SPEC® CFP2006 Result

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IBM Corporation

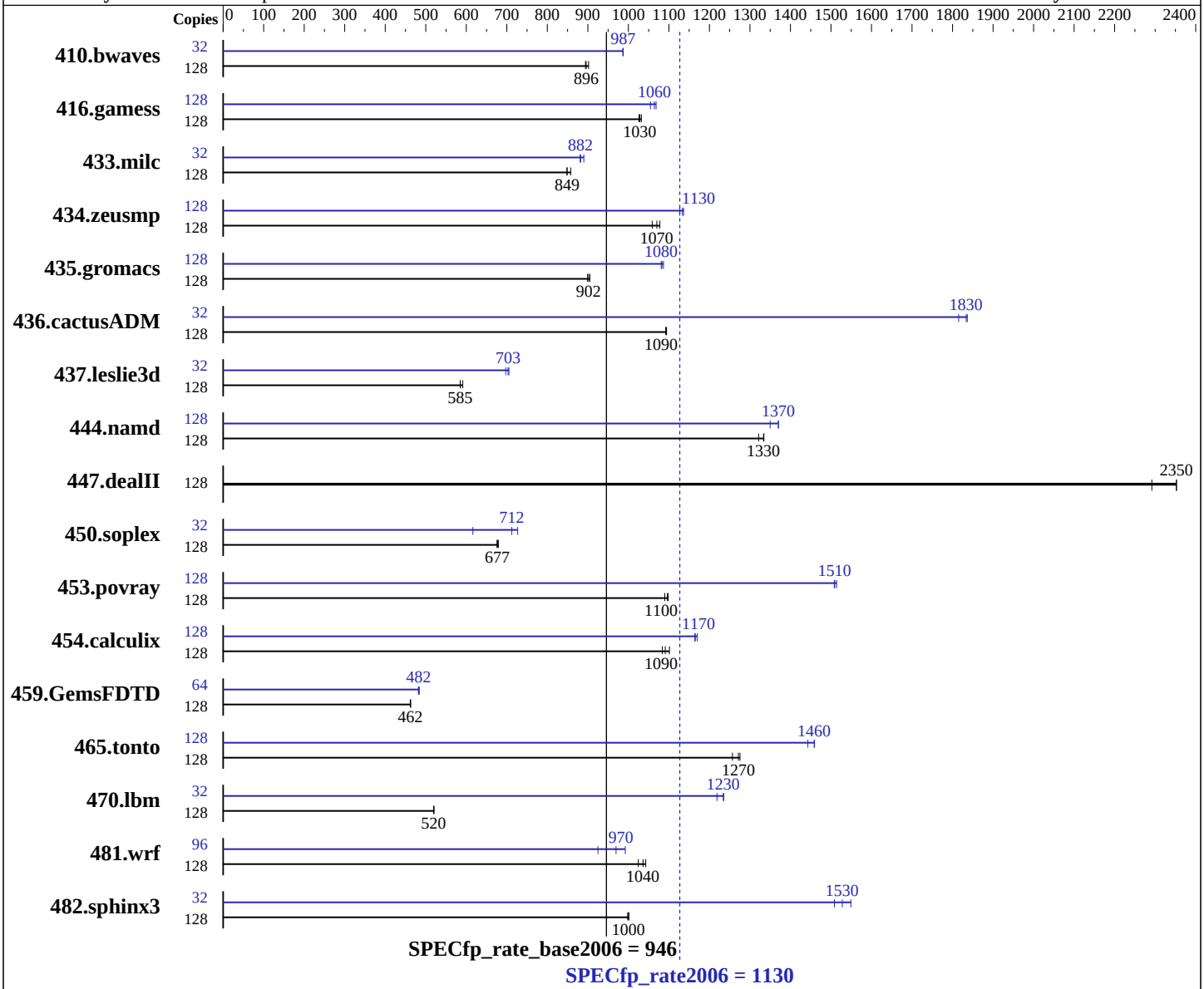
IBM Power 750 Express (3.5 GHz, 32 core)

SPECfp®_rate2006 = 1130

SPECfp_rate_base2006 = 946

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation

Test date: Jan-2013
Hardware Availability: Mar-2013
Software Availability: Feb-2013



Hardware

CPU Name:	POWER7+
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 3.955 GHz
CPU MHz:	3500
FPU:	Integrated
CPU(s) enabled:	32 cores, 8 chips, 4 cores/chip, 4 threads/core
CPU(s) orderable:	8, 16, 24, 32 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 12.1 of IBM XL C/C++ for AIX; Fortran: Version 14.1 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

