SPEC® CFP2006 Result

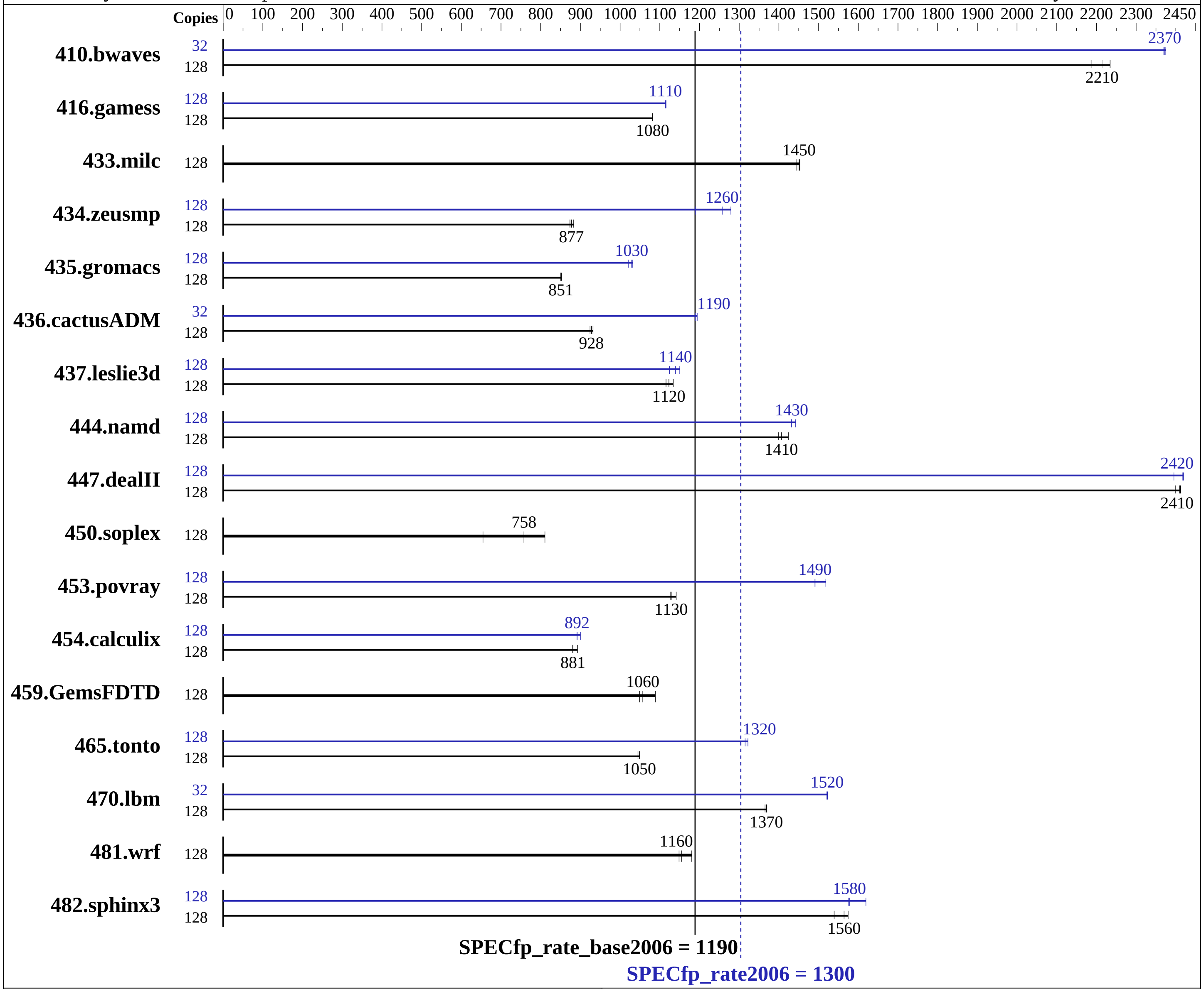
IBM Corporation

IBM Power 780 (4.14 GHz, 32 core)

SPECfp®_rate2006 = 1300

SPECfp_rate_base2006 = 1190

CPU2006 license:	11	**Test date:**	Jan-2010
Test sponsor:	IBM Corporation	**Hardware Availability:**	Mar-2010
Tested by:	IBM Corporation	**Software Availability:**	Mar-2010



Hardware

CPU Name:	POWER7
CPU Characteristics:	TurboCore mode
CPU MHz:	4140
FPU:	Integrated
CPU(s) enabled:	32 cores, 8 chips, 4 cores/chip, 4 threads/core
CPU(s) orderable:	8,16,24,32,48,64 cores
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core

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Software

Operating System:	IBM AIX V6.1 with the 6100-04 Technology Level and Service Pack 3
Compiler:	XL C/C++ Enterprise Edition V10.1.0.5 for AIX XL Fortran Enterprise Edition V12.1.0.6 for AIX
Auto Parallel:	No
File System:	AIX/JFS2
System State:	Multi-user
Base Pointers:	32-bit
Peak Pointers:	32/64-bit

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L3 Cache: 4 MB I+D on chip per core
Other Cache: 16 MB I+D on chip per chip
Memory: 512 GB (64x8 GB) DDR3 1066 MHz
Disk Subsystem: 12x146.8 GB SAS SFF 15K RPM
Other Hardware: None

