SPEC® CFP2006 Result

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IBM Corporation

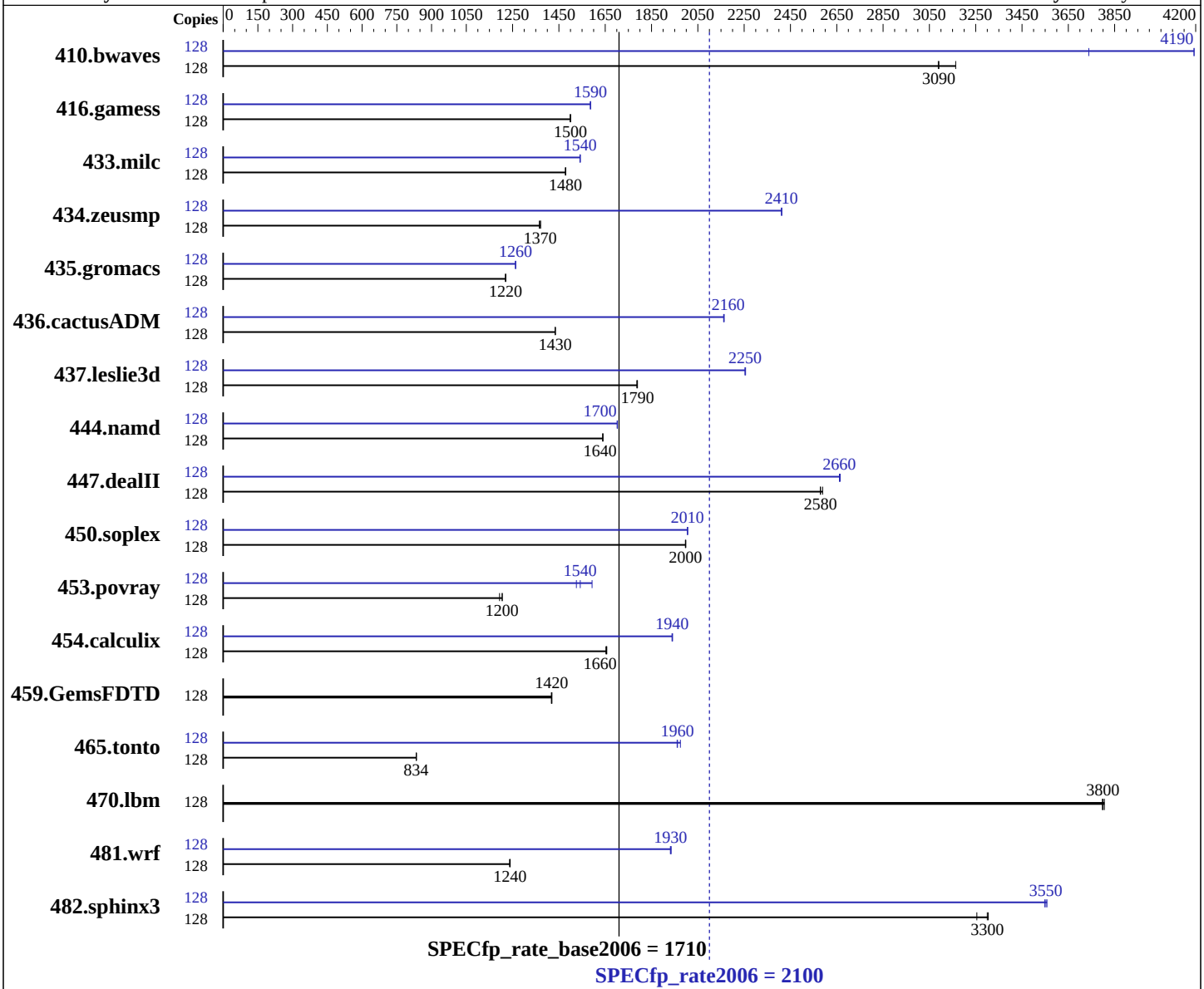
IBM Power 595 (5.0 GHz, 64 core, RedHat)

SPECfp®_rate2006 = 2100

SPECfp_rate_base2006 = 1710

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

Test date: Jun-2008
Hardware Availability: Jun-2008
Software Availability: May-2008



Hardware

CPU Name:	POWER6
CPU Characteristics:	
CPU MHz:	5000
FPU:	Integrated
CPU(s) enabled:	64 cores, 32 chips, 2 cores/chip, 2 threads/core
CPU(s) orderable:	8,16,24,32,40,48,56,64 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 5.2 for IBM POWER
Compiler:	IBM XL C/C++ Advanced Edition for Linux, V9.0 Updated with the Mar2008 PTF. IBM XL Fortran Advanced Edition for Linux, V11.1 Updated with the Mar2008 PTF.
Auto Parallel:	No
File System:	ext3
System State:	Run level 3 (multi-user)

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L3 Cache: 32 MB I+D off chip per chip
Other Cache: None
Memory: 512 GB (256x2 GB) DDR2 667 MHz
Disk Subsystem: 4x146 GB SCSI 15K RPM
Other Hardware: None

