SPEC® CFP2006 Result

IBM Corporation

IBM BladeCenter LS42 (AMD Opteron 8384)

$SPECfp®2006 =$ 24.4

$SPECfp\_base2006 =$ 22.6
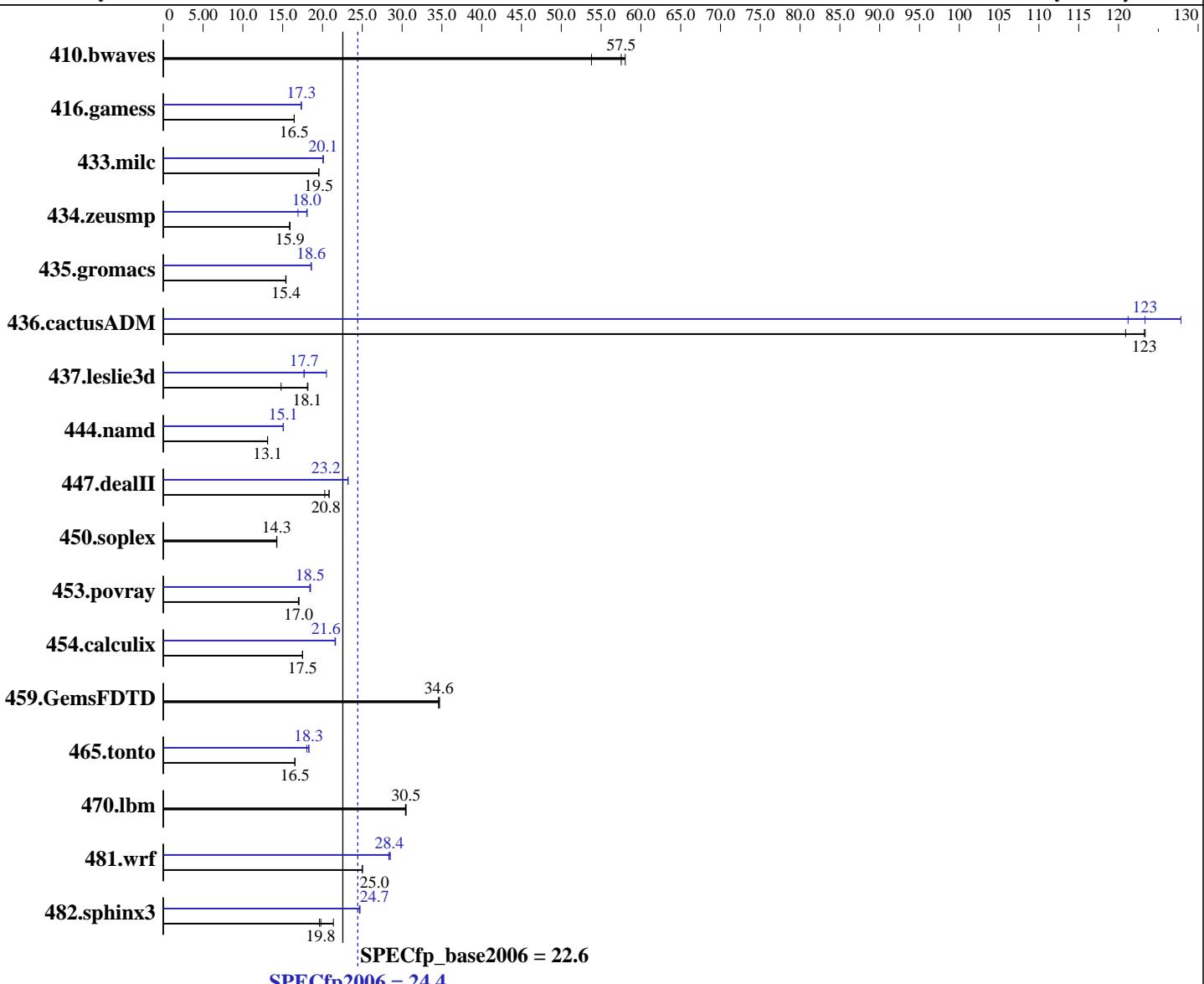
CPU2006 license: 11

Test sponsor: IBM Corporation

Tested by: Advanced Micro Devices

Test date: Nov-2008

Hardware Availability: Nov-2008

Software Availability: May-2008

Benchmark	Result
410.bwaves	57.5
416.gamess	17.3 / 16.5
433.milc	20.1 / 19.5
434.zeusmp	18.0 / 15.9
435.gromacs	18.6 / 15.4
436.cactusADM	123 / 123
437.leslie3d	17.7 / 18.1
444.namd	15.1 / 13.1
447.dealII	23.2 / 20.8
450.soplex	14.3
453.povray	18.5 / 17.0
454.calculix	21.6 / 17.5
459.GemsFDTD	34.6
465.tonto	18.3 / 16.5
470.lbm	30.5
481.wrf	28.4 / 25.0
482.sphinx3	24.7 / 19.8

