



SPEC[®] CFP2006 Result

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Hewlett-Packard Company

SPECfp[®]_rate2006 = 74.4

ProLiant DL165 G6
(2.8 GHz AMD Opteron 2439 SE)

SPECfp_rate_base2006 = 67.2

CPU2006 license: 3

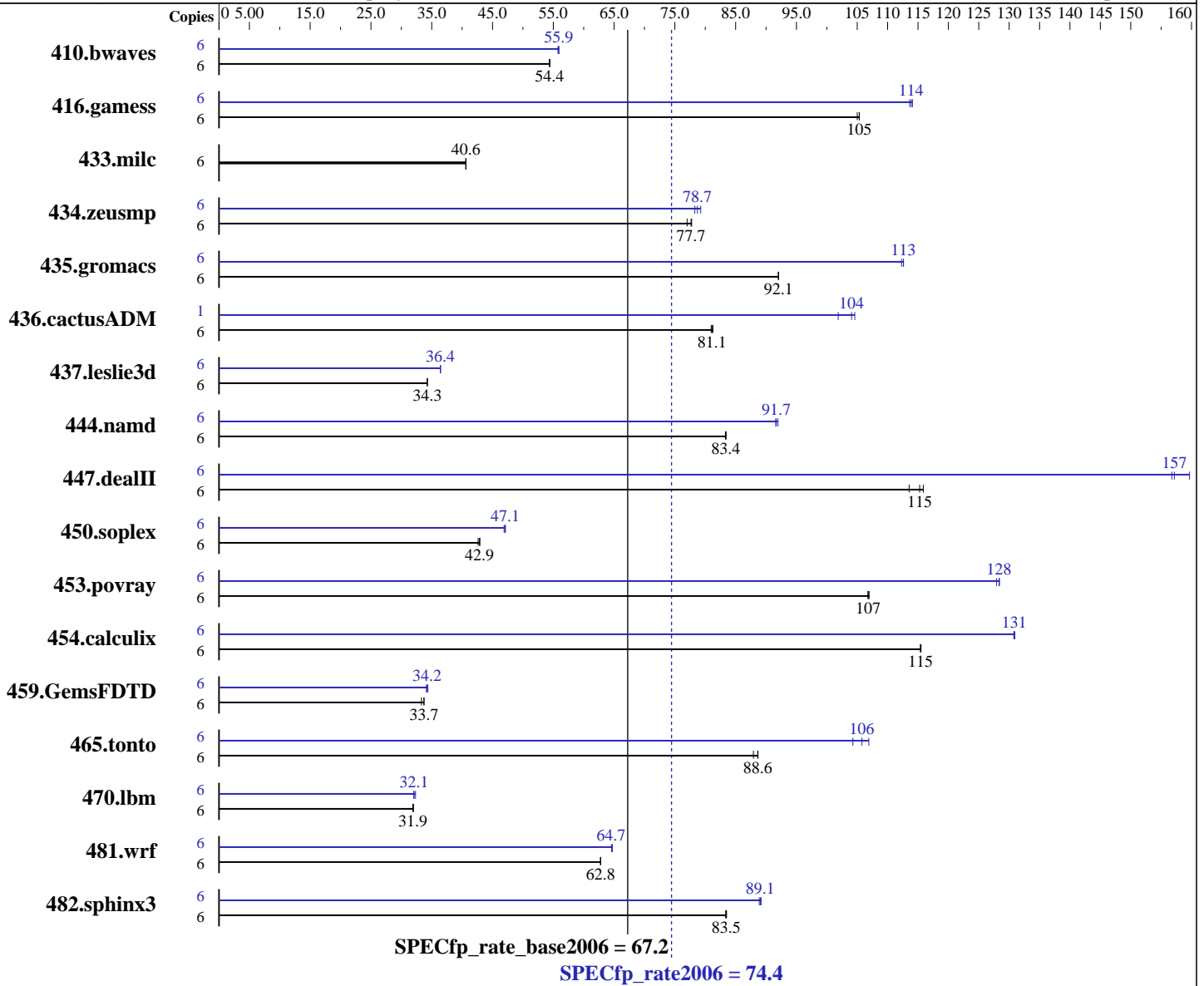
Test date: Jun-2009

Test sponsor: Hewlett-Packard Company

Hardware Availability: Jul-2009

Tested by: Hewlett-Packard Company

Software Availability: Apr-2009



Hardware

CPU Name: AMD Opteron 2439 SE
 CPU Characteristics: 2800
 CPU MHz: Integrated
 FPU: 6 cores, 1 chip, 6 cores/chip
 CPU(s) enabled: 1,2 chips
 CPU(s) orderable: 64 KB I + 64 KB D on chip per core
 Primary Cache: 512 KB I+D on chip per core
 Secondary Cache:

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Software

Operating System: Red Hat Enterprise Linux Server release 5.3, Advanced Platform, Kernel 2.6.18-128.el5
 Compiler: PGI Server Complete Version 8.0 x86 Open64 4.2.2 Compiler Suite
 Auto Parallel: Yes
 File System: ext3
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: 32/64-bit

