SPEC® CFP2006 Result

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IBM Corporation

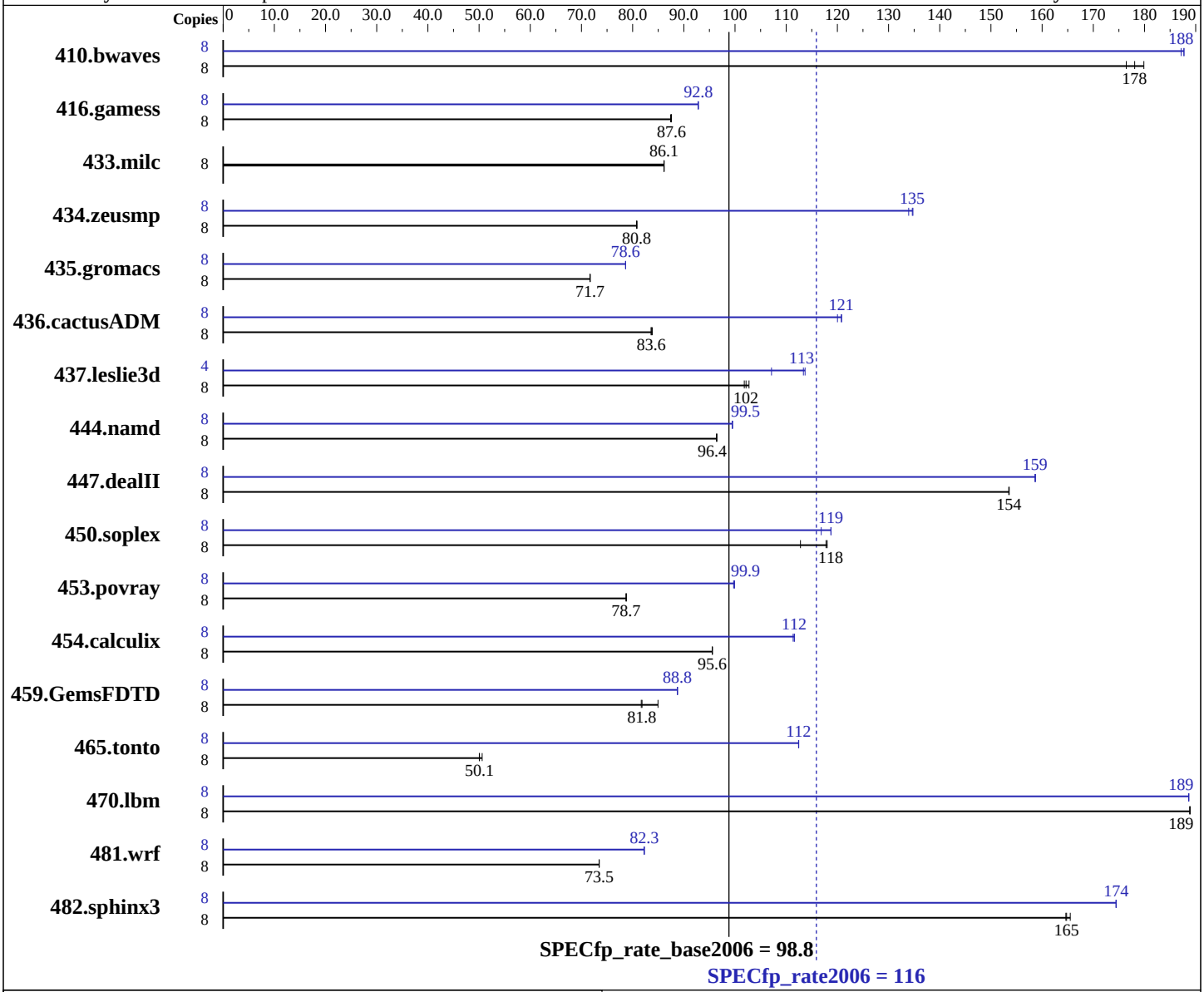
IBM System p 570 (4.7 GHz, 4 core, RHEL)

SPECfp®_rate2006 = 116

SPECfp_rate_base2006 = 98.8

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

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



Hardware

CPU Name:	POWER6
CPU Characteristics:	
CPU MHz:	4700
FPU:	Integrated
CPU(s) enabled:	4 cores, 2 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

Continued on next page

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: 32 GB (16x2 GB) DDR2 667 MHz
Disk Subsystem: 2x73 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	8	604	180	616	176	**611**	**178**	8	**579**	**188**	579	188	581	187
416.gamess	8	**1789**	**87.6**	1792	87.4	1788	87.6	8	1687	92.8	**1687**	**92.8**	1688	92.8
433.milc	8	853	86.1	**853**	**86.1**	852	86.2	8	853	86.1	**853**	**86.1**	852	86.2
434.zeusmp	8	**901**	**80.8**	902	80.7	900	80.9	8	540	135	544	134	**541**	**135**
435.gromacs	8	**797**	**71.7**	797	71.7	797	71.7	8	727	78.6	**726**	**78.6**	726	78.6
436.cactusADM	8	**1143**	**83.6**	1143	83.6	1140	83.8	8	**792**	**121**	797	120	791	121
437.leslie3d	8	732	103	739	102	**736**	**102**	4	351	107	331	114	**332**	**113**
444.namd	8	665	96.4	**665**	**96.4**	665	96.4	8	645	99.5	**645**	**99.5**	645	99.5
447.dealII	8	**596**	**154**	596	154	596	153	8	577	159	**577**	**159**	577	159
450.soplex	8	592	113	565	118	**566**	**118**	8	571	117	**562**	**119**	562	119
453.povray	8	541	78.7	**541**	**78.7**	540	78.8	8	427	99.7	**426**	**99.9**	426	99.9
454.calculix	8	691	95.5	**691**	**95.6**	690	95.6	8	591	112	593	111	**592**	**112**
459.GemsFDTD	8	**1037**	**81.8**	999	85.0	1039	81.7	8	**956**	**88.8**	957	88.7	956	88.8
465.tonto	8	1573	50.0	1556	50.6	**1572**	**50.1**	8	700	112	**700**	**112**	700	112
470.lbm	8	582	189	582	189	**582**	**189**	8	583	189	583	189	**583**	**189**
481.wrf	8	1216	73.5	**1217**	**73.5**	1217	73.4	8	1087	82.2	1086	82.3	**1086**	**82.3**
482.sphinx3	8	**946**	**165**	942	165	947	165	8	894	174	**894**	**174**	894	174

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

General Notes

```
kernel release 2.6.18-52.el5.

See flags file for details on following settings.

ulimit -s (stack) set to 262144.


System set to Enhanced mode when defining partition on HMC

Large pages reserved as follows by root user:
    echo 800 > /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 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
```

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 -lhugetlbfs

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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 -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.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/lop-xl-flags.20090714.xml`

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