SPEC® CFP2006 Result

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Hewlett-Packard Company

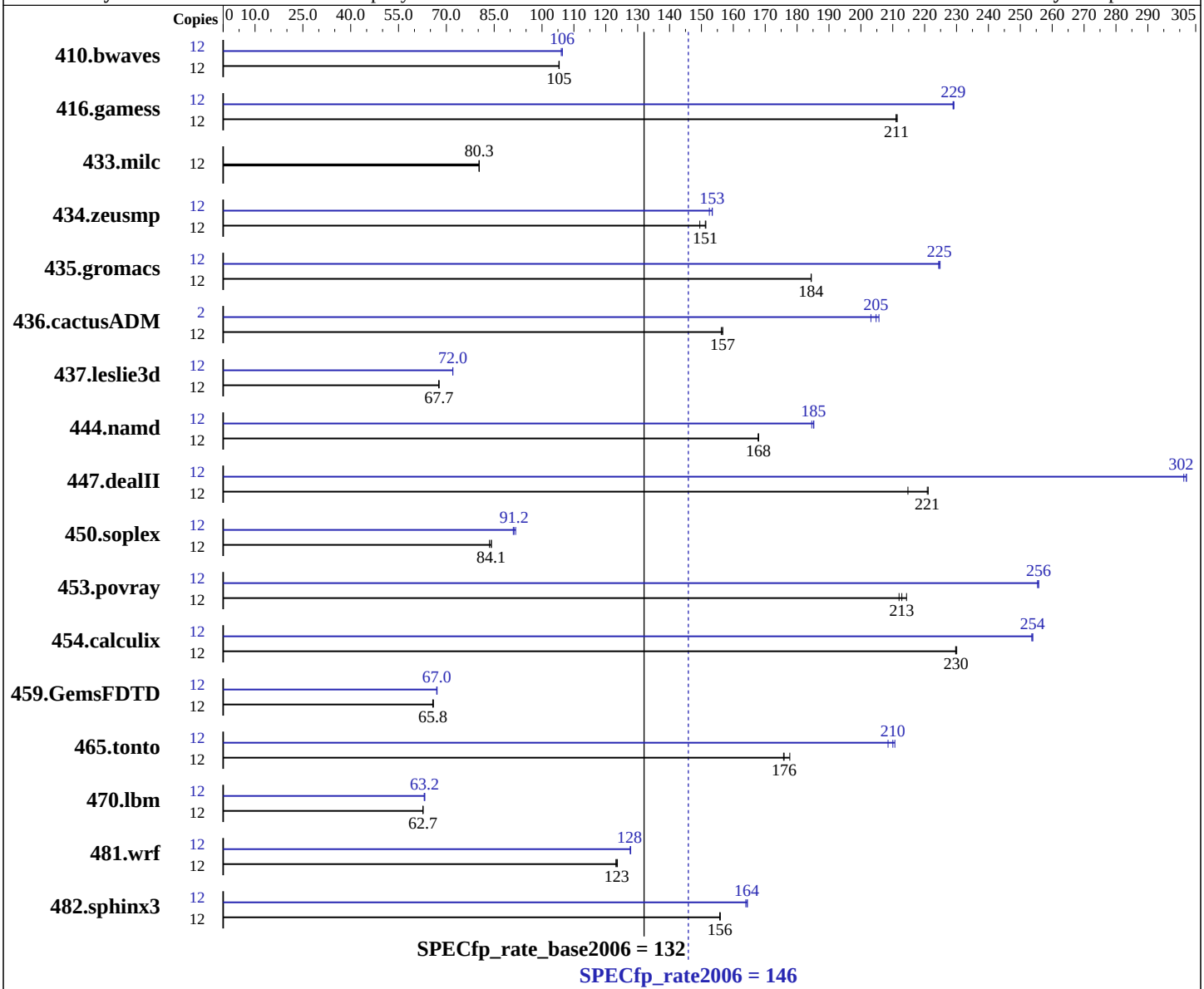
ProLiant DL585 G6
(2.8 GHz AMD Opteron 8439 SE)

SPECfp®_rate2006 = 146

SPECfp_rate_base2006 = 132

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

Test date: Jun-2009
Hardware Availability: Jul-2009
Software Availability: Apr-2009



