SPEC® CFP2006 Result

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IBM Corporation

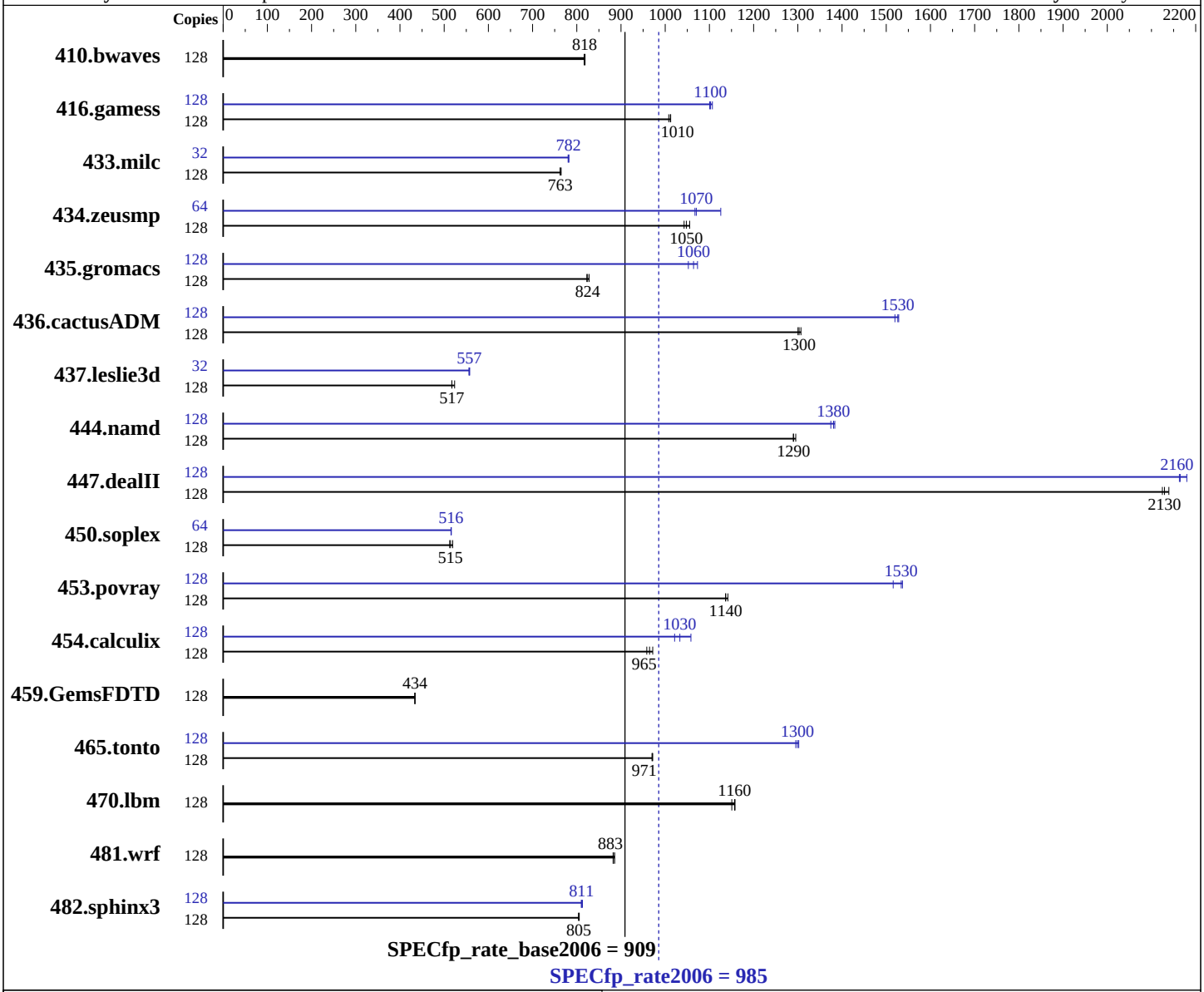
IBM Power 750 Express (3.61 GHz, 32 core)

SPECfp®_rate2006 = 985

SPECfp_rate_base2006 = 909

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

Test date: Mar-2011
Hardware Availability: May-2011
Software Availability: May-2011



Hardware

CPU Name:	POWER7
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 3.86 GHz
CPU MHz:	3612
FPU:	Integrated
CPU(s) enabled:	32 cores, 4 chips, 8 cores/chip, 4 threads/core
CPU(s) orderable:	8 - 32 cores
Primary Cache:	32 KB I + 32 KB D on chip per core

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Software

Operating System:	IBM AIX V7.1 with Service Pack 3
Compiler:	IBM XL C/C++ for AIX, V11.1 Version: 11.01.0000.0005 IBM XL Fortran for AIX, V13.1 Version: 13.01.0000.0005
Auto Parallel:	No
File System:	AIX/JFS2

