SPEC® CFP2006 Result

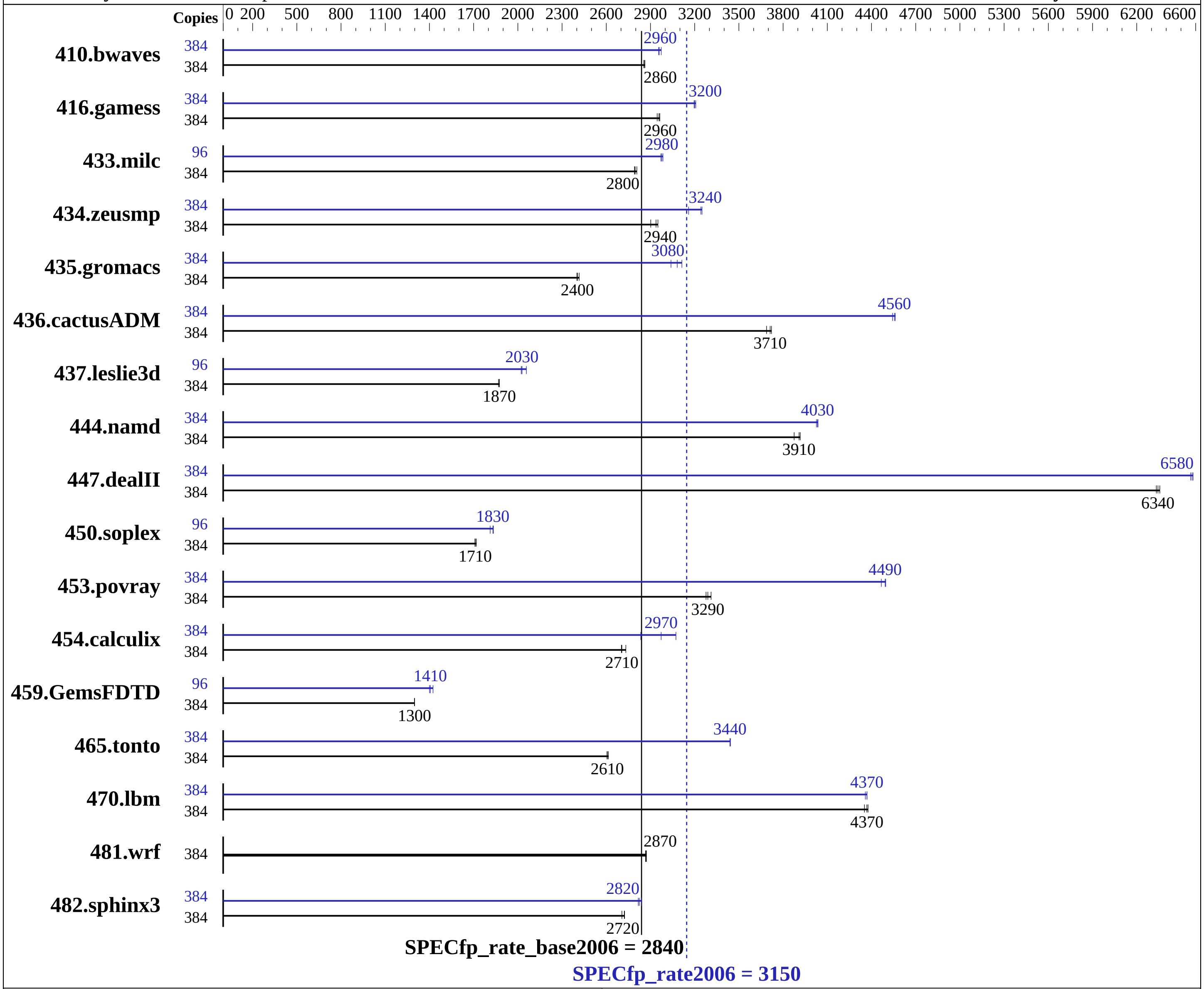
IBM Corporation

IBM Power 780 (3.44 GHz, 96 core)

SPECfp®_rate2006 = 3150

SPECfp_rate_base2006 = 2840

CPU2006 license:	11	**Test date:**	Sep-2011
Test sponsor:	IBM Corporation	**Hardware Availability:**	Oct-2011
Tested by:	IBM Corporation	**Software Availability:**	Oct-2011



Hardware

CPU Name:	POWER7
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 3.780 GHz
CPU MHz:	3444
FPU:	Integrated
CPU(s) enabled:	96 cores, 16 chips, 6 cores/chip, 4 threads/core
CPU(s) orderable:	24,48,72,96 cores
Primary Cache:	32 KB I + 32 KB D on chip per core

