SPEC® CFP2006 Result

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IBM Corporation

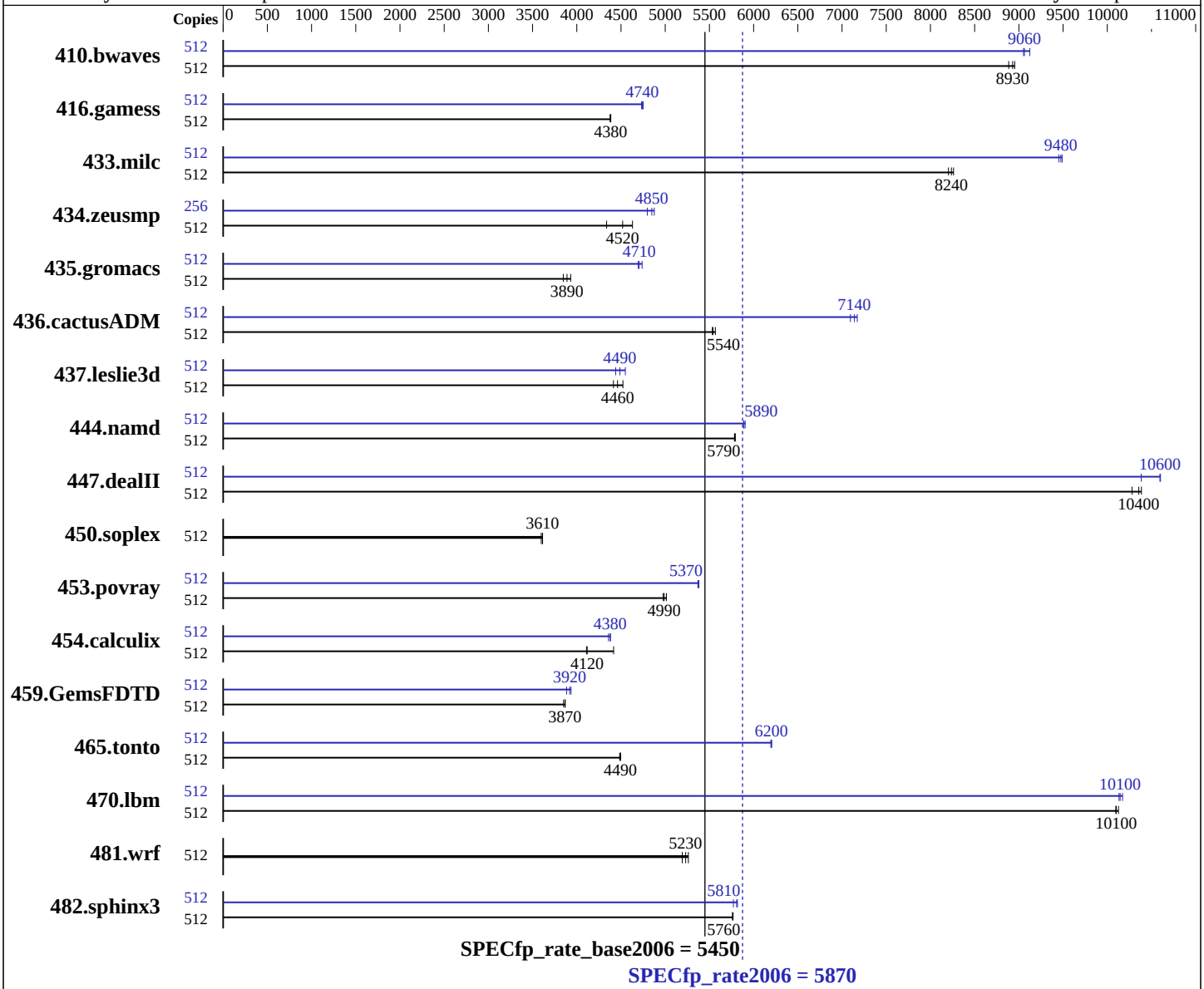
IBM Power 795 (4.25 GHz, 128 core)

