SPEC® CFP2006 Result

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IBM Corporation

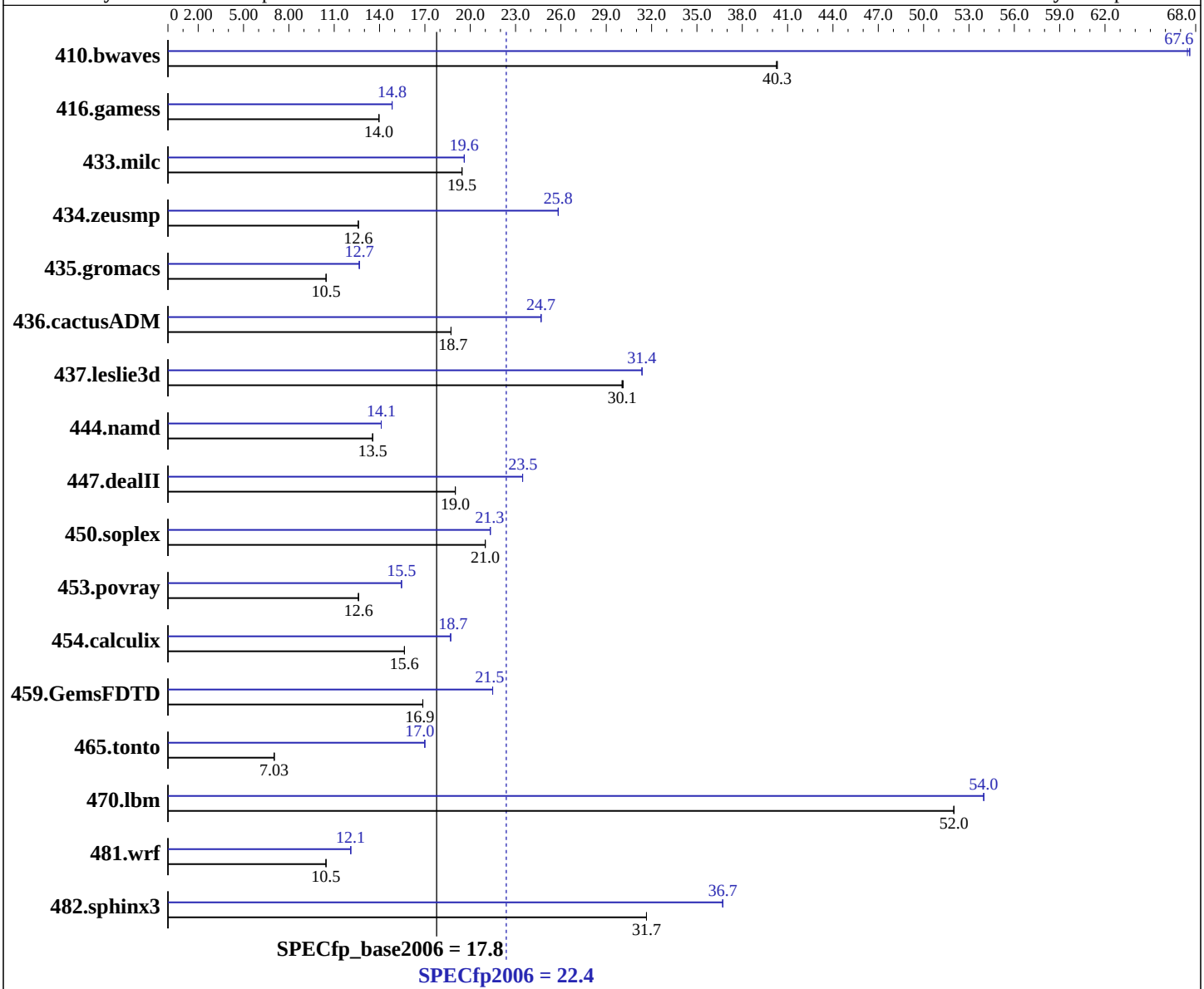
IBM System p 570 (4.7 GHz, 1 core, SLES)

SPECfp®2006 = 22.4

SPECfp_base2006 = 17.8

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:	1 core, 1 chip, 2 cores/chip
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: 32 GB (16x2 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					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	338	40.3	337	40.3	**337**	**40.3**	201	67.5	**201**	**67.6**	201	67.6
416.gamess	1403	14.0	1402	14.0	**1403**	**14.0**	1320	14.8	**1320**	**14.8**	1321	14.8
433.milc	472	19.5	472	19.5	**472**	**19.5**	**468**	**19.6**	468	19.6	468	19.6
434.zeusmp	**722**	**12.6**	722	12.6	723	12.6	**352**	**25.8**	352	25.8	352	25.8
435.gromacs	**682**	**10.5**	682	10.5	682	10.5	564	12.7	**564**	**12.7**	564	12.7
436.cactusADM	638	18.7	**638**	**18.7**	638	18.7	484	24.7	**484**	**24.7**	484	24.7
437.leslie3d	313	30.0	**313**	**30.1**	312	30.1	**300**	**31.4**	300	31.4	300	31.4
444.namd	**592**	**13.5**	592	13.5	592	13.5	568	14.1	**568**	**14.1**	568	14.1
447.dealII	602	19.0	**602**	**19.0**	602	19.0	487	23.5	**487**	**23.5**	487	23.5
450.soplex	**397**	**21.0**	397	21.0	397	21.0	**391**	**21.3**	391	21.3	391	21.3
453.povray	422	12.6	422	12.6	**422**	**12.6**	344	15.5	**344**	**15.5**	344	15.5
454.calculix	527	15.6	527	15.6	**527**	**15.6**	441	18.7	441	18.7	**441**	**18.7**
459.GemsFDTD	**629**	**16.9**	629	16.9	629	16.9	**494**	**21.5**	494	21.5	494	21.5
465.tonto	1400	7.03	**1399**	**7.03**	1399	7.03	**579**	**17.0**	579	17.0	579	17.0
470.lbm	264	52.0	**264**	**52.0**	264	52.0	255	54.0	255	54.0	**255**	**54.0**
481.wrf	**1068**	**10.5**	1068	10.5	1068	10.5	**924**	**12.1**	924	12.1	923	12.1
482.sphinx3	616	31.7	**616**	**31.7**	616	31.7	**531**	**36.7**	531	36.7	531	36.7

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 200 > /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 HUGETLB_MORECORE_HEAPBASE=0x50000000
    export XLFRTEOPTS=intrinthds=1
Linux booted with the options:
       maxcpus=1 smt-enabled=off

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
```

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Base Optimization Flags (Continued)

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

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`

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Peak Portability Flags (Continued)

437.leslie3d: -qfixed
454.calculix: -qfixed -qextname
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

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Peak Optimization Flags (Continued)

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