Other Software: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	128	796	2190	**786**	**2210**	779	2230	32	184	2370	**183**	**2370**	183	2370
416.gamess	128	**2317**	**1080**	2315	1080	2319	1080	128	**2250**	**1110**	2251	1110	2246	1120
433.milc	128	813	1450	**810**	**1450**	809	1450	128	813	1450	**810**	**1450**	809	1450
434.zeusmp	128	1333	874	**1328**	**877**	1319	883	128	979	1190	**926**	**1260**	911	1280
435.gromacs	128	**1074**	**851**	1074	851	1072	852	128	**888**	**1030**	886	1030	896	1020
436.cactusADM	128	1655	924	**1649**	**928**	1642	932	32	**320**	**1190**	320	1190	321	1190
437.leslie3d	128	1061	1130	**1071**	**1120**	1078	1120	128	1070	1120	1046	1150	**1056**	**1140**
444.namd	128	**730**	**1410**	734	1400	721	1420	128	**717**	**1430**	717	1430	712	1440
447.dealII	128	**608**	**2410**	610	2400	607	2410	128	**606**	**2420**	605	2420	611	2400
450.soplex	128	**1409**	**758**	1317	811	1631	654	128	**1409**	**758**	1317	811	1631	654
453.povray	128	597	1140	604	1130	**603**	**1130**	128	449	1520	457	1490	**457**	**1490**
454.calculix	128	1183	893	**1198**	**881**	1199	881	128	1173	900	**1184**	**892**	1184	892
459.GemsFDTD	128	1247	1090	1295	1050	**1285**	**1060**	128	1247	1090	1295	1050	**1285**	**1060**
465.tonto	128	1200	1050	**1201**	**1050**	1205	1050	128	953	1320	958	1320	**954**	**1320**
470.lbm	128	1284	1370	**1285**	**1370**	1288	1370	32	289	1520	**289**	**1520**	289	1520
481.wrf	128	1245	1150	1211	1180	**1238**	**1160**	128	1245	1150	1211	1180	**1238**	**1160**
482.sphinx3	128	1621	1540	1585	1570	**1595**	**1560**	128	**1581**	**1580**	1541	1620	1583	1580

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

Peak Tuning Notes

```
fdpr binary optimization tool used for 410.bwaves
 with options -O3 -vrox -pbsi -A 64
fdpr binary optimization tool used for 433.milc
 with options -O4 -vrox -pbsi
fdpr binary optimization tool used for 434.zeusmp
 with options -O3 -vrox -sdp 9
fdpr binary optimization tool used for 435.gromacs
 with options -O4 -vrox -pbsi
fdpr binary optimization tool used for 437.leslie3d
 with options -O4 -vrox -pbsi
fdpr binary optimization tool used for 450.soplex
 with options -O3 -vrox -sdp 9
fdpr binary optimization tool used for 453.povray
 with options -O4 -vrox -pbsi
```

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Peak Tuning Notes (Continued)

```
fdpr binary optimization tool used for 454.calculix
 with options -O4 -vrox -pbsi
fdpr binary optimization tool used for 459.GemsFDTD
 with options -O4 -vrox -pbsi
fdpr binary optimization tool used for 470.lbm
 with options -O3 -vrox -sdp 9
fdpr binary optimization tool used for 481.wrf
 with options -O4 -vrox -pbsi
fdpr binary optimization tool used for 482.sphinx3
 with options -O4 -vrox -pbsi
```

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

```
all ulimits set to unlimited.
25600 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"

 See the flags file for details on settings.
```

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:
-bmaxdata:0x40000000 -O5 -qlargepage -D_ILS_MACROS -blpdata

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

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

Benchmarks using both Fortran and C:
-bmaxdata:0x60000000 -O5 -qlargepage -D_ILS_MACROS
-qsmallstack=dynlenonheap -qalias=nostd -blpdata

Base Other Flags

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

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

Fortran benchmarks:
-qipa=threads -qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg
-qsuppress=1500-036

Benchmarks using both Fortran and C:
-qipa=threads -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: basepeak = yes

470.lbm: -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=auto -qtune=auto -qlargepage -q64 -D_ILS_MACROS -qfdpr -blpdata

482.sphinx3: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qlargepage -D_ILS_MACROS -qfdpr -blpdata

C++ benchmarks:

444.namd: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qlargepage -D_ILS_MACROS -blpdata

447.dealII: -bmaxdata:0x50000000 -O5 -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: basepeak = yes

453.povray: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -D_ILS_MACROS -qalign=natural -qfdpr -btextpsize:64K

Fortran benchmarks:

410.bwaves: -bmaxdata:0x50000000 -O5 -qlargepage -qenablevmx -qvecnvol -qfdpr -qsmallstack=dynlenonheap -blpdata

416.gamess: -bmaxdata:0x40000000 -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qlargepage -qalias=nostd -blpdata

434.zeusmp: -bmaxdata:0x40000000 -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=auto -qtune=auto -qlargepage -qenablevmx -qvecnvol -qxlf90=nosignedzero -qfdpr -blpdata

437.leslie3d: -O5 -qlargepage -qenablevmx -qvecnvol -qfdpr -blpdata

459.GemsFDTD: basepeak = yes

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

Benchmarks using both Fortran and C:

435.gromacs: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -D_ILS_MACROS -qfdpr

436.cactusADM: -bmaxdata:0x60000000 -qpdf1(pass 1) -qpdf2(pass 2) -O2 -qarch=auto -qtune=auto -qenablevmx -qvecnvol -D_ILS_MACROS -qfdpr -qnostrict -blpdata -btextpsize:64K

454.calculix: -O4 -qlargepage -q64 -D_ILS_MACROS -qfdpr -blpdata

481.wrf: basepeak = yes

Peak Other Flags

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

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

Fortran benchmarks:
-qipa=threads -qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg -qsuppress=1500-036

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Peak Other Flags (Continued)

Benchmarks using both Fortran and C:
    -qipa=threads -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.20100303.html
http://www.spec.org/cpu2006/flags/IBM-AIX.20100303.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/IBM-XL.20100303.xml
http://www.spec.org/cpu2006/flags/IBM-AIX.20100303.xml

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

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