



SPEC[®] CFP2006 Result

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IBM Corporation

SPECfp[®]_rate2006 = 75.0

IBM BladeCenter JS22 (4.0 GHz, 4 core, SLES)

SPECfp_rate_base2006 = 65.7

CPU2006 license: 11

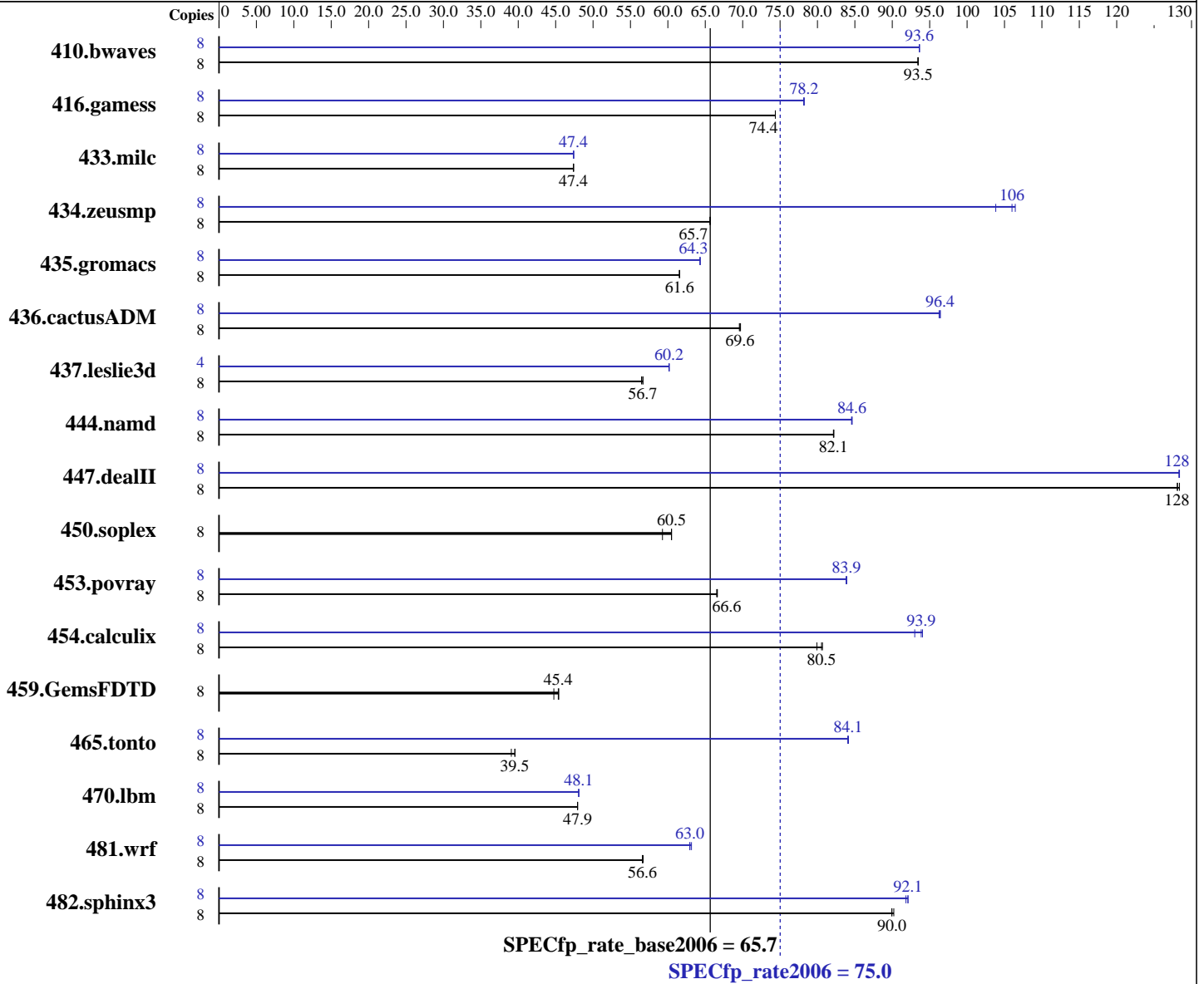
Test date: Oct-2007

Test sponsor: IBM Corporation

Hardware Availability: Nov-2007

Tested by: IBM Corporation

Software Availability: Sep-2007



Hardware

CPU Name: POWER6
 CPU Characteristics: 4000
 CPU MHz: Integrated
 FPU: 4 cores, 2 chips, 2 cores/chip, 2 threads/core
 CPU(s) enabled: 4 cores
 CPU(s) orderable: 4 cores
 Primary Cache: 64 KB I + 64 KB D on chip per core
 Secondary Cache: 4 MB I+D on chip per core

