



SPEC® CFP2006 Result

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IBM Corporation

SPECfp®2006 = 71.5

IBM Power 780 Server (3.86 GHz, 16 core)

SPECfp_base2006 = 44.5

CPU2006 license: 11

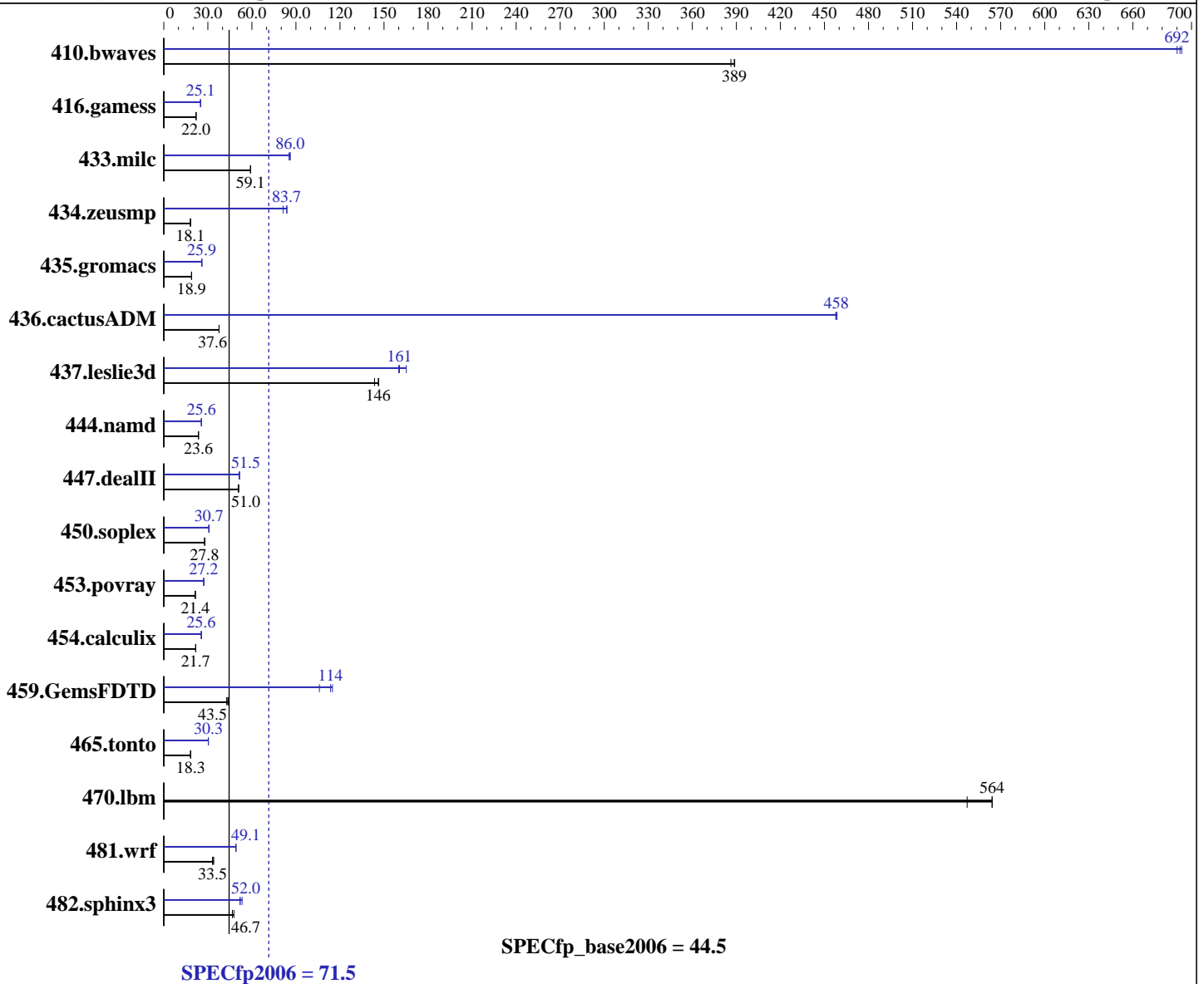
Test date: Apr-2010

Test sponsor: IBM Corporation

Hardware Availability: Mar-2010

Tested by: IBM Corporation

Software Availability: Apr-2010



Hardware

CPU Name: POWER7
 CPU Characteristics: Intelligent Energy Optimization enabled, up to 3.94 GHz
 CPU MHz: 3860
 FPU: Integrated
 CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip
 CPU(s) orderable: 16,32,48,64 cores
 Primary Cache: 32 KB I + 32 KB D on chip per core

