SPEC® CFP2006 Result

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IBM Corporation

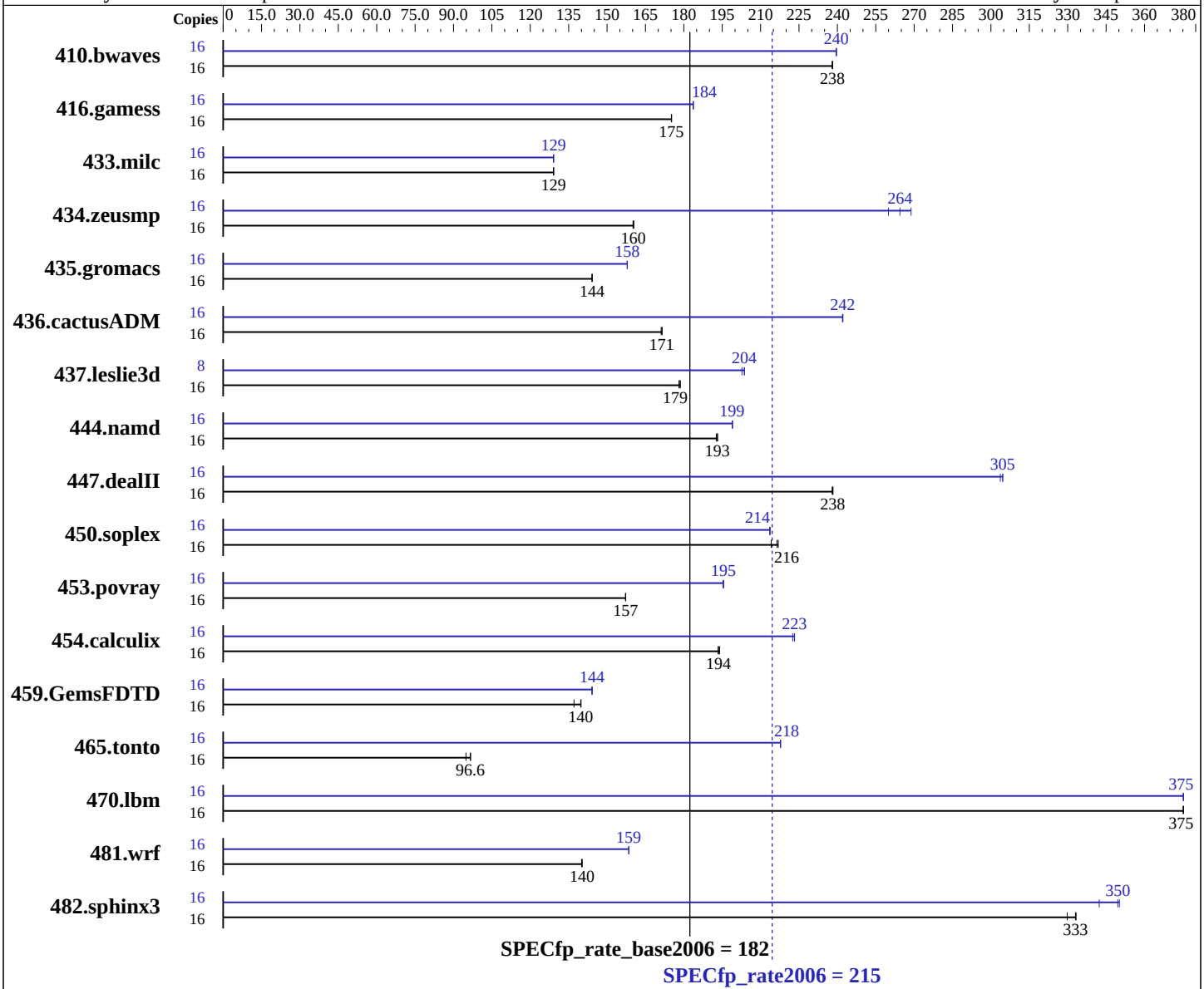
IBM System p 570 (4.7 GHz, 8 core, SLES)

