SPEC® CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

IBM Power 780 (3.7 GHz, 128 core)

$SPECfp^®\_rate2006 =$ 4160

$SPECfp\_rate\_base2006 =$ 3420

CPU2006 license: 11	**Test date:** Sep-2012
Test sponsor: IBM Corporation	**Hardware Availability:** Oct-2012
Tested by: IBM Corporation	**Software Availability:** Nov-2012

Copies

Benchmark	Copies (blue)	Blue value	Copies (black)	Black value
410.bwaves	512	3030	512	2920
416.gamess	512	4480	512	4330
433.milc	128	2930	512	2850
434.zeusmp	512	3710	512	3240
435.gromacs	512	4500	512	3710
436.cactusADM	512	6630	512	4510
437.leslie3d	256	2250	512	1980
444.namd	512	5740	512	5630
447.dealII			512	9250
450.soplex	256	2730	512	2200
453.povray	512	6410	512	4590
454.calculix	512	4860	512	4530
459.GemsFDTD	128	1600	512	1500
465.tonto	512	5160	512	4580
470.lbm	128	4110	512	1680
481.wrf			512	3500
482.sphinx3	128	6400	512	3320

SPECfp_rate_base2006 = 3420

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Hardware

CPU Name:	POWER7+
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 4.144 GHz
CPU MHz:	3724
FPU:	Integrated
CPU(s) enabled:	128 cores, 16 chips, 8 cores/chip, 4 threads/core
CPU(s) orderable:	32,64,96,128 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

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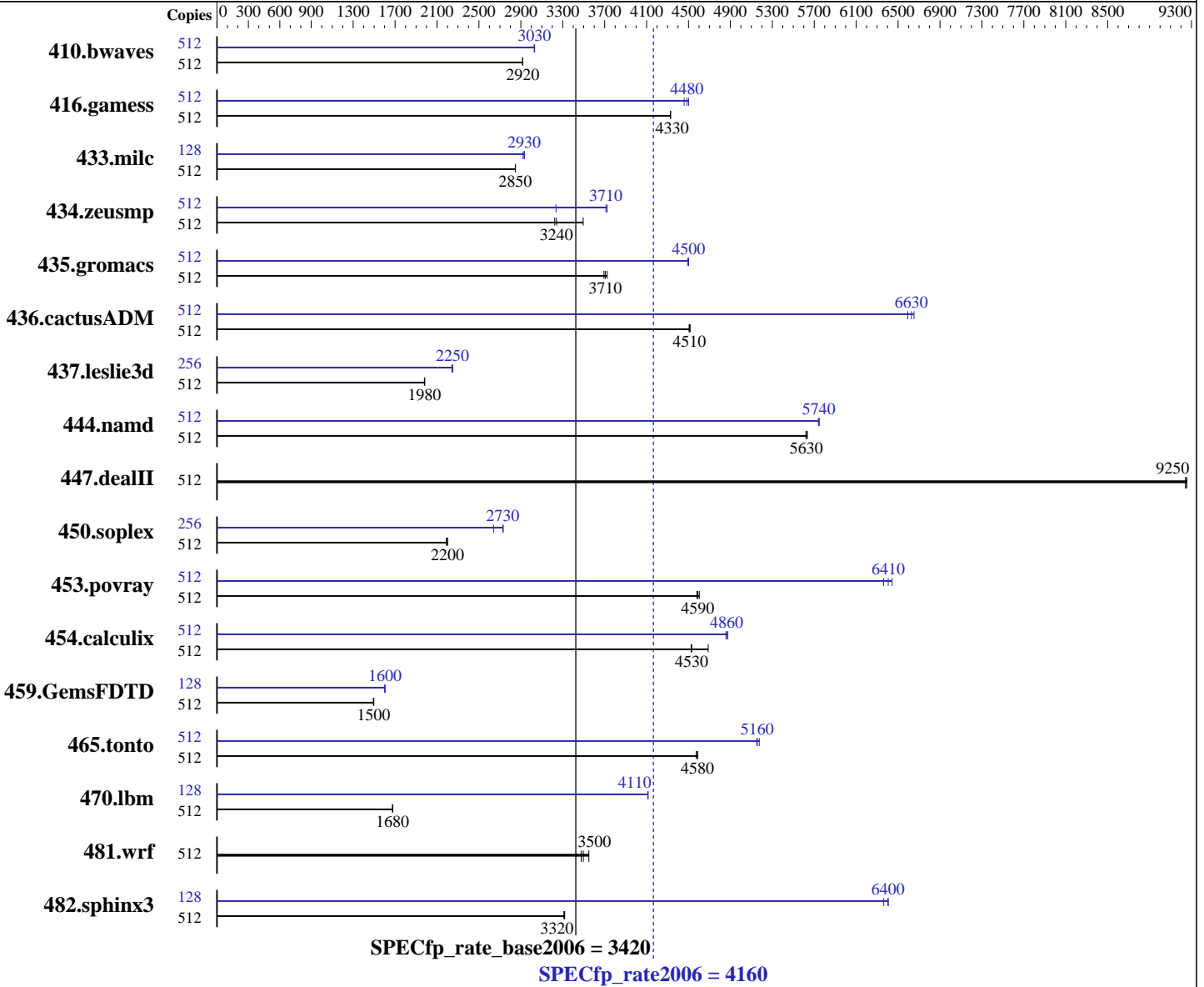### SPECfp_rate_base2006 = 3420

