SPEC® CFP2006 Result

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IBM Corporation

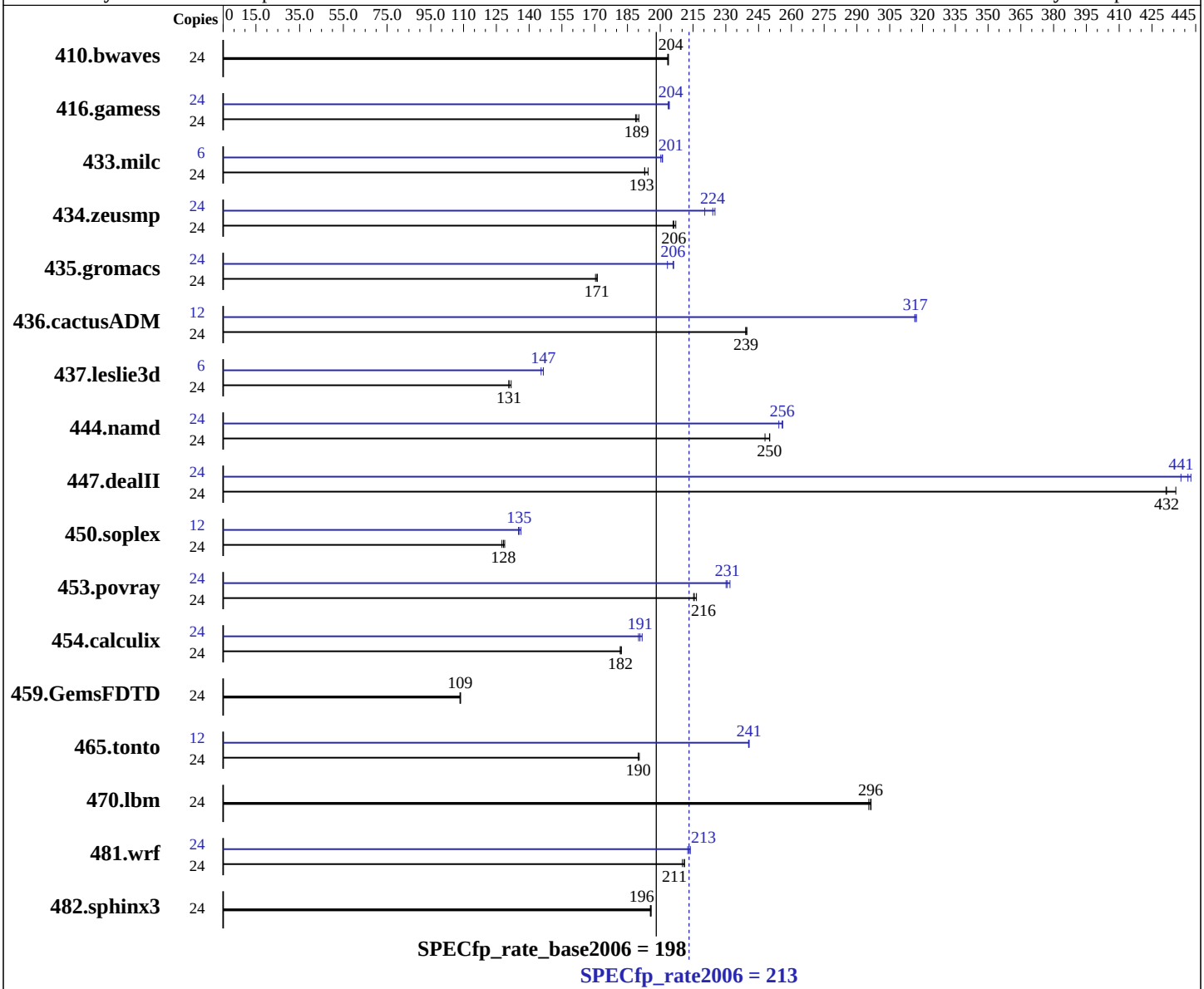
IBM Power 710 Express (3.7 GHz, 6 core)

SPECfp®_rate2006 = 213

SPECfp_rate_base2006 = 198

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

Test date: Aug-2010
Hardware Availability: Sep-2010
Software Availability: Sep-2010



Hardware

CPU Name:	POWER7
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 3.92 GHz
CPU MHz:	3724
FPU:	Integrated
CPU(s) enabled:	6 cores, 1 chip, 6 cores/chip, 4 threads/core
CPU(s) orderable:	6 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:	IBM XL C/C++ for AIX, V11.1 Version: 11.01.0000.0002 IBM XL Fortran for AIX, V13.1 Version: 13.01.0000.0002
Auto Parallel:	No
File System:	AIX/JFS2
System State:	Multi-user

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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:	64 GB (8x8 GB) DDR3 1066 MHz
Disk Subsystem:	2x146.8 GB SAS SFF 15K RPM
Other Hardware:	None

