SPEC® CFP2006 Result

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Hewlett-Packard Company

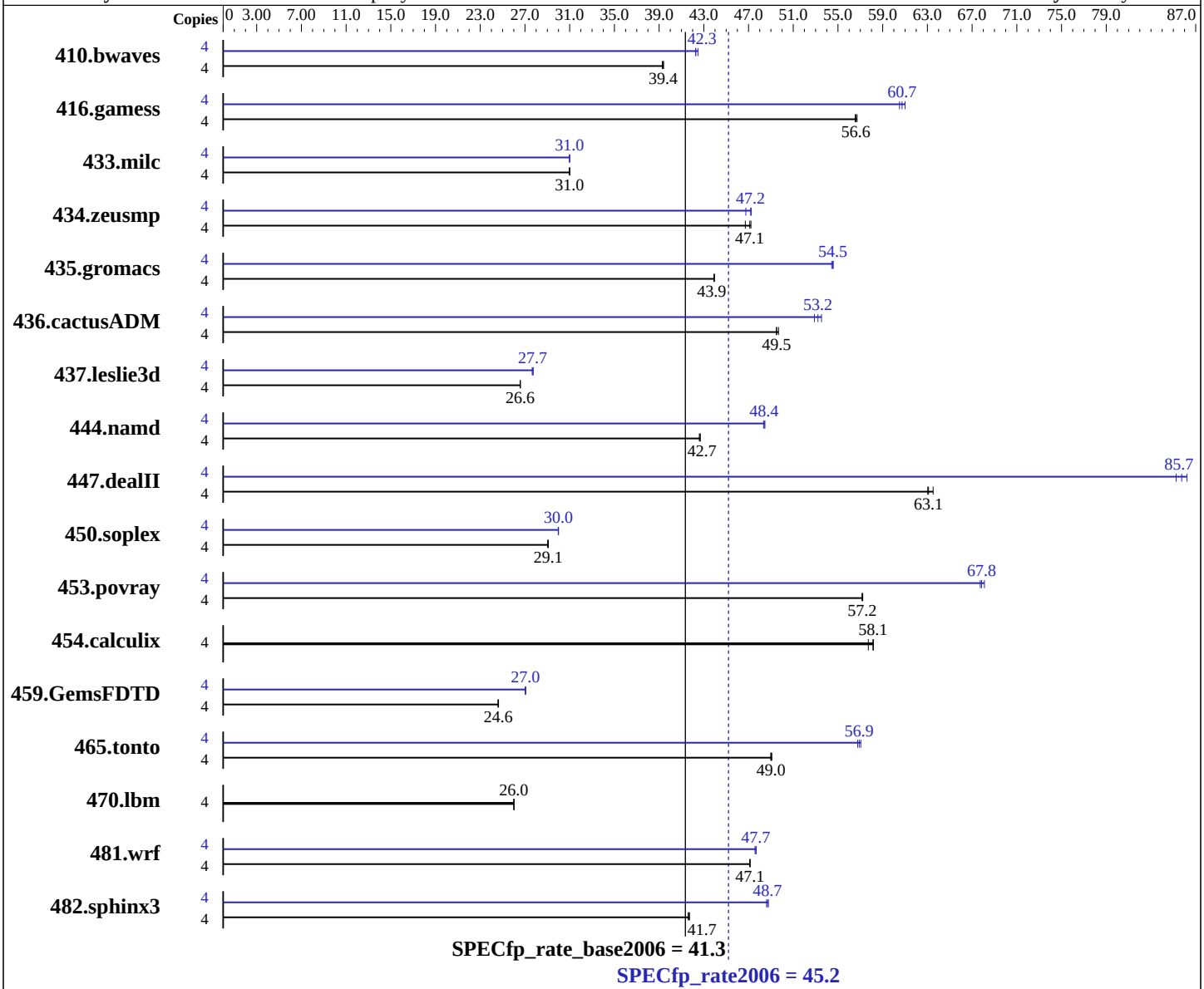
ProLiant BL465c G5
(2.3 GHz AMD Opteron 2356)

SPECfp®_rate2006 = 45.2

SPECfp_rate_base2006 = 41.3

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

Test date: Mar-2008
Hardware Availability: Mar-2008
Software Availability: May-2008



