SPEC® CFP2006 Result

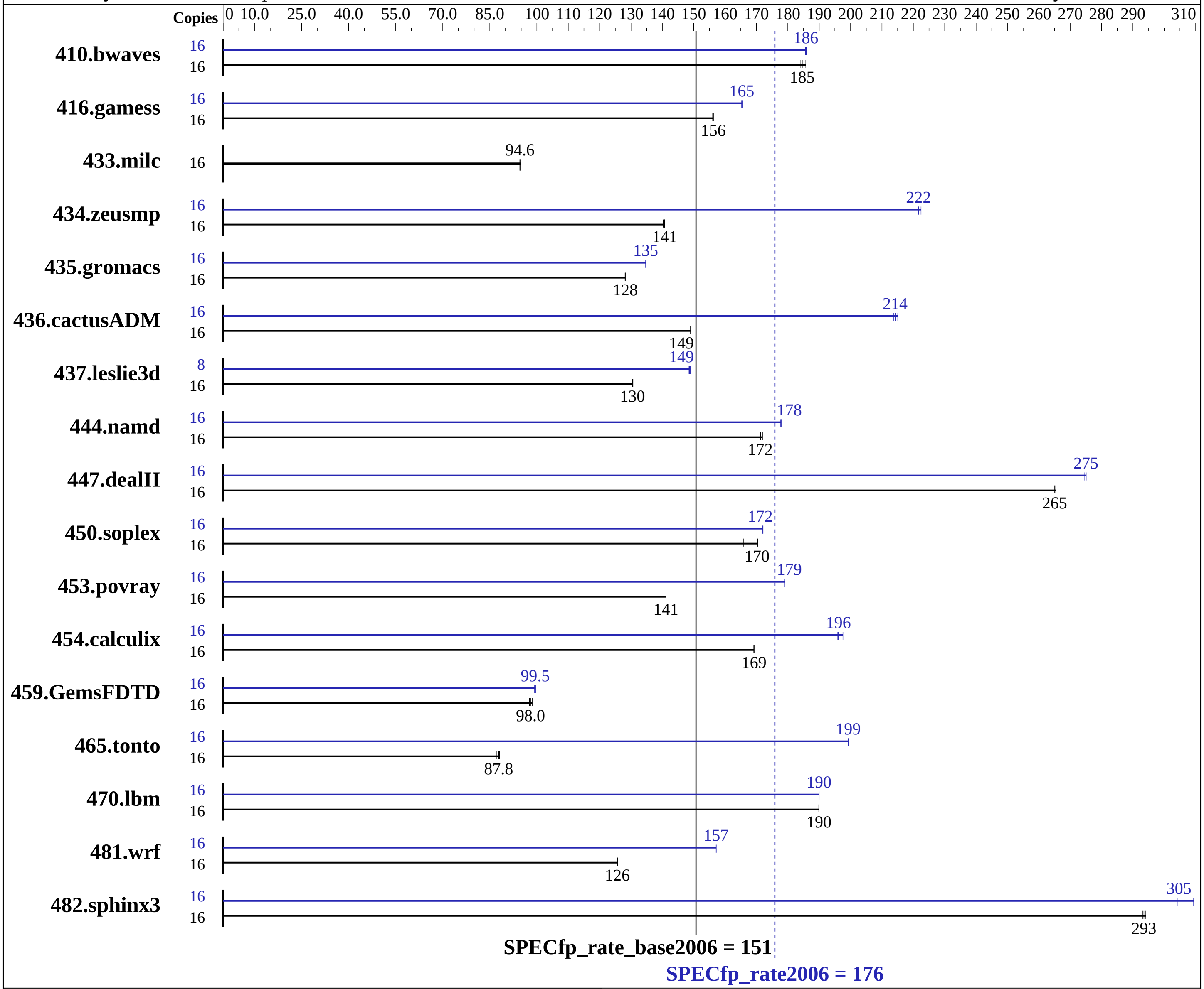
IBM Corporation

IBM System p 550 (4.2 GHz, 8 core, RedHat)

