



SPEC[®] CFP2006 Result

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IBM Corporation

SPECfp[®]_rate2006 = 105

IBM Power 520 (4.7 GHz, 4 core)

SPECfp_rate_base2006 = 88.7

CPU2006 license: 11

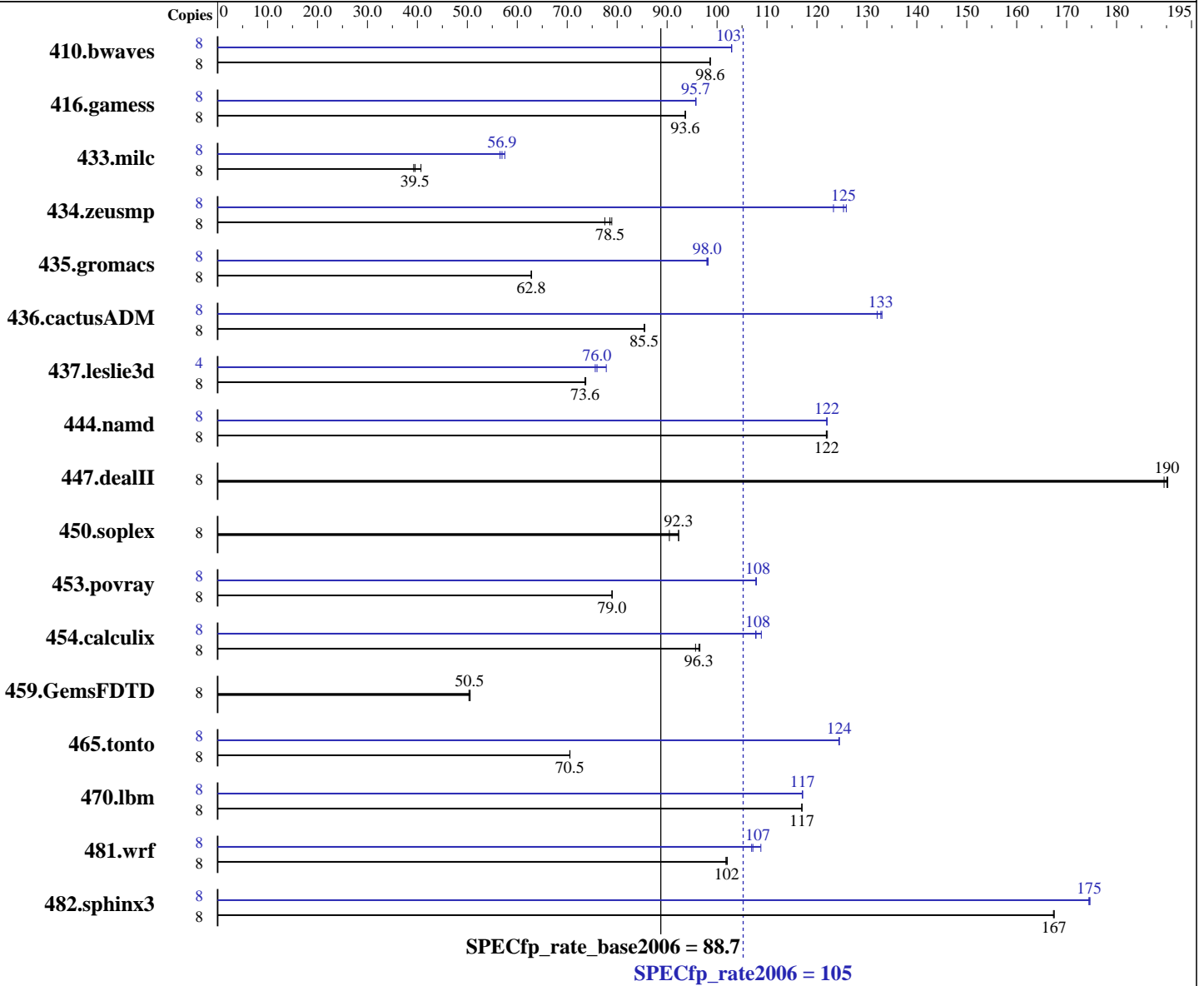
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Apr-2009

Hardware Availability: May-2009

Software Availability: May-2009



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 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: IBM AIX V6.1
 with the 6100-03 Technology Level
 Compiler: XL C/C++ Enterprise Edition V10.1.0.2 for AIX
 XL Fortran Enterprise Edition V12.1.0.3 for AIX
 Auto Parallel: No
 File System: AIX/JFS2
 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 (8x4 GB) DDR2 667 MHz
Disk Subsystem: 2x146 GB SAS 15K RPM
Other Hardware: None