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Software

Operating System:	IBM AIX V7.1
Compiler:	C/C++: Version 11.1 of IBM XL C/C++ for AIX; Fortran: Version 13.1 of IBM XL Fortran for AIX
Auto Parallel:	No
File System:	AIX/JFS2
System State:	Multi-user
Base Pointers:	32-bit
Peak Pointers:	32/64-bit
Other Software:	None

Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	4 MB I+D on chip per core
Other Cache:	None
Memory:	1 TB (64 x 16 GB) DDR3 1066 MHz
Disk Subsystem:	12 x 146.8 GB Raid0 SAS SFF 15K RPM
Other Hardware:	None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	384	**1827**	**2860**	1823	2860	1828	2860	384	**1764**	**2960**	1755	2970	1766	2960
416.gamess	384	2537	2960	2553	2950	**2542**	**2960**	384	2352	3200	**2350**	**3200**	2344	3210
433.milc	384	**1261**	**2800**	1256	2810	1263	2790	96	**296**	**2980**	295	2980	297	2970
434.zeusmp	384	1184	2950	1204	2900	**1189**	**2940**	384	1106	3160	1075	3250	**1078**	**3240**
435.gromacs	384	**1140**	**2400**	1135	2420	1142	2400	384	**890**	**3080**	902	3040	881	3110
436.cactusADM	384	**1236**	**3710**	1233	3720	1244	3690	384	1010	4540	**1007**	**4560**	1006	4560
437.leslie3d	384	**1925**	**1870**	1932	1870	1925	1880	96	439	2060	446	2020	**445**	**2030**
444.namd	384	786	3920	795	3880	**788**	**3910**	384	765	4030	**764**	**4030**	763	4040
447.dealII	384	694	6330	**692**	**6340**	691	6360	384	**668**	**6580**	669	6570	667	6580
450.soplex	384	**1872**	**1710**	1874	1710	1864	1720	96	442	1810	437	1830	**437**	**1830**
453.povray	384	617	3310	623	3280	**621**	**3290**	384	457	4470	454	4500	**455**	**4490**
454.calculix	384	**1171**	**2710**	1159	2730	1172	2700	384	1118	2830	1031	3070	**1066**	**2970**
459.GemsFDTD	384	**3136**	**1300**	3137	1300	3135	1300	96	715	1420	727	1400	**724**	**1410**
465.tonto	384	1445	2610	1450	2610	**1449**	**2610**	384	**1098**	**3440**	1098	3440	1098	3440
470.lbm	384	**1208**	**4370**	1206	4380	1212	4350	384	**1208**	**4370**	1207	4370	1211	4360
481.wrf	384	**1495**	**2870**	1493	2870	1496	2870	384	**1495**	**2870**	1493	2870	1496	2870
482.sphinx3	384	2747	2720	2766	2710	**2749**	**2720**	384	**2650**	**2820**	2636	2840	2657	2820

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

Compiler Invocation Notes

```
C/C++ compiler update to August 2011 PTF
      Version: 11.01.0000.0007
Fortran compiler updated to August 2011 PTF
        Version: 13.01.0000.0007
```

Peak Tuning Notes

```
fdpr binary optimization tool used for 416.gamess
 with options -O4 -cbpth -1 -sdp -1 -m power7
fdpr binary optimization tool used for 433.milc
 with options -O4 -nodp -m power7
fdpr binary optimization tool used for 434.zeusmp
 with options -O4 -vrox -nodp -m power7
```

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Peak Tuning Notes (Continued)

```
fdpr binary optimization tool used for 436.cactusADM
 with options -O3 -lu -1 -nodp -sdp 9 -m power7
fdpr binary optimization tool used for 437.leslie3d
 with options -O4 -vrox -m power7
fdpr binary optimization tool used for 450.soplex
 with options -O3 -lu -1 -nodp -sdp 9 -m power7
fdpr binary optimization tool used for 453.povray
 with options -O3 -cbpth -1 -m power7
fdpr binary optimization tool used for 459.GemsFDTD
 with options -O3 -cbpth -1 -m power7
fdpr binary optimization tool used for 465.tonto
 with options -O4 -m power7
fdpr binary optimization tool used for 482.sphinx3
 with options -O4 -rcctf 0 -sdp 9 -vrox -m power7
```

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

```
AIX updated to V7.1 TL 1 SP 1 (7.1.1.1)

All ulimits set to unlimited.

38400 16M large pages defined with vmo command
```

General Notes

```
Environment variables set by runspec before the start of the run:
MALLOCOPTIONS = "pool"
MEMORY_AFFINITY = "MCM"
XLFRTEOPTS = "intrinthds=1"
```