Base Pointers: 32-bit
Peak Pointers: 32/64-bit
Other Software: -IBM Post-Link Optimization for Linux on POWER, Version 5.4.0-17
-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	128	563	3090	**563**	**3090**	550	3160	128	465	3740	415	4190	**415**	**4190**
416.gamess	128	1672	1500	1671	1500	**1671**	**1500**	128	1579	1590	**1580**	**1590**	1580	1590
433.milc	128	794	1480	**795**	**1480**	795	1480	128	763	1540	762	1540	**762**	**1540**
434.zeusmp	128	**850**	**1370**	850	1370	853	1370	128	483	2410	**483**	**2410**	483	2410
435.gromacs	128	749	1220	750	1220	**749**	**1220**	128	724	1260	**724**	**1260**	724	1260
436.cactusADM	128	1067	1430	1066	1430	**1066**	**1430**	128	**707**	**2160**	707	2160	708	2160
437.leslie3d	128	**673**	**1790**	672	1790	673	1790	128	534	2250	533	2260	**534**	**2250**
444.namd	128	**626**	**1640**	626	1640	626	1640	128	603	1700	**603**	**1700**	603	1700
447.dealII	128	566	2590	**568**	**2580**	568	2580	128	**550**	**2660**	549	2660	550	2660
450.soplex	128	535	2000	**535**	**2000**	534	2000	128	532	2010	**532**	**2010**	532	2000
453.povray	128	570	1190	**565**	**1200**	565	1210	128	427	1590	**442**	**1540**	446	1530
454.calculix	128	**638**	**1660**	637	1660	639	1650	128	**545**	**1940**	544	1940	545	1940
459.GemsFDTD	128	**957**	**1420**	958	1420	957	1420	128	**957**	**1420**	958	1420	957	1420
465.tonto	128	1508	835	1511	833	**1510**	**834**	128	638	1970	**642**	**1960**	642	1960
470.lbm	128	**463**	**3800**	463	3800	462	3810	128	**463**	**3800**	463	3800	462	3810
481.wrf	128	1153	1240	**1154**	**1240**	1156	1240	128	740	1930	**740**	**1930**	739	1930
482.sphinx3	128	755	3300	766	3250	**756**	**3300**	128	**702**	**3550**	701	3560	703	3550

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

Submit Notes

```
The config file option 'submit' was used.
```

General Notes

```
kernel release 2.6.18-92.el5.

See flags file for details on following settings.

ulimit -s (stack) set to 1048576.

System in normal architected mode
```

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General Notes (Continued)

```
Large pages reserved as follows by root user:
    echo 8960 > /proc/sys/vm/nr_hugepages
System configured with libhugetlbfs library for application access to large pages
    export HUGETLB_VERBOSE=0
    export HUGETLB_MORECORE=yes
    export XLFRTEOPTS=intrinthds=1
Benchmarks bound to a processor using numactl on the submit command.
IBM Post-Link optimization tool used for
    433.milc 435.gromacs 436.cactusADM 453.povray 465.tonto 482.sphinx3
```

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 -qarch=pwr6 -qtune=pwr6 -qnoenablevmx -lhugetlbfs
```

C++ benchmarks:
```
-O5 -qarch=pwr6 -qtune=pwr6 -qrtti -qnoenablevmx -qstaticlink
```

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Base Optimization Flags (Continued)

Fortran benchmarks:
`-O5 -qarch=pwr6 -qtune=pwr6 -qsmallstack=dynlenonheap -qalias=nostd -qnoenablevmx -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT`

Benchmarks using both Fortran and C:
`-O5 -qarch=pwr6 -qtune=pwr6 -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`

Continued on next page

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: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6 -qtune=pwr6 -qnoenablevmx -lhugetlbfs

470.lbm: basepeak = yes

482.sphinx3: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr6 -qtune=pwr6 -lhugetlbfs

C++ benchmarks:

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

447.dealII: -O5 -qarch=pwr6 -qtune=pwr6 -qrtti -qnoenablevmx -qstaticlink -Wl,--whole-archive /usr/lib/libsmartheap.a -Wl,--no-whole-archive

450.soplex: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr6 -qtune=pwr6 -qstrict -lhugetlbfs

453.povray: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6 -qtune=pwr6 -lsmartheap

Fortran benchmarks:

410.bwaves: -O5 -qarch=pwr6 -qtune=pwr6 -qsmallstack=dynlenonheap -lhugetlbfs

416.gamess: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6 -qtune=pwr6 -qalias=nostd -qnoenablevmx

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

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

459.GemsFDTD: basepeak = yes

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Peak Optimization Flags (Continued)

465.tonto: `-Wl,-q -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -qarch=pwr6 -qtune=pwr6 -qessl -q64 -lessl -lsmartheap -lxlf90_r`

Benchmarks using both Fortran and C:

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

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

454.calculix: `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O4 -qarch=pwr6 -qtune=pwr6 -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT`

481.wrf: `-O5 -qarch=pwr6 -qtune=pwr6 -qnoenablevmx -q64 -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/IBM-Linux-XL.20090713.00.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20090713.00.xml`

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