Other Software: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	8	1102	98.6	1102	98.6	<u>1102</u>	<u>98.6</u>	8	1056	103	<u>1056</u>	<u>103</u>	1057	103
416.gamess	8	1673	93.6	<u>1673</u>	<u>93.6</u>	1672	93.7	8	<u>1636</u>	<u>95.7</u>	1635	95.8	1636	95.7
433.milc	8	<u>1858</u>	<u>39.5</u>	1871	39.3	1804	40.7	8	<u>1290</u>	<u>56.9</u>	1299	56.5	1277	57.5
434.zeusmp	8	922	78.9	939	77.5	<u>927</u>	<u>78.5</u>	8	590	123	578	126	<u>581</u>	<u>125</u>
435.gromacs	8	<u>909</u>	<u>62.8</u>	910	62.8	909	62.9	8	583	98.0	582	98.2	<u>583</u>	<u>98.0</u>
436.cactusADM	8	1120	85.4	1118	85.5	<u>1118</u>	<u>85.5</u>	8	724	132	<u>720</u>	<u>133</u>	719	133
437.leslie3d	8	1020	73.7	1022	73.5	<u>1022</u>	<u>73.6</u>	4	497	75.6	483	77.8	<u>495</u>	<u>76.0</u>
444.namd	8	526	122	525	122	<u>526</u>	<u>122</u>	8	526	122	526	122	<u>526</u>	<u>122</u>
447.dealII	8	483	190	<u>482</u>	<u>190</u>	481	190	8	483	190	<u>482</u>	<u>190</u>	481	190
450.soplex	8	<u>723</u>	<u>92.3</u>	723	92.3	738	90.5	8	<u>723</u>	<u>92.3</u>	723	92.3	738	90.5
453.povray	8	<u>539</u>	<u>79.0</u>	539	79.0	539	79.0	8	<u>395</u>	<u>108</u>	395	108	395	108
454.calculix	8	<u>685</u>	<u>96.3</u>	690	95.7	683	96.6	8	606	109	<u>612</u>	<u>108</u>	613	108
459.GemsFDTD	8	1687	50.3	<u>1682</u>	<u>50.5</u>	1679	50.6	8	1687	50.3	<u>1682</u>	<u>50.5</u>	1679	50.6
465.tonto	8	<u>1116</u>	<u>70.5</u>	1116	70.5	1116	70.6	8	633	124	<u>633</u>	<u>124</u>	632	124
470.lbm	8	<u>940</u>	<u>117</u>	939	117	940	117	8	<u>939</u>	<u>117</u>	939	117	939	117
481.wrf	8	878	102	876	102	<u>877</u>	<u>102</u>	8	822	109	<u>834</u>	<u>107</u>	836	107
482.sphinx3	8	931	168	<u>931</u>	<u>167</u>	932	167	8	<u>893</u>	<u>175</u>	894	174	893	175

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

Peak Tuning Notes

fdpr binary optimization tool used for 410.bwaves
with options -bf -bp -ece -lap -las -nop -nopr -pto
-RC -RD -rmte -so -tlo -A 64 -lu 6 -rt 0.10 -ihf 60
-sdpla 32 -sdpms 32 -shci 10 -si -siht 15 -lun 32

fdpr binary optimization tool used for 433.milc
435.gromacs 437.leslie3d 453.povray
454.calculix 481.wrf 482.sphinx3
with options -O4 -vrox -pbsi

fdpr binary optimization tool used for 434.zeusmp 470.lbm
with options -O3 -vrox -sdp 9



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Submit Notes

The config file option 'submit' was used to assign benchmark copy to specific kernel thread using the "bindprocessor" command (see flags file for details).

Operating System Notes

all ulimits set to unlimited.
1000 16M large pages defined with vmo command

Platform Notes

System set to "Enhanced" mode when defining partition on HMC.

General Notes

Environment variables set by runspec before the start of the run:

MALLOCOPTIONS = "pool"
MEMORY_AFFINITY = "MCM"
XLFRTEOPTS = "intrinthds=1"

See the flags file for details on settings.