SPECfp®_rate2006 = 215

SPECfp_rate_base2006 = 182

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

Test date: Jun-2007
Hardware Availability: Jun-2007
Software Availability: Sep-2007



Hardware

CPU Name:	POWER6
CPU Characteristics:	
CPU MHz:	4700
FPU:	Integrated
CPU(s) enabled:	8 cores, 4 chips, 2 cores/chip, 2 threads/core
CPU(s) orderable:	2,4,8,12,16 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:	SUSE Linux Enterprise 10 SP1
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:	ReiserFS
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: 2x73 GB SAS 15K RPM
Other Hardware: None

Other Software: -Post-Link Optimization for Linux on POWER, Version 5.4.0
-MicroQuill SmartHeap 7.3
-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	**913**	**238**	913	238	914	238	16	908	239	907	240	**908**	**240**
416.gamess	16	1789	175	1788	175	**1788**	**175**	16	1706	184	**1706**	**184**	1705	184
433.milc	16	**1138**	**129**	1138	129	1138	129	16	**1138**	**129**	1138	129	1138	129
434.zeusmp	16	909	160	907	160	**908**	**160**	16	542	269	560	260	**551**	**264**
435.gromacs	16	792	144	792	144	**792**	**144**	16	**723**	**158**	724	158	723	158
436.cactusADM	16	1115	172	**1115**	**171**	1117	171	16	**790**	**242**	790	242	790	242
437.leslie3d	16	**842**	**179**	844	178	842	179	8	369	204	**369**	**204**	371	203
444.namd	16	**664**	**193**	664	193	666	193	16	645	199	**645**	**199**	645	199
447.dealII	16	768	238	769	238	**768**	**238**	16	601	305	**601**	**305**	603	304
450.soplex	16	623	214	**617**	**216**	615	217	16	625	214	**625**	**214**	624	214
453.povray	16	541	157	541	157	**541**	**157**	16	436	195	435	196	**435**	**195**
454.calculix	16	683	193	680	194	**682**	**194**	16	591	223	593	223	**591**	**223**
459.GemsFDTD	16	1238	137	1214	140	**1215**	**140**	16	**1178**	**144**	1177	144	1178	144
465.tonto	16	1659	94.9	**1630**	**96.6**	1629	96.7	16	723	218	723	218	**723**	**218**
470.lbm	16	586	375	586	375	**586**	**375**	16	586	375	586	375	**586**	**375**
481.wrf	16	1274	140	1276	140	**1274**	**140**	16	1127	159	1128	158	**1127**	**159**
482.sphinx3	16	**936**	**333**	945	330	936	333	16	890	350	911	342	**892**	**350**

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

General Notes

```
kernel release 2.6.16.46-0.12-ppc64.

See flags file for details on following settings.

ulimit -s (stack) set to unlimited.


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
```

Continued on next page

General Notes (Continued)

```
    export HUGETLB_MORECORE=yes
    export HUGETLB_MORECORE_HEAPBASE=0x50000000
    export XLFRTEOPTS=intrinthds=1

fdpr binary optimization tool used for
    435.gromacs 436.cactusADM 482.sphinx3

Benchmarks bound to a processor using taskset 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 -B/usr/share/libhugetlbfs/ -tl
-Wl,--hugetlbfs-link=BDT
```

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

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 -B/usr/share/libhugetlbfs/ -tl`
`-Wl,--hugetlbfs-link=BDT -qsmallstack=dynlenonheap -qalias=nostd`

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`

Continued on next page

Peak Portability Flags (Continued)

481.wrf: -DNOUNDERSCORE
482.sphinx3: -qchars=signed

Peak Optimization Flags

C benchmarks:

433.milc: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qnoenablevmx
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT

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/libhugetlbfs.a
-Wl,--no-whole-archive

450.soplex: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qstrict
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT

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 -lhugetlbfs
-lxlf90_r

Continued on next page

Peak Optimization Flags (Continued)

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 -lhugetlbfs`

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

481.wrf: `-O5 -qnoenablevmx -qalias=nostd -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.20090714.01.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/lop-xl-flags.20090714.01.xml`

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