



SPEC® CFP2006 Result

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IBM Corporation

IBM BladeCenter JS23 Express (4.2 GHz, 4 core, SLES)

SPECfp®_rate2006 = 92.4

SPECfp_rate_base2006 = 75.8

CPU2006 license: 11

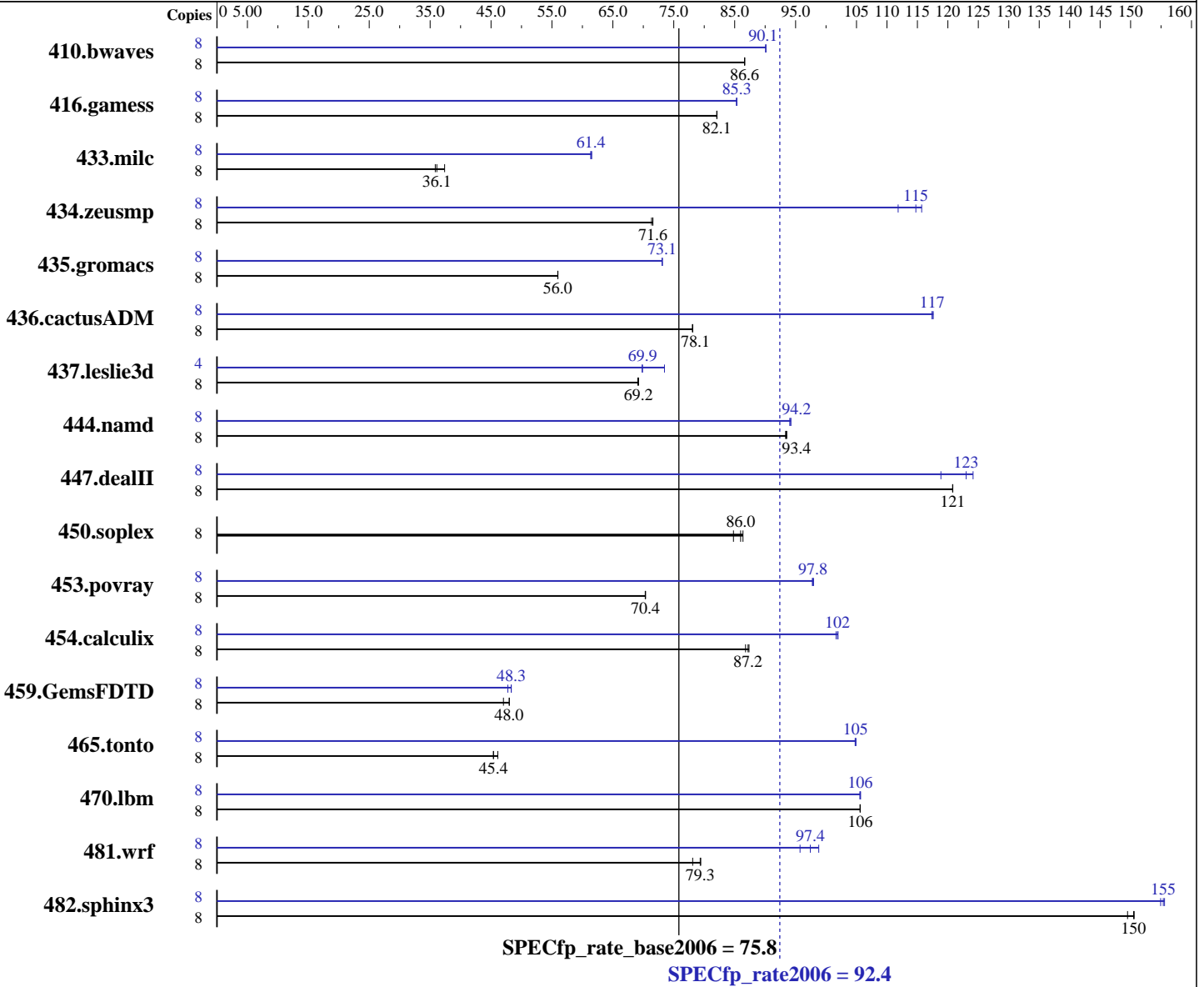
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Mar-2009