Hardware

CPU Name:	AMD Opteron 2356
CPU Characteristics:	
CPU MHz:	2300
FPU:	Integrated
CPU(s) enabled:	4 cores, 1 chip, 4 cores/chip
CPU(s) orderable:	1,2 chips
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core

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Software

Operating System:	SUSE Linux Enterprise Server 10 (x86_64) SP1, Kernel 2.6.16.46-0.12-smp
Compiler:	PGI Server Complete Version 7.2 PathScale Compiler Suite, Release Pre-3.2 Beta
Auto Parallel:	No
File System:	ext2
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	32/64-bit

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L3 Cache: 2 MB I+D on chip per chip
Other Cache: None
Memory: 16 GB (4x4 GB, PC2-5300P CL5)
Disk Subsystem: 1x146 GB 10 K SAS
Other Hardware: None

Other Software: binutils-2.18.50

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	4	1384	39.3	1380	39.4	**1380**	**39.4**	4	1279	42.5	**1286**	**42.3**	1286	42.3
416.gamess	4	**1384**	**56.6**	1385	56.5	1381	56.7	4	**1290**	**60.7**	1284	61.0	1294	60.5
433.milc	4	1185	31.0	1185	31.0	**1185**	**31.0**	4	1185	31.0	1185	31.0	**1185**	**31.0**
434.zeusmp	4	779	46.7	**773**	**47.1**	771	47.2	4	770	47.3	**771**	**47.2**	778	46.8
435.gromacs	4	**650**	**43.9**	650	43.9	650	43.9	4	**524**	**54.5**	523	54.6	525	54.4
436.cactusADM	4	962	49.7	966	49.5	**965**	**49.5**	4	**898**	**53.2**	904	52.9	893	53.5
437.leslie3d	4	1415	26.6	1415	26.6	**1415**	**26.6**	4	**1357**	**27.7**	1356	27.7	1360	27.6
444.namd	4	752	42.7	753	42.6	**752**	**42.7**	4	664	48.3	**663**	**48.4**	662	48.5
447.dealII	4	**725**	**63.1**	726	63.0	720	63.5	4	**534**	**85.7**	537	85.3	531	86.2
450.soplex	4	**1147**	**29.1**	1147	29.1	1149	29.0	4	1113	30.0	**1112**	**30.0**	1112	30.0
453.povray	4	372	57.2	**372**	**57.2**	372	57.2	4	314	67.7	312	68.1	**314**	**67.8**
454.calculix	4	**568**	**58.1**	572	57.7	567	58.2	4	**568**	**58.1**	572	57.7	567	58.2
459.GemsFDTD	4	1723	24.6	1727	24.6	**1724**	**24.6**	4	1568	27.1	1570	27.0	**1570**	**27.0**
465.tonto	4	803	49.0	**803**	**49.0**	802	49.1	4	**692**	**56.9**	690	57.0	693	56.8
470.lbm	4	**2113**	**26.0**	2113	26.0	2112	26.0	4	**2113**	**26.0**	2113	26.0	2112	26.0
481.wrf	4	**948**	**47.1**	948	47.1	948	47.1	4	939	47.6	**938**	**47.7**	937	47.7
482.sphinx3	4	**1870**	**41.7**	1869	41.7	1874	41.6	4	**1601**	**48.7**	1604	48.6	1598	48.8

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Operating System Notes

```
Environment stack size set to 'unlimited'
Max locked memory set to 2097152
PGI_HUGE_PAGES set to 896.
Total number of huge pages available is 3584.
NCPUS set to number of cores
numactl used to bind processes to CPUs
```

Platform Notes

```
BIOS configuration:
  Power Regulator set to Static High Performance Mode
```

Base Compiler Invocation

C benchmarks:
pgcc

C++ benchmarks:
pgcpp

Fortran benchmarks:
pgf95

Benchmarks using both Fortran and C:
pgcc pgf95

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 -Mnomain
436.cactusADM: -DSPEC_CPU_LP64 -Mnomain
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -Mnomain
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:
-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

C++ benchmarks:
-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 --zc_eh -tp barcelona-64 -Bstatic_pgi