SPECfp®_rate2006 = 176

SPECfp_rate_base2006 = 151

CPU2006 license:	11	**Test date:**	Jan-2008
Test sponsor:	IBM Corporation	**Hardware Availability:**	Feb-2008
Tested by:	IBM Corporation	**Software Availability:**	Nov-2007



Hardware

CPU Name:	POWER6
CPU Characteristics:	
CPU MHz:	4200
FPU:	Integrated
CPU(s) enabled:	8 cores, 4 chips, 2 cores/chip, 2 threads/core
CPU(s) orderable:	2,4,6,8 cores
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	4 MB I+D on chip per core

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Software

Operating System:	Red Hat Enterprise Linux Advanced Platform 5.1 for IBM POWER
Compiler:	IBM XL C/C++ Advanced Edition for Linux, V9.0 IBM XL Fortran Advanced Edition for Linux, V11.1
Auto Parallel:	No
File System:	ext3
System State:	Multi-User
Base Pointers:	32-bit
Peak Pointers:	32/64-bit

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L3 Cache:	32 MB I+D off chip per chip
Other Cache:	None
Memory:	64 GB (32x2 GB) DDR2 667 MHz
Disk Subsystem:	2x146 GB SAS 15K RPM
Other Hardware:	None

Other Software:	-IBM Post-Link Optimization for Linux on POWER, Version 5.4.0-10 -MicroQuill SmartHeap 8.1 -IBM Engineering and Scientific Subroutine Library for Linux on POWER, Version 4.3

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	16	1171	186	1181	184	**1178**	**185**	16	1171	186	**1171**	**186**	1170	186
416.gamess	16	**2005**	**156**	2008	156	2005	156	16	1895	165	1894	165	**1895**	**165**
433.milc	16	1553	94.6	1550	94.8	**1552**	**94.6**	16	1553	94.6	1550	94.8	**1552**	**94.6**
434.zeusmp	16	1038	140	1035	141	**1035**	**141**	16	657	222	655	222	**657**	**222**
435.gromacs	16	892	128	**891**	**128**	891	128	16	**848**	**135**	848	135	849	135
436.cactusADM	16	1282	149	**1283**	**149**	1285	149	16	**893**	**214**	894	214	889	215
437.leslie3d	16	1153	130	**1153**	**130**	1151	131	8	506	148	505	149	**506**	**149**
444.namd	16	749	171	**747**	**172**	746	172	16	**722**	**178**	722	178	721	178
447.dealII	16	694	264	690	265	**691**	**265**	16	**665**	**275**	665	275	666	275
450.soplex	16	804	166	783	170	**784**	**170**	16	776	172	**776**	**172**	775	172
453.povray	16	606	140	603	141	**603**	**141**	16	476	179	**476**	**179**	475	179
454.calculix	16	780	169	780	169	**780**	**169**	16	668	198	**673**	**196**	674	196
459.GemsFDTD	16	1739	97.6	1723	98.5	**1732**	**98.0**	16	1710	99.3	**1706**	**99.5**	1705	99.6
465.tonto	16	1788	88.1	1808	87.1	**1792**	**87.8**	16	790	199	790	199	**790**	**199**
470.lbm	16	**1157**	**190**	1158	190	1157	190	16	1158	190	**1157**	**190**	1157	190
481.wrf	16	1421	126	**1422**	**126**	1423	126	16	1140	157	**1137**	**157**	1137	157
482.sphinx3	16	1060	294	**1062**	**293**	1064	293	16	1025	304	**1024**	**305**	1008	309

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

General Notes

```
kernel release 2.6.18-53.el5.

See flags file for details on following settings.

ulimit -s (stack) set to 1048576.


System set to Enhanced mode when defining partition on HMC

Large pages reserved as follows by root user:
    echo 1600 > /proc/sys/vm/nr_hugepages
System configured with libhugetlbfs library for application access to large pages
Environment variables set before executing benchmarks.
    export HUGETLB_VERBOSE=0
```

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General Notes (Continued)

```
     export HUGETLB_MORECORE=yes
     export XLFRTEOPTS=intrinthds=1

 IBM Post-Link Optimization tool used for
     435.gromacs 436.cactusADM 482.sphinx3

 Benchmarks bound to a processor using numactl on the submit command.
```