SPECfp_base2006 = 22.6

SPECfp2006 = 24.4

Hardware

CPU Name: AMD Opteron 8384

CPU Characteristics:

CPU MHz: 2700

FPU: Integrated

CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip

CPU(s) orderable: 1,2,3,4 chips

Primary Cache: 64 KB I + 64 KB D on chip per core

Secondary Cache: 512 KB I+D on chip per core

Continued on next page

Software

Operating System: SuSE Linux Enterprise Server 10 (x86_64) SP2, Kernel 2.6.16.60-0.21-smp

Compiler: PGI Server Complete Version 7.2

Auto Parallel: Yes

File System: ReiserFS

System State: Run level 3 (Full multiuser with network)

Base Pointers: 32/64-bit

Peak Pointers: 64-bit

Continued on next page

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L3 Cache:	6 MB I+D on chip per chip
Other Cache:	None
Memory:	32 GB (8 x 4 GB DDR2-6400 ECC)
Disk Subsystem:	1 x 73 GB SAS, 10000 RPM
Other Hardware:	None

Other Software: binutils 2.18.50
32-bit and 64-bit libhugetlbfs libraries

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	234	58.0	**236**	**57.5**	253	53.8	234	58.0	**236**	**57.5**	253	53.8
416.gamess	1190	16.4	**1190**	**16.5**	1190	16.5	1129	17.3	1131	17.3	**1129**	**17.3**
433.milc	**470**	**19.5**	470	19.6	470	19.5	**457**	**20.1**	457	20.1	457	20.1
434.zeusmp	571	15.9	**572**	**15.9**	574	15.9	**505**	**18.0**	538	16.9	503	18.1
435.gromacs	464	15.4	**463**	**15.4**	463	15.4	384	18.6	384	18.6	**384**	**18.6**
436.cactusADM	98.9	121	**97.0**	**123**	96.9	123	**96.9**	**123**	93.5	128	98.6	121
437.leslie3d	517	18.2	**519**	**18.1**	635	14.8	**531**	**17.7**	459	20.5	531	17.7
444.namd	612	13.1	611	13.1	**612**	**13.1**	532	15.1	**532**	**15.1**	532	15.1
447.dealII	**549**	**20.8**	564	20.3	549	20.8	493	23.2	**493**	**23.2**	492	23.2
450.soplex	**585**	**14.3**	584	14.3	585	14.2	**585**	**14.3**	584	14.3	585	14.2
453.povray	312	17.0	**313**	**17.0**	314	17.0	288	18.5	289	18.4	**288**	**18.5**
454.calculix	472	17.5	471	17.5	**471**	**17.5**	382	21.6	**382**	**21.6**	381	21.6
459.GemsFDTD	**306**	**34.6**	307	34.6	306	34.7	**306**	**34.6**	307	34.6	306	34.7
465.tonto	596	16.5	594	16.6	**595**	**16.5**	545	18.0	538	18.3	**538**	**18.3**
470.lbm	451	30.5	**451**	**30.5**	452	30.4	451	30.5	**451**	**30.5**	452	30.4
481.wrf	446	25.0	447	25.0	**447**	**25.0**	394	28.3	**393**	**28.4**	392	28.5
482.sphinx3	912	21.4	994	19.6	**985**	**19.8**	**790**	**24.7**	791	24.6	789	24.7

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.

General Notes

    The libhugetlbfs libraries were installed using the
    installation rpms that came with the distribution.

    'ulimit -s unlimited' was used to set environment stack size
    'ulimit -l 2097152' was used to set environment locked pages in memory limit

    Set vm/nr_hugepages=7168 in /etc/sysctl.conf
    mount -t hugetlbfs nodev /mnt/hugepages

Continued on next page

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Test sponsor:	IBM Corporation	**Hardware Availability:**	Nov-2008
Tested by:	Advanced Micro Devices	**Software Availability:**	May-2008

General Notes (Continued)

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/root/work/cpu2006v1.1/pgi72/linux_lib64:/root/work/cpu2006v1.1/pgi72/linux_lib32"
PGI_HUGE_PAGES = "7168"
NCPUS = "8"
The powersaved was disabled, set the CPU frequency to its maximum.
Memory ChipKill Disabled in BIOS
```

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:
```
    -Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mconcur
    -Mfprelaxed -Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi
```

Continued on next page

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Software Availability: May-2008

Base Optimization Flags (Continued)

C++ benchmarks:
```
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed
-Mconcur --zc_eh -Mipa=fast -Mipa=inline -tp barcelona-64
-Bstatic_pgi
```

Fortran benchmarks:
```
-Mvect=cachesize:6291456 -fastsse -Mfprelaxed -Msmartalloc=huge
-Mconcur -Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi
```

Benchmarks using both Fortran and C:
```
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mconcur
-Mfprelaxed -Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi
```

Base Other Flags

C benchmarks:
```
-Mipa=jobs:8
```

C++ benchmarks:
```
-Mipa=jobs:8
```

Fortran benchmarks:
```
-Mipa=jobs:8
```

Benchmarks using both Fortran and C:
```
-Mipa=jobs:8
```

Peak Compiler Invocation

C benchmarks:
```
pgcc
```

C++ benchmarks:
```
pgcpp
```

Fortran benchmarks:
```
pgf95
```

Benchmarks using both Fortran and C:
```
pgcc pgf95
```

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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  -Mnomain
 437.leslie3d: -DSPEC_CPU_LP64
    444.namd: -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
```