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	24	1601	204	1604	203	**1601**	**204**	24	1601	204	1604	203	**1601**	**204**
416.gamess	24	2471	190	**2483**	**189**	2490	189	24	**2303**	**204**	2302	204	2308	204
433.milc	24	1133	194	**1142**	**193**	1142	193	6	274	201	**274**	**201**	275	200
434.zeusmp	24	**1059**	**206**	1054	207	1061	206	24	970	225	991	220	**975**	**224**
435.gromacs	24	1001	171	1006	170	**1002**	**171**	24	**832**	**206**	843	203	831	206
436.cactusADM	24	**1199**	**239**	1199	239	1197	240	12	453	316	**453**	**317**	452	317
437.leslie3d	24	1712	132	**1725**	**131**	1726	131	6	**385**	**147**	385	147	388	145
444.namd	24	776	248	**770**	**250**	770	250	24	**753**	**256**	757	254	752	256
447.dealII	24	636	431	**636**	**432**	630	436	24	620	443	**622**	**441**	626	438
450.soplex	24	1569	128	1554	129	**1560**	**128**	12	734	136	**739**	**135**	741	135
453.povray	24	590	217	593	215	**592**	**216**	24	551	232	**553**	**231**	555	230
454.calculix	24	1089	182	**1089**	**182**	1086	182	24	1033	192	1042	190	**1038**	**191**
459.GemsFDTD	24	2344	109	2350	108	**2346**	**109**	24	2344	109	2350	108	**2346**	**109**
465.tonto	24	1240	190	1244	190	**1243**	**190**	12	491	240	**491**	**241**	491	241
470.lbm	24	1116	295	1112	296	**1113**	**296**	24	1116	295	1112	296	**1113**	**296**
481.wrf	24	1270	211	**1271**	**211**	1276	210	24	1261	213	**1257**	**213**	1254	214
482.sphinx3	24	2393	195	**2392**	**196**	2388	196	24	2393	195	**2392**	**196**	2388	196

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:
   450.soplex
 with options -O4 -sdp 9 -vrox -kr -m power7
fdpr binary optimization tool used for:
   433.milc 435.gromacs 444.namd
 with options -O3 -lu -1 -nodp -sdp 9 -m power7
fdpr binary optimization tool used for 434.zeusmp
 with options -RD -O4 -sdp 9 -vrox -nodp -m power7
fdpr binary optimization tool used for 436.cactusADM
 with options -O3 -m power7
fdpr binary optimization tool used for:
   437.leslie3d 453.povray 454.calculix
 with options -O4 -sdp 9 -vrox -rtb -nodp -m power7
```

Continued on next page

Peak Tuning Notes (Continued)

```
fdpr binary optimization tool used for 447.dealII
 with options -O4 -sdp 9 -vrox -m power7 -RD -dp
```

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

```
Environment variables set by runspec before the start of the run:
  MALLOCOPTIONS = "pool"
  MEMORY_AFFINITY = "MCM"
  XLFRTEOPTS = "intrinthds=1"

All ulimits set to unlimited.
6400 16M large pages defined with vmo command

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

Continued on next page

Base Portability Flags (Continued)

482.sphinx3: `-qchars=signed`

Base Optimization Flags

C benchmarks:
`-qipa=threads -bmaxdata:0x40000000 -O5 -qlargepage -O4 -D_ILS_MACROS -blpdata`

C++ benchmarks:
`-qipa=threads -bmaxdata:0x50000000 -O5 -qlargepage -O4 -D_ILS_MACROS -qrtti=all -D__IBM_FAST_VECTOR -D__IBM_FAST_SET_MAP_ITERATOR -blpdata`

Fortran benchmarks:
`-qipa=threads -bmaxdata:0x60000000 -O5 -qlargepage -O4 -qsmallstack=dynlenonheap -qalias=nostd -blpdata`

Benchmarks using both Fortran and C:
`-qipa=threads -bmaxdata:0x60000000 -O5 -qlargepage -O4 -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`

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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 -DSPEC_CPU_LP64
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 -qsimd -qvecnvol
-qlargepage -D_ILS_MACROS -qrestrict -qprefetch=aggressive
-qalign=natural -blpdata -btextpsize:64K

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

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

447.dealII: -qipa=threads -bmaxdata:0x50000000 -O4 -D_ILS_MACROS
-qrtti=all -D__IBM_FAST_VECTOR -D__IBM_FAST_SET_MAP_ITERATOR
-blpdata -btextpsize:64K

450.soplex: -bmaxdata:0x40000000 -qpdf1(pass 1) -qpdf2(pass 2) -O3
-qarch=auto -qtune=auto -q64 -qlargepage -D_ILS_MACROS
-blpdata -btextpsize:64K

453.povray: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -q64
-qsimd -qvecnvol -qlargepage -D_ILS_MACROS -qalign=natural
-bdatapsize:64K -bstackpsize:64K -btextpsize:64K

Continued on next page

Peak Optimization Flags (Continued)

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -qipa=threads -bmaxdata:0x40000000 -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qsimd -qvecnvol -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: -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=auto -qtune=auto -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 -O4 -q64 -qsimd -qvecnvol -D_ILS_MACROS -qnostrict -blpdata -btextpsize:64K

454.calculix: -qipa=threads -O5 -qsimd -qvecnvol -qlargepage -D_ILS_MACROS -blpdata -btextpsize:64K

481.wrf: -bmaxdata:0x30000000 -O3 -qarch=auto -qtune=auto -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

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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 (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.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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