SPECfp®_rate2006 = 5870

SPECfp_rate_base2006 = 5450

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:	TurboCore mode
CPU MHz:	4256
FPU:	Integrated
CPU(s) enabled:	128 cores, 32 chips, 4 cores/chip, 4 threads/core
CPU(s) orderable:	48 - 128 cores
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+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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L3 Cache: 4 MB I+D on chip per core
Other Cache: 16 MB I+D on chip per chip
Memory: 2 TB (256 x 8 GB) DDR3 1066 MHz
Disk Subsystem: 38 x 146.8 GB Raid0 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	512	777	8950	**779**	**8930**	783	8890	512	**768**	**9060**	763	9120	769	9050
416.gamess	512	**2287**	**4380**	2291	4380	2286	4380	512	2110	4750	2118	4730	**2114**	**4740**
433.milc	512	573	8200	569	8260	**571**	**8240**	512	497	9450	**496**	**9480**	495	9490
434.zeusmp	512	1074	4340	**1031**	**4520**	1006	4630	256	486	4800	478	4880	**480**	**4850**
435.gromacs	512	**940**	**3890**	950	3850	930	3930	512	**777**	**4710**	771	4740	779	4690
436.cactusADM	512	1106	5530	**1104**	**5540**	1099	5570	512	862	7100	853	7170	**857**	**7140**
437.leslie3d	512	1090	4410	**1079**	**4460**	1064	4520	512	1058	4550	1084	4440	**1073**	**4490**
444.namd	512	**710**	**5790**	710	5780	709	5790	512	697	5890	695	5900	**697**	**5890**
447.dealII	512	570	10300	564	10400	**566**	**10400**	512	**553**	**10600**	552	10600	564	10400
450.soplex	512	1187	3600	1182	3610	**1182**	**3610**	512	1187	3600	1182	3610	**1182**	**3610**
453.povray	512	547	4980	543	5010	**546**	**4990**	512	506	5380	507	5370	**507**	**5370**
454.calculix	512	956	4420	1028	4110	**1026**	**4120**	512	969	4360	**965**	**4380**	964	4380
459.GemsFDTD	512	1411	3850	**1405**	**3870**	1404	3870	512	**1386**	**3920**	1380	3940	1398	3880
465.tonto	512	**1121**	**4490**	1123	4480	1121	4500	512	812	6200	813	6190	**812**	**6200**
470.lbm	512	695	10100	**696**	**10100**	697	10100	512	694	10100	692	10200	**693**	**10100**
481.wrf	512	**1093**	**5230**	1087	5260	1101	5190	512	**1093**	**5230**	1087	5260	1101	5190
482.sphinx3	512	1732	5760	**1732**	**5760**	1730	5770	512	1729	5770	**1718**	**5810**	1715	5820

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 -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 435.gromacs
 with options -O3 -lu -1 -nodp -sdp 9 -m power7
fdpr binary optimization tool used for 436.cactusADM
 with options -O3 -m power7
fdpr binary optimization tool used for 437.leslie3d
 with options -O4 -sdp 9 -vrox -rtb -nodp -m power7
fdpr binary optimization tool used for 444.namd
 with options -O3 -lu -1 -nodp -sdp 9 -m power7
fdpr binary optimization tool used for 447.dealII
 with options -O4 -sdp 9 -vrox -m power7 -RD -dp
```

Continued on next page

Peak Tuning Notes (Continued)

```
fdpr binary optimization tool used for 450.soplex
 with options -O4 -sdp 9 -vrox -kr -m power7
fdpr binary optimization tool used for 453.povray
 with options -O4 -sdp 9 -vrox -rtb -nodp -m power7
fdpr binary optimization tool used for 454.calculix
 with options -O4 -sdp 9 -vrox -rtb -nodp -m power7
fdpr binary optimization tool used for 459.GemsFDTD
 with options -O4 -sdp 9 -vrox -kr -m power7
fdpr binary optimization tool used for 482.sphinx3
 with options -O4 -nodp -m power7 -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

```
all ulimits set to unlimited.
84600 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"
```

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 -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

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: -qipa=threads -bmaxdata:0x30000000 -O5 -qlargepage
-D_ILS_MACROS -blpdata -btextpsize:64K

482.sphinx3: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O4
-qlargepage -D_ILS_MACROS -blpdata -btextpsize:64K

C++ benchmarks:

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

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Peak Optimization Flags (Continued)

450.soplex: basepeak = yes

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

Fortran benchmarks:

410.bwaves: -qipa=threads -bmaxdata:0x50000000 -qpdf1(pass 1)
-qpdf2(pass 2) -O4 -qlargepage -qsmallstack=dynlenonheap
-blpdata -btextpsize:64K

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) -O5 -blpdata -btextpsize:64K

459.GemsFDTD: -bmaxdata:0x50000000 -qpdf1(pass 1) -qpdf2(pass 2) -O3
-qarch=auto -qtune=auto -qlargepage -blpdata
-btextpsize:64K

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: basepeak = yes

Peak Other Flags

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

470.lbm: `-qsuppress=1500-036`

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

Fortran benchmarks (except as noted below):
```
-qsuppress=1500-010 -qsuppress=cmpmsg -qsuppress=1500-036
```

410.bwaves: `-qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg -qsuppress=1500-036`

416.gamess: `-qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg -qsuppress=1500-036`

465.tonto: `-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
```

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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