Hardware Availability: May-2009

Software Availability: Mar-2009



Hardware

CPU Name: POWER6+
 CPU Characteristics:
 CPU MHz: 4200
 FPU: Integrated
 CPU(s) enabled: 4 cores, 2 chips, 2 cores/chip, 2 threads/core
 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

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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: 32 GB (8x4 GB) DDR2 667 MHz
Disk Subsystem: 1x146 GB SAS 15K RPM
Other Hardware: None

Base Pointers: 32-bit
Peak Pointers: 32/64-bit
Other Software: -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	8	1255	86.7	1255	86.6	<u>1255</u>	<u>86.6</u>	8	1207	90.1	<u>1207</u>	<u>90.1</u>	1206	90.1
416.gamess	8	<u>1909</u>	<u>82.1</u>	1908	82.1	1909	82.1	8	<u>1835</u>	<u>85.3</u>	1837	85.3	1835	85.4
433.milc	8	<u>2034</u>	<u>36.1</u>	1965	37.4	2049	35.8	8	1197	61.4	1194	61.5	<u>1196</u>	<u>61.4</u>
434.zeusmp	8	<u>1017</u>	<u>71.6</u>	1017	71.6	1020	71.4	8	629	116	<u>634</u>	<u>115</u>	651	112
435.gromacs	8	1021	56.0	1020	56.0	<u>1021</u>	<u>56.0</u>	8	781	73.1	782	73.1	<u>781</u>	<u>73.1</u>
436.cactusADM	8	1225	78.1	1224	78.1	<u>1224</u>	<u>78.1</u>	8	814	117	813	118	<u>814</u>	<u>117</u>
437.leslie3d	8	<u>1087</u>	<u>69.2</u>	1087	69.2	1088	69.1	4	539	69.8	512	73.5	<u>538</u>	<u>69.9</u>
444.namd	8	687	93.4	<u>687</u>	<u>93.4</u>	686	93.6	8	681	94.2	<u>681</u>	<u>94.2</u>	682	94.0
447.dealII	8	<u>758</u>	<u>121</u>	758	121	758	121	8	770	119	<u>744</u>	<u>123</u>	737	124
450.soplex	8	<u>776</u>	<u>86.0</u>	787	84.8	773	86.4	8	<u>776</u>	<u>86.0</u>	787	84.8	773	86.4
453.povray	8	<u>605</u>	<u>70.4</u>	605	70.4	605	70.3	8	<u>435</u>	<u>97.8</u>	435	98.0	435	97.7
454.calculix	8	761	86.8	756	87.4	<u>757</u>	<u>87.2</u>	8	<u>648</u>	<u>102</u>	649	102	647	102
459.GemsFDTD	8	<u>1769</u>	<u>48.0</u>	1805	47.0	1768	48.0	8	1756	48.3	1777	47.8	<u>1757</u>	<u>48.3</u>
465.tonto	8	<u>1734</u>	<u>45.4</u>	1707	46.1	1734	45.4	8	751	105	<u>751</u>	<u>105</u>	750	105
470.lbm	8	1041	106	1041	106	<u>1041</u>	<u>106</u>	8	<u>1041</u>	<u>106</u>	1041	106	1040	106
481.wrf	8	1125	79.4	<u>1126</u>	<u>79.3</u>	1144	78.1	8	<u>917</u>	<u>97.4</u>	933	95.7	904	98.8
482.sphinx3	8	<u>1036</u>	<u>150</u>	1043	150	1035	151	8	<u>1004</u>	<u>155</u>	1002	156	1006	155

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 numactl 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
Large pages reserved as follows by root user:
echo 530 > /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" (optimizatio
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: basepeak = yes

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

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

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Peak Optimization Flags (Continued)

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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