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L3 Cache: 6 MB I+D on chip per chip
Other Cache: None
Memory: 16 GB (4x4 GB, PC2-6400P CL5)
Disk Subsystem: 1 x 146 GB 15 K SAS
Other Hardware: None

Other Software: binutils 2.18

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	6	<u>1499</u>	<u>54.4</u>	1498	54.4	1500	54.4	6	1458	55.9	<u>1459</u>	<u>55.9</u>	1462	55.8
416.gamess	6	1115	105	<u>1115</u>	<u>105</u>	1119	105	6	1034	114	1030	114	<u>1032</u>	<u>114</u>
433.milc	6	<u>1356</u>	<u>40.6</u>	1356	40.6	1356	40.6	6	<u>1356</u>	<u>40.6</u>	1356	40.6	1356	40.6
434.zeusmp	6	702	77.8	<u>703</u>	<u>77.7</u>	709	77.0	6	689	79.3	697	78.3	<u>694</u>	<u>78.7</u>
435.gromacs	6	<u>465</u>	<u>92.1</u>	466	92.0	465	92.1	6	<u>380</u>	<u>113</u>	381	112	380	113
436.cactusADM	6	882	81.3	885	81.0	<u>884</u>	<u>81.1</u>	1	114	105	<u>115</u>	<u>104</u>	117	102
437.leslie3d	6	<u>1646</u>	<u>34.3</u>	1646	34.3	1646	34.3	6	<u>1548</u>	<u>36.4</u>	1548	36.4	1548	36.4
444.namd	6	577	83.3	577	83.4	<u>577</u>	<u>83.4</u>	6	525	91.6	<u>525</u>	<u>91.7</u>	523	92.0
447.dealII	6	<u>595</u>	<u>115</u>	605	114	592	116	6	438	157	<u>437</u>	<u>157</u>	430	160
450.soplex	6	1174	42.6	<u>1168</u>	<u>42.9</u>	1166	42.9	6	1067	46.9	<u>1062</u>	<u>47.1</u>	1062	47.1
453.povray	6	<u>299</u>	<u>107</u>	298	107	299	107	6	<u>249</u>	<u>128</u>	250	128	249	128
454.calculix	6	<u>429</u>	<u>115</u>	429	115	429	115	6	<u>378</u>	<u>131</u>	378	131	379	131
459.GemsFDTD	6	1912	33.3	1887	33.7	<u>1888</u>	<u>33.7</u>	6	1866	34.1	1852	34.4	<u>1859</u>	<u>34.2</u>
465.tonto	6	<u>666</u>	<u>88.6</u>	666	88.7	672	87.9	6	<u>558</u>	<u>106</u>	566	104	552	107
470.lbm	6	2576	32.0	<u>2585</u>	<u>31.9</u>	2586	31.9	6	<u>2568</u>	<u>32.1</u>	2549	32.3	2573	32.0
481.wrf	6	1068	62.8	<u>1068</u>	<u>62.8</u>	1067	62.8	6	<u>1036</u>	<u>64.7</u>	1035	64.7	1038	64.6
482.sphinx3	6	1400	83.5	<u>1401</u>	<u>83.5</u>	1403	83.4	6	1316	88.9	1311	89.2	<u>1313</u>	<u>89.1</u>

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

Submit Notes

The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.
See the configuration file for details.

Operating System Notes

'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 2097152' was used to set environment locked pages in memory limit
The libhugetlbfs libraries were installed using the installation rpms that came with the distribution.

Set vm/nr_hugepages=2700 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages

The x86 Open64 Compiler Suite is only available from (and supported by) AMD at
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Operating System Notes (Continued)

<http://developer.amd.com/cpu/open64>.

General Notes

Environment variables set by runspec before the start of the run:

HUGETLB_LIMIT = "450"

LD_LIBRARY_PATH = "/cpu2006/amd0905is-libs/64:/cpu2006/amd0905is-libs/32"

NCPUS = "6"

PGI_HUGE_PAGES = "450"