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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:	1 TB (64 x 16 GB) DDR3 1066 MHz
Disk Subsystem:	8 x 387 GB Raid0 SFF-1 SSD
Other Hardware:	None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	512	2385	2920	**2384**	**2920**	2384	2920	512	2295	3030	2299	3030	**2296**	**3030**
416.gamess	512	2315	4330	2317	4330	**2316**	**4330**	512	**2235**	**4480**	2227	4500	2249	4460
433.milc	512	**1650**	**2850**	1650	2850	1651	2850	128	402	2920	**401**	**2930**	401	2930
434.zeusmp	512	1446	3220	**1438**	**3240**	1333	3490	512	1440	3240	1251	3720	**1255**	**3710**
435.gromacs	512	982	3720	**986**	**3710**	990	3690	512	812	4500	814	4490	**812**	**4500**
436.cactusADM	512	1355	4520	1358	4510	**1357**	**4510**	512	920	6650	**923**	**6630**	928	6590
437.leslie3d	512	2427	1980	2431	1980	**2428**	**1980**	256	1070	2250	1073	2240	**1070**	**2250**
444.namd	512	729	5630	731	5620	**730**	**5630**	512	**715**	**5740**	715	5740	714	5750
447.dealII	512	633	9250	634	9240	**633**	**9250**	512	633	9250	634	9240	**633**	**9250**
450.soplex	512	1940	2200	**1941**	**2200**	1952	2190	256	809	2640	781	2730	**783**	**2730**
453.povray	512	**594**	**4590**	592	4600	595	4580	512	423	6440	428	6360	**425**	**6410**
454.calculix	512	**932**	**4530**	933	4530	901	4690	512	866	4880	**868**	**4860**	870	4860
459.GemsFDTD	512	3638	1490	**3634**	**1500**	3628	1500	128	**847**	**1600**	846	1600	849	1600
465.tonto	512	1098	4590	1101	4570	**1099**	**4580**	512	978	5150	**977**	**5160**	973	5180
470.lbm	512	4195	1680	4199	1680	**4195**	**1680**	128	428	4110	428	4110	**428**	**4110**
481.wrf	512	**1636**	**3500**	1645	3480	1611	3550	512	**1636**	**3500**	1645	3480	1611	3550
482.sphinx3	512	3014	3310	3007	3320	**3010**	**3320**	128	389	6410	**390**	**6400**	392	6360

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: -O3 -lu -1
435.gromacs fdpr options: -O
436.cactusADM fdpr options: -O3 -lu -1 -nodp -sdp 9
437.leslie3d fdpr options: -O3
453.povray fdpr options: -O3 -cbpth -1
```

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Peak Tuning Notes (Continued)

```
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

All ulimits set to unlimited.

51200 16M large pages defined with vmo command
```

Platform Notes

```
Service Processor Memory Mirroring Property Disabled
```

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
```

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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
```

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 -qprefetch=aggressive -qalign=natural
               -blpdata -btextpsize:64K

      470.lbm: -qipa=threads -bmaxdata:0x30000000 -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 -O5 -qsimd -qvecnvol`
`-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 -O5 -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: `basepeak = yes`

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 (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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