Hardware

CPU Name:	AMD Opteron 8439 SE
CPU Characteristics:	
CPU MHz:	2800
FPU:	Integrated
CPU(s) enabled:	12 cores, 2 chips, 6 cores/chip
CPU(s) orderable:	2,4 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:	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: 32 GB (8x4 GB, PC2-6400P CL5)
Disk Subsystem: 1x146 GB 10 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	12	**1548**	**105**	1547	105	1549	105	12	1538	106	1533	106	**1533**	**106**
416.gamess	12	1114	211	1111	211	**1113**	**211**	12	1025	229	**1026**	**229**	1026	229
433.milc	12	1372	80.3	**1372**	**80.3**	1372	80.3	12	1372	80.3	**1372**	**80.3**	1372	80.3
434.zeusmp	12	730	149	721	151	**722**	**151**	12	712	153	**712**	**153**	716	152
435.gromacs	12	465	184	**465**	**184**	464	184	12	381	225	382	224	**381**	**225**
436.cactusADM	12	915	157	918	156	**916**	**157**	2	118	203	116	206	**117**	**205**
437.leslie3d	12	**1667**	**67.7**	1668	67.6	1666	67.7	12	1566	72.0	1567	72.0	**1566**	**72.0**
444.namd	12	**573**	**168**	573	168	574	168	12	521	185	**520**	**185**	519	185
447.dealII	12	621	221	**622**	**221**	639	215	12	456	301	**454**	**302**	454	302
450.soplex	12	1199	83.5	1190	84.1	**1190**	**84.1**	12	1100	91.0	**1097**	**91.2**	1091	91.7
453.povray	12	301	212	**300**	**213**	298	214	12	**250**	**256**	250	255	250	256
454.calculix	12	430	230	**431**	**230**	431	230	12	390	254	**390**	**254**	390	254
459.GemsFDTD	12	**1935**	**65.8**	1937	65.7	1930	66.0	12	1901	67.0	1897	67.1	**1900**	**67.0**
465.tonto	12	**671**	**176**	672	176	664	178	12	**562**	**210**	566	209	561	211
470.lbm	12	2630	62.7	**2631**	**62.7**	2632	62.7	12	2615	63.0	2607	63.2	**2610**	**63.2**
481.wrf	12	1088	123	**1086**	**123**	1084	124	12	**1049**	**128**	1049	128	1050	128
482.sphinx3	12	**1501**	**156**	1500	156	1502	156	12	1422	164	**1424**	**164**	1427	164

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 2457600'  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=5400 in /etc/sysctl.conf
 mount -t hugetlbfs nodev /mnt/hugepages
```

Platform Notes

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

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"

The x86 Open64 Compiler Suite is only available from (and supported by) AMD at
http://developer.amd.com/cpu/open64
```

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

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Base Portability Flags (Continued)

482.sphinx3: -DSPEC_CPU_LP64

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:11

C++ benchmarks:
-Mipa=jobs:11

Fortran benchmarks:
-Mipa=jobs:11

Benchmarks using both Fortran and C:
-Mipa=jobs:11

Peak Compiler Invocation

C benchmarks:
pgcc

C++ benchmarks (except as noted below):
openCC

444.namd: pgcpp

Continued on next page

Peak Compiler Invocation (Continued)

Fortran benchmarks (except as noted below):
openf95

410.bwaves: pgf95

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

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Peak Optimization Flags (Continued)

C++ benchmarks:

444.namd: -Mpfi(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

447.dealII: -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: -Mpfi=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

Continued on next page

Peak Optimization Flags (Continued)

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

454.calculix: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2) -Mipa=fast(pass 2) -Mipa=inline(pass 2) -fastsse -Mvect=short -Msmartalloc=huge -Mprefetch=t0 -Mpre -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:11(pass 2)

C++ benchmarks:

444.namd: -Mipa=jobs:11(pass 2)

Fortran benchmarks:

410.bwaves: -Mipa=jobs:11

434.zeusmp: -Mipa=jobs:11

437.leslie3d: -Mipa=jobs:11(pass 2)

Benchmarks using both Fortran and C:

436.cactusADM: -Mipa=jobs:11

454.calculix: -Mipa=jobs:11(pass 2)

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/x86-open64-4.2.2-flags-revA.html
http://www.spec.org/cpu2006/flags/pgi80_linux_flags.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/x86-open64-4.2.2-flags-revA.xml
http://www.spec.org/cpu2006/flags/pgi80_linux_flags.xml
http://www.spec.org/cpu2006/flags/hp-amd-linux-flags.xml

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For other inquiries, please contact webmaster@spec.org.

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