Continued on next page

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: ext3
 System State: Multi-User
 Base Pointers: 32-bit
 Peak Pointers: 32/64-bit

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L3 Cache: None
Other Cache: None
Memory: 16 GB (4x4 GB) DDR2 667 MHz
Disk Subsystem: 1x73 GB SAS 15K RPM
Other Hardware: None

Other Software: -IBM Post-Link Optimization for Linux on POWER, Version 5.4.0-10
-MicroQuill SmartHeap 7.3
-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	8	1164	93.4	1163	93.5	1163	93.5	8	1161	93.6	1161	93.6	1161	93.6
416.gamess	8	2106	74.4	2106	74.4	2106	74.4	8	2003	78.2	2002	78.2	2004	78.1
433.milc	8	1550	47.4	1550	47.4	1550	47.4	8	1549	47.4	1550	47.4	1550	47.4
434.zeusmp	8	1109	65.7	1109	65.7	1109	65.6	8	684	106	687	106	701	104
435.gromacs	8	928	61.5	928	61.6	928	61.6	8	888	64.3	888	64.3	888	64.3
436.cactusADM	8	1371	69.7	1374	69.6	1373	69.6	8	993	96.3	992	96.4	992	96.4
437.leslie3d	8	1327	56.7	1331	56.5	1327	56.7	4	625	60.2	625	60.2	625	60.2
444.namd	8	781	82.1	781	82.2	781	82.1	8	759	84.6	758	84.6	758	84.6
447.dealII	8	714	128	713	128	714	128	8	713	128	713	128	713	128
450.soplex	8	1125	59.3	1103	60.5	1103	60.5	8	1125	59.3	1103	60.5	1103	60.5
453.povray	8	640	66.5	639	66.6	639	66.6	8	507	83.9	507	83.9	508	83.8
454.calculix	8	826	79.9	818	80.7	819	80.5	8	702	94.0	703	93.9	710	93.0
459.GemsFDTD	8	1869	45.4	1872	45.4	1896	44.8	8	1869	45.4	1872	45.4	1896	44.8
465.tonto	8	1989	39.6	1991	39.5	2014	39.1	8	936	84.1	936	84.1	937	84.1
470.lbm	8	2293	47.9	2293	47.9	2293	47.9	8	2286	48.1	2286	48.1	2286	48.1
481.wrf	8	1576	56.7	1579	56.6	1579	56.6	8	1415	63.2	1420	62.9	1419	63.0
482.sphinx3	8	1733	90.0	1729	90.2	1734	89.9	8	1698	91.8	1693	92.1	1693	92.1

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

General Notes

kernel release 2.6.16.53-0.8-ppc64.

See flags file for details on following settings.

ulimit -s (stack) set to unlimited.

The binaries were compiled on a system with 32 GB of memory.

Large pages reserved as follows by root user:

```
echo 530 > /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
```

fdpr binary 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
-Wl,--whole-archive /usr/lib/libhugetlbfs.a -Wl,--no-whole-archive
```

Fortran benchmarks:

```
-O5 -qsmallstack=dynlenonheap -qalias=nostd -qnoenablevmx
-B/usr/share/libhugetlbfs/ -t1 -Wl,--hugetlbfs-link=BDT
```

Continued on next page



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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

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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: basepeak = yes

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: basepeak = yes

465.tonto: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -less1 -lhugetlbfs
-lxlf90_r

Benchmarks using both Fortran and C:

Continued on next page



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Peak Optimization Flags (Continued)

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-x1-flags.20090714.00.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/lop-x1-flags.20090714.00.xml>

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For other inquiries, please contact webmaster@spec.org.

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