



SPEC® CFP2006 Result

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IBM Corporation

SPECfp®_rate2006 = 2180

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

SPECfp_rate_base2006 = 1680

CPU2006 license: 11

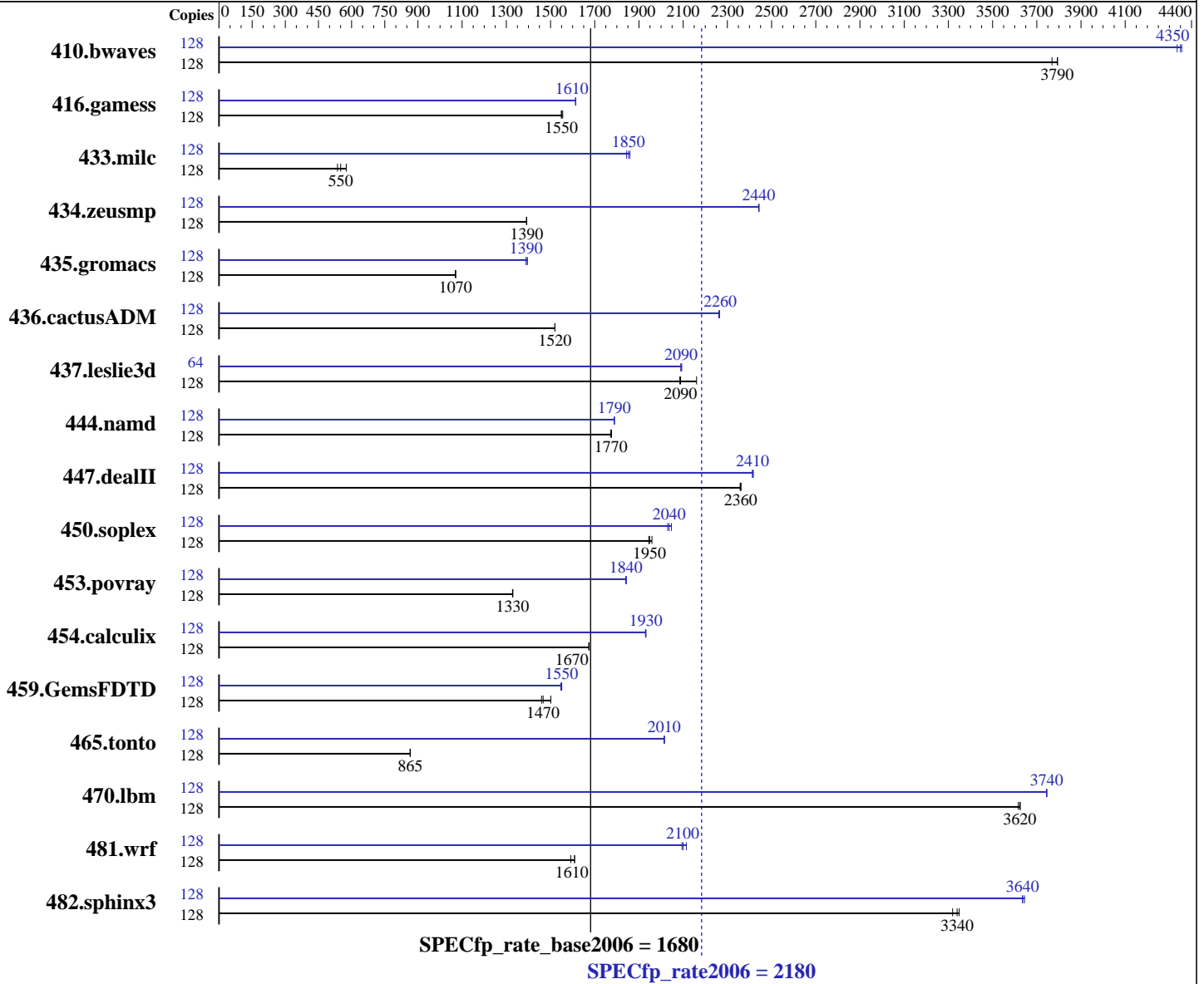
Test date: Mar-2009

Test sponsor: IBM Corporation

Hardware Availability: Jun-2008

Tested by: IBM Corporation

Software Availability: Mar-2009



Hardware

CPU Name: POWER6
 CPU Characteristics: 5000
 CPU MHz: Integrated
 FPU: 64 cores, 32 chips, 2 cores/chip, 2 threads/core
 CPU(s) enabled: 8,16,24,32,40,48,56,64 cores
 CPU(s) orderable: 64 KB I + 64 KB D on chip per core
 Primary Cache: 4 MB I+D on chip per core
 Secondary Cache:

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Software

Operating System: SUSE Linux Enterprise Server 11
 Compiler: IBM XL C/C++ for Linux, V10.1
 Updated with the Mar2009 PTF.
 IBM XL Fortran for Linux, V12.1
 Updated with the Mar2009 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 5.4.0-21
-MicroQuill SmartHeap 8.1

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	128	462	3770	458	3790	459	3790	128	400	4350	399	4360	401	4340
416.gamess	128	1618	1550	1612	1560	1617	1550	128	1554	1610	1553	1610	1552	1610
433.milc	128	2191	536	2135	550	2041	576	128	634	1850	632	1860	637	1840
434.zeusmp	128	837	1390	837	1390	836	1390	128	477	2440	477	2440	477	2440
435.gromacs	128	854	1070	854	1070	854	1070	128	655	1400	658	1390	658	1390
436.cactusADM	128	1006	1520	1006	1520	1006	1520	128	675	2260	677	2260	676	2260
437.leslie3d	128	577	2080	557	2160	576	2090	64	288	2090	288	2090	287	2090
444.namd	128	579	1770	578	1780	579	1770	128	574	1790	574	1790	574	1790
447.dealII	128	621	2360	620	2360	620	2360	128	606	2420	607	2410	607	2410
450.soplex	128	548	1950	545	1960	549	1940	128	524	2040	522	2050	526	2030
453.povray	128	513	1330	513	1330	512	1330	128	370	1840	370	1840	370	1840
454.calculix	128	631	1670	631	1670	631	1670	128	547	1930	547	1930	547	1930
459.GemsFDTD	128	931	1460	926	1470	905	1500	128	876	1550	878	1550	876	1550
465.tonto	128	1457	865	1455	865	1456	865	128	625	2010	625	2020	625	2010
470.lbm	128	486	3620	485	3620	485	3630	128	470	3740	470	3750	470	3740
481.wrf	128	889	1610	898	1590	889	1610	128	681	2100	683	2090	676	2110
482.sphinx3	128	745	3350	752	3320	747	3340	128	686	3640	684	3640	686	3640

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.
Benchmarks bound to a processor using taskset on the submit command.

General Notes

kernel release 2.6.27.19-5-ppc64.
See flags file for details on following settings.
ulimit -s (stack) set to 1048576.
System configured with libhugetlbfs library for application access to large pages
Large pages reserved as follows by root user:
echo 8960 > /proc/sys/vm/nr_hugepages
Environment variables set before executing benchmarks.
export HUGETLB_VERBOSE=0
export HUGETLB_MORECORE=yes

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General Notes (Continued)

```

export XLFRTEOPTS=intrinths=1
IBM Post-Link optimization tool was used for these benchmarks, with options:
433.milc : "-imullX" (instrumentation phase), "-O4 -omullX" (optimization phase)
435.gromacs : same as 433.milc
436.cactusADM : same as 433.milc
482.sphinx3 : same as 433.milc
453.povray : "-imullX" (instrumentation phase), "-O4 -omullX -see 1 -ihf -1" (optimization phase)
465.tonto : "-O4" (optimization phase)

```

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

Fortran benchmarks:

```
-O5 -qarch=pwr6 -qtune=pwr6 -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 -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
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: -Wl,-q -O5 -qarch=pwr6 -qtune=pwr6 -qnoenablevmx
-lhugetlbfs

470.lbm: -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=pwr6 -qtune=pwr6
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT
-q64

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) -O5 -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: -O5 -qarch=pwr6 -qtune=pwr6 -qsmallstack=dynlenonheap
-qnoenablevmx -B/usr/share/libhugetlbfs/ -tl
-Wl,--hugetlbfs-link=BDT

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Peak Optimization Flags (Continued)

459.GemsFDTD: -O5 -qarch=pwr6 -qtune=pwr6 -B/usr/share/libhugetlbfs/ -tl
-Wl,--hugetlbfs-link=BDT -q64

465.tonto: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6
-qtune=pwr6 -q64 -lsmartheap64 -lxlf90_r

Benchmarks using both Fortran and C:

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

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

454.calculix: -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.html>

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

<http://www.spec.org/cpu2006/flags/IBM-Linux-XL.xml>



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