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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: 256 GB (32 x 8 GB) DDR3 1066 MHz
Disk Subsystem: 6 x 146.8 GB Raid0 SAS SFF 15K RPM
Other Hardware: None

System State: Multi-user
Base Pointers: 32-bit
Peak Pointers: 32/64-bit
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	2125	819	**2127**	**818**	2130	817	128	2125	819	**2127**	**818**	2130	817
416.gamess	128	**2478**	**1010**	2476	1010	2486	1010	128	2277	1100	2265	1110	**2273**	**1100**
433.milc	128	1537	765	1541	762	**1540**	**763**	32	376	780	376	782	**376**	**782**
434.zeusmp	128	1117	1040	1104	1060	**1112**	**1050**	64	**544**	**1070**	517	1130	546	1070
435.gromacs	128	1104	828	1111	823	**1108**	**824**	128	868	1050	852	1070	**859**	**1060**
436.cactusADM	128	**1174**	**1300**	1176	1300	1170	1310	128	1001	1530	1007	1520	**1002**	**1530**
437.leslie3d	128	2298	524	2326	517	**2325**	**517**	32	539	558	541	556	**540**	**557**
444.namd	128	793	1300	**796**	**1290**	796	1290	128	**743**	**1380**	742	1380	747	1370
447.dealII	128	689	2120	**688**	**2130**	684	2140	128	**676**	**2160**	677	2160	672	2180
450.soplex	128	2083	512	**2075**	**515**	2056	519	64	1035	515	**1035**	**516**	1034	516
453.povray	128	599	1140	596	1140	**599**	**1140**	128	**444**	**1530**	443	1540	449	1520
454.calculix	128	**1095**	**965**	1087	972	1102	958	128	1034	1020	**1022**	**1030**	998	1060
459.GemsFDTD	128	**3130**	**434**	3131	434	3130	434	128	**3130**	**434**	3131	434	3130	434
465.tonto	128	1296	972	**1297**	**971**	1298	970	128	967	1300	**969**	**1300**	972	1300
470.lbm	128	**1520**	**1160**	1519	1160	1529	1150	128	**1520**	**1160**	1519	1160	1529	1150
481.wrf	128	**1619**	**883**	1614	886	1621	882	128	**1619**	**883**	1614	886	1621	882
482.sphinx3	128	3097	806	3104	804	**3100**	**805**	128	**3077**	**811**	3069	813	3079	810

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:
 433.milc with options:
  -O4 -nodp -m power7
 434.zeusmp with options:
  -O4 -vrox -nodp -m power7
 436.cactusADM 450.soplex with options:
  -O3 -lu -1 -nodp -sdp 9 -m power7
 437.leslie3d with options:
  -O4 -vrox -m power7
 465.tonto with options:
  -O4 -m power7
 482.sphinx3 with options:
  -O4 -sdp 9 -vrox -m power7
```

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.

12800 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"

 The "IBM Power 750 Express (3.61 GHz)" and the "IBM Power 755 (3.61 GHz)"
 are electronically equivalent. The results have been measured on the
 "IBM Power Express 750 (3.61 GHz)".
```

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`

Continued on next page

Base Portability Flags (Continued)

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`

Continued on next page

Peak Compiler Invocation (Continued)

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

470.lbm: basepeak = yes

482.sphinx3: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5
-qlargepage -D_ILS_MACROS -blpdata -btextpsize:64K

C++ benchmarks:

444.namd: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -q64
-qsimd -qvecnvol -qlargepage -D_ILS_MACROS -blpdata
-btextpsize:64K

447.dealII: -qipa=threads -bmaxdata:0x50000000 -qpdf1(pass 1)
-qpdf2(pass 2) -O4 -qsimd -qvecnvol -D_ILS_MACROS
-qrtti=all -D__IBM_FAST_VECTOR -D__IBM_FAST_SET_MAP_ITERATOR
-blpdata -btextpsize:64K

450.soplex: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -q64 -qlargepage
-D_ILS_MACROS -blpdata -btextpsize:64K

Continued on next page

Peak Optimization Flags (Continued)

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 -O3 -qarch=auto -qtune=auto -qlargepage -qxlf90=nosignedzero -blpdata -btextpsize:64K

437.leslie3d: -O5 -q64 -blpdata -btextpsize:64K

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) -O4 -qsimd -qvecnvol -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

C++ benchmarks (except as noted below):
-qipa=noobject -qsuppress=1500-036

450.soplex: -qsuppress=1500-036

Continued on next page

Peak Other Flags (Continued)

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`

437.leslie3d: `-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.20100901.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.20100901.xml
http://www.spec.org/cpu2006/flags/IBM-AIX.20100303.xml

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