:	NTFS
System State:	Default
Base Pointers:	32-bit
Peak Pointers:	32-bit
Other Software:	SmartHeap Library Version 10 (Multi-Core) from http://www.microquill.com/

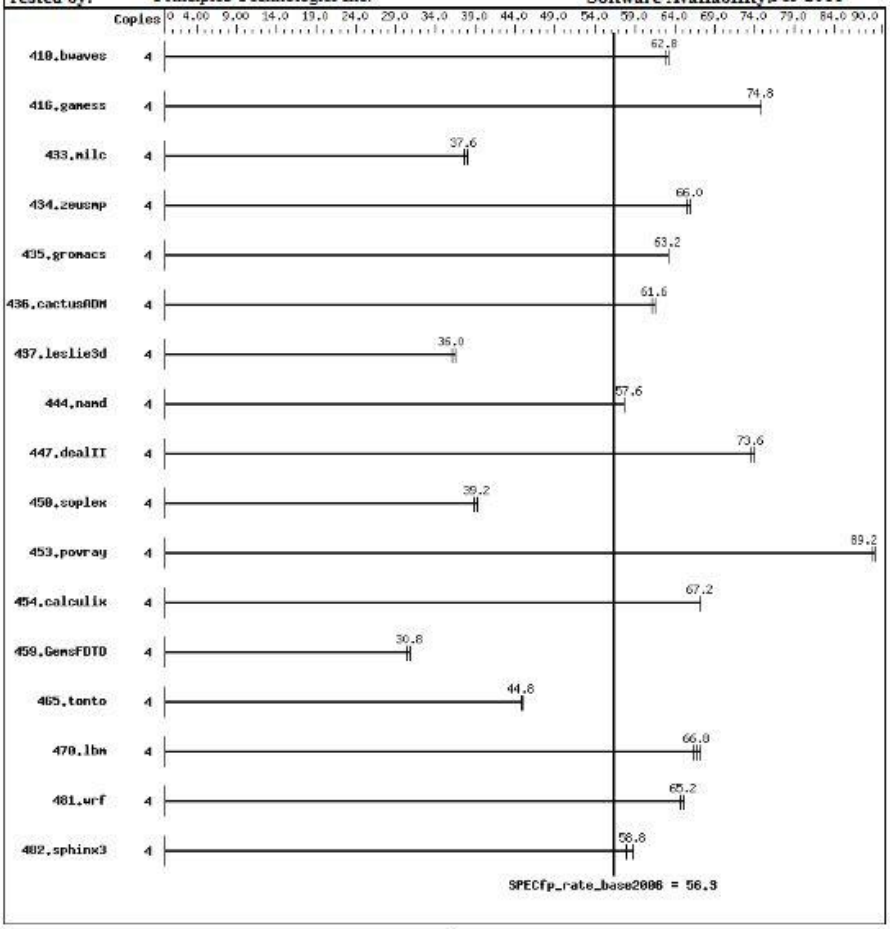
SPEC® CFP2006 Result

Hewlett-Packard Company
HP Pavilion p6750z (AMD Phenom II X4 840)

SPECfp®_rate2006 = Not Run
SPECfp_rate_base2006 = 56.3

CPU2006 license: 3184
Test sponsor: Dell Inc.
Tested by: Principled Technologies Inc.

Test date: May-2011
Hardware Availability: Jan-2011
Software Availability: Feb-2011



Hardware

CPU Name:	AMD Phenom II X4 840
CPU Characteristics:	
CPU MHz:	2900
FPU:	Integrated
CPU(s) enabled:	4 cores, 1 chip, 4 cores/chip
CPU(s) orderable:	1 chip
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core
L3 Cache:	6 MB I+D on chip per chip
Other Cache:	None
Memory:	8 GB (4x2GB PC3-10600)
Disk Subsystem:	Seagate 1500 GB SATA, 7200RPM
Other Hardware:	None

Software

Operating System:	Windows 7 Ultimate w/ SP1 (64-bit)
Compiler:	Intel C++ Compiler XE for IA32 Version 12.0.4.196 Build 20110427 Intel Visual Fortran Compiler XE for IA32 Version 12.0.4.196 Build 20110427 Microsoft Visual Studio 2008 Professional SP1 (for libraries)
Auto Parallel:	No
File System:	NTFS
System State:	Default
Base Pointers:	32-bit
Peak Pointers:	32-bit
Other Software:	SmartHeap Library Version 10 (Multi-Core) from http://www.microquill.com/

ABOUT PRINCIPLED TECHNOLOGIES

Principled Technologies, Inc.
1007 Slater Road, Suite 300
Durham, NC, 27703
www.principledtechnologies.com

We provide industry-leading technology assessment and fact-based marketing services. We bring to every assignment extensive experience with and expertise in all aspects of technology testing and analysis, from researching new technologies, to developing new methodologies, to testing with existing and new tools.

When the assessment is complete, we know how to present the results to a broad range of target audiences. We provide our clients with the materials they need, from market-focused data to use in their own collateral to custom sales aids, such as test reports, performance assessments, and white papers. Every document reflects the results of our trusted independent analysis.

We provide customized services that focus on our clients' individual requirements. Whether the technology involves hardware, software, Web sites, or services, we offer the experience, expertise, and tools to help our clients assess how it will fare against its competition, its performance, its market readiness, and its quality and reliability.

Our founders, Mark L. Van Name and Bill Catchings, have worked together in technology assessment for over 20 years. As journalists, they published over a thousand articles on a wide array of technology subjects. They created and led the Ziff-Davis Benchmark Operation, which developed such industry-standard benchmarks as Ziff Davis Media's Winstone and WebBench. They founded and led eTesting Labs, and after the acquisition of that company by Lionbridge Technologies were the head and CTO of VeriTest.