SPEC® CFP2006 Result
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IBM Corporation

IBM Power 760 (3.4 GHz, 48 core)

$SPECfp®\_rate2006 =$ 1400
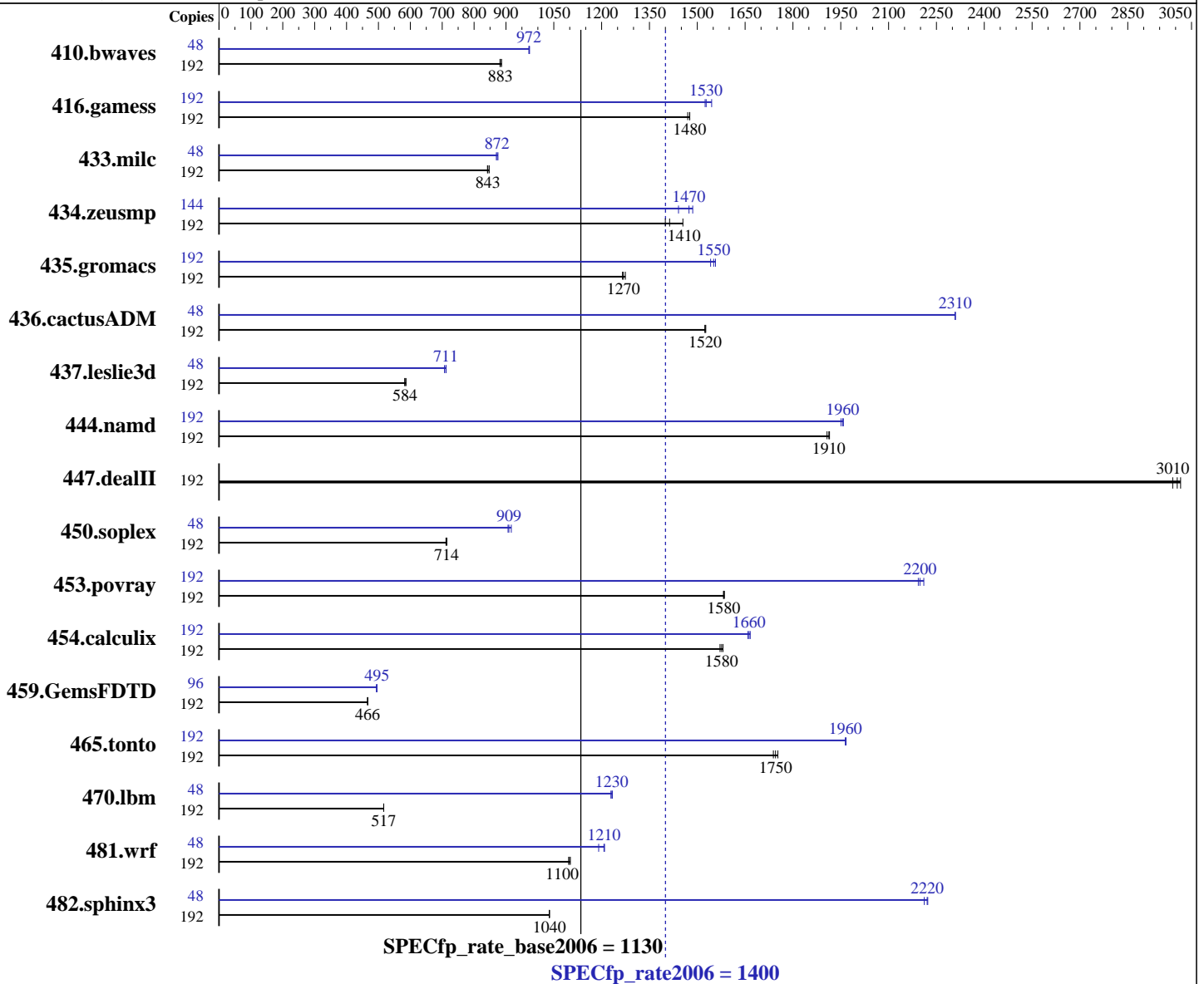
$SPECfp\_rate\_base2006 =$ 1130

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

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

Copies

Benchmark	Copies	Value
410.bwaves	48	972
	192	883
416.gamess	192	1530
	192	1480
433.milc	48	872
	192	843
434.zeusmp	144	1470
	192	1410
435.gromacs	192	1550
	192	1270
436.cactusADM	48	2310
	192	1520
437.leslie3d	48	711
	192	584
444.namd	192	1960
	192	1910
447.dealII	192	3010
450.soplex	48	909
	192	714
453.povray	192	2200
	192	1580
454.calculix	192	1660
	192	1580
459.GemsFDTD	96	495
	192	466
465.tonto	192	1960
	192	1750
470.lbm	48	1230
	192	517
481.wrf	48	1210
	192	1100
482.sphinx3	48	2220
	192	1040

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Hardware

CPU Name: POWER7+
CPU Characteristics: Intelligent Energy Optimization enabled, up to 3.787 GHz
CPU MHz: 3416
FPU: Integrated
CPU(s) enabled: 48 cores, 8 chips, 6 cores/chip, 4 threads/core
CPU(s) orderable: 12, 24, 36, 48 cores
Primary Cache: 32 KB I + 32 KB D on chip per core

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

Continued on next page

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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:	512 GB (64 x 8 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	192	2944	886	2961	881	**2955**	**883**	48	**671**	**972**	670	974	671	972
416.gamess	192	2546	1480	**2547**	**1480**	2557	1470	192	2466	1520	**2460**	**1530**	2433	1550
433.milc	192	2080	847	2093	842	**2090**	**843**	48	507	870	504	875	**505**	**872**
434.zeusmp	192	1248	1400	**1236**	**1410**	1201	1450	144	882	1490	909	1440	**889**	**1470**
435.gromacs	192	1083	1270	1076	1270	**1081**	**1270**	192	889	1540	**884**	**1550**	880	1560
436.cactusADM	192	**1505**	**1520**	1503	1530	1506	1520	48	**248**	**2310**	248	2310	248	2310
437.leslie3d	192	3077	587	3099	582	**3093**	**584**	48	**634**	**711**	633	712	638	707
444.namd	192	808	1910	**805**	**1910**	804	1910	192	789	1950	786	1960	**787**	**1960**
447.dealII	192	734	2990	728	3020	**731**	**3010**	192	734	2990	728	3020	**731**	**3010**
450.soplex	192	2250	712	**2244**	**714**	2241	715	48	437	917	**440**	**909**	442	906
453.povray	192	**645**	**1580**	646	1580	644	1590	192	462	2210	**465**	**2200**	466	2190
454.calculix	192	1008	1570	**1005**	**1580**	1002	1580	192	951	1670	**953**	**1660**	955	1660
459.GemsFDTD	192	4372	466	4365	467	**4371**	**466**	96	2063	494	2056	495	**2056**	**495**
465.tonto	192	1087	1740	1078	1750	**1082**	**1750**	192	**961**	**1960**	961	1970	962	1960
470.lbm	192	5105	517	**5107**	**517**	5107	517	48	535	1230	**535**	**1230**	537	1230
481.wrf	192	1956	1100	1946	1100	**1951**	**1100**	48	450	1190	443	1210	**444**	**1210**
482.sphinx3	192	3613	1040	3610	1040	**3612**	**1040**	48	423	2210	421	2220	**421**	**2220**

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
```

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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.

19200 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
```

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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
```

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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`

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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`

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

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