Base Compiler Invocation

C benchmarks:
`xlc -qlanglvl=extc99`

C++ benchmarks:
`xlC`

Fortran benchmarks:
`xlf95`

Benchmarks using both Fortran and C:
`xlc -qlanglvl=extc99 xlf95`

Base Portability Flags

410.bwaves: -qfixed
416.gamess: -qfixed
434.zeusmp: -qfixed
435.gromacs: -qfixed -qextname
436.cactusADM: -qfixed -qextname
437.leslie3d: -qfixed
454.calculix: -qfixed -qextname
481.wrf: -DNOUNDERSCORE
482.sphinx3: -qchars=signed

Base Optimization Flags

C benchmarks:
`-O5 -qnoenablevmx -lhugetlbfs`

C++ benchmarks:
`-O5 -qrtti -qnoenablevmx -qstaticlink`

Fortran benchmarks:
`-O5 -qsmallstack=dynlenonheap -qalias=nostd -qnoenablevmx`
`-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT`

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
```
-O5 -qnoenablevmx -qsmallstack=dynlenonheap -qalias=nostd
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT
```

Base Other Flags

C benchmarks:
```
-qipa=noobject -qipa=threads
```

C++ benchmarks:
```
-qipa=noobject -qipa=threads
```

Fortran benchmarks:
```
-qipa=noobject -qipa=threads
```

Benchmarks using both Fortran and C:
```
-qipa=noobject -qipa=threads
```

Peak Compiler Invocation

C benchmarks:
```
xlc -qlanglvl=extc99
```

C++ benchmarks:
```
xlC
```

Fortran benchmarks:
```
xlf95
```

Benchmarks using both Fortran and C:
```
xlc -qlanglvl=extc99 xlf95
```

Peak Portability Flags

410.bwaves: -qfixed
416.gamess: -qfixed
434.zeusmp: -qfixed
435.gromacs: -qfixed -qextname
436.cactusADM: -qfixed -qextname
437.leslie3d: -qfixed
454.calculix: -qfixed -qextname
481.wrf: -DNOUNDERSCORE
482.sphinx3: -qchars=signed

Peak Optimization Flags

C benchmarks:

433.milc: `basepeak = yes`

470.lbm: `-O3 -qarch=pwr6e -qtune=pwr6 -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT -q64`

482.sphinx3: `-Wl,-q` `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O4 -lhugetlbfs`

C++ benchmarks:

444.namd: `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O3 -qarch=pwr6e -qtune=pwr6`

447.dealII: `-O5 -qrtti -qnoenablevmx -qstaticlink -Wl,--whole-archive /usr/lib/libsmartheap.a -Wl,--no-whole-archive`

450.soplex: `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O4 -qstrict -lhugetlbfs`

453.povray: `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -lsmartheap`

Fortran benchmarks:

410.bwaves: `-O5 -qsmallstack=dynlenonheap -lhugetlbfs`

416.gamess: `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -qalias=nostd -qnoenablevmx`

434.zeusmp: `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O3 -qarch=pwr6e -qtune=pwr6 -qxlf90=nosignedzero -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT`

437.leslie3d: `-O3 -qarch=pwr6e -qtune=pwr6 -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT -q64`

459.GemsFDTD: `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT -q64`

465.tonto: `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -lessl -lsmartheap -lxlf90_r`

Benchmarks using both Fortran and C:

435.gromacs: `-Wl,-q -O2 -qarch=pwr6e -qtune=pwr6 -lhugetlbfs`

436.cactusADM: `-Wl,-q` `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O2 -qarch=pwr6e -qtune=pwr6 -qnostrict -lhugetlbfs`

Continued on next page

Peak Optimization Flags (Continued)

454.calculix: `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O4`
`-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT`

481.wrf: `-O5 -qnoenablevmx -qsmallstack=dynlenonheap -lhugetlbfs`

Peak Other Flags

C benchmarks:
`-qipa=noobject -qipa=threads`

C++ benchmarks:
`-qipa=noobject -qipa=threads`

Fortran benchmarks:
`-qipa=noobject -qipa=threads`

Benchmarks using both Fortran and C:
`-qipa=noobject -qipa=threads`

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

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

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

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