Base Compiler Invocation

C benchmarks:

/usr/vac/bin/xlc -qlanglvl=extc99

C++ benchmarks:

/usr/vacpp/bin/xlC

Fortran benchmarks:

/usr/bin/xlf95

Benchmarks using both Fortran and C:

/usr/vac/bin/xlc -qlanglvl=extc99 /usr/bin/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

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Base Portability Flags (Continued)

481.wrf: -DSPEC_CPU_AIX -DNOUNDERSCORE
482.sphinx3: -qchars=signed

Base Optimization Flags

C benchmarks:

-bmaxdata:0x40000000 -O5 -qlargepage -D_ILS_MACROS -blpdata

C++ benchmarks:

-bmaxdata:0x50000000 -O5 -qlargepage -D_ILS_MACROS -qrtti=all
-D__IBM_FAST_VECTOR -D__IBM_FAST_SET_MAP_ITERATOR -blpdata

Fortran benchmarks:

-bmaxdata:0x60000000 -O5 -qlargepage -qsmallstack=dynlenonheap
-qalias=nostd -blpdata

Benchmarks using both Fortran and C:

-bmaxdata:0x60000000 -O5 -qlargepage -D_ILS_MACROS
-qsmallstack=dynlenonheap -qalias=nostd -blpdata

Base Other Flags

C benchmarks:

-qipa=threads -qipa=noobject -qsuppress=1500-036

C++ benchmarks:

-qipa=threads -qipa=noobject -qsuppress=1500-036

Fortran benchmarks:

-qipa=threads -qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg
-qsuppress=1500-036

Benchmarks using both Fortran and C:

-qipa=threads -qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg
-qsuppress=1500-036

Peak Compiler Invocation

C benchmarks:

/usr/vac/bin/xlc -qlanglvl=extc99

C++ benchmarks:

/usr/vacpp/bin/xlC

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Peak Compiler Invocation (Continued)

Fortran benchmarks:

/usr/bin/xlf95

Benchmarks using both Fortran and C:

/usr/vac/bin/xlc -qlanglvl=extc99 /usr/bin/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: -DSPEC_CPU_AIX -DNOUNDERSCORE
 482.sphinx3: -qchars=signed

Peak Optimization Flags

C benchmarks:

433.milc: -bmaxdata:0x40000000 -O5 -qlargepage -D_ILS_MACROS
-qalign=natural -qfdpr -blpdata

470.lbm: -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=auto -qtune=auto
-qlargepage -q64 -D_ILS_MACROS -qfdpr -blpdata

482.sphinx3: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qlargepage
-D_ILS_MACROS -qfdpr -blpdata

C++ benchmarks:

444.namd: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qlargepage
-D_ILS_MACROS -blpdata

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -D_ILS_MACROS
-qalign=natural -qfdpr -btextpsize:64K

Fortran benchmarks:

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Peak Optimization Flags (Continued)

410.bwaves: -bmaxdata:0x50000000 -O5 -qlargepage -qenablevmx -qvecnvml
-qfdpr -qsmallstack=dynlenonheap -blpdata

416.gamess: -bmaxdata:0x40000000 -qpdf1(pass 1) -qpdf2(pass 2) -O5
-qlargepage -qalias=nostd -blpdata

434.zeusmp: -bmaxdata:0x40000000 -qpdf1(pass 1) -qpdf2(pass 2) -O3
-qarch=auto -qtune=auto -qlargepage -qenablevmx -qvecnvml
-qxlf90=nosignedzero -qfdpr -blpdata

437.leslie3d: -O5 -qlargepage -qenablevmx -qvecnvml -qfdpr -blpdata

459.GemsFDTD: basepeak = yes

465.tonto: -bmaxdata:0x50000000 -qpdf1(pass 1) -qpdf2(pass 2) -O5
-bdatapsize:64K -bstacksize:64K -btextpsize:64K

Benchmarks using both Fortran and C:

435.gromacs: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -D_ILS_MACROS -qfdpr

436.cactusADM: -bmaxdata:0x60000000 -qpdf1(pass 1) -qpdf2(pass 2) -O2
-qarch=auto -qtune=auto -qenablevmx -qvecnvml
-D_ILS_MACROS -qfdpr -qnostrict -bdatapsize:64K
-bstacksize:64K -btextpsize:64K

454.calculix: -O4 -qlargepage -q64 -D_ILS_MACROS -qfdpr -blpdata

481.wrf: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qlargepage -q64
-D_ILS_MACROS -qfdpr -blpdata

Peak Other Flags

C benchmarks:

-qipa=threads -qipa=noobject -qsuppress=1500-036

C++ benchmarks:

-qipa=threads -qipa=noobject -qsuppress=1500-036

Fortran benchmarks:

-qipa=threads -qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg
-qsuppress=1500-036

Benchmarks using both Fortran and C:

-qipa=threads -qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg
-qsuppress=1500-036



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The flags files that were used to format this result can be browsed at

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

<http://www.spec.org/cpu2006/flags/IBM-AIX.html>

You can also download the XML flags sources by saving the following links:

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

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

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