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

```



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Base Optimization Flags

C benchmarks:

-fastsse -Msmartalloc=huge -Mfprelaxed -Mipa=fast -Mipa=inline
-tp shanghai-64 -Bstatic_pgi

C++ benchmarks:

-fastsse -Msmartalloc=huge -Mfprelaxed --zc_eh -Mipa=fast
-Mipa=inline -tp shanghai-64 -Bstatic_pgi

Fortran benchmarks:

-fastsse -Msmartalloc=huge -Mfprelaxed -Mvect=short -Mipa=fast
-Mipa=inline -tp shanghai-64 -Bstatic_pgi

Benchmarks using both Fortran and C:

-fastsse -Msmartalloc=huge -Mfprelaxed -Mipa=fast -Mipa=inline
-tp shanghai-64 -Mvect=short -Bstatic_pgi

Base Other Flags

C benchmarks:

-Mipa=jobs:4

C++ benchmarks:

-Mipa=jobs:4

Fortran benchmarks:

-Mipa=jobs:4

Benchmarks using both Fortran and C:

-Mipa=jobs:4

Peak Compiler Invocation

C benchmarks:

pgcc

C++ benchmarks (except as noted below):

openCC

444.namd: pgcpp

Fortran benchmarks (except as noted below):

openf95

410.bwaves: pgf95

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Peak Compiler Invocation (Continued)

434.zeusmp: pgf95

437.leslie3d: pgf95

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

pgcc pgf95

435.gromacs: opencc openf95

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
 436.cactusADM: -DSPEC_CPU_LP64 -Mnomain
 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_CASE_FLAG -DSPEC_CPU_LINUX
 482.sphinx3: -DSPEC_CPU_LP64

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: -fastsse -Msmartalloc=huge -Mprefetch=t0 -Mloop32
-Mfprelaxed -Mipa=fast -Mipa=inline -tp shanghai-64
-Bstatic_pgi

482.sphinx3: -Mphi=indirect(pass 1) -Mpfo=indirect(pass 2)
-Mipa=fast(pass 2) -Mipa=inline(pass 2) -fastsse
-Mfprelaxed -Msmartalloc -tp shanghai-64 -Bstatic_pgi

C++ benchmarks:

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

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Peak Optimization Flags (Continued)

447.deallI: -march=barcelona -Ofast -static -INLINE:aggressive=on
-LNO:opt=0 -Wf,-fno-exceptions -m32 -OPT:unroll_times_max=8
-OPT:unroll_size=256 -OPT:unroll_level=2 -HP:bdt=2m:heap=2m
-GRA:unspill=on -CG:cmp_peep=on -TENV:frame_pointer=off

450.soplex: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -O3 -INLINE:aggressive=on
-OPT:IEEE_arith=3 -OPT:IEEE_NaN_Inf=off
-OPT:fold_unsigned_relops=on -OPT:malloc_alg=1
-CG:load_exe=0 -fno-exceptions -m32 -HP:bdt=2m

453.povray: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -INLINE:aggressive=on
-HP:bdt=2m:heap=2m

Fortran benchmarks:

410.bwaves: -fastsse -Msmartalloc -Mprefetch=nta -Mfprelaxed
-Mipa=fast -Mipa=inline -tp shanghai-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 -HP:bdt=2m:heap=2m

434.zeusmp: -fastsse -Mfprelaxed -Mprefetch=distance:8 -Mprefetch=t0
-Msmartalloc=huge -Msmartalloc=hugebss -Mipa=fast
-Mipa=inline -tp shanghai-64 -Bstatic_pgi

437.leslie3d: -Mphi=indirect(pass 1) -Mpfo=indirect(pass 2)
-Mipa=fast(pass 2) -Mipa=inline(pass 2) -fastsse
-Mvect=fuse -Msmartalloc=huge -Mprefetch=distance:8
-Mprefetch=t0 -Mfprelaxed -tp shanghai-64 -Bstatic_pgi

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

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

Benchmarks using both Fortran and C:

435.gromacs: -march=barcelona -Ofast -OPT:rsqrt=2 -HP:bdt=2m:heap=2m

436.cactusADM: -fastsse -Mconcur -Msmartalloc=huge -Mfprelaxed -Mipa=fast
-Mipa=inline -tp shanghai-64 -Bstatic_pgi

454.calculix: -Mphi=indirect(pass 1) -Mpfo=indirect(pass 2)
-Mipa=fast(pass 2) -Mipa=inline(pass 2) -fastsse
-Mvect=short -Msmartalloc=huge -Mprefetch=t0 -Mpre

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Peak Optimization Flags (Continued)

454.calculix (continued):

-Mfprelaxed -tp shanghai-64 -Bstatic_pgi

481.wrf: -fastsse -Mvect=noaltcode -Msmartalloc=huge

-Mprefetch=distance:8 -Mfprelaxed -tp shanghai-64

-Bstatic_pgi

Peak Other Flags

C benchmarks:

-Mipa=jobs:4(pass 2)

C++ benchmarks:

444.namd: -Mipa=jobs:4(pass 2)

Fortran benchmarks:

410.bwaves: -Mipa=jobs:4

434.zeusmp: -Mipa=jobs:4

437.leslie3d: -Mipa=jobs:4(pass 2)

Benchmarks using both Fortran and C:

436.cactusADM: -Mipa=jobs:4

454.calculix: -Mipa=jobs:4(pass 2)

The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2006/flags/pgi80_linux_flags.html

<http://www.spec.org/cpu2006/flags/x86-open64-4.2.2-flags-revB.html>

<http://www.spec.org/cpu2006/flags/hp-amd-linux-flags.html>

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2006/flags/pgi80_linux_flags.xml

<http://www.spec.org/cpu2006/flags/x86-open64-4.2.2-flags-revB.xml>

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