SPEC® CFP2006 Result

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IBM Corporation

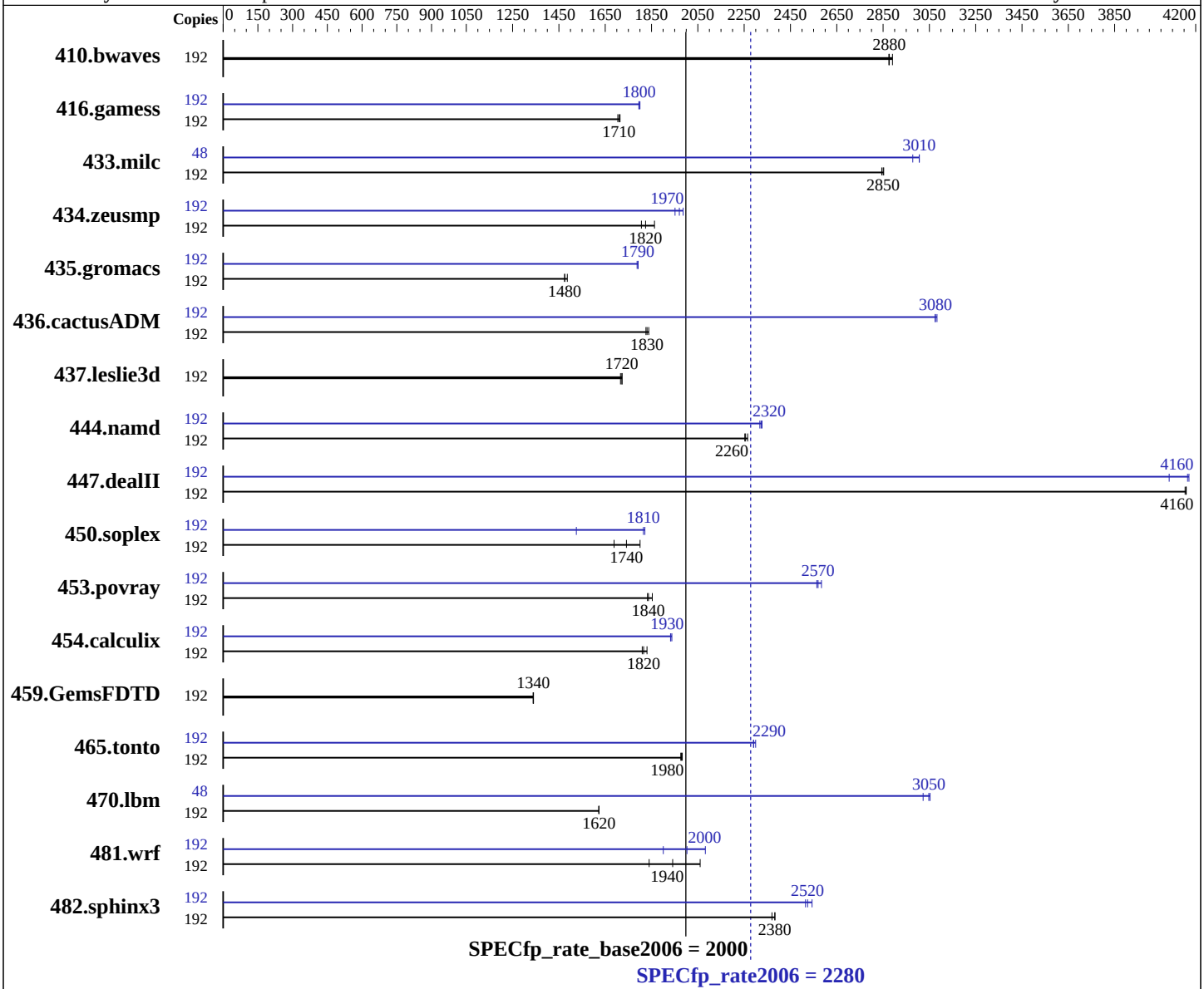
IBM Power 770 (4.2 GHz, 48 core)

SPECfp®_rate2006 = 2280

SPECfp_rate_base2006 = 2000

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

Test date: Sep-2012
Hardware Availability: Oct-2012
Software Availability: Nov-2012



Hardware

CPU Name:	POWER7+
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 4.396 GHz
CPU MHz:	4228
FPU:	Integrated
CPU(s) enabled:	48 cores, 16 chips, 3 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

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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: 512 GB (64 x 8 GB) DDR3 1066 MHz
Disk Subsystem: 8 x 146.8 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	908	2870	903	2890	**907**	**2880**	192	908	2870	903	2890	**907**	**2880**
416.gamess	192	**2198**	**1710**	2206	1700	2193	1710	192	2094	1800	2088	1800	**2092**	**1800**
433.milc	192	**618**	**2850**	620	2840	618	2850	48	147	3010	148	2980	**147**	**3010**
434.zeusmp	192	938	1860	**958**	**1820**	967	1810	192	895	1950	**887**	**1970**	880	1990
435.gromacs	192	**929**	**1480**	930	1470	922	1490	192	765	1790	767	1790	**765**	**1790**
436.cactusADM	192	1257	1830	**1253**	**1830**	1248	1840	192	744	3080	**746**	**3080**	746	3070
437.leslie3d	192	**1048**	**1720**	1052	1720	1048	1720	192	**1048**	**1720**	1052	1720	1048	1720
444.namd	192	**683**	**2260**	684	2250	680	2270	192	664	2320	662	2330	**663**	**2320**
447.dealII	192	528	4160	**528**	**4160**	529	4150	192	538	4090	**527**	**4160**	527	4170
450.soplex	192	889	1800	948	1690	**919**	**1740**	192	1050	1530	**882**	**1810**	879	1820
453.povray	192	551	1850	557	1830	**556**	**1840**	192	398	2560	**398**	**2570**	395	2580
454.calculix	192	**872**	**1820**	875	1810	865	1830	192	817	1940	820	1930	**819**	**1930**
459.GemsFDTD	192	1522	1340	**1520**	**1340**	1520	1340	192	1522	1340	**1520**	**1340**	1520	1340
465.tonto	192	**955**	**1980**	953	1980	956	1980	192	822	2300	825	2290	**825**	**2290**
470.lbm	192	1625	1620	**1625**	**1620**	1626	1620	48	**216**	**3050**	216	3050	218	3020
481.wrf	192	**1105**	**1940**	1166	1840	1041	2060	192	1128	1900	**1071**	**2000**	1030	2080
482.sphinx3	192	**1571**	**2380**	1570	2380	1579	2370	192	1488	2510	1471	2540	**1482**	**2520**

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
```

Continued on next page

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.

19200 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
```

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`

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: `-qipa=threads -bmaxdata:0x50000000 -O5 -qsimd -qvecnvol -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: -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: basepeak = yes

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: basepeak = yes

459.GemsFDTD: basepeak = yes

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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