Software

Operating System: IBM AIX V6.1 with the 6100-05 Technology Level SP1
 Compiler: XL C/C++ Enterprise Edition V11.1.0.1 for AIX
 XL Fortran Enterprise Edition V13.1.0.1 for AIX
 Auto Parallel: Yes
 File System: AIX/JFS2
 System State: Multi-user
 Base Pointers: 32-bit
 Peak Pointers: 32/64-bit

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Secondary Cache: 256 KB I+D on chip per core
 L3 Cache: 4 MB I+D on chip per core
 Other Cache: None
 Memory: 128 GB (16x8 GB) DDR3 1066 MHz
 Disk Subsystem: 1x64 GB IBM SSD raid0
 Other Hardware: --

Other Software: None

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	35.0	389	35.2	386	34.9	389	19.7	690	19.6	692	19.6	693
416.gamess	892	22.0	891	22.0	891	22.0	782	25.0	781	25.1	782	25.1
433.milc	155	59.1	155	59.1	155	59.1	108	85.3	107	86.1	107	86.0
434.zeusmp	503	18.1	499	18.2	502	18.1	109	83.7	112	81.3	108	83.9
435.gromacs	378	18.9	377	18.9	377	18.9	276	25.9	275	25.9	275	25.9
436.cactusADM	318	37.6	317	37.6	317	37.6	26.1	459	26.1	458	26.1	458
437.leslie3d	65.5	144	64.2	146	64.4	146	58.6	161	56.9	165	58.8	160
444.namd	340	23.6	340	23.6	339	23.6	313	25.6	313	25.6	313	25.6
447.dealII	224	51.0	226	50.7	224	51.0	222	51.5	223	51.4	221	51.6
450.soplex	299	27.9	300	27.8	300	27.8	271	30.7	271	30.8	272	30.6
453.povray	248	21.5	248	21.4	248	21.4	195	27.2	195	27.2	195	27.2
454.calculix	380	21.7	380	21.7	379	21.7	323	25.5	323	25.6	323	25.6
459.GemsFDTD	244	43.5	248	42.8	241	43.9	92.3	115	100	106	93.4	114
465.tonto	539	18.3	539	18.3	539	18.3	324	30.3	324	30.3	324	30.4
470.lbm	24.4	564	25.1	547	24.4	564	24.4	564	25.1	547	24.4	564
481.wrf	334	33.5	328	34.0	337	33.1	227	49.1	227	49.2	228	49.0
482.sphinx3	417	46.7	408	47.8	417	46.7	365	53.4	375	52.0	375	51.9

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:
 433.milc 435.gromacs 436.cactusADM 450.soplex 482.sphinx3
 with options -O4 -nodp
 434.zeusmp
 with options -O4 -vrox -nodp
 437.leslie3d 444.namd
 with options -O3 -lu -1 -nodp -sdp 9
 453.povray 454.calculix
 with options -O3



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Operating System Notes

all ulimits set to unlimited.
2000 16M large pages defined with vmo command
System set to single thread mode with the OS command:
smtctl -m off -w boot

General Notes

Environment variables set by runspec before the start of the run:
MALLOCMULTIHEAP = "1"
MALLOCOPTIONS = "pool"
MEMORY_AFFINITY = "MCM"
XLFRTOPTS = "intrinthds=1"
XLSMPOPTS = "spins=0:yields=0:startproc=0:stride=1"

See the flags file for details on settings.

Base Compiler Invocation

C benchmarks:

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

C++ benchmarks:

/usr/vacpp/bin/xlC

Fortran benchmarks:

/usr/bin/xlf95_r

Benchmarks using both Fortran and C:

/usr/vac/bin/xlc_r -qlanglvl=extc99 /usr/bin/xlf95_r

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



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Base Optimization Flags

C benchmarks:

-qipa=threads -bmaxdata:0x40000000 -O5 -qlargepage -qsmp=auto
-D_ILS_MACROS -blpdata

C++ benchmarks:

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

Fortran benchmarks:

-qipa=threads -bmaxdata:0x60000000 -O5 -qlargepage -qsmp=auto
-qsmallstack=dynlenonheap -qalias=nostd -blpdata

Benchmarks using both Fortran and C:

-qipa=threads -bmaxdata:0x60000000 -O5 -qlargepage -qsmp=auto
-D_ILS_MACROS -qsmallstack=dynlenonheap -qalias=nostd -blpdata

Base Other Flags

C benchmarks:

-qipa=noobject -qsuppress=1500-036

C++ benchmarks:

-qipa=noobject -qsuppress=1500-036

Fortran benchmarks:

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

Benchmarks using both Fortran and C:

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

Peak Compiler Invocation

C benchmarks (except as noted below):