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Secondary Cache: 256 KB I+D on chip per core
L3 Cache: 10 MB I+D on chip per core
Other Cache: None
Memory: 256 GB (64 x 4 GB) DDR3 1066 MHz
Disk Subsystem: 5 x 300 GB 15K RPM Raid0 SFF SAS
Other Hardware: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	128	1929	902	**1942**	**896**	1945	894	32	**441**	**987**	440	987	441	986
416.gamess	128	**2437**	**1030**	2428	1030	2442	1030	128	2346	1070	**2355**	**1060**	2377	1050
433.milc	128	1370	858	**1384**	**849**	1385	848	32	334	881	**333**	**882**	330	890
434.zeusmp	128	1100	1060	1081	1080	**1088**	**1070**	128	1034	1130	**1028**	**1130**	1025	1140
435.gromacs	128	**1013**	**902**	1016	899	1010	905	128	845	1080	**844**	**1080**	841	1090
436.cactusADM	128	1398	1090	1400	1090	**1399**	**1090**	32	211	1820	**209**	**1830**	208	1840
437.leslie3d	128	2034	591	2057	585	**2056**	**585**	32	431	697	427	705	**428**	**703**
444.namd	128	769	1330	777	1320	**770**	**1330**	128	**749**	**1370**	749	1370	761	1350
447.dealII	128	**623**	**2350**	622	2350	639	2290	128	**623**	**2350**	622	2350	639	2290
450.soplex	128	**1577**	**677**	1580	676	1572	679	32	367	727	**375**	**712**	433	616
453.povray	128	**621**	**1100**	625	1090	620	1100	128	452	1510	**451**	**1510**	450	1510
454.calculix	128	**968**	**1090**	959	1100	974	1080	128	903	1170	907	1160	**906**	**1170**
459.GemsFDTD	128	2933	463	**2941**	**462**	2941	462	64	1409	482	**1408**	**482**	1403	484
465.tonto	128	988	1280	**991**	**1270**	1002	1260	128	863	1460	873	1440	**864**	**1460**
470.lbm	128	**3385**	**520**	3378	521	3387	519	32	356	1240	**356**	**1230**	361	1220
481.wrf	128	1396	1020	**1380**	**1040**	1371	1040	96	1159	925	1081	992	**1106**	**970**
482.sphinx3	128	**2494**	**1000**	2492	1000	2499	998	32	403	1550	**408**	**1530**	413	1510

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

Compiler Invocation Notes

```
C/C++ compiler updated to November 2012 PTF
      Version: 12.01.0000.0002
Fortran compiler updated to November 2012 PTF
      Version: 14.01.0000.0002
```

Peak Tuning Notes

```
416.gamess fdpr options: -O4 -cbpth -1 -sdp -1
433.milc fdpr options: -O4 -nodp
435.gromacs fdpr options: -O
436.cactusADM fdpr options: -O3 -lu -1 -nodp -sdp 9
437.leslie3d fdpr options: -O3
450.soplex fdpr options: -O4 -nodp
```

Continued on next page

Peak Tuning Notes (Continued)

```
453.povray fdpr options: -O3 -cbpth -1
459.GemsFDTD fdpr options: -O3 -cbpth -1
465.tonto fdpr options: -O4
482.sphinx3 fdpr options: -O4 -rcctf 0 -sdp 9 -vrox
```

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 2 SP2

All ulimits set to unlimited.

12800 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`

Benchmarks using both Fortran and C:
`/usr/vac/bin/xlc -qlanglvl=extc99 /usr/bin/xlf95`

Base Portability Flags

410.bwaves: `-qfixed`
416.gamess: `-qfixed`

Continued on next page

Base Portability Flags (Continued)

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

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 -qalign=natural -blpdata -btextpsize:64K

470.lbm: -qipa=threads -bmaxdata:0x30000000 -qpdf1(pass 1)
-qpdf2(pass 2) -O5 -D_ILS_MACROS -blpdata -btextpsize:64K

482.sphinx3: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qlargepage
-D_ILS_MACROS -blpdata -btextpsize:64K

C++ benchmarks:

444.namd: -qipa=threads -O4 -q64 -qlargepage -D_ILS_MACROS
-D__IBM_FAST_VECTOR -D__IBM_FAST_SET_MAP_ITERATOR -blpdata
-btextpsize:64K

447.dealII: basepeak = yes

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Peak Optimization Flags (Continued)

450.soplex: -qipa=threads -bmaxdata:0x40000000 -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=auto -qtune=auto -D_ILS_MACROS -D__IBM_FAST_VECTOR -D__IBM_FAST_SET_MAP_ITERATOR -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 -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=auto -qtune=auto -qlargepage -qxlf90=nosignedzero -blpdata -btextpsize:64K

437.leslie3d: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -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) -O5 -D_ILS_MACROS -blpdata -btextpsize:64K

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

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

481.wrf: -qipa=threads -bmaxdata:0x30000000 -O5 -qsimd -qvecnvol -D_ILS_MACROS -blpdata -btextpsize:64K

Peak Other Flags

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

C++ benchmarks (except as noted below):
```
-qipa=noobject -qsuppress=1500-036
```

450.soplex: `-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 (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-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

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