Peak Optimization Flags

C benchmarks:

```
    433.milc: -Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge
            -Msafeptr -Mconcur -Mfprelaxed -Mipa=inline -Mipa=arg
            -Mipa=const -Mipa=ptr -Mipa=shape -tp barcelona-64
            -Bstatic_pgi

     470.lbm: basepeak = yes

  482.sphinx3: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)
            -Mipa=inline(pass 2) -Mvect=cachesize:6291456 -fastsse
            -Mfprelaxed -Msmartalloc -tp barcelona-64 -Bstatic_pgi
```

C++ benchmarks:

```
    444.namd: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)
            -Mipa=inline(pass 2) -Mvect=cachesize:6291456 -fastsse
            -Munroll=n:4 -Munroll=m:8 -Msmartalloc=huge -Mnodepchk
            -Mfprelaxed --zc_eh -tp barcelona-64 -Bstatic_pgi

   447.dealII: -Mvect=cachesize:6291456 -fastsse -alias=ansi
            -Msmartalloc=huge -Mprefetch=t0 -Mnovect -Mfprelaxed
            --zc_eh -Mipa=fast -Mipa=inline -tp barcelona-32
            -Bstatic_pgi

   450.soplex: basepeak = yes

   453.povray: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)
            -Mipa=fast(pass 2) -Mipa=inlinenopfo:3(pass 2)
            -Mipa=staticfunc(pass 2) -Mvect=cachesize:6291456 -fastsse
```

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Peak Optimization Flags (Continued)

453.povray (continued):
-Msmartalloc=huge -Mprefetch=t0 -Mfprelaxed
-tp barcelona-64 -Bstatic_pgi

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)
-Mipa=inline(pass 2) -Mvect=cachesize:6291456 -fastsse
-Msmartalloc=huge -Mvect=noaltcode -Mprefetch=t0
-Mfprelaxed -tp barcelona-64 -Bstatic_pgi

434.zeusmp: -Mvect=cachesize:6291456 -fastsse -Mfprelaxed -Mconcur
-Mprefetch=distance:8 -Mprefetch=t0 -Msmartalloc=huge
-Msmartalloc=hugebss -Mipa=fast -Mipa=inline
-tp barcelona-64 -Bstatic_pgi

437.leslie3d: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)
-Mconcur=noaltcode(pass 2) -Mipa=fast(pass 2)
-Mipa=inline(pass 2) -Mvect=cachesize:6291456 -fastsse
-Mvect=fuse -Msmartalloc=huge -Mprefetch=distance:8
-Mprefetch=t0 -Mfprelaxed -tp barcelona-64 -Bstatic_pgi

459.GemsFDTD: basepeak = yes

465.tonto: -Mvect=cachesize:6291456 -fastsse -O4 -Mvect=noaltcode
-Msmartalloc=huge -Mprefetch=distance:8 -Mprefetch=t0
-Mfprelaxed -Mipa=fast -Mipa=inline -tp barcelona-64
-Bstatic_pgi

Benchmarks using both Fortran and C:

435.gromacs: -Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge
-Mfprelaxed -Mconcur -Mfpapprox=rsqrt -Mipa=fast
-Mipa=inline -tp barcelona-64 -Bstatic_pgi

436.cactusADM: -Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge
-Mfprelaxed -Mconcur -Mdse -Mipa=fast -Mipa=inline
-tp barcelona-64 -Bstatic_pgi

454.calculix: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)
-Mipa=fast(pass 2) -Mipa=inline(pass 2)
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge
-Mloop32 -Mprefetch=t0 -Mpre -Mfprelaxed -tp barcelona-64
-Bstatic_pgi

481.wrf: -Mvect=cachesize:6291456 -fastsse -Mvect=noaltcode
-Msmartalloc=huge -Mprefetch=distance:8 -Mconcur=noaltcode
-Mfprelaxed -tp barcelona-64 -Bstatic_pgi

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Peak Other Flags

C benchmarks:
    -Mipa=jobs:8(pass 2)

C++ benchmarks:
    -Mipa=jobs:8(pass 2)

Fortran benchmarks:
    -Mipa=jobs:8

Benchmarks using both Fortran and C (except as noted below):
    -Mipa=jobs:8(pass 2)

        481.wrf: No flags used

The flags file that was used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/pgi72_linux_flags.20090713.01.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/pgi72_linux_flags.20090713.01.xml

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