SPEC® CFP2006 Result

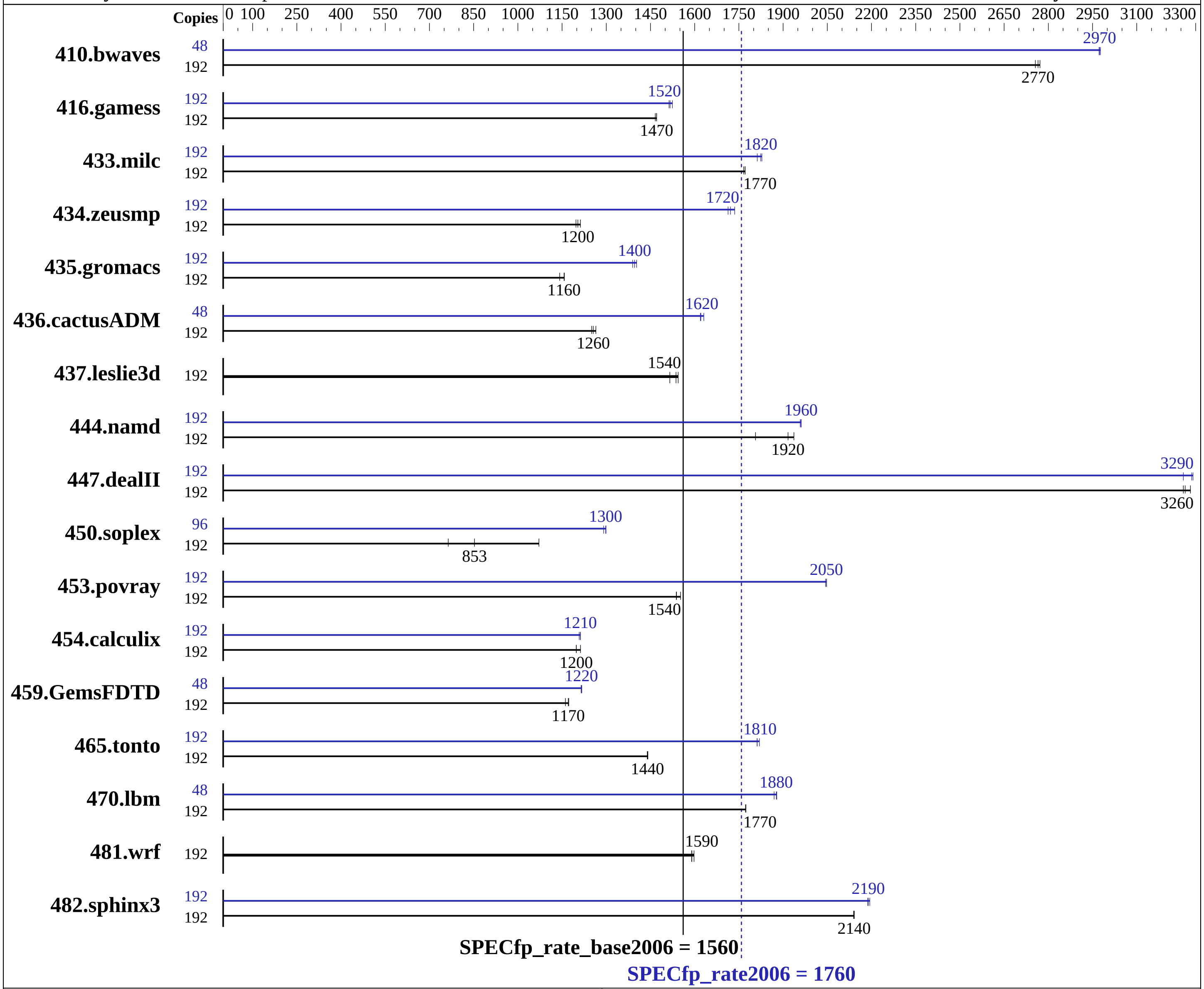
IBM Corporation

IBM Power 770 (3.5 GHz, 48 core)

SPECfp®_rate2006 = 1760

SPECfp_rate_base2006 = 1560

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



Hardware

CPU Name:	POWER7
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 3.75 GHz
CPU MHz:	3500
FPU:	Integrated
CPU(s) enabled:	48 cores, 8 chips, 6 cores/chip, 4 threads/core
CPU(s) orderable:	12,16,24,32,36,48,64 cores
Primary Cache:	32 KB I + 32 KB 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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Secondary Cache: 256 KB I+D on chip per core
L3 Cache: 4 MB I+D on chip per core
Other Cache: None
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

	Base							Peak						
Benchmark	**Copies**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Copies**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**
410.bwaves	192	941	2770	947	2760	**944**	**2770**	48	**219**	**2970**	219	2980	219	2970
416.gamess	192	2556	1470	**2556**	**1470**	2564	1470	192	2466	1520	2485	1510	**2479**	**1520**
433.milc	192	**995**	**1770**	998	1770	995	1770	192	964	1830	973	1810	**966**	**1820**
434.zeusmp	192	**1452**	**1200**	1459	1200	1441	1210	192	1020	1710	**1015**	**1720**	1007	1740
435.gromacs	192	1200	1140	1184	1160	**1185**	**1160**	192	987	1390	**982**	**1400**	977	1400
436.cactusADM	192	**1827**	**1260**	1814	1260	1835	1250	48	354	1620	**354**	**1620**	352	1630
437.leslie3d	192	1191	1520	1169	1540	**1175**	**1540**	192	1191	1520	1169	1540	**1175**	**1540**
444.namd	192	852	1810	**803**	**1920**	795	1940	192	785	1960	**785**	**1960**	786	1960
447.dealII	192	669	3280	**673**	**3260**	674	3260	192	674	3260	667	3290	**668**	**3290**
450.soplex	192	1494	1070	2097	764	**1877**	**853**	96	**617**	**1300**	616	1300	620	1290
453.povray	192	658	1550	664	1540	**664**	**1540**	192	**499**	**2050**	499	2050	500	2040
454.calculix	192	**1322**	**1200**	1322	1200	1306	1210	192	1307	1210	**1307**	**1210**	1311	1210
459.GemsFDTD	192	**1740**	**1170**	1737	1170	1754	1160	48	**419**	**1220**	418	1220	419	1210
465.tonto	192	1313	1440	**1312**	**1440**	1311	1440	192	1043	1810	**1043**	**1810**	1038	1820
470.lbm	192	**1488**	**1770**	1487	1770	1488	1770	48	353	1870	351	1880	**351**	**1880**
481.wrf	192	1349	1590	**1349**	**1590**	1342	1600	192	1349	1590	**1349**	**1590**	1342	1600
482.sphinx3	192	1749	2140	1748	2140	**1748**	**2140**	192	1711	2190	1706	2190	**1710**	**2190**

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
```

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Peak Tuning Notes (Continued)

```
 with options -O4 -vrox -pbsi
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.
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"

 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: -bmaxdata:0x40000000 -O5 -qlargepage -D_ILS_MACROS -qalign=natural -qfdpr -blpdata

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: -O3 -qarch=auto -qtune=auto -qlargepage -q64 -D_ILS_MACROS -qfdpr -blpdata

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: basepeak = yes

459.GemsFDTD: -O4 -qlargepage -q64 -qfdpr -blpdata

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