Fortran benchmarks:
-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
`-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi`

Base Other Flags

C benchmarks:
`-w`

C++ benchmarks:
`-w`

Fortran benchmarks:
`-w`

Benchmarks using both Fortran and C:
`-w`

Peak Compiler Invocation

C benchmarks (except as noted below):
`pgcc`

482.sphinx3: `pathcc`

C++ benchmarks (except as noted below):
`pathCC`

444.namd: `pgcpp`

Fortran benchmarks (except as noted below):
`pathf95`

410.bwaves: `pgf95`

434.zeusmp: `pgf95`

Benchmarks using both Fortran and C (except as noted below):
`pgcc pgf95`

436.cactusADM: `pathcc pathf95`

481.wrf: `pathcc pathf95`

Peak Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 -Mnomain
436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -Mnomain
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX -fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

Peak Optimization Flags

C benchmarks:

433.milc: -fastsse -Msmartalloc=huge:150 -Msafeptr -Mfprelaxed
-Mipa=jobs:4 -Mipa=inline -Mipa=arg -Mipa=const -Mipa=ptr
-Mipa=shape -tp barcelona-64 -Bstatic_pgi

470.lbm: basepeak = yes

482.sphinx3: -march=barcelona -Ofast -LNO:vintr=2
-CG:locs_shallow_depth=1

C++ benchmarks:

444.namd: -Mpfi(pass 1) -Mipa=jobs:4(pass 2) -Mipa=fast(pass 2)
-Mipa=inline(pass 2) -Mpfo(pass 2) -fast -Mfprelaxed
-Msmartalloc=huge:150 --zc_eh -Mnodepchk -Munroll=n:4
-Munroll=m:8 -tp barcelona-64 -Bstatic_pgi

447.dealII: -march=barcelona -Ofast -static -INLINE:aggressive=on
-OPT:malloc_alg=1 -m32 -fno-exceptions

450.soplex: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -m32 -O3 -TENV:frame_pointer=off
-LNO:prefetch=1 -OPT:malloc_alg=1 -CG:load_exe=0

453.povray: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast

Fortran benchmarks:

Continued on next page

Peak Optimization Flags (Continued)

410.bwaves: -Mpfi(pass 1) -Mipa=jobs:4(pass 2) -Mipa=fast(pass 2) -Mipa=inline(pass 2) -Mpfo(pass 2) -fastsse -Mfprelaxed -Msmartalloc -Mprefetch=distance:12 -Mprefetch=nta -tp barcelona-64 -Bstatic_pgi

416.gamess: -march=barcelona -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -O2 -OPT:Ofast -OPT:ro=3 -OPT:unroll_size=256

434.zeusmp: -fastsse -Mfprelaxed -Msmartalloc=huge:150 -Mipa=jobs:4 -Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi

437.leslie3d: -march=barcelona -Ofast -m3dnow -OPT:unroll_size=256 -CG:load_exe=0

459.GemsFDTD: -march=barcelona -Ofast -LNO:fission=2 -LNO:simd=2 -LNO:prefetch_ahead=1 -CG:load_exe=0

465.tonto: -march=barcelona -Ofast -OPT:alias=no_f90_pointer_alias -LNO:blocking=off -CG:load_exe=1 -IPA:plimit=525

Benchmarks using both Fortran and C:

435.gromacs: -fast -Mfpapprox=rsqrt -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

436.cactusADM: -march=barcelona -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast -LNO:blocking=off

454.calculix: basepeak = yes

481.wrf: -march=barcelona -Ofast -LNO:blocking=off -LNO:prefetch_ahead=10 -m3dnow -LANG:copyinout=off -IPA:callee_limit=5000

Peak Other Flags

C benchmarks (except as noted below):

-w

482.sphinx3: No flags used

C++ benchmarks:

444.namd: -w

Continued on next page

Peak Other Flags (Continued)

Fortran benchmarks:

410.bwaves: `-w`

434.zeusmp: `-w`

Benchmarks using both Fortran and C:

435.gromacs: `-w`

454.calculix: `-w`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/hp-PGI72-PS32-flags.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/hp-PGI72-PS32-flags.xml`

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