Base Compiler Invocation

C benchmarks:
`/usr/vac/bin/xlc -qlanglvl=extc99`

C++ benchmarks:
`/usr/vacpp/bin/xlC`

Fortran benchmarks:
`/usr/bin/xlf95`

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Base Compiler Invocation (Continued)

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

Base Optimization Flags

C benchmarks:
-qipa=threads -bmaxdata:0x40000000 -qlargepage -O5 -D_ILS_MACROS -blpdata

C++ benchmarks:
-qipa=threads -bmaxdata:0x50000000 -qlargepage -O5 -qsimd -qvecnvol -D_ILS_MACROS -qrtti=all -D__IBM_FAST_VECTOR -D__IBM_FAST_SET_MAP_ITERATOR -blpdata

Fortran benchmarks:
-qipa=threads -bmaxdata:0x60000000 -qlargepage -O5 -qsmallstack=dynlenonheap -qalias=nostd -blpdata

Benchmarks using both Fortran and C:
-qipa=threads -bmaxdata:0x60000000 -qlargepage -O5 -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

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Base Other Flags (Continued)

Benchmarks using both Fortran and C:
```
-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
```

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: -qipa=threads -bmaxdata:0x40000000 -O5 -qlargepage -D_ILS_MACROS -qrestrict -qprefetch=aggressive -qalign=natural -blpdata -btextpsize:64K

470.lbm: -qipa=threads -bmaxdata:0x30000000 -O5 -D_ILS_MACROS -blpdata -btextpsize:64K

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SPECfp_rate_base2006 = 2840

CPU2006 license: 11

Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Sep-2011

Hardware Availability: Oct-2011

Software Availability: Oct-2011

Peak Optimization Flags (Continued)

482.sphinx3: -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=auto -qtune=auto -qlargepage -D_ILS_MACROS -blpdata -btextpsize:64K

C++ benchmarks:

444.namd: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -q64 -qsimd -qvecnvol -qlargepage -D_ILS_MACROS -blpdata -btextpsize:64K

447.dealII: -qipa=threads -bmaxdata:0x50000000 -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qsimd -qvecnvol -D_ILS_MACROS -qrtti=all -D__IBM_FAST_VECTOR -D__IBM_FAST_SET_MAP_ITERATOR -blpdata -btextpsize:64K

450.soplex: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -q64 -qlargepage -D_ILS_MACROS -blpdata -btextpsize:64K

453.povray: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qsimd -qvecnvol -qlargepage -D_ILS_MACROS -qalign=natural -blpdata -btextpsize:64K

Fortran benchmarks:

410.bwaves: -qipa=threads -bmaxdata:0x50000000 -O5 -qlargepage -qsmallstack=dynlenonheap -blpdata -btextpsize:64K

416.gamess: -qipa=threads -bmaxdata:0x40000000 -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr5 -qlargepage -qalias=nostd -blpdata -btextpsize:64K

434.zeusmp: -bmaxdata:0x40000000 -O3 -qarch=auto -qtune=auto -qlargepage -qxlf90=nosignedzero -blpdata -btextpsize:64K

437.leslie3d: -qipa=threads -O5 -q64 -blpdata -btextpsize:64K

459.GemsFDTD: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -q64 -qlargepage -blpdata -btextpsize:64K

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

Benchmarks using both Fortran and C:

435.gromacs: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qsimd -qvecnvol -D_ILS_MACROS -bdatapsize:64K -bstackpsize:64K -btextpsize:64K

436.cactusADM: -qipa=threads -bmaxdata:0x60000000 -O4 -qsimd -qvecnvol -D_ILS_MACROS -qnostrict -blpdata -btextpsize:64K

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Peak Optimization Flags (Continued)

454.calculix: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qsimd -qvecnvol -qlargepage -D_ILS_MACROS -bdatapsize:64K -bstackpsize:64K -btextpsize:64K

481.wrf: basepeak = yes

Peak Other Flags

C benchmarks:
-qipa=noobject -qsuppress=1500-036

C++ benchmarks:
-qipa=noobject -qsuppress=1500-036

Fortran benchmarks (except as noted below):
-qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg -qsuppress=1500-036

434.zeusmp: -qsuppress=1500-010 -qsuppress=cmpmsg -qsuppress=1500-036

Benchmarks using both Fortran and C:
-qipa=noobject -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-XL.20110613.html
http://www.spec.org/cpu2006/flags/IBM-AIX.20110613.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/IBM-XL.20110613.xml
http://www.spec.org/cpu2006/flags/IBM-AIX.20110613.xml

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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