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

433.milc: /usr/vac/bin/xlc -qlanglvl=extc99

C++ benchmarks:

/usr/vacpp/bin/xlC

Fortran benchmarks (except as noted below):

/usr/bin/xlf95_r

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Peak Compiler Invocation (Continued)

416.gamess: /usr/bin/xlf95

465.tonto: /usr/bin/xlf95

Benchmarks using both Fortran and C (except as noted below):

/usr/vac/bin/xlc -qlanglvl=extc99 /usr/bin/xlf95

436.cactusADM: /usr/vac/bin/xlc_r -qlanglvl=extc99 /usr/bin/xlf95_r

481.wrf: /usr/vac/bin/xlc_r -qlanglvl=extc99 /usr/bin/xlf95_r

Peak Portability Flags

410.bwaves: -qfixed

416.gamess: -qfixed

434.zeusmp: -qfixed

435.gromacs: -qfixed -qextname

436.cactusADM: -qfixed -qextname -DSPEC_CPU_LP64

437.leslie3d: -qfixed

454.calculix: -qfixed -qextname

481.wrf: -DSPEC_CPU_AIX -DNOUNDERSCORE

482.sphinx3: -qchars=signed

Peak Optimization Flags

C benchmarks:

433.milc: -qipa=threads -bmaxdata:0x40000000 -O5 -qsimd -qvecnv01
-qlargepage -D_ILS_MACROS -qrestrict -qprefetch=aggressive
-qalign=natural -blpdata

470.lbm: basepeak = yes

482.sphinx3: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qsmp=auto
-qlargepage -D_ILS_MACROS -blpdata

C++ benchmarks:

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

447.dealII: -qipa=threads -bmaxdata:0x50000000 -O5 -D_ILS_MACROS
-qrtti=all -D__IBM_FAST_VECTOR -D__IBM_FAST_SET_MAP_ITERATOR
-blpdata -btextpsize:64K

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Peak Optimization Flags (Continued)

450.soplex: -bmaxdata:0x40000000 -qpdf1(pass 1) -qpdf2(pass 2) -O3
-qarch=auto -qtune=auto -qarch=pwr5 -qlargepage
-D_ILS_MACROS -blpdata

453.povray: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -q64
-qsimd -qvecnvml -D_ILS_MACROS -qalign=natural
-btextpsize:64K

Fortran benchmarks:

410.bwaves: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qsmp=auto
-qlargepage -q64 -blpdata

416.gamess: -qipa=threads -bmaxdata:0x40000000 -qpdf1(pass 1)
-qpdf2(pass 2) -O5 -qarch=pwr5 -qlargepage -qalias=nostd
-blpdata

434.zeusmp: -qipa=threads -bmaxdata:0x40000000 -qpdf1(pass 1)
-qpdf2(pass 2) -O5 -qsmp=auto -qlargepage
-qxl90=nosignedzero -blpdata

437.leslie3d: -qipa=threads -O4 -q64 -qsmp=auto -blpdata

459.GemsFDTD: -qipa=threads -bmaxdata:0x50000000 -O4 -qsmp=auto -qsimd
-qvecnvml -qlargepage -blpdata

465.tonto: -qipa=threads -bmaxdata:0x50000000 -qpdf1(pass 1)
-qpdf2(pass 2) -O5 -qsimd -qvecnvml -blpdata
-btextpsize:64K

Benchmarks using both Fortran and C:

435.gromacs: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qsimd
-qvecnvml -D_ILS_MACROS

436.cactusADM: -qipa=threads -O4 -q64 -qsmp=auto -D_ILS_MACROS
-qnostrict -blpdata -btextpsize:64K

454.calculix: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qsimd
-qvecnvml -qlargepage -D_ILS_MACROS -blpdata

481.wrf: -O3 -qarch=auto -qtune=auto -q64 -qsmp=auto -D_ILS_MACROS
-blpdata

Peak Other Flags

C benchmarks:

-qipa=noobject -qsuppress=1500-036

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Peak Other Flags (Continued)

C++ benchmarks (except as noted below):

-qipa=noobject -qsuppress=1500-036

450.soplex: -qsuppress=1500-036

Fortran benchmarks:

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

Benchmarks using both Fortran and C (except as noted below):

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

481.wrf: -qsuppress=1500-010 -qsuppress=cmpmsg -qsuppress=1500-036

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

<http://www.spec.org/cpu2006/flags/IBM-AIX.20100511.html>

<http://www.spec.org/cpu2006/flags/IBM-XL.20100511.html>

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

<http://www.spec.org/cpu2006/flags/IBM-AIX.20100511.xml>

<http://www.spec.org/cpu2006/flags/IBM-XL.20100511.xml>

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