SPEC® CFP2006 Result

IBM Corporation

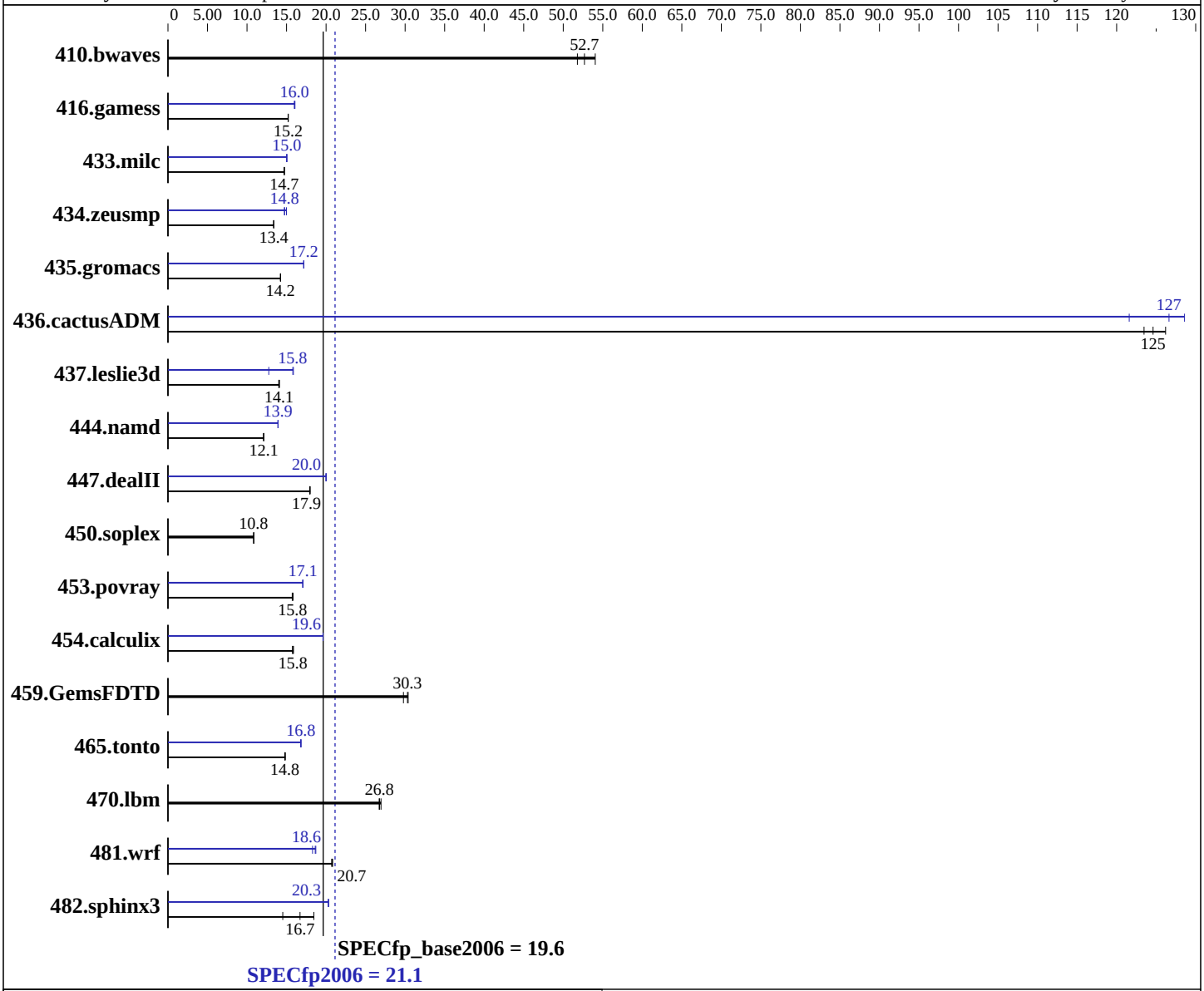
IBM BladeCenter LS42 (AMD Opteron 8380)

SPECfp®2006 = 21.1

SPECfp_base2006 = 19.6

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation

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



Hardware

CPU Name:	AMD Opteron 8380
CPU Characteristics:	
CPU MHz:	2500
FPU:	Integrated
CPU(s) enabled:	16 cores, 4 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

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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
Other Software:	binutils 2.18

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L3 Cache: 6 MB I+D on chip per chip
Other Cache: None
Memory: 64 GB (16 x 4 GB DDR2-6400 ECC)
Disk Subsystem: 1 x 73 GB SAS, 10000 RPM
Other Hardware: None

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	262	51.8	251	54.0	**258**	**52.7**	262	51.8	251	54.0	**258**	**52.7**
416.gamess	**1288**	**15.2**	1286	15.2	1289	15.2	1224	16.0	1219	16.1	**1223**	**16.0**
433.milc	624	14.7	623	14.7	**624**	**14.7**	**611**	**15.0**	611	15.0	611	15.0
434.zeusmp	679	13.4	681	13.4	**680**	**13.4**	**616**	**14.8**	618	14.7	607	15.0
435.gromacs	**501**	**14.2**	502	14.2	501	14.2	**416**	**17.2**	415	17.2	416	17.2
436.cactusADM	96.8	123	94.7	126	**95.9**	**125**	98.3	122	**94.4**	**127**	92.9	129
437.leslie3d	671	14.0	**669**	**14.1**	667	14.1	737	12.8	592	15.9	**595**	**15.8**
444.namd	661	12.1	**662**	**12.1**	664	12.1	576	13.9	**576**	**13.9**	577	13.9
447.dealII	636	18.0	638	17.9	**638**	**17.9**	572	20.0	572	20.0	**572**	**20.0**
450.soplex	767	10.9	769	10.8	**769**	**10.8**	767	10.9	769	10.8	**769**	**10.8**
453.povray	338	15.7	**338**	**15.8**	336	15.8	311	17.1	312	17.0	**312**	**17.1**
454.calculix	524	15.8	**522**	**15.8**	520	15.9	421	19.6	421	19.6	**421**	**19.6**
459.GemsFDTD	356	29.8	349	30.4	**350**	**30.3**	356	29.8	349	30.4	**350**	**30.3**
465.tonto	**665**	**14.8**	665	14.8	663	14.9	584	16.8	586	16.8	**585**	**16.8**
470.lbm	510	26.9	514	26.7	**513**	**26.8**	510	26.9	514	26.7	**513**	**26.8**
481.wrf	**539**	**20.7**	536	20.8	539	20.7	597	18.7	611	18.3	**600**	**18.6**
482.sphinx3	1056	18.5	1342	14.5	**1167**	**16.7**	960	20.3	961	20.3	**960**	**20.3**

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=14336 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
```

Continued on next page

General Notes (Continued)

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/cpu2006/pgi72/linux_lib32:/cpu2006/pgi72/linux_lib64"
PGI_HUGE_PAGES = "14336"
SPEC_DIR = "/cpu2006"
NCPUS = "16"

Processor Performance States Disabled in BIOS
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
```

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
```

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

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.20090713.00.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/pgi72_linux